

**MUNICIPAL SOLID WASTE LANDFILL  
GAS COLLECTION AND CONTROL SYSTEM**

**STARTUP, SHUTDOWN, AND MALFUNCTION PLAN**

**Washington County Landfill  
330 N Landfill Road  
Washington, Utah 84780  
Title V Operating Permit Number 5300053002  
Approval Order Number AN0119790001-11**

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**STARTUP, SHUTDOWN, AND MALFUNCTION PLAN**

Washington County Landfill  
County of Washington, Utah  
330 N Landfill Road  
Washington, Utah 84780

This startup, shutdown, and malfunction (SSM) plan (Plan) was prepared for the Washington County Solid Waste Administrative Control Board Special Service District Number 1 (District) for the Washington County Landfill (WCL). This SSM Plan is prepared in accordance with 40 Code of Federal Regulations (CFR) Part 63, Subpart AAAA, and the National Emission Standard for Hazardous Air Pollutants (NESHAPs) for Municipal Solid Waste (MSW) landfills. This SSM Plan contains all of the required elements set forth within 40 CFR §63.6(e).

This SSM Plan will be revised if the procedures described herein do not adequately address any malfunction or startup/shutdown events that occur at the facility. A copy of the original plan and all revisions/addenda will be kept on file at the facility for at least five (5) years. The District is responsible for assuring that the most recent copy of this SSM Plan is made available to all personnel involved with the landfill gas (LFG) collection and control system (GCCS) at WCL as well as to appropriate regulatory agency personnel for inspection.

Name of Plan Preparer: Neil Schwendiman, District Manager 10/6/11  
Name Date

Approved:

District: \_\_\_\_\_  
Name Date

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### **Appendices**

- A SSM Procedures
- B SSM Checklist, Departure Form, Log
- C Common Causes and Response Actions for GCCS Malfunctions

# 1 Revision History

Add the effective date of the most-recent revision to the list below. Do not overwrite or delete any dates. This is intended to be a complete record of all revisions made to this plan, and assists in making certain that all plan versions are retained for at least 5 years as required by 40 CFR §63.6(e)(3)(v).

Date of Initial Issuance
10/6/2011
Revision Dates

## 2 Introduction

### 2.1 Purpose and Scope

The MSW landfill owner or operator of an affected source must develop and implement a written SSM Plan that describes, in detail, procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction; a program of corrective action for malfunctioning processes; and air pollution control and monitoring equipment used to comply with the relevant standard. The purpose of the SSM Plan is to:

- Ensure that, at all times, the MSW landfill owner or operator operates and maintains the affected source, including associated air pollution control and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions to the levels required by the relevant standards;
- Ensure that MSW landfill owners or operators are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and
- Reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).

The District plans on starting up its GCCS at the WCL in 2011. As such, an SSM Plan is required to be prepared and implemented per 40 CFR §63.6(e). This SSM Plan meets this requirement.

The District fully understands and acknowledges the SSM Plan requirements. This SSM Plan has been developed to specifically address these requirements as summarized above.

### 2.2 Description of SSM Plan

This SSM Plan has been divided into three major sections comprising the major elements related to startup, shutdown, and/or malfunction of a GCCS at a MSW landfill. Malfunction events are distinct events when the GCCS is not operating in accordance with the New Source Performance Standards / Emission Guidelines (NSPS/EG) requirements which result, or have the potential to result, in an exceedance of one or more emission limitations or operational standards under the NSPS/EG. Startup and shutdown events are generally planned events associated with system repair, maintenance, testing, and upgrade, and may or may not be related to or occur in association with a malfunction of the GCCS.

## 2.3 Site Equipment Subject To This SSM Plan

The following components of the GCCS are subject to this SSM Plan:

Collection wells and other collectors
Lateral and header extraction piping
LFG mover equipment / flare
Temperature monitoring and recording equipment
Flow monitoring and recording equipment

## 3 Startup Plan

This section details procedures for the startup of the GCCS to ensure that, at all times, good safety and air pollution control practices are used for minimizing emissions to the levels required by the relevant standards.

### 3.1 How to Identify a GCCS Startup Event

The regulatory definition of “startup” reads as follows:

**“Startup** means the setting in operation of an affected source or portion of an affected source for any purpose.” (40 CFR §63.2)

GCCS startup operations generally include startup of LFG mover equipment, LFG control devices, and any ancillary equipment that could affect the operation of the GCCS (e.g., power supply, air compressors, etc.).

### 3.2 Actions To Take When the GCCS is Started-Up

The following provides a summary of typical response actions for startup of the GCCS.

#### 3.2.1 Gas Mover and Collection System

The following activities may have the potential to emit regulated air pollutants to the atmosphere during startup of the collection system portion of GCCS: (1) purging of gases trapped within the piping system prior to normal operation; (2) repair of system leaks discovered during startup, and (3) all other activities after construction of the system but prior to full time operation, which could release Hazardous Air Pollutants (HAPs) from the collection system. These activities would be subject to the Startup Plan portion of the SSM Plan.

During such activities, work shall progress such that air emissions are minimized to the greatest extent possible by:

- Temporarily capping pipes venting gas if such capping does not impact safety or the effective construction of the system;
- Minimizing surface area allowing LFG to emit to the atmosphere to the extent that it does not impact safety or the effective construction of the system;
- Ensuring that other parts of the system, not impacted by the activity, are operating in accordance with the applicable requirements of NSPS/EG; and

- Limiting the purging of piping to as short duration as possible to ensure safe combustion of the LFG in the control device.

Once installed, a GCCS is a “closed” system designed to prevent the uncontrolled release of LFG to the atmosphere. The network of piping installed at the site connects each extraction point with the control device(s) with no open vents located anywhere in the collection system.

Portions of collection systems or individual extraction points may be isolated by valves installed in the system from time to time and subsequently opened. Opening these valves shall not be considered a startup, unless such an activity causes the venting of LFG to the atmosphere. If the activity results in emissions to the atmosphere, the actions listed above shall be followed.

The operation of the collection system, once installed, shall be consistent with the provisions of NSPS/EG, as well as the GCCS Design Plan, which has been developed and approved for the facility.

### 3.2.2 Control Device(s):

Personnel shall follow the procedures as identified below when starting the respective control devices. Control devices operating at MSW landfills normally undergo planned startups. However, flare systems are designed for unattended operation. Automatic startups are described in the standard operating procedures incorporated as part of this SSM Plan, as listed below. Control device startup procedures can be located in operations manuals, notes, reports, etc.

**Table 3-1—Startup Procedure Reference**

<b>Device Name</b>	<b>Appendix</b>
<b>LFG Collection and Control System</b>	
Blower or Other Gas Mover Equipment	A
Extraction Wells and Collection Piping	A
Blower or Other Gas Mover Equipment And Control Device	A
<b>LFG Control Devices</b>	
Flow Monitoring/ Recording Devices	A
Temperature Monitoring/ Recording Devices	A
Control Devices	A

### 3.3 What to Record for All Startup Events

Startup information is recorded on the **SSM Plan Checklist Form** (Appendix B), control device downtime logs and the LFG collection system **SSM log** (Appendix B). The following information is recorded on these logs:

- The date and time the startup occurred;
- The duration of the startup;
- The actions taken to affect the startup;
- Whether procedures in this SSM Plan were followed. If the procedures in the SSM Plan were not followed, an **SSM Plan Departure Report Form** (Appendix B) must also be completed; and
- If an applicable emission limitation was exceeded, a description of the emission standard that was exceeded.

### 3.4 Whom to Notify at the Facility in Case of a Startup Event

The following should be notified in the case of a startup event:

- The GCCS operator, WCL District Manager, Operations Supervisor, or the consultant under contract to operate the GCCS should be notified immediately of the startup;
- The GCCS operator, WCL District Manager, Operations Supervisor, or the consultant under contract to operate the GCCS should be notified within a reasonable timeframe of progress of the diagnosis and resolution of the startup;
- The GCCS operator, WCL District Manager, and the Operations Supervisor, should be notified when the alternative timeframe for startup has been established if it is outside of the timeframes currently allowed by the NSPS/EG for particular compliance elements; and
- The required should be initially prepared upon startup, or discovery of an automatic startup, and implementation of the SSM Plan. The logs should be finalized by the GCCS operator on duty upon successful implementation of the SSM Plan and submitted to the WCL District Manager. The original log should be retained in the landfill files for five (5) years.

### 3.5 What to Report for a Startup Event

The following should be reported in the case of a startup event:

- If the actions taken during the startup **were consistent** with this SSM Plan, file the necessary information in your semi-annual SSM report (*within 30 days following the end of each 6-month period*) with the following information included:
  1. Name and title of GCCS Operator and WCL District Manager;
  2. Certifying signature of the owner/operator or other responsible official;
  3. Statement that the actions taken during the startup or shutdown were consistent with the SSM Plan; and
  4. A copy of the **SSM Log** (Appendix B).
  
- If the actions taken during a startup **were not consistent** with this SSM Plan, **and** the startup resulted in an exceedance of an applicable emission standard, the GCCS Operator or the WCL District Manager **must report** the actions taken to the enforcing authority **by telephone or facsimile transmission within 24 hours** after the startup or shutdown. **A letter must then be sent to the enforcing authority within two weeks** after the startup or shutdown. The letter should be sent by certified or registered mail or overnight delivery service, and must include the following information:
  1. Name and title of GCCS Operator and WCL District Manager;
  2. Certifying signature of the owner/operator or other responsible official;
  3. A copy of the Downtime Logs;
  4. Detailed explanation of the circumstances of the startup;
  5. The reasons the SSM Plan was not adequate; and whether any excess emissions and/or parameter monitoring exceedances is believed to have occurred during the event; and
  6. A copy of the **SSM Log** (Appendix B).
  
- Note: If the revisions to the SSM Plan alter the scope of the process activities at the WCL or otherwise modify the applicability of any emission limit, work practice requirement, or other requirement in the Maximum Achievable Control Technology (MACT) rule or the NSPS/EG, the revised SSM Plan is not effective until written notice has been provided to the permitting authority describing the SSM Plan revision(s).

## 4 Shutdown Plan

This section details procedures for the shutdown of the GCCS to ensure that, at all times, good safety and air pollution control practices are used for minimizing emissions to the levels required by the relevant standards.

Pursuant to the requirements of the NSPS/EG for MSW landfills, a GCCS cannot be removed unless the landfill meets all the applicable criteria for removal of the GCCS in 40 CFR 60, Subpart WWW.

### 4.1 How to Identify a GCCS Shutdown Event

The regulatory definition of “shutdown” reads as follows:

“**Shutdown** means the cessation of an affected source or portion of an affected source or portion of an affected source for any purpose.” (40 CFR §63.2)

With a GCCS, shutdown events would generally include shutdown of LFG mover equipment, LFG control devices, and any ancillary equipment that could affect the operation of the GCCS (e.g., power supply, air compressors, etc.).

The following list includes events that may necessitate a shutdown of the GCCS at a MSW Landfill. This list should not be considered exhaustive.

**Table 4-1—Potential Events Necessitating Shutdown of the GCCS**

Control Device Maintenance, Repair, or Cleaning
Addition of New GCCS Components
Extraction Well Raising
Movement of LFG Piping to Accommodate New Components or Filling Operations
Source Testing
Gas Mover Equipment Maintenance, Repair, or Cleaning
Gas Processing Equipment Maintenance, Repair, or Cleaning
Ancillary Equipment (e.g., compressors, etc.) Maintenance, Repair, or Cleaning
New Equipment Testing and Debugging
Shutdown and Subsequent Startup to Address Malfunctions or Other Occurrences
Planned Electrical Outages

## 4.2 Actions to Take When the GCCS is Shutdown

### 4.2.1 Collection System

Once installed, a GCCS is a “closed” system, designed to prevent the uncontrolled release of LFG to the atmosphere. The network of piping installed at the site connects each extraction point with the control device(s) with no open vents located anywhere in the collection system.

Portions of collection systems or individual extraction points may be isolated by valves installed in the system from time to time. Closing these valves shall not be considered a shutdown, unless such an activity causes an exceedance of the provisions of the NSPS/EG and/or any subsequent approvals of alternatives in the facility’s GCCS Design Plan or approved variances issued thereafter. If a shutdown occurs, the following action shall occur.

### 4.2.2 Control Device(s):

Personnel shall follow the procedures as identified below when shutting down the respective control devices. Control devices operating at MSW landfills normally undergo planned shutdowns for the various events listed above. Shutdowns for equipment malfunction or breakdown should be addressed in the malfunction plan. Control device shutdown procedures can be located in operations manuals, notes, reports, etc.

**Table 4-2—Shutdown Procedure Reference**

<b>Control Device ID</b>	<b>Appendix</b>
<b>LFG Collection and Control System</b>	
Blower or Other Gas Mover Equipment	A
Extraction Wells and Collection Piping	A
Blower or Other Gas Mover Equipment And Control Device	A
<b>LFG Control Devices</b>	
Flow Monitoring/Recording Devices	A
Temperature Monitoring/Recording Devices	A
Control Devices	A

### 4.3 What to Record for All Shutdown Events

Shutdown information is recorded on the **SSM Plan Checklist Form** (Appendix B), control device SSM log (Appendix B) and the LFG collection system SSM log (Appendix B). The following information is recorded on these logs:

- The date and time the shutdown occurred;
- The duration of the shutdown;
- The actions taken to affect the shutdown;
- Whether procedures in this SSM Plan were followed. If the procedures in the plan were not followed, an **SSM Plan Departure Report Form (Appendix B)** must also be completed; and
- If an applicable emission limitation was exceeded, a description of the emission standard that was exceeded.

### 4.4 Whom to Notify at the Facility in Case of a Shutdown Event

The following should be notified in the case of a shutdown event:

- The GCCS operator, WCL District Manager, and the WCL Operations Supervisor should be notified immediately of the shutdown;
- The GCCS operator, WCL District Manager, and Operations Supervisor, should be notified within a reasonable timeframe of progress of the diagnosis and resolution of the shutdown;
- The GCCS operator and the WCL District Manager should be notified when the alternative timeframe for shutdown has been established if it is outside of the timeframes currently allowed by the NSPS/EG for particular compliance elements; and
- The required forms should be initially prepared upon shutdown, or discovery of an automatic shutdown, and implementation of the SSM Plan. The form should be finalized by the GCCS Operator on duty upon successful implementation of the SSM Plan and submitted to the WCL District Manager. The original form should be retained in the landfill files for five (5) years.

### 4.5 What to Report for a Shutdown Event

The following should be reported in the case of a shutdown event:

- If the actions taken during the shutdown **were consistent** with this SSM Plan, file the necessary information in your semi-annual SSM report (*within 30 days following the end of each 6-month period*) with the following information included:
  1. Name and title of GCCS Operator and WCL District Manager;
  2. Certifying signature of the owner/operator or other responsible official;
  3. Statement that the actions taken during the shutdown were consistent with the SSM Plan; and
  4. A copy of the SSM Logs (Appendix B).
  
- If the actions taken during a shutdown **were not consistent** with this SSM Plan, **and** the shutdown resulted in an exceedance of an applicable emission standard, the GCCS Operator or the WCL District Manager **must report** the actions taken to the enforcing authority **by telephone or facsimile transmission within 24 hours** after commencing the actions that were inconsistent with the plan. A **letter must then be sent** to the enforcing authority **within two weeks** after the startup or shutdown. The letter should be sent by certified or registered mail or overnight delivery service, and must include the following information:
  1. Name and title of GCCS Operator and WCL District Manager;
  2. Certifying signature of the owner/operator or other responsible official;
  3. A copy of the Downtime Logs;
  4. Detailed explanation of the circumstances of the shutdown;
  5. The reasons the SSM Plan was not adequate;
  6. Whether any excess emissions and/or parameter monitoring exceedances is believed to have occurred during the event; and
  7. A copy of the **SSM Log** (Appendix B).
  
- Note: If the revisions to the SSM Plan alter the scope of the process activities at the WCL or otherwise modify the applicability of any emission limit, work practice requirement, or other requirement in the MACT rule or the NSPS/EG, the revised SSM Plan is not effective until written notice has been provided to the permitting authority describing the SSM Plan revision(s).

## 5 Malfunction Plan

### 5.1 How to Identify a GCCS Malfunction

The regulatory definition of “malfunction” reads as follows:

**“Malfunction** means 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 limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.” (40 CFR §63.2, revised 5/30/03)

The following list includes events that may constitute a malfunction of the GCCS at the WCL. The cause of these events should be investigated immediately in order to determine the best course of action to correct the malfunction. Each of these malfunctions could have multiple causes that need to be evaluated and possibly considered. It is the intent of this SSM Plan to include all possible causes for the specific malfunction events. Common malfunction events for GCCSs are listed in Table 5-1.

**Table 5-1—Potential Malfunction Events**

Possible Malfunction	Section
Loss of LFG Flow/Gas Mover Malfunction	5.3
Loss of Electrical Power	5.4
Loss of Flame at the Control Device	5.5
Malfunction of Flow Measuring/Recording Device	5.6
Malfunction of Temperature Measuring/Recording Device	5.7
Collection Well and Pipe Failures	5.8
Other Control Device Malfunctions	5.9
Malfunctions of Field Monitoring Equipment	5.10

For one of these occurrences to be considered a malfunction that is required to be addressed by this SSM Plan, it must result in, or have the potential to result in, an exceedance of one or more of the NSPS/EG operational and compliance requirements or the provisions of the MACT rule (e.g., exceedance, reading outside of required operational range, etc). The following table constitutes the possible exceedances of the NSPS/EG for MSW landfills that could occur due to a malfunction of GCCS, thereby necessitating implementation of this SSM Plan.

**Table 5-2— Potential Emission Limitation Exceedances  
Caused by Malfunction Events**

GCCS downtime of greater than 5 days (if alternative timeframe has not been established)
Free venting of collected LFG without control for greater than one hour
Downtime for temperature monitoring and/or recording equipment of greater than 15 minutes (if alternative timeframe has not been established)
Any downtime for LFG flow monitoring and/or recording equipment (if alternative timeframe has not been established)

If the occurrence does not result in an exceedance of an applicable emission limitation, or does not have the potential to result in such an exceedance, then **it is not required to be corrected in accordance with this SSM Plan**, although use of the plan may still be advisable. Malfunctions should be considered actionable under this SSM Plan whether the MSW landfill owner or operator discovers them during normal operations or by a regulatory agency during compliance inspections.

The GCCS Operator should follow all the corrective action, notification, record keeping, and reporting procedures described herein in case of malfunction of the GCCS.

## 5.2 Actions to Take When the GCCS Malfunctions—All Malfunctions

The following actions should be taken when the GCCS malfunctions:

- Determine whether the malfunction has caused an exceedance, or has the potential to cause an exceedance, of any applicable emission limitation contained in the NSPS/EG, or the MACT rule;
- Determine if the malfunction is an “unavoidable breakdown” in accordance with Utah Administrative Code Rule 307-107. If it is, following reporting requirements in Rule 307-107-2. All unavoidable breakdowns lasting longer than 2 hours shall be reported to the Executive Secretary in accordance with Rule 307-107-2.
- Identify whether the malfunction is causing or has caused excess emissions to the atmosphere. If excess emissions are occurring, take necessary steps to reduce emissions to the maximum extent possible using good air pollution control practices and safety procedures;
- Contact the GCCS Operator, the WCL District Manager, and the WCL Operations Supervisor immediately and proceed with the malfunction diagnosis and correction procedures described in Appendix C (“Common Causes and Response Actions for GCCS Malfunctions”) for each specific malfunction;

- Site-specific malfunction and/or troubleshooting procedures are contained in the documents or appendices referenced below. Personnel shall follow these procedures when addressing a malfunction of the GCCS;

**Table 5-3—Malfunction Procedure Reference**

<b>Device Name</b>	<b>Appendix</b>
<b>LFG Collection and Control System</b>	
Blower or Other Gas Mover Equipment	A
Extraction Wells and Collection Piping	A
Blower or Other Gas Mover Equipment And Control Device	A
<b>LFG Control Devices</b>	
Flow Monitoring/ Recording Devices	A
Temperature Monitoring/ Recording Devices	A
Control Devices	A

- If the procedures in this SSM Plan do not address or adequately address the malfunction that has occurred, the operator should attempt to correct the malfunction with the best resources available. The GCCS Operator, the WCL District Manager, and the Operations Supervisor should be notified of this situation immediately. Complete an **SSM Plan Departure Report Form** (Appendix B) as discussed in Section 5.11. The SSM Plan must be updated to better address this type of malfunction;
- If the GCCS malfunction cannot be corrected within the time frame specified in the NSPS/EG, notify the GCCS Operator, the WCL District Manager, and the Operations Supervisor and proceed to shutdown the control device (if malfunction is causing excess emissions) and/or the process(es) venting to the control device, if this has not already occurred automatically;
- If the GCCS malfunction cannot be corrected within the time frame allowed by the NSPS/EG rules for each specific malfunction, define the appropriate alternative timeframe for corrective action that is reasonable for the type of repair or maintenance that is required to correct the malfunction;
- If the GCCS malfunction cannot be corrected within alternative timeframe for corrective action specified above, notify the GCCS Operator, the WCL District Manager, and the Operations Supervisor, and conduct the appropriate record keeping and reporting required for Departures of the MACT rule and Title V permit;

- Once the malfunction is corrected, notify the GCCS Operator, the WCL District Manager, and the Operations Supervisor as soon as the system is operational.
- Complete the **SSM Plan Checklist Form** (Appendix B) after the malfunction diagnosis and correction procedures are completed;
- If the procedures in this SSM Plan do not address or adequately address the malfunction that has occurred, the GCCS Operator should note the circumstances and the actual steps taken to correct the malfunction in the **SSM Plan Departure Report Form** (Appendix B). This SSM Plan will need to be revised based on this information, as described in Section 5.13 below; and
- Follow procedures in Sections 5.11 through 5.13, as appropriate, to adequately document, notify, and report the malfunction and corrective action.

### 5.3 Loss of LFG Flow/Gas Mover Malfunction

The following should occur with loss of LFG flow or a gas mover malfunction:

- Follow the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions;**
- Check to see if the control device has shutdown. If the control device has shutdown, make sure that the LFG mover equipment has shutdown to prevent free venting of LFG. Attempt to restart control device to determine if system will remain operational;
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix C; and
- If the malfunction cannot be corrected within 5 days, follow the procedures under Section 5.2 above to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting if the malfunction cannot be corrected within the established timeframe.

### 5.4 Loss of Electrical Power

The following should occur with the loss of electrical power:

- Follow also the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions;**

- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix C; and
- If the malfunction cannot be corrected within the time frame allowed by the NSPS/EG rules, follow the procedures under Section 5.2 above to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting if malfunction cannot be corrected within the established timeframe.

## 5.5 Loss of Flame at the Control Device

The following should occur with the loss of flame at the control device:

- Follow also the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions;**
- Check to see if the control device has shutdown. If control device has shutdown, make sure that the LFG mover equipment has shutdown to prevent free venting of LFG. Attempt to restart control device to determine if system will remain operational;
- If system will not restart, follow also the procedures in Section 5.3, above: **Loss of LFG Flow;**
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix C; and
- If the malfunction cannot be corrected within the time frame allowed by the NSPS/EG rules, follow the procedures under Section 5.2 above to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting if the malfunction cannot be corrected within the established timeframe.

## 5.6 Malfunctions of Flow Monitoring/Recording Device

The following should occur with malfunctions of flow monitoring or recording devices:

- Follow the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions;**

- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix C; and
- If the malfunction cannot be corrected in the time frame allowed by the NSPS/EG rules, follow the procedures under Section 5.2 above to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting if the malfunction cannot be corrected within the established timeframe.

## 5.7 Malfunctions of Temperature Monitoring/Recording Device

The following should occur with malfunctions of temperature monitoring and recording devices:

- Follow the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions;**
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix C; and
- If the malfunction cannot be corrected within 15 minutes, follow the procedures under Section 5.2 above to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting if the malfunction cannot be corrected within the established timeframe.

## 5.8 Collection Well and Pipe Failures

The following should occur with collection well and pipe failures:

- Follow the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions;**
- Follow also the procedures in Section 5.3, above: **Loss of Flow/Gas Mover Malfunction;**
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix C; and
- If the malfunction causes the entire GCCS to go off-line and cannot be corrected within 5 days, follow the procedures under Section 5.2 above to establish an appropriate alternative timeframe for corrective action and

complete necessary record keeping and reporting if the malfunction cannot be corrected within the established timeframe.

## 5.9 Other Control Device Malfunctions

The following should occur with other control device malfunctions:

- Follow also the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions;**
- Check to see if the control device has shutdown. If control device has shutdown, make sure that the LFG mover equipment has shutdown to prevent free venting of LFG. Attempt to restart control device to determine if system will remain operational;
- Conduct diagnostic procedures to identify the cause of the malfunction. Potential causes and response actions for this type of malfunction are listed in Appendix C;
- If the malfunction causes an exceedance of the control device's minimum temperature for a 3-hour block average, follow the procedures under Section 5.2 above to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting if the malfunction cannot be corrected within the established timeframe; and
- If the malfunction causes the entire GCCS to go offline and cannot be corrected within 5 days, follow the procedures under Section 5.2 above to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting if the malfunction cannot be corrected within the established timeframe.

## 5.10 Malfunctions of Field Monitoring Equipment

The following should occur with malfunctions of field monitoring equipment:

- Follow the procedures in Section 5.2, above: **What to Do When the GCCS Malfunctions—All Malfunctions;**
- Verify that a malfunction of monitoring equipment will cause a Departure of the NSPS/EG requirements for wellhead and/or surface emissions monitoring;
- Conduct diagnostic procedures to identify the cause of the malfunction;

- Repair the device or obtain replacement device to complete the monitoring as required by the NSPS/EG;
- Conduct proper calibration procedures before use of the device for NSPS/EG compliance monitoring; and
- If the malfunction cannot be corrected so that the monitoring equipment can be used for the purposes required by the NSPS/EG rules, follow the procedures under Section 5.2 above to establish an appropriate alternative timeframe for corrective action and complete necessary record keeping and reporting if the malfunction cannot be corrected within the established timeframe.

### 5.11 What to Record for a Malfunction

The GCCS Operator must record the following information on the attached **SSM Plan Checklist Form**:

- The date and time the malfunction occurred;
- The duration of the malfunction;
- A description of the affected equipment;
- The cause or reason for the malfunction (if known);
- The actions taken to correct the malfunction (checklist);
- Whether the procedures in this SSM Plan were followed. If the procedures in the plan were not followed, an **SSM Plan Departure Report Form** (Appendix B) must also be completed; and
- A description of the emission standard that was exceeded or had the potential to be exceeded.

### 5.12 Whom to Notify at the Facility in Case of a Malfunction

The following should be notified in case of a malfunction:

- The GCCS Operator, the WCL District Manager, and the Operations Supervisor shall be notified immediately of the malfunction;
- The GCCS Operator, the WCL District Manager, and the Operations Supervisor shall be notified within a reasonable timeframe of progress of the diagnosis and corrective action of the malfunction;

- The GCCS Operator and the WCL District Manager shall be notified when the alternative timeframe for corrective action has been established if it is outside of the timeframes currently allowed by the NSPS/EG for particular compliance elements;
- The GCCS Operator and the WCL District Manager shall be notified if the malfunction cannot be corrected within the timeframe allowed by the NSPS/EG rules or the alternate timeframe established under this SSM Plan. Notification should also occur if the malfunction that occurred is not addressed by the current SSM Plan; and
- The **SSM Plan Departure Report Form** shall be initially prepared upon discovery of the malfunction and implementation of the SSM Plan. The form shall be finalized by the GCCS Operator on duty upon successful implementation of the SSM Plan and submitted to the WCL District Manager. The original form must be retained in the landfill files for 5 years.

### 5.13 What to Report for a Malfunction Event

The following should be reported in the case of a malfunction event:

- If the actions taken during the malfunction **were consistent** with this SSM Plan, file the necessary information in your semi-annual SSM report (*within 30 days following the end of each 6-month period*) with the following information included:
  1. Name and title of GCCS Operator and the WCL District Manager;
  2. Certifying signature of the owner/operator or other responsible official;
  3. A copy of the Downtime Logs;
  4. Detailed explanation of the circumstances of the shutdown;
  5. The reasons the SSM Plan was not adequate;
  6. Whether any excess emissions and/or parameter monitoring exceedances is believed to have occurred during the event; and
  7. A copy of the **SSM Log**.
- If the actions taken during a malfunction **were not consistent** with this SSM Plan, and the malfunction resulted in an exceedance of an applicable emission standard, (see items listed under Step 1 above), the GCCS Operator or the WCL District Manager **must report** the actions taken to the enforcing authority **by telephone or facsimile (FAX) transmission within 24 hours** after commencing the actions that were inconsistent with the plan. **A letter must then be sent** to the enforcing authority **within two weeks** after the malfunction. The letter should be sent by certified or registered mail or overnight delivery service, and must include the following information:

1. Name and title of GCCS Operator and WCL District Manager;
  2. Certifying signature of the owner/operator or other responsible official;
  3. A copy of the **SSM Log**;
  4. Detailed explanation of the circumstances of the malfunction;
  5. The reasons the SSM Plan was not adequate;
  6. Whether any excess emissions and/or parameter monitoring exceedances is believed to have occurred during the event; and
  7. Prepare and include **Departure Report Form** (Appendix B).
- If the actions taken during the malfunction **were not consistent** with this SSM Plan, the GCCS Operator or the WCL District Manager must:
    1. Revise the SSM Plan within 45 days after the malfunction to include procedures for operating and maintaining the GCCS during similar malfunction events; and
    2. Include the revised SSM Plan in the semi-annual report (within 30 days following the end of each 6-month period).

Note: If the revisions to the SSM Plan alter the scope of the process activities at the WCL or otherwise modify the applicability of any emission limit, work practice requirement, or other requirement in the MACT rule or the NSPS/EG, the revised SSM Plan is not effective until written notice has been provided to the permitting authority describing the SSM Plan revision(s).

**APPENDIX A**

**Washington County Landfill GCCS  
Startup and Shutdown Procedures**

## **STANDARD OPERATING PROCEDURES\***

### **Shutdown**

1. Ensure that there are no unsafe conditions present, contact manager immediately
2. Initiate shutdown sequence below by one or more of the following (Note date and time)
  - a. Press Emergency Stop if necessary
  - b. Close On/Off switch(es) or Push On/Off button(s)
  - c. Close adjacent valves if necessary
3. Observe that system achieves normal shutdown ranges for levels, pressures, and temperatures (Note date and time)
4. For well shutdown, fully close the wellhead valve. Record date/time.

### **Startup**

1. Ensure that there are no unsafe conditions present
2. Ensure that the system is ready to start by one of the following:
  - a. Valves are in correct position
  - b. Levels, pressures, and temperatures are within normal starting range
  - c. Alarms are cleared
  - d. Power is on and available to control panel and ready to energized equipment.
  - e. Emergency stop is de-energized
3. Initiate start sequence (Note time and date)
4. Observe that system achieves normal operating ranges for levels, pressures, and temperatures (Note time and date)
5. For well startup, open the wellhead valve to the desired position. Record date/time.

**\*See Also the WCL GCCS Operations and Maintenance Manual for Startup and Shutdown Procedures**

**APPENDIX B**

**SSM Plan Checklist Form, Departure Report Form, SSM Log**

**SSM CHECKLIST FORM**  
**WASHINGTON COUNTY LANDFILL**  
*Landfill Gas Collection and Control System*

This form is used to document actions taken during a planned startup, shutdown, or malfunction of any portion of the gas collection and control system. If any of the steps taken are not consistent with the SSM Plan, document the variations on a "SSM Plan Departure Form" and follow the reporting requirements in the SSM plan.

<b>1. Type of Event (check all that apply)</b> <input type="checkbox"/> Startup <input type="checkbox"/> Shutdown <input type="checkbox"/> Malfunction		
2. Beginning of Event:	<i>Date:</i>	<i>Time:</i>
3. End of Event:	<i>Date:</i>	<i>Time:</i>
4. Duration of Event (hours):		
5. Description of Affected Equipment:		
6. Cause/Reason for Startup/Shutdown/Malfunction:		
7. Name and Title (please print):		
8. Signature:		9. Date:
10. Did the actual steps taken vary from the procedure specified in the SSM Plan? <input type="checkbox"/> YES <input type="checkbox"/> NO <i>If the response is "Yes," proceed to box 11 below and complete an SSM Plan Departure Report Form. If "No," stop.</i>		
11. Did this event result in an exceedance of any applicable emission limitation? <input type="checkbox"/> YES <input type="checkbox"/> NO <i>If response is "Yes," proceed to box 12 below. If "No," stop.</i>		
12. Describe the emission standard that was exceeded below.		
<p>[Notify the UDEQ verbally or by fax within 24-hours after commencing the actions that an event inconsistent with the SSM Plan and which resulted in an exceedance of an applicable emission limitation has occurred. Notify the UDEQ in writing within two (2) weeks of the event.]. For any unavoidable breakdown per Rule 307-107-2 that lasts longer than 2 hours, report to the Executive Secretary within 3 hours from the initial breakdown by calling (801) 536-4123. See Rule 307-107-2 for reporting requirements.</p>		

**WASHINGTON COUNTY LANDFILL  
SSM PLAN DEPARTURE REPORT FORM**

1. Type of Event:	<input type="checkbox"/> Startup	<input type="checkbox"/> Shutdown	<input type="checkbox"/>
Malfunction			
2. Date:	Time:	Duration:	
3. Provide detailed explanation of the circumstances of the startup, shutdown, or malfunction:*			
4. Provide description of corrective actions taken:*			
5. Describe the reasons the SSM Plan was not followed:*			
6. Describe any proposed revisions to the SSM Plan:*			
7. Name (print):			
8. Title			

\*Use additional sheets if necessary.

**Note: If the event documented in this form was a malfunction and if the SSM plan needs to be revised to address the particular type of malfunction that occurred, the revision of the SSM plan must be made within 45 days of the event.**

This form is intended to assist in meeting the recordkeeping and reporting requirements of 40 CFR §63.6(e)(3)(iv).

**CONTROL DEVICE AND LFG COLLECTION SYSTEM DOWNTIME LOG**  
**Washington County Landfill Flare**

DATE COMPLETED

Washington County Landfill												
SSMP REPORT - From START OF PERIOD through END OF PERIOD												
Identify Flare & Check Applicable Event	(1) Start of Event Date and Time	(2) End of Event Date and Time	(3) Duration of Event (Hours)	(4) Duration Shutdown (Hours)	(5) Cause or Reason	(6) Applicable Condition	(7) Date Form Completed	(8) Type of Event (Startup and Shutdown Events Only)	(9) Procedures Used	(10) Did Steps Taken Vary From Section 9?	(11) Did Event Cause Any Emission Limit Exceedance	(12) Describe Emission Standard(s) Exceeded
Component: Flare						I.5. Maintenance / Troubleshooting (R307-401-4)		Manual (Go to Section 9)	Shutdown conducted in accordance with Section 4.2 of the SSM Plan.	Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Power Outage						
Shutdown Event						Malfunction		Automatic (Go to Section 11)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	No (Stop)	No (Stop)	
Malfunction Event						I.6. Unavoidable Breakdown (R307-107)*						
						II.B.2.b. Flow Exceeded 295 scfm						
Startup Event						Construction		Manual (Go to Section 9)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	Yes (Go to Section 11)	Yes (Go to Section 12)	
Shutdown Event						Low Temperature						
Malfunction Event						Equipment Replacement		Automatic (Go to Section 11)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	No (Stop)	No (Stop)	
						Insufficient LFG Quality or Quantity						
						Other						
Component: Flare						I.5. Maintenance / Troubleshooting (R307-401-4)		Manual (Go to Section 9)	Shutdown conducted in accordance with Section 4.2 of the SSM Plan.	Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Power Outage						
Shutdown Event						Malfunction		Automatic (Go to Section 11)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	No (Stop)	No (Stop)	
Malfunction Event						I.6. Unavoidable Breakdown (R307-107)*						
						II.B.2.b. Flow Exceeded 295 scfm						
Startup Event						Construction		Manual (Go to Section 9)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	Yes (Go to Section 11)	Yes (Go to Section 12)	
Shutdown Event						Low Temperature						
Malfunction Event						Equipment Replacement		Automatic (Go to Section 11)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	No (Stop)	No (Stop)	
						Insufficient LFG Quality or Quantity						
						Other						
Component: Flare						I.5. Maintenance / Troubleshooting (R307-401-4)		Manual (Go to Section 9)	Shutdown conducted in accordance with Section 4.2 of the SSM Plan.	Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Power Outage						
Shutdown Event						Malfunction		Automatic (Go to Section 11)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	No (Stop)	No (Stop)	
Malfunction Event						I.6. Unavoidable Breakdown (R307-107)*						
						II.B.2.b. Flow Exceeded 295 scfm						
Startup Event						Construction		Manual (Go to Section 9)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	Yes (Go to Section 11)	Yes (Go to Section 12)	
Shutdown Event						Low Temperature						
Malfunction Event						Equipment Replacement		Automatic (Go to Section 11)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	No (Stop)	No (Stop)	
						Insufficient LFG Quality or Quantity						
						Other						
Component: Flare						I.5. Maintenance / Troubleshooting (R307-401-4)		Manual (Go to Section 9)	Shutdown conducted in accordance with Section 4.2 of the SSM Plan.	Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Power Outage						
Shutdown Event						Malfunction		Automatic (Go to Section 11)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	No (Stop)	No (Stop)	
Malfunction Event						I.6. Unavoidable Breakdown (R307-107)*						
						II.B.2.b. Flow Exceeded 295 scfm						
Startup Event						Construction		Manual (Go to Section 9)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	Yes (Go to Section 11)	Yes (Go to Section 12)	
Shutdown Event						Low Temperature						
Malfunction Event						Equipment Replacement		Automatic (Go to Section 11)	Startup conducted in accordance with Section 3.2 of the SSM Plan.	No (Stop)	No (Stop)	
						Insufficient LFG Quality or Quantity						
						Other						

\*If checked, see R307-102, Reporting

**CONTROL DEVICE AND LFG COLLECTION SYSTEM DOWNTIME LOG**  
**Washington County Landfill Wellfield**

DATE COMPLETED

Washington County Landfill												
SSMP REPORT - From START OF PERIOD through END OF PERIOD												
Identify Well & Check Applicable Event	(1) Start of Event Date and Time	(2) End of Event Date and Time	(3) Duration of Event (Hours)	(4) Duration of Shutdown (Hours)	(5) Cause or Reason	(6) Applicable Condition	(7) Date Form Completed	(8) Type of Event (Startup and Shutdown Events Only)	(9) Procedures Used	(10) Did Steps Taken Vary From Section 9?	(11) Did Event Cause Any Emission Limit Exceedance	(12) Describe Emission Standard(s) Exceeded
Component:						Well Raising for Fill Operations		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Construction						
Shutdown Event						Prevent Subsurface Fire		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Decommissioning						
Component:						Maintenance		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Well Sounding						
Shutdown Event						Wellhead Replacement		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Other						
Component:						Well Raising for Fill Operations		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Construction						
Shutdown Event						Prevent Subsurface Fire		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Decommissioning						
Component:						Maintenance		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Well Sounding						
Shutdown Event						Wellhead Replacement		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Other						
Component:						Well Raising for Fill Operations		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Construction						
Shutdown Event						Prevent Subsurface Fire		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Decommissioning						
Component:						Maintenance		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Well Sounding						
Shutdown Event						Wellhead Replacement		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Other						
Component:						Well Raising for Fill Operations		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Construction						
Shutdown Event						Prevent Subsurface Fire		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Decommissioning						
Component:						Maintenance		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Well Sounding						
Shutdown Event						Wellhead Replacement		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Other						
Component:						Well Raising for Fill Operations		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Construction						
Shutdown Event						Prevent Subsurface Fire		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Decommissioning						
Component:						Maintenance		Manual (Go to Section 9)		Yes (Go to Section 11)	Yes (Go to Section 12)	
Startup Event						Well Sounding						
Shutdown Event						Wellhead Replacement		Automatic (Go to Section 11)		No (Stop)	No (Stop)	
Malfunction Event						Other						

## **APPENDIX C**

### **Common Causes and Response Actions for GCCS Malfunctions**

(Appendix C represents a summary of possible causes and response actions for GCCS malfunctions. The list is not considered to be exhaustive. The list of response actions is not intended to be a sequence of events that are to be implemented in order. Certain malfunction incidents may or may not be associated with the listed “common causes” nor will the “common response actions” be appropriate in all instances. Site-specific evaluation of the malfunctions and development of specific response actions is recommended in all cases.)

EQUIPMENT	PURPOSE	MALFUNCTION EVENT	COMMON CAUSES	TYPICAL RESPONSE ACTIONS
<b>LFG Collection and Control System</b>				
Blower or Other Gas Mover Equipment	Applies vacuum to wellfield to extract LFG and transport to control device	Loss of LFG Flow/Blower Malfunction	<ul style="list-style-type: none"> <li>-Flame arrestor fouling/deterioration</li> <li>-Automatic valve problems</li> <li>-Blower failure (e.g., belt, motor, impeller, coupling, seizing, etc.)</li> <li>-Loss of power</li> <li>-Extraction piping failure</li> <li>-Condensate knock-out problems</li> <li>-Extraction piping blockages</li> </ul>	<ul style="list-style-type: none"> <li>-Repair breakages in extraction piping</li> <li>-Clean flame arrestor</li> <li>-Repair blockages in extraction piping</li> <li>-Verify automatic valve operation, compressed air/nitrogen supply</li> <li>-Notify power utility, if appropriate</li> <li>-Provide/utilize auxiliary power source, if necessary</li> <li>-Repair Settlement in Collection Piping</li> <li>- Repair Blower</li> <li>-Activate back-up blower, if available</li> <li>-Clean knock-up pot/demister</li> <li>-Drain knock-out pot</li> </ul>
Extraction Wells and Collection Piping	Conduits for extractions and movement of LFG flow	Collection well and pipe failures	<ul style="list-style-type: none"> <li>-Break/crack in header or lateral piping</li> <li>-Leaks at wellheads, valves, flanges, Test ports, seals, couplings, etc.</li> <li>-Collection piping blockages</li> <li>-Problems due to settlement (e.g. pipe separation, deformation, development of low points)</li> </ul>	<ul style="list-style-type: none"> <li>-Repair leaks or breaks in lines or wellheads</li> <li>-Follow procedures for loss of LFG flow/blower malfunction</li> <li>-Repair blockages in collection piping</li> <li>-Repair settlement in collection piping</li> <li>-Re-install, repair, or replace piping</li> </ul>

EQUIPMENT	PURPOSE	MALFUNCTION EVENT	COMMON CAUSES	TYPICAL RESPONSE ACTIONS
<b>LFG Collection and Control System</b>				
Blower or Other Gas Mover Equipment And Control Device	Collection and control of LFG	Loss of electrical power	<ul style="list-style-type: none"> <li>- Force majeure/Act of God (e.g., lightning, flood, earthquake, etc.)</li> <li>-Area-wide or local blackout or brown-out</li> <li>-Interruption in service (e.g. blown service fuse)</li> <li>-Electrical line failure</li> <li>-Breaker trip</li> <li>-Transformer failure</li> <li>-Motor starter failure/trip</li> <li>-Overdraw of power</li> <li>-Problems in electrical panel</li> <li>-Damage to electrical equipment from on-site operations</li> </ul>	<ul style="list-style-type: none"> <li>-Check/reset breaker</li> <li>-Check/repair electrical panel components</li> <li>-Check/repair transformer</li> <li>-Check/repair motor starter</li> <li>-Check/repair electrical line</li> <li>-Test amperage to various equipment</li> <li>-Contact electricity supplier</li> <li>-Contact/contract electrician</li> <li>-Provide auxiliary power (if necessary)</li> </ul>
LFG Control Device	Combusts LFG	Loss of Flame	<ul style="list-style-type: none"> <li>-Problems/failure of thermocouple</li> <li>-Loss/change of LFG flow</li> <li>-Loss/change of LFG quality</li> <li>-Problems with air/fuel controls</li> <li>-Problems/failure of flame sensor</li> <li>-Problems with temperature monitoring equipment</li> </ul>	<ul style="list-style-type: none"> <li>-Check/repair temperature monitoring equipment</li> <li>-Check/repair thermocouple</li> <li>-Follow procedures for loss of flow/blower malfunction</li> <li>-Check/adjust air/fuel controls</li> <li>-Check/adjust/repair flame sensor</li> <li>-Check/adjust LFG collectors</li> </ul>
Flow Monitoring/Recording Device	Measures and records gas flow from collection system to control	Malfunctions of Flow Monitoring/Recording Device	<ul style="list-style-type: none"> <li>-Problems with orifice plate, pitot tube, or other in-line flow measuring device</li> <li>-Problems with device controls and/or wiring</li> <li>-Problems with chart recorder</li> </ul>	<ul style="list-style-type: none"> <li>-Check/adjust/repair flow measuring device and/or wiring</li> <li>-Check/repair chart recorder</li> <li>-Replace paper in chart recorder</li> </ul>
Temperature Monitoring/Recording Device	Monitors and records combustion temperature of enclosed combustion device	Malfunctions of Temperature Monitoring/Recording Device	<ul style="list-style-type: none"> <li>-Problems with thermocouple</li> <li>-Problems with device controls and/or wiring</li> <li>-Problems with chart recorder</li> </ul>	<ul style="list-style-type: none"> <li>-Check/adjust/repair thermocouple</li> <li>-Check/adjust/repair controller and/or wiring</li> <li>-Check/adjust/repair electrical panel components</li> <li>-Check/repair chart recorder</li> <li>-Replace paper in chart recorder</li> </ul>

EQUIPMENT	PURPOSE	MALFUNCTION EVENT	COMMON CAUSES	TYPICAL RESPONSE ACTIONS
LFG Collection and Control System				
Control Device	Combusts LFG	Other Control Device Malfunctions	<ul style="list-style-type: none"> <li>-Control device smoking (i.e. visible emissions)</li> <li>-Problems with flare insulation</li> <li>-Problems with pilot light system</li> <li>-Problems with air louvers</li> <li>-Problems with air/fuel controllers</li> <li>-Problems with thermocouple</li> <li>-Problems with burners</li> <li>-Problems with flame arrester</li> <li>-Alarmed malfunction conditions not covered above</li> <li>-Unalarmed conditions discovered during inspection not covered above</li> </ul>	<ul style="list-style-type: none"> <li>-Site-specific diagnosis procedures</li> <li>-Site-specific responses actions based on diagnosis</li> <li>-Open manual louvers</li> <li>-Clean pitot orifice</li> <li>-Clean/drain flame arrester</li> <li>-Refill propane supply</li> <li>-Check/repair pilot sparking system</li> </ul>