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March 4, 2022

Mr. Jonathan Lamb
Michigan Department of Environment, Great Lakes, and Energy
Air Quality Division
Detroit Field Office
Cadillac Place
3058 West Grand Boulevard
Suite 2-300
Detroit, MI 48202-6058

RE: Revised Startup, Shutdown and Malfunction Abatement Plan
Ameresco Woodland Meadows Romulus LLC (P0317) – Canton, Michigan
Permit to Install No. 61-16

Dear Mr. Lamb:

Ameresco Woodland Meadows Romulus LLC (Ameresco) is submitting to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) the enclosed revised Startup, Shutdown and Malfunction Abatement Plan (Plan) for the Ameresco facility located in Canton, Michigan. This Plan was previously prepared and submitted to MDEQ to comply with Condition III.5 for emission unit EUHBTUENCL and Condition III.10 for emission unit EUHBTUOPEN of Permit to Install No. 61-16 dated effective August 29, 2016 and Renewable Operating Permit No. MI-ROP-P0317-2012a (pending renewal). This SSM Plan is also required by Michigan Rule 336.1911. The purpose of this Plan is to provide procedures to prevent, detect and correct malfunctions or equipment failures resulting in emissions exceeding any applicable emissions limitation.

The revisions made to this plan are noted in the Revision History table included at the beginning of the Plan.

Should you have any questions concerning the content of this revised Plan, or require additional information, please do not hesitate to contact Ms. Stevia Smith at (508) 598-4386 or smiths@ameresco.com.

Respectfully submitted,

Mr. Harold Stewart
Manager – Plant Operations
Ameresco Woodland Meadows Romulus LLC
By: AMERESCO, Inc. Its Sole Member



MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
AIR QUALITY DIVISION

**RENEWABLE OPERATING PERMIT
REPORT CERTIFICATION**

Authorized by 1994 P.A. 451, as amended. Failure to provide this information may result in civil and/or criminal penalties.

Reports submitted pursuant to R 336.1213 (Rule 213), subrules (3)(c) and/or (4)(c), of Michigan's Renewable Operating Permit (ROP) program must be certified by a responsible official. Additional information regarding the reports and documentation listed below must be kept on file for at least 5 years, as specified in Rule 213(3)(b)(ii), and be made available to the Department of Environment, Great Lakes, and Energy, Air Quality Division upon request.

Source Name Ameresco Woodland Meadows Romulus LLC County Wayne

Source Address 4620 Hannan Road City Canton

AQD Source ID (SRN) P0317 ROP No. P0317-2012a ROP Section No. _____

Please check the appropriate box(es):

Annual Compliance Certification (Pursuant to Rule 213(4)(c))

Reporting period (provide inclusive dates): From _____ To _____

- 1. During the entire reporting period, this source was in compliance with **ALL** terms and conditions contained in the ROP, each term and condition of which is identified and included by this reference. The method(s) used to determine compliance is/are the method(s) specified in the ROP.
- 2. During the entire reporting period this source was in compliance with all terms and conditions contained in the ROP, each term and condition of which is identified and included by this reference, **EXCEPT** for the deviations identified on the enclosed deviation report(s). The method used to determine compliance for each term and condition is the method specified in the ROP, unless otherwise indicated and described on the enclosed deviation report(s).

Semi-Annual (or More Frequent) Report Certification (Pursuant to Rule 213(3)(c))

Reporting period (provide inclusive dates): From _____ To _____

- 1. During the entire reporting period, **ALL** monitoring and associated recordkeeping requirements in the ROP were met and no deviations from these requirements or any other terms or conditions occurred.
- 2. During the entire reporting period, all monitoring and associated recordkeeping requirements in the ROP were met and no deviations from these requirements or any other terms or conditions occurred, **EXCEPT** for the deviations identified on the enclosed deviation report(s).

Other Report Certification

Reporting period (provide inclusive dates): From N/A To N/A

Additional monitoring reports or other applicable documents required by the ROP are attached as described:

Startup, Shutdown & Malfunction Abatement Plan (required by PTI 61-16)-Revised 3/4/22

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this report and the supporting enclosures are true, accurate and complete

<u>Harold Stewart</u>	<u>Manager-Plant Operations</u>	<u>847-463-0628</u>
Name of Responsible Official (print or type)	Title	Phone Number

Signature of Responsible Official

3-4-2022

Date

* Photocopy this form as needed.

STARTUP, SHUTDOWN AND MALFUNCTION ABATEMENT PLAN

AMERESCO WOODLAND MEADOWS ROMULUS LLC
STATE REGISTRATION NUMBER (SRN): P0317

ECP-WM-05

Prepared for and by:



Ameresco Woodland Meadows Romulus LLC
4620 Hannan Road
Canton, Michigan 48184

REVISED MARCH 4, 2022

TABLE OF CONTENTS

SECTION	PAGE
1.0 INTRODUCTION	2
1.1 Purpose of Plan.....	2
1.2 Facility Information	2
2.0 MONITORING OF OPERATIONS	2
3.0 IDENTIFICATION OF SSM EVENTS	3
4.0 STARTUP AND SHUTDOWN PROCEDURES	3
5.0 MALFUNCTION PROCEDURES	4
6.0 PREVENTATIVE MAINTENANCE PROCEDURES	5
7.0 SSM RECORDKEEPING	5
8.0 SSM COMMUNICATION	5
9.0 SSM REPORTING	6
9.1 Semi-Annual SSM Reports.....	6
9.2 Reporting Events Inconsistent with SSM Plan	6
TABLES	
1 Potential Malfunctions and Corrective Actions	
ATTACHMENTS	
A Facility Contacts	
B Open and Enclosed Flares Preventative Maintenance Procedures	

1.0 INTRODUCTION

1.1 Purpose of Plan

This Startup, Shutdown and Malfunction Abatement Plan (SSM Plan) has been prepared to comply with Permit to Install No. 61-16 dated effective August 29, 2016 and Renewable Operating Permit No. MI-ROP-P0317-2012a (pending renewal) for the Ameresco Woodland Meadows Romulus LLC (Ameresco) facility located in Canton, Michigan. The purpose of this SSM Plan is to provide procedures to prevent, detect and correct malfunctions or equipment failures resulting in emissions exceeding any applicable emissions limitation. This SSM Plan is also required by Michigan Rule 336.1911, which states that the following components must be included, as applicable:

- a) A complete preventative maintenance program, including identification of the supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air-cleaning devices, a description of the items or conditions that shall be inspected, the frequency of the inspections or repairs, and an identification of the major replacement parts that shall be maintained in inventory for quick replacement;
- b) An identification of the source and air-cleaning device operating variables that shall be monitored to detect a malfunction or failure, the normal operating range of these variables, and a description of the method of monitoring or surveillance procedures; and,
- c) A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

1.2 Facility Information

The Ameresco Woodland Meadows Romulus facility is located at 4620 Hannan Road in Canton, Michigan. The Ameresco facility processes landfill gas from Waste Management of Michigan, Inc.'s (Waste Management) Woodland Meadows Recycling and Disposal Facility (Woodland Meadows RDF) into high-BTU gas to be delivered to a natural gas pipeline owned by Detroit Edison Gas Company (DTE). The Ameresco facility is owned and operated separately from the Woodland Meadows RDF and the DTE pipeline.

Ameresco's facility is able to process up to 6,600 standard cubic feet per minute (scfm) of landfill gas to produce 2,630 scfm of high-BTU gas. The facility includes one (1) enclosed flare (EUHBTUENCL) and one (1) open flare (EUHBTUOPEN) which will combust the waste gas streams from the high-BTU process. Siloxanes, hydrocarbons, sulfides and sulfur compounds present in the raw landfill gas are removed during regeneration of a CO₂ pressure swing absorption (PSA) gas treatment system. The waste gas from the regeneration process is sent to the enclosed flare (EUHBTUENCL) for destruction. Waste gas from the N₂ PSA system is destroyed in the open flare (EUHBTUOPEN). The Ameresco facility is designed to operate continuously with occasional downtime for maintenance.

2.0 MONITORING OF OPERATIONS

Normal operations at the facility involves operation of the CO₂ and N₂ PSA systems to treat landfill gas, operation of the enclosed and open flares to combust tail gases from the CO₂ and N₂ PSA systems, and operation of various devices which monitor operations and collect data. The equipment monitoring devices are designed to detect when the facility is experiencing normal or abnormal conditions. If a malfunction of a component of the Ameresco facility is detected, the automated system alarms and sends alerts to the facility Operator, Compliance Team, and other appropriate personnel.

Flow meters are present at the Ameresco facility which measure the flow of gas to the open and enclosed flares. Flow data is recorded at least every 15 minutes. If abnormal or insufficient flow is delivered to a flare, or if a flow meter malfunctions, the PLC detects the abnormal data received from the flow meter, and electronically alerts Ameresco personnel.

Multiple thermocouples are present on the open and enclosed flares. The thermocouples detect the temperature at the flare in order to verify that combustion is occurring. The temperature data sensed by the thermocouples is transmitted to the PLC and recorded. If a flare is intended to be operating, and the temperature data from the thermocouples indicates that combustion is not occurring at the flare, or the temperature is too low or too high, then the flow of gas to the flare would be stopped, the flare would be shut down, and an electronic alert sent to Ameresco personnel.

The emission sources at this Ameresco facility are the open and enclosed flares, and the monitoring equipment detects normal and abnormal operations of the flares including startups, shutdowns and malfunctions of the flares, which are to be handled in accordance with this Plan.

3.0 IDENTIFICATION OF SSM EVENTS

Definitions for startup, shutdown and malfunction are provided in 40 CFR 63.2, as follows:

Startup is “the setting in operation of an affected source or portion of an affected source for any purpose.”

Shutdown is “the cessation of operation of an affected source or portion of any affected source for any purpose.”

Malfunction is “any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitation in an appropriate standard to be exceeded.”

Startup, shutdown and malfunction events can be classified as intentional or unintentional, and manual or automatic. An unintentional shutdown is deemed to be a malfunction. Startup actions are usually in response to some previous shutdown action and are classified as intentional, meaning there is no such thing as an unintentional startup action. Malfunction actions are, by definition, deemed to be unintentional. Startup and shutdown actions are classified as manual if the action involved manual intervention to achieve the objective, and are classified as automatic if the action involved no manual intervention.

4.0 STARTUP AND SHUTDOWN PROCEDURES

Because most equipment and components of the Ameresco facility are expected to normally be operational or in a functional mode, the majority of shutdown and malfunction actions are soon followed by a startup action. The Ameresco facility is designed for partial automatic operation under normal conditions. Typical planned startups and shutdowns of the facility do not create excess emissions.

Some common causes of planned shutdowns at the facility are as follows:

- Equipment maintenance, repair, or cleaning
- Addition or removal of facility components
- Equipment testing
- Planned electrical outages
- Events at the Woodland Meadows RDF (owned and operated separately from the Ameresco facility), such as:
 - Landfill gas extraction well raising
 - Landfill gas collection system modifications or expansions
 - Movement of piping to accommodate new components or filling operations
 - Landfill testing
- Planned maintenance on the utility (DTE) remote monitoring station for the product gas

The general basic shutdown procedures for the facility are as follows:

- Ensure that no unsafe conditions exist in or near the facility area.
- Initiate the shutdown sequence(s) per manufacturer’s instructions.

- After the process is shutdown, depressurize and purge feed and product compressors to the flares.
- Once process is shutdown and purged, proceed in shutting down the flares.
- After shutdown, verify that the system has achieved normal shutdown levels for all levels, temperatures, and pressures.

For specific shutdown instructions for individual equipment at the Ameresco facility, refer to the appropriate operations manual from the manufacturer.

The general basic startup procedures for the facility are as follows:

- Ensure that no unsafe conditions exist in or near the facility area.
- Ensure that the following conditions are met:
 - All system manual stop or isolation valves are in their proper position.
 - All system equipment are functional and ready for service.
 - Levels, pressures, and temperatures are within normal startup ranges.
 - All system alarms are reset and clear.
 - Main power is on and available to the control panel, and equipment energized.
 - No Emergency stops are active.
- Initiate main startup sequences per manufacturer's guidelines.
- Verify that the system achieves normal operating conditions.

The Enclosed Flare must be started, up to temperature, and ready to accept waste gas as a permissive in order for the CO₂ PSA system to start. The Open Flare must be ready to start and accept waste gas as a permissive in order for the N₂ PSA system to start.

For specific startup instructions for individual equipment at the Ameresco facility, refer to the appropriate operations manual from the manufacturer.

5.0 MALFUNCTION PROCEDURES

Malfunctions are considered abnormal operating conditions at the Ameresco facility and must be corrected as soon as possible. In general, the following process should be followed in response to a malfunction:

- Minimize/halt excess emissions (if present);
- Notify appropriate Ameresco management personnel;
- Determine the cause of the malfunction;
- Correct the issue causing the malfunction;
- Document the malfunction in the appropriate SSM event form;
- Communicate progress of resolving the malfunction event with Ameresco management personnel.

One of the initial responses to a malfunction is to determine whether the event has caused an exceedance, or has the potential to cause an exceedance, of any applicable emission limitation. If excess air pollutant emissions are occurring or could occur, personnel must take immediate necessary steps to reduce emissions to permissible limits. If excess emissions result from an SSM event, Ameresco compliance team personnel are responsible for submitting a notification/report to the appropriate regulatory entity, as applicable, as discussed in Section 9.0 of this SSM Plan.

The following are examples of malfunctions which could occur at the Ameresco facility, some of which have the potential to cause excess emissions:

- Enclosed or open flare loss of flame
- Enclosed or open flare failure to achieve desired combustion temperature
- Free venting of gas
- Any process system (including the CO₂ and N₂ PSA systems) malfunction that causes the loss of the run permissive signal for that system.

- Blower(s) malfunction
- Valve(s) malfunction
- Fire event as detected by the plants fire detection systems
- Methane event as detected in the compressor building methane detectors
- Overpressure of the CO₂ or N₂ tail gas systems.
- Malfunction of gas flow, methane and temperature monitoring devices for the flares
- Gas piping leak or damage
- Excessive pollutants in gas delivered to Ameresco facility
- Loss of electrical power
- Visible emissions
- Gas analyzer malfunction causing shutdown of process
- Gas quality issues resulting in DTE shutting in facility

The scenarios at the facility which could result in excess emissions include equipment malfunctions such as a leak of gas to the atmosphere, or free venting of gas through a flare when combustion is not occurring. As described in this SSM Plan, Ameresco has devices and features at its facility to detect malfunctions which could result in excess emissions.

Table 1 attached is a list of equipment at the Ameresco facility with associated potential malfunctions and corrective actions.

6.0 FLARES PREVENTATIVE MAINTENANCE PROCEDURES

See Attachment B for preventative maintenance procedures for the open and enclosed flares at this Ameresco facility.

7.0 SSM RECORDKEEPING

For any SSM event which results in an exceedance of an emission limitations or an operational standard under the facility's air permit(s) or applicable regulation(s), the facility operator must complete a SSM record. SSM records should be retained in the facility files for a minimum of at least 5 years. The SSM record must include the following information:

- Date and time the startup, shutdown and/or malfunction event occurred;
- Duration of the SSM event;
- A description of the affected equipment;
- Cause of SSM event (if known);
- Corrective action; and,
- Whether or not an applicable emission limitation was exceeded, and if so, a description of the limit.

8.0 SSM COMMUNICATION

Significant and major malfunctions at the facility must be communicated to the appropriate Ameresco personnel. In addition to various alarms and alerts which are programmed into the control systems at the facility, the Operator(s) must alert the appropriate management personnel in the event of such abnormal conditions. The Operator(s) shall notify appropriate personnel of these event by phone as soon as possible, noting all pertinent details including when the malfunction began, the cause (if known), and the corrective action being taken. The management personnel will provide additional instructions for correction of the event if necessary. In addition to this initial phone call, the Operator(s) shall continue phone communication with management personnel as needed concerning the status of the malfunction, such as change in conditions and when the malfunction is corrected. Attachment A to this SSM Plan contains a contact list for the Ameresco Woodland Meadows facility.

9.0 SSM REPORTING

9.1 Semi-Annual Reports

Ameresco is required to submit a SSM Plan report to the EGLE Air Quality District office annually by March 15 for reporting period July 1 to December 31 and September 15 for the reporting period January 1 to June 30. The SSM report must include the name, title, and signature of the owner or operator or other responsible official who is certifying its accuracy.

In accordance with 40 CFR 63.10(d)(5), if actions taken during a malfunction were consistent with this SSM Plan, and the malfunction resulted or had the potential to result in an exceedance of an applicable emission standard, then the event must be noted in the semi-annual SSM report including actions taken to minimize emissions during the SSM event, duration, and a brief description.

9.2 Reporting Events Inconsistent With SSM Plan

If actions taken during a malfunction were not consistent with this SSM Plan, and the malfunction resulted in an exceedance of an applicable emission standard, the event must be reported to Michigan Department of Environment, Great Lakes and Energy, Air Quality Division, Detroit District Office by telephone or facsimile within two (2) working days after commencing the actions that were inconsistent with the plan. The phone and facsimile numbers are as follow:

EGLE Air Quality Division Detroit District Office:

Telephone: 313-456-4700

Facsimile: 313-456-4692

If a malfunction event qualifies as an environmental emergency, it must also be reported to the EGLE Pollution Emergency Alerting System (PEAS) at 800-292-4706. The PEAS hotline should be used to report environmental pollution emergencies including releases of hazardous materials to land, water, or air. The PEAS hotline is staffed to take emergency calls 24/7.

A letter must be sent to the enforcing authority within seven (7) working days after a malfunction. The letter must include the following information:

- Name, title, and signature of the owner or operator or other responsible official who is certifying its accuracy;
- An explanation of the circumstances of the event;
- The reasons for not following the SSM Plan;
- A description of all excess emissions and/or parameter monitoring exceedances which are believed to have occurred (or could have occurred); and,
- Actions taken to minimize emissions.

The letter shall be sent to the following address:

Michigan Department of Environment, Great Lakes and Energy
Air Quality Division
Detroit District Office
Cadillac Place, Suite 2-300
3058 West Grand Blvd.
Detroit, MI 48202

If actions taken during a malfunction were not consistent with this SSM Plan, and if actions taken were an inappropriate and/or ineffective response, Ameresco must also revise the SSM Plan within 45 days after the malfunction to include operating procedures and corrective actions for the facility during similar malfunction events, and include the revised SSM Plan in the next semi-annual SSM report.

TABLES

**TABLE 1. POTENTIAL MALFUNCTIONS AND CORRECTIVE ACTIONS
AMERESCO WOODLAND MEADOWS ROMULUS LLC**

EQUIPMENT	PURPOSE	POTENTIAL MALFUNCTION	CORRECTIVE ACTION
Transmission Piping			
Gas Piping and Fittings	Conveys extracted LFG to the treatment facility equipment.	Broken or cracked pipe or fitting.	Repair or replace broken or cracked pipe segment or fitting.
		Pipe obstructions.	Remove obstruction, or replace obstructed portion of pipe.
		Leak at flange connection or other system fitting.	Re-tighten flange bolts; replace flange gasket; or replace affected fitting.
		Differential settlement issues.	Re-route gas collection piping around settlement area, or perform cover soil maintenance to fill in surface depression(s).
Relief Valves	Protects system from overpressure	Leaking or "tea kettling"	Repair leaking relief valves, reduce operating pressure if valve is lifting off seat ("tea kettling")
Isolation Valves	Regulates vacuum or used to isolate segments of the LFG piping for maintenance.	Unable to adjust vacuum or unable to isolate segments of LFG piping.	Repair or replace defective valve assembly.
Expansion Joints	Provides flexibility to piping system from thermal expansion and contraction, and differential settlement.	Material failure or separation of expansion joint from piping.	Repair or replace expansion joint.
Condensate Management System			
Condensate Sump	Collects liquid condensate discharged from gas collection piping and LFG treatment equipment.	Condensate unable to drain into sump.	Repair or replace drain line between condensate sump and gas collection piping or LFG control and treatment equipment. Too high of system vacuum in gas collection piping or LFG control and treatment equipment; reduce system operating pressure or reinstall sump deeper into ground.
		High pressure drop or low flow capacity	Check bag filters/replace as needed
Condensate Treatment System	Treats condensate for metals, phenols prior to sewer discharge	Condensate sample not meeting limits	Check system for proper operation, bypass of media tanks, replace media if needed.
Sump Pump Assembly	Pumps accumulated condensate from sump through force main system to its point of disposal.	Pump unable to pump condensate from sump.	Repair or replace defective pump or pump component(s). Repair or replace defective level switches.
		Sump Pump Controller	Controls and regulates air supply to sump pump.
Valves	Isolates condensate sump or a portion of the air supply or force main piping from rest of system.	Unable to isolate condensate sump or a portion of the air supply or force main piping from rest of system.	Repair or replace defective valve assembly.
Check Valves	Prevents reverse flow of condensate in force main back into condensate sump.	Unable to stop reverse flow condensate back into condensate sump.	Repair or replace defective valve assembly.
Drain lines, force main, and air supply piping	Conveys condensate into and from condensate sumps, and provides compressed air from air compressor to sump pump or pump controller.	Broken or cracked pipe or fitting.	Replace broken or cracked pipe segment or fitting.
		Pipe obstructions.	Remove obstruction, or replace obstructed portion of pipe.
		Leak at flange connection or other system fitting.	Re-tighten flange bolts; replace flange gasket; or replace affected fitting.
Condensate Knockout Pot	Removes excess moisture and particulates from gas stream before entering LFG blower.	Vessel will not drain accumulated condensate.	Clean bottom interior of vessel of sedimentation that may be obstructing drain connection.
		Excess pressure drop across vessel.	Check filters, replace if needed. Check for moisture freezing on filters. Check heat trace for proper operation
		Leaking flanges or fittings.	Retighten flange bolts, replace flange gasket or affected fitting.
Air Compressor	Provides compressed air for condensate sump pumps and pneumatic autovalve.	Unable to provide compressed air at the parameters needed for equipment operation.	Troubleshoot problem(s) and repair air compressor in accordance with the equipment manufacturer's O&M manual and recommendations.
		High moisture in air resulting in actuator failure or freezing	Check air dryer operation and regeneration functions, replace desiccant.
		High duty cycle.	Reduce air supply demand or replace existing air compressor with larger capacity unit.
Gas Treatment Process Devices			
Compressor(s)/Blower (s)	Compress gas to required process pressures.	Unable to provide the gas flow and operating pressure parameters required.	Check system operation for points of excessive pressure drops. Troubleshoot problem. Reduce flow if required. Troubleshoot problem(s) and repair or replace blower(s)/compressor(s) in accordance with the equipment manufacturer's O&M manual and recommendations.
		Compressor/Blower Motor and Drive Unit	Prime mover for gas compressor/blower.
Isolation Valves	Isolate individual compressor(s)/blower(s) or used as a manual stop valve to prevent LFG from passively venting through system.	Unable to isolate compressor/blower or prevent passive venting of LFG.	Repair or replace defective valve assembly.
Check Valves	Prevents reverse flow of LFG from one compressor/blower into another.	Unable to stop reverse flow of LFG back into offline compressor/blower.	Repair or replace defective valve assembly.
Auto-valve	Normally-closed, pneumatically-operated valve that initiates closure upon system shutdown to prevent LFG from passively venting through system when system is unattended.	Valve unable to open or close when actuated by system controls.	Troubleshoot problem(s) and repair or replace autovalve in accordance with the manufacturer's O&M manual and recommendations.
Electrical/Electrical Control Panel	Houses electrical service entrance, motor starters, relays, PLC, autodialer, and system controls, including switches, indicator lights and/or gauges.	Unable to supply electrical power to activate or deactivate system or system components when initiated.	Power outage through local utility company. Troubleshoot problem(s) and repair or replace defective components in accordance with the control panel manufacturer's O&M manual and recommendations.

**TABLE 1. POTENTIAL MALFUNCTIONS AND CORRECTIVE ACTIONS
AMERESCO WOODLAND MEADOWS ROMULUS LLC**

EQUIPMENT	PURPOSE	POTENTIAL MALFUNCTION	CORRECTIVE ACTION
Compressor/Blower Operations	Generate the required pressure to the end users.	High amperage - too high of LFG flow through compressor/blower.	Reduce LFG flow rate or operate multiple compressors/blowers in parallel, if so equipped.
		Compressor/Blower surge - too low of LFG flow through compressor/blower.	Increase LFG flow rate, or, install recirculation line with an adjustment valve between compressor/blower discharge and compressor/blower inlet and recirculate gas flow.
		Excessive compressor/blower vibration or operating noise.	Troubleshoot compressor/blower impeller, shaft seals and bearing assemblies. Repair or replace components in accordance with the compressor/blower manufacturer's O&M manual and recommendations.
Dehydration Unit	Cools the landfill gas	Mechanical, electrical or structural failure	Troubleshoot problem and repair in accordance with manufacturer's O&M manual and recommendations.
Cooler	Supply clean and dehumidified LFG by reducing temperature and removes majority of the containments as well as large portion of condensate	Mechanical, electrical or structural failure	Troubleshoot problem and repair in accordance with manufacturer's O&M manual and recommendations.
Chiller	Reduce gas temperature and removes condensate and other impurities	Mechanical, electrical or structural failure	Troubleshoot problem and repair in accordance with manufacturer's O&M manual and recommendations.
Filter	Remove particulates from the landfill gas	Obstruction	Troubleshoot problem and repair in accordance with manufacturer's O&M manual and recommendations.
Open and Enclosed Flare Systems			
Open and enclosed flares-general	Combust CO2 and N2 PSA systems tail gases	Not able to restart due to ignitor and or flame scanner.	Troubleshoot problem and repair in accordance with manufacturer's O&M manual and recommendations.
		Too much oxygen in the gas or lack of LFG flow to the flare	Identify cause of oxygen or blockage of flow and repair.
		Shutdown of flare due to high water levels in flare stack	Empty flare stack drain(s).
		Pilot flame failure	Propane supply low - replenish supply of propane. Scanner or pilot TC needs to be checked for proper operation and/or repositioned. Dirty ignitor - clean.
		Accidental pressing of emergency STOP button	Follow manufacturer's procedures for flare startup.
Enclosed flare-general	Combust CO PSA system tail gas	Enclosed flare temperature high or low	Check damper operation, check selection of correct thermocouple for control, check for high methane in CO2 tail gas-reduce flow if possible & check CO2 PSA operation. Check burner flow control valve for proper operation.
		Not able to start due to purge failure	Check differential pressure switch operation, check blower power supply & operation.
Open flare-general	Combust N2 PSA system tail gas	Wind/storm blowing out flame	Follow manufacturer's instructions for flare startup.
		N2 tail gas methane content low	Switch over to continuous pilot to help assist flame stability.
Thermocouple	Measure temperature at flare tip	Failure of the thermocouple	Replace thermocouple with onsite backup unit.
Flame Arrestor	Prevent fire or explosion	Failure of the flame arrestor (clogging, freezing, etc.)	Clean flame arrestor or replace if necessary.
Monitoring Equipment			
Sample or Monitoring Port	Provides access to LFG stream for monitoring.	Sample or monitoring port does not operate or is broken off.	Replace with new sample or monitoring port.
Pressure Gauge	Provides instantaneous reading of static or differential pressure.	Gauge does not operate.	Replace with new instrument.
Pitot Tube	Measures differential or velocity pressure for flow determination.	Unable to provide measurable differential or velocity pressures.	Repair or replace pitot tube.
Orifice Plate	Measures differential pressure for flow determination.	Unable to provide measurable differential pressures.	Repair or replace orifice plate.
Flow Measuring Device	Measures velocities for flow determination.	Device unable to provide accurate or measurable velocities.	Calibrate, repair or replace flow measuring device or signal wire in accordance with the equipment manufacturer's O&M manual and recommendations.
Compressor/blower Surge, Vibration or High Amperage Sensors	Used to detect faults in compressor/blower operation.	Sensors unable to detect compressor/blower faults or transmit signal to control panel.	Repair or replace sensor or signal wire.

ATTACHMENTS

ATTACHMENT A
FACILITY CONTACTS

FACILITY CONTACTS

*****IN AN EMERGENCY EVENT CALL 911*****

FACILITY:

Ameresco Woodland Meadows Romulus LLC
4620 Hannan Road
Canton, Michigan 48184
Facility Office Phone: 734-595-8789

OPERATORS:

Paul Pronishen – Operator
Office: 734-595-8789
Mobile: 810-422-8922
Email: ppronishen@ameresco.com

Don Meeks – Operator
Office: 734-595-8789
Mobile: 248-996-0350
Email: dmeeks@ameresco.com

Tygh Outland
Office: 734-595-8789
Mobile: 989-666-6786
Email: toutland@ameresco.com

MANAGEMENT:

Harold Stewart – Manager of Plant Operations
Office: N/A
Mobile: 847-463-0628
Email: hstewart@ameresco.com

COMPLIANCE TEAM:

Richard Peary – Compliance Manager
Office: 508-598-3076
Mobile: 781-267-0063
Email: rpeary@ameresco.com

Stevia Smith – Sr. Environmental Compliance Specialist
Office: 508-598-4386
Mobile: 704-989-2023
Email: smiths@ameresco.com

Rebecca Sherwood – Environmental Compliance Engineer
Office: (508) 598-3049
Mobile: (215) 586-1197
Email: rsherwood@ameresco.com

POLICE DEPARTMENT:

Canton Police Department
1150 S. Canton Center Road
Canton, MI 48188
Phone: 734-394-5400
Emergency: 911

FIRE DEPARTMENT:

Canton Fire Department
1150 S. Canton Center Road
Canton, MI 48188
Phone: 734-394-5455
Emergency: 911

HOSPITAL:

Oakwood Healthcare Center – Canton
7300 N Canton Center Road
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ATTACHMENT B

OPEN AND ENCLOSED FLARES PREVENTATIVE MAINTENANCE PROCEDURES

XII. MAINTENANCE

NOTICE

The following maintenance summary is designed only as a guideline and does not identify all areas or components requiring maintenance attention. A maintenance program must be developed considering existing company policy, operational experience, and manufacturer requirements. This operating manual is to be used in conjunction with, and does not replace, any company policies.

General

1. Refer to manufacturer literature in Section XIX, "Manufacturer Information" for specific maintenance requirements of individual components.
2. Review operation and calibration procedures for individual instruments in Section XIX, "Manufacturer Information" as recommended by the manufacturer.
3. Inspect all flanges and connections for indications of leaking. Repair or replace if necessary.

Flare

1. Visually inspect flare tips and flare stack for damage or deterioration.
2. Inspect the exterior surface for indications of heat degradation. Paint discoloration may indicate insulation damage.
3. Assess overall integrity of internal insulation once a month. Torn or worn insulation may result in equipment damage. Repair if necessary.
4. Remove the flare tip for cleaning if an obstruction is suspected. Measure pressure differential between the flare inlet flange and flare tip exit. If the value exceeds 5" H₂O, then clean the tips.
5. Inspect all thermocouple assemblies and replace at least once each year.
6. Inspect the pilot assembly, ignition rod, electrode, and insulators for damage once every three months. Repair or replace if necessary.
7. Verify pilot gas supply pressure and pilot ignition.
8. Inspect flame detection components. Clean the flame scanner lens and vent port.
9. Verify proper operation of air damper louvers and lubricate if necessary.
10. Remove the arrester element for cleaning every six months. Measure pressure differential across the arrester element. If the value exceeds 5" H₂O, then clean the element.

Miscellaneous

1. Remove and clean any filter elements or mesh strainers every three months.
2. Monitor differential pressure for the mist elimination element inside the ZMS Moisture Separator. If the value exceeds 5" H₂O, then clean the element.
3. Annual calibration, as a minimum, is recommended for any analyzer or flow meter.
4. Press the "Hand" button available for any blower to verify proper operation.
5. Verify sufficient pressure is available from the compressed air or nitrogen source.
6. Inspect any gauges and valves for deterioration.