



**MUNICIPAL SOLID WASTE LANDFILL
GAS COLLECTION AND CONTROL SYSTEM (GCCS)
STARTUP, SHUTDOWN, AND MALFUNCTION PLAN
PINE TREE ACRES, INC. LANDFILL
LENOX, MICHIGAN**

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**MUNICIPAL SOLID WASTE LANDFILL
GAS COLLECTION AND CONTROL SYSTEM (GCCS)**

STARTUP, SHUTDOWN, AND MALFUNCTION PLAN

**PINE TREE ACRES, INC. LANDFILL
LENOX, MICHIGAN**

This startup, shutdown, and malfunction (SSM) plan (SSM Plan) was prepared by Pine Tree Acres, Inc. in order to comply with the requirements of 40 CFR 63.6(e)(3), as this facility is subject to 40 CFR Part 63, Subpart AAAAA, the National Emission Standard for Hazardous Air Pollutants (NESHAPs) for Municipal Solid Waste (MSW) landfills. The SSM Plan contains all of the required elements set forth within 40 CFR 63.6(e)(3).

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 Facility Manager 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 Pine Tree Acres, Inc. Landfill as well as to appropriate regulatory agency personnel for inspection.

Name of Plan Preparer: Steven M. Niehoff, P.E. July 1, 2014
Name Date

Approved:
Facility Manager: _____
Name Date

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- A Common Causes and Response Actions for GCCS Malfunctions
- B SSM Reporting Forms
- C Standard Operating Procedures for Startup and Shutdown Events

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 §63.6(e)(3)(v).

Date of Initial Issuance
January 16, 2004
Revision Dates
June 22, 2005
August 19, 2009
June 7, 2011
September 19, 2011
January 1, 2015

2 Introduction

2.1 Purpose and Scope

The owner or operator of an affected municipal solid waste (MSW) landfill must develop a written startup, shutdown, and malfunction (SSM) Plan. The SSM Plan must describe, 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 SSM Plan does not need to address scenarios that would not cause the source to exceed an applicable emission limitation in the relevant standard. Further, the elements of the SSM plan shall not be considered to be an applicable requirement (of a facility's Title V Operating Permit) as defined in 40 CFR Section 70.2 and 71.2.

The SSM Plan serves the following purposes:

- 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;
- 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 any malfunctioning process and/or air pollution control equipment to its normal or usual manner of operation).

The Pine Tree Acres, Inc. Landfill is an existing affected source under the Maximum Achievable Control Technology (MACT) rule for MSW landfills, which began operating its GCCS voluntarily during the summer of 1998, and under the requirements of NSPS on March 18, 2002. It commenced construction the spring of 1998. As such, a SSM Plan is required to be prepared and implemented for this landfill site by January 16, 2004, and this SSM Plan meets or exceeds this requirement.

The management of the Pine Tree Acres, Inc. Landfill fully understands and acknowledges the SSM Plan requirements of the MACT rule. 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 landfill gas (LFG) collection and control system (GCCS) at a MSW landfill. Malfunction events are sudden, infrequent, and not reasonably preventable failures of the GCCS (and related monitoring equipment) to operate in a normal or

usual manner and which result, or have the potential to result, in an exceedance of one or more emission limitations under the New Source Performance Standards for MSW Landfills. 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:

Landfill gas moving equipment
Flame monitoring and recording equipment
Flow monitoring and recording equipment
Temperature monitoring and recording equipment
Landfill gas utility flares
Landfill gas enclosed flares
Landfill gas treatment 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.

Pursuant to the requirements of The NSPS for MSW landfills, a GCCS must be installed and operated when an applicable landfill exceeds a threshold of 50 Mg/year NMOC and meets all the other criteria requiring gas collection and control at a landfill.

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.” (§63.2)

GCCS startup operations generally include startup of gas 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

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 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 fulltime operation, which could release HAPs from the collection system. These activities could potentially be subject to the Startup Plan portion of the SSM Plan. However, it is unlikely that these events would cause the source to exceed any applicable emission.

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

- Temporarily capping pipes that may vent gas, if such capping does not impact safety or the effective construction of the system.
- Minimizing surface area that could allow gas emissions 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.
- Limiting the purging of piping to as short a duration as possible to ensure safe combustion of the gas in the control device.

A GCCS, once installed, 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 to 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 source to exceed an applicable emission limitation. If the activity results in such an exceedance, the actions listed in Sections 3.3 through 3.5 shall be followed.

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

3.2.2 Utility Flares

Personnel shall follow proper procedures when starting a utility flare. Startup procedures can be located in operations manuals, notes, reports, or other sources.

3.2.2.1 Manual Startup

Personnel shall follow the procedures identified in Appendix C when starting the utility flare.

3.2.2.2 Automatic Startup

The utility flare is designed for unattended operation. After a shutdown, the flare will automatically attempt to re-start itself (via an automatic sparker, pilot flame, or similar device).

3.2.3 LFG Treatment Systems

Under current USEPA interpretation, the “treatment system” consists of the equipment that compresses, dewateres, and filters the landfill gas prior to its introduction into an engine or other manner of beneficial use. Treated landfill gas from Pine Tree Acres, Inc. Landfill is conveyed to the onsite engines that use the gas to generate electricity.

Personnel shall follow the procedures identified in Appendix C when starting the landfill gas treatment system.

3.2.4 Enclosed Flare

Personnel shall follow proper procedures when starting a utility flare. Startup procedures can be located in operations manuals, notes, reports, or other sources.

Enclosed flares are required to operate within a certain temperature range that is established during a performance test. In some scenarios, startups of enclosed flares can result in a brief exceedance of an emission limitation (e.g., 98%+ NMOC destruction) as the flare reaches proper operating temperature. When starting up an enclosed flare, personnel should follow the recordkeeping, notification, and reporting procedures outlined in the sections below.

3.2.4.1 Manual Startup

Personnel shall follow the procedures identified in Appendix C when starting the enclosed flare.

3.2.4.2 Automatic Startup

The enclosed flare is designed for unattended operation. After a shutdown, the flare will automatically attempt to re-start itself via its programmed ignition sequence

3.3 What to Record for Any Startup Event That Causes an Emission Exceedance

Based on changes in SSM regulations published on April 20, 2006, normal startups of utility flares and treatment systems do not cause an emission limitation to be exceeded and do not need to be recorded.

A deviation can occur during startup of an enclosed flare if the startup results in a 3-hour average combustion temperature that was more than 28° C below the average temperature established during the performance test.

If a malfunction occurs during startup, and the malfunction causes, or has the potential to cause, an emission exceedance, follow the procedures outlined in the “Malfunctions” section.

Facilities may, at their discretion, record all startup events regardless of whether an emission limitation was exceeded, in order to document downtime and/or runtime as needed.

In the event that a startup caused an emission limitation to be exceeded (typically identified as a period during which free-venting of landfill gas occurred), the operator shall record the following information:

- The date and time the startup occurred.

- The date and time the unit reached the required operating temperature (enclosed flares only).
- The duration of the startup. This is the time between the startup was initiated until the time the unit reached normal operating conditions (e.g., required combustion operating temperature for enclosed flares).
- The 3-hour average combustion temperature, beginning at the time startup was initiated (enclosed flares only).
- Records (e.g., form, checklist) that demonstrate that the procedures specified in this SSM Plan were followed.
- If the actions were not consistent with this SSM Plan, then the facility must record the actions taken for that event. The facility may use the **Deviation Report Form** (Appendix B) to record such events. Actions not consistent with this SSM Plan must be reported within 2 working days, followed by a letter within 7 working days after the end of the event.
- The gas technician/manager or other appropriate personnel shall prepare the initial records upon discovery of a startup that caused an emission limitation of the relevant emission standards to be exceeded.
- The gas technician/manager or other appropriate personnel shall finalize the records upon successful implementation of the SSM Plan and notification shall be provided to the Facility Manager.
- The relevant records shall be retained electronically (or hard-copy files) for five (5) years.

Note: The facility may use the GCCS Recordkeeping System template prepared by Corporate Air Programs to record/document SSM events and SSM Plan Departures.

3.4 Whom to Notify in Case of a Startup Event that Causes an Emission Exceedance

Based on changes in SSM regulations published on April 20, 2006, normal startups of utility flares and treatment systems do not cause an emission limitation to be exceeded and do not require notification.

A deviation can occur during startup of an enclosed flare if the startup results in a 3-hour average combustion temperature that was more than 28° C below the average temperature established during the performance test.

If a malfunction occurs during startup, and the malfunction causes, or has the potential to cause, an emission exceedance, follow the procedures outlined in the “Malfunctions” section.

- Notify the Facility Manager or other appropriate personnel of the startup that causes an emission limitation of the relevant emission standards to be exceeded.
- Notify the Facility Manager or other appropriate personnel within a reasonable timeframe of progress of the diagnosis and resolution of the startup that causes an emission limitation of the relevant emission standards to be exceeded.
- Notify the Facility Manager or other appropriate personnel when the alternative timeframe for startup has been established if it is outside of the timeframes currently allowed by the NSPS for particular compliance elements.

3.5 What to Report for a Startup Event That Causes an Emission Exceedance

Based on changes in SSM regulations published on April 20, 2006, normal startups of utility flares and treatment systems do not cause an emission limitation to be exceeded and do not need to be reported.

A deviation can occur during startup of an enclosed flare if the startup results in a 3-hour average combustion temperature that was more than 28° C below the average temperature established during the performance test.

If a malfunction occurs during startup, and the malfunction causes, or has the potential to cause, an emission exceedance, follow the procedures outlined in the “Malfunctions” section.

If the actions taken during the startup **were consistent** with this SSM Plan, then state such 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 Facility Manager or other appropriate personnel;
2. Certifying signature of the owner/operator or other responsible official; and
3. A summary of the actions taken to minimize emissions during applicable startups. This may be prepared once for similar events.

If the actions taken during a startup **were not consistent** with this SSM Plan, **and** the startup caused an exceedance of an emission limitation, the Facility Manager or other appropriate personnel must report the actions taken to the enforcing authority by telephone or facsimile transmission (or an otherwise acceptable manner) within two (2) working days after the startup. A letter must be sent to the enforcing authority within seven (7) working days after the startup.

The letter shall be sent by certified or registered mail or overnight delivery service, and must include the following information:

1. Name and title of Facility Manager or other appropriate personnel;
2. Certifying signature of the owner/operator or other responsible official (Note that “responsible official” has the same meaning as under the Title V permitting program. See previous corporate guidance on this topic.);
3. Detailed explanation of the circumstances of the startup causing an emission limitation of the relevant emission standards to be exceeded;
4. The reasons for not following the SSM plan, describing all excess emissions and/or parameter monitoring exceedances which are believed to have occurred, and actions taken to minimize emissions.
5. A copy of the **Deviation Report Form or other records that document the departure.**

Note: If the SSM Plan is revised to re-define activities that constitute a startup, shutdown, or malfunction; or otherwise modifies the applicability of any emission limit, work practice requirement, or other requirement in the MACT rule, the revised SSM Plan does not take effect 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.

Pursuant to the requirements of the NSPS for MSW landfills, a GCCS can not be removed unless the landfill meets all the applicable criteria for removal of collection and control system 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.” (§63.2)

With GCCS, shutdown events would generally include shutdown of gas 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 activities listed in Table 4-1 could potentially be subject to the Shutdown Plan portion of the SSM Plan. However, it is unlikely that these events would cause the source to exceed any applicable emission limitation in The NSPS.

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

Table 4-1—Potential Events That May Cause a Shutdown of the GCCS

Control Device Maintenance, Repair, or Cleaning
Addition of New GCCS Components
Raising or Other Modification of Gas Extraction Wells
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 to Address Malfunctions or Other Occurrences
Planned Electrical Outages
Unplanned Electrical Outages
Sudden Change in Gas Quality

4.2 Actions To Take When The GCCS Is Shut Down

4.2.1 Collection System

GCCS's, once installed, are "closed" systems 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 activity causes an exceedance of the provisions of NSPS, the facility's GCCS design plan, or other applicable approval. If a shutdown causes the source to exceed an applicable emission limitation, the recordkeeping, notification, and reporting procedures outlined in Sections 4.3, 4.4, and 4.5, respectively, should be followed.

4.2.2 Utility Flares

Personnel shall follow proper procedures when shutting down a utility flare. Shutdown procedures can be located in operations manuals, notes, reports, or other sources.

4.2.2.1 Manual Shutdown

Under normal circumstances, shutdown of the utility flare causes an automatic shutdown of the gas moving equipment and does not result in exceedance of an emission limitation. Personnel shall follow the procedures identified in Appendix C when shutting down the utility flare.

4.2.2.2 Automatic Shutdown

The utility flare will automatically shut down if power is lost, gas flow/quality drops below a pre-set point, or other conditions occur. Under normal circumstances, shutdown of the flare causes an automatic shutdown of the gas moving equipment and does not result in exceedance of an emission limitation.

4.2.3 LFG Treatment System

Under normal circumstances, shutdown of the landfill gas treatment system does not result in exceedance of an emission limitation. Under current USEPA interpretation, the "treatment system" consists of the equipment that compresses, dewateres, and filters the landfill gas prior to its introduction into the pipeline.

Personnel shall follow the proper procedures when shutting down the treatment system. To protect downstream equipment, most treatment systems will automatically shut down if power is lost, gas flow/quality drops below a pre-set point, or other conditions occur. Personnel shall

follow the procedures identified in Appendix C when manually shutting down the landfill gas treatment system.

4.2.4 Enclosed Flare

Personnel shall follow proper procedures when shutting down an enclosed flare. Shutdown procedures can be located in operations manuals, notes, reports, or other sources.

4.2.4.1 Manual Shutdown

Under normal circumstances, shutdown of the flare causes an automatic shutdown of the gas moving equipment and does not result in exceedance of an emission limitation. Personnel shall follow the procedures identified in Appendix C when shutting down the enclosed flare.

4.2.4.2 Automatic Shutdown

The enclosed flare will automatically shut down if power is lost, gas flow/quality drops below a pre-set point, or other conditions occur. Under normal circumstances, shutdown of the flare causes an automatic shutdown of the gas moving equipment and does not result in exceedance of an emission limitation.

4.3 What To Record For Any Shutdown Events That Causes an Emission Exceedance

Based on changes in SSM regulations published on April 20, 2006, normal shutdowns of utility flares and treatment systems do not cause an emission limitation to be exceeded and do not need to be recorded.

If a malfunction occurs during shutdown, and the malfunction causes, or has the potential to cause, an emission exceedance, follow the procedures outlined in the “Malfunctions” section.

The operator shall record the following information for any shutdown that caused an emission limitation of the relevant emission standards to be exceeded:

- The date and time the shutdown occurred.
- The date and time the landfill gas flow rate to the control device reached zero
- The duration of the shutdown (for SSM recordkeeping, this is the time the shutdown occurred until the landfill gas flow reached zero).
- Records (e.g., form, checklist) that demonstrate that the procedures specified in this SSM Plan were followed.

- If the actions taken were not consistent with this SSM Plan, then the facility must record the actions taken for the event. The Facility may use the **Deviation Report Form** (Appendix B) to record such events. Actions not consistent with this SSM Plan must be reported within 2 working days, followed by a letter within 7 working days after the end of the event.
- The gas technician/manager or other appropriate personnel shall prepare the initial records upon discovery of a shutdown that caused an emission limitation of the relevant emission standards to be exceeded.
- The gas technician/manager or other appropriate personnel shall finalize the records upon successful implementation of the SSM Plan and notification shall be provided to the Facility Manager or other appropriate personnel.
- The relevant records shall be retained electronically (or hard-copy files) for five (5) years.

Note: Periods where control system did not operate more than 1 hour, or collection system did not operate more than 5 days must be recorded and reported under the NSPS even if an emission limit is not exceeded. Facilities may, at their discretion, record all shutdown events regardless of whether an emission limitation was exceeded, in order to document downtime and/or runtime as needed.

Note: The facility may use the GCCS Recordkeeping System template prepared by Corporate Air Programs to record/document SSM events and SSM Plan Departures.

4.4 Whom to Notify in Case of a Shutdown Event that Causes an Emission Exceedance

Based on changes in SSM regulations published on April 20, 2006, normal shutdowns of utility flares and treatment systems do not cause an emission limitation to be exceeded and do not require notification.

If a malfunction occurs during shutdown, and the malfunction causes, or has the potential to cause, an emission exceedance, follow the procedures outlined in the “Malfunctions” section.

- Notify the Facility Manager or other appropriate personnel of the shutdown that causes an emission limitation of the relevant emission standards to be exceeded.
- Notify the Facility Manager or other appropriate personnel within a reasonable timeframe of progress of the diagnosis and resolution of the shutdown that causes an emission emission limitation of the relevant emission standards to be exceeded.

- Notify the Facility Manager or other appropriate personnel when the alternative timeframe for shutdown has been established if it is outside of the timeframes currently allowed by the NSPS for particular compliance elements.

4.5 What to Report for a Shutdown Event That Causes an Emission Exceedance

Based on changes in SSM regulations published on April 20, 2006, normal shutdowns of utility flares and treatment systems do not cause an emission limitation to be exceeded and do not need to be reported.

If a malfunction occurs during shutdown, and the malfunction causes, or has the potential to cause, an emission exceedance, follow the procedures outlined in the “Malfunctions” section.

If the actions taken during the shutdown causing an emission limitation of the relevant emission standards to be exceeded **were consistent** with this SSM Plan, then state such 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 Facility Manager or Other appropriate Facility Personnel;
2. Certifying signature of the owner/operator or other responsible official (Note that “responsible official” has the same meaning as under the Title V permitting program. See previous corporate guidance on this topic.); and
3. A summary of the actions taken to minimize emissions during applicable shutdowns. This may be prepared once for similar events.

If the actions taken during a shutdown **were not consistent** with this SSM Plan, **and** the shutdown caused an exceedance of an emission limitation, the Facility Manager or other appropriate personnel must report the actions taken to the enforcing authority by telephone or facsimile transmission (or an otherwise acceptable manner) within two (2) working days after commencing the actions that were inconsistent with the plan. A letter must then be sent to the enforcing authority within seven (7) working days after the shutdown. The letter shall be sent by certified or registered mail or overnight delivery service, and must include the following information:

1. Name and title of Facility Manager or other appropriate personnel;
2. Certifying signature of the owner/operator or other responsible official (Note that “responsible official” has the same meaning as under the Title V permitting program. See previous corporate guidance on this topic.);
3. Detailed explanation of the circumstances of the shutdown causing an emission limitation of the relevant emission standards to be exceeded;
4. The reasons for not following the SSM plan, describing all excess emissions and/or parameter monitoring exceedances which are believed to have occurred, and actions taken to minimize emissions.

5. A copy of the **Deviation Report Form** or other records that document the departure.

Note: If the SSM Plan is revised to re-define activities that constitute a startup, shutdown, or malfunction; or otherwise modifies the applicability of any emission limit, work practice requirement, or other requirement in the MACT rule, the revised SSM Plan does not take effect 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.” (§63.2, revised 5/30/03)

The following list includes events that may constitute a malfunction of the GCCS at Pine Tree Acres, Inc. Landfill. The cause of these events will be investigated 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 LFG collection and control systems 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 Flame at the Control Device	5.4
Low Temperature Conditions at the Control Device	5.5
Malfunction of Flow Measuring/Recording Device	5.6
Malfunction of Flame Presence/Recording Device	5.7
Malfunction of Temperature Measuring/Recording Device	5.8
Other Control Device or Treatment System Malfunctions	5.9

The following list constitutes the possible exceedances of emission limitations 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 for any period due to downtime of flame presence/recording equipment (if alternative timeframe has not been established).
Excess flow through control device(s) for any period due to downtime of flow monitoring/recording equipment (if alternative timeframe has not been established).
Visible emissions from utility flare for more than 5 minutes during any two consecutive hours.
Incomplete landfill gas treatment prior to beneficial use or other application.
Excess emissions due to downtime of temperature monitoring and/or recording equipment and duration of downtime is more than 15 minutes (if alternative timeframe has not been established).
Excess emissions due to operation of an enclosed flare at a temperature lower than the temperature established during the performance test.

Malfunctions that result in or have the potential to result in an exceedance of an emission limitation shall be considered actionable under this SSM Plan whether they are discovered by Pine Tree Acres, Inc. Landfill personnel during normal operations, or by a regulatory agency during compliance inspections.

The operator shall follow the corrective action, notification, recordkeeping, and reporting procedures described herein in case of malfunction of the GCCS.

5.2 Actions to Take When the GCCS Malfunctions—All Malfunctions

- Determine whether the malfunction has caused an exceedance, or has the potential to cause an exceedance, of any applicable emission limitation.
- 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 greatest extent possible using good air pollution control practices and safety procedures.
- Some common malfunctions, along with their associated remedies, are summarized in Appendix A. Personnel shall follow these procedures when addressing a malfunction of a collection system or control device.
- Contact the Facility Manager or other appropriate personnel and proceed with the malfunction diagnosis and correction procedures for each specific malfunction.
- Notify the Facility Manager or other appropriate personnel of the progress of the diagnosis and correction procedures and status of the malfunction as soon as practicable.

- If the GCCS malfunction cannot be corrected within the time frame specified in the NSPS, then:
 - Notify the Facility Manager or other appropriate personnel and proceed to shutdown the control device and/or the process(es) venting to the control device, if this has not already occurred automatically.
 - 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.
 - Complete the appropriate record keeping and reporting required for deviations of the MACT rule and Title V permit.
- Once the malfunction is corrected, notify the Facility Manager or other appropriate personnel as soon as the system is operational.
- Complete records after the malfunction diagnosis and correction procedures are completed.
- Follow procedures in Sections 5.10 through 5.12, as appropriate, to adequately document, notify, and report the malfunction and corrective action. If the SSM Plan must be revised based on this information, follow the procedures listed below.

If the procedures in this SSM Plan do not address or adequately address the malfunction that has occurred, the operator shall record the circumstances and the actual steps taken to correct the malfunction. The Facility Manager or other appropriate personnel shall be notified of this situation. The facility must record deficiencies with procedures for addressing the malfunction and may use the **Deviation Report Form** (Appendix B) to record such event(s), or equivalent recordkeeping format.

Note: The facility may use the GCCS Recordkeeping System template prepared by Corporate Air Programs to record/document the deficiencies with procedures for addressing the malfunction and SSM Plan departures.

The SSM Plan must be updated, within 45 days after the event, to better address this type of malfunction. In general, revised SSM Plans shall not take effect until after the facility has provided a written notice (describing the revision) to the permitting authority. Revisions made to the SSM Plan are not to be considered revisions to the facility's Title V Operating Permit and the elements of the plan are not applicable requirements of the Title V Operating Permit.

5.3 Loss of LFG Flow/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 shut down. If control device has shut down, make sure that gas mover equipment has shut down 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 A.
- If the malfunction cannot be corrected within the timeframe allowed by the NSPS, 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 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 shut down. If control device has shut down, make sure that gas mover equipment has shut down 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 A.
- If the malfunction cannot be corrected within the time frame allowed by the NSPS, 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.

5.5 Low Temperature Conditions 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 shut down. If control device has shut down, make sure that gas mover equipment has shut down 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 A.

- If the malfunction causes, or has the potential to cause, the control device's 3-hour block average temperature to fall below the established minimum operating temperature, 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.
- If the malfunction causes the GCCS to go off-line and cannot be corrected within the time frame allowed by the NSPS, 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

- 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 A.
- If the malfunction cannot be corrected in the time frame allowed by the NSPS, 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 Flame Presence/Recording Device

- 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 A.
- If the malfunction cannot be corrected within the timeline established by the NSPS, 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 Malfunctions of Temperature Measuring/Recording Device

- 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 A.

- 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.

5.9 Other Control Device or Treatment System 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 or treatment system has shut down. If the control device or treatment system has shut down, make sure that gas mover equipment has shut down to prevent free venting of LFG. Attempt to restart the control device and/or treatment system 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 A.
- If the malfunction causes, or has the potential to cause, the control device's 3-hour block average temperature to fall below the established minimum operating temperature, 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.
- 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.

5.10 What to Record for a Malfunction Event

The gas technician/manager or operator must record the following information for each malfunction that occurs:

- 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 and minimize emissions (e.g., form/checklist).

- Whether the procedures in this SSM Plan were followed. If the procedures in the plan were not followed, the facility must complete records. The **Deviation Report Form** (Appendix B), or equivalent recordkeeping format may be used to record such events.
- If applicable, a description of the emission standard that was exceeded or had the potential to be exceeded.
- The gas technician/manager or other appropriate personnel shall prepare the initial records upon discovery of the malfunction and implementation of the SSM Plan.
- The records shall be finalized by the gas technician/manager or other appropriate personnel upon successful implementation of the SSM Plan and the Facility Manager and/or other appropriate personnel shall be notified of the system update.
- The data must be retained in the landfill files for five (5) years.

Note: The facility may use the GCCS Recordkeeping System template prepared by Corporate Air Programs to record/document SSM events and SSM Plan Departures.

5.11 Whom to Notify at the Facility for a Malfunction Event

- Notify the Facility Manager or other appropriate personnel of the malfunction.
- Notify the Facility Manager or other appropriate personnel within a reasonable timeframe of progress of the diagnosis and corrective action of the malfunction.
- Notify the Facility Manager or other appropriate personnel 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.
- Notify the Facility Manager or other appropriate personnel if the malfunction cannot be corrected within the timeframe allowed by the NSPS rule or the alternate timeframe established under this SSM Plan. Notification shall also occur if the malfunction that occurred is not addressed by the current SSM Plan.

5.12 What to Report for a Malfunction Event

Reporting of a malfunction event is required if the malfunction caused, or had the potential to cause, an exceedance of an applicable emission limitation.

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 Facility Manager or other appropriate personnel;
2. Certifying signature of the owner/operator or other responsible official (Note that “responsible official” has the same meaning as under the Title V permitting program. See previous corporate guidance on this topic.);
3. Statement that the actions taken during the malfunction were consistent with the SSM Plan; and
4. Number, duration, and brief description of each malfunction.

If the actions taken during a malfunction **were not consistent** with this SSM Plan, the Facility Manager or other appropriate personnel must report the actions taken to the enforcing authority by telephone or facsimile (FAX) transmission within two (2) working days after commencing the actions that were inconsistent with the plan. A letter must then be sent to the enforcing authority within seven (7) working days after the malfunction. The letter shall be sent by certified or registered mail or overnight delivery service, and must include the following information:

1. Name and title of Facility Manager or other appropriate personnel;
2. Certifying signature of the owner/operator or other responsible official (Note that “responsible official” has the same meaning as under the Title V permitting program. See previous corporate guidance on this topic.);
3. Number, duration, and brief description of each malfunction.;
4. Detailed explanation of the circumstances of the malfunction;
5. The reasons the SSM Plan was not adequate; and
6. The excess emissions and/or parameter monitoring exceedance that is believed to have occurred during the event.
7. Actions taken to minimize emissions.

In addition, if the actions taken during the malfunction **were not consistent** with this SSM Plan, the Facility Manager or other appropriate personnel at the landfill 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.
2. Report that the facility revised the SSM Plan within the next semi-annual submittal (within 30 days following the end of each 6-month period).

Note: If the SSM Plan is revised to re-define activities that constitute a startup, shutdown, or malfunction; or otherwise modifies the applicability of any emission limit, work practice requirement, or other requirement in the MACT rule, the revised SSM Plan does not take effect until written notice has been provided to the permitting authority describing the SSM Plan revision(s).

APPENDIX A

Common Causes and Response Actions for GCCS Malfunctions

(Note that this 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. Incident-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
LFG Collection and Control System				
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"> -Flame arrestor fouling/deterioration -Automatic valve problems -Blower failure (e.g., belt, motor, impeller, coupling, seizing, etc.) -Extraction piping failure -Condensate knock-out problems -Extraction piping blockages 	<ul style="list-style-type: none"> -Repair breakages in extraction piping -Clean flame arrestor -Repair blockages in extraction piping -Verify automatic valve operation, compressed air/nitrogen supply -Provide/utilize auxiliary power source, if necessary -Repair Settlement in Collection Piping - Repair Blower -Activate back-up blower, if available -Clean knock-up pot/demister -Drain knock-out pot
Utility or Enclosed Flare	Combusts LFG	Loss of Flame	<ul style="list-style-type: none"> -Problems/failure of thermocouple -Loss/change of LFG flow -Loss/change of LFG quality -Problems with air/fuel controls -Problems/failure of flame sensor -Problems with temperature monitoring equipment 	<ul style="list-style-type: none"> -Check/repair temperature monitoring equipment -Check/repair thermocouple -Follow procedures for loss of flow/blower malfunction -Check/adjust air/fuel controls -Check/adjust/repair flame sensor -Check/adjust LFG collectors
Utility or Enclosed Flare	Combusts LFG	Other Malfunctions	<ul style="list-style-type: none"> -Control device smoking (i.e. visible emissions) -Problems with pilot light system -Problems with air/fuel controllers -Problems with thermocouple -Problems with burner -Problems with flame arrestor -Alarmed malfunction conditions not covered above -Unalarmed conditions discovered during inspection not covered above 	<ul style="list-style-type: none"> -Site-specific diagnosis procedures -Site-specific responses actions based on diagnosis -Clean pitot/orifice -Clean/drain flame arrestor -Refill propane supply -Check/repair pilot sparking system
Treatment System	Compresses, Dewateres, and Filters Landfill Gas	Other Malfunctions	<ul style="list-style-type: none"> -Alarmed malfunction conditions not covered above -Unalarmed conditions discovered during inspection not covered above 	<ul style="list-style-type: none"> -Site-specific diagnosis procedures -Site-specific responses actions based on diagnosis

EQUIPMENT	PURPOSE	MALFUNCTION EVENT	COMMON CAUSES	TYPICAL RESPONSE ACTIONS
LFG Collection and Control System				
Enclosed Flare	Combusts LFG	Low temperature conditions at control device	<ul style="list-style-type: none"> -Problems with temperature - monitoring equipment -Problems/failure of -thermocouple and/or thermocouple wiring -Change of LFG flow -Change of LFG quality -Problems with air louvers -Problems with air/fuel controls -Change in atmospheric conditions 	<ul style="list-style-type: none"> -Check/repair temperature monitoring equipment -Check/repair thermocouple and/or wiring -Follow procedures for loss of flow/blower malfunction -Check/adjust louvers -Check/adjust air/fuel controls
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"> -Problems with thermocouple -Problems with device controls and/or wiring -Problems with chart recorder 	<ul style="list-style-type: none"> -Check/adjust/repair thermocouple -Check/adjust/repair controller and/or wiring -Check/adjust/repair electrical panel components -Check/repair chart recorder -Replace paper in chart recorder
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"> -Problems with orifice plate, pitot tube, or other in-line flow measuring device -Problems with device controls and/or wiring -Problems with chart recorder 	<ul style="list-style-type: none"> -Check/adjust/repair flow measuring device and/or wiring -Check/repair chart recorder -Replace paper in chart recorder
Flame Presence/ Recording Device	Monitors and records presence of flame at utility flare.	Malfunctions of Flame Sensing/Recording Device	<ul style="list-style-type: none"> -Problems with thermocouple -Problems with device controls and/or wiring -Problems with chart recorder 	<ul style="list-style-type: none"> -Check/adjust/repair thermocouple -Check/adjust/repair controller and/or wiring -Check/adjust/repair electrical panel components -Check/repair chart recorder -Replace paper in chart recorder

APPENDIX B
SSM Reporting Forms

APPENDIX C

Standard Operating Procedures for Startup and Shutdown Events

Startup

- 1 Check that there are no unsafe conditions present.
- 2 Check that the system is ready to start by one or more of the following:
 - a. Valves are in correct operating position
 - b. Levels, pressures, temperatures are within normal starting range
 - c. Alarms are cleared
 - d. Power is on and available to control panel and energized equipment
 - e. Emergency Stop is de-energized
 - f. Check that there are no gas emissions
- 3 Initiate start sequence
- 4 Observe that system achieves normal operating ranges for levels, pressures, and temperatures

Shutdown

- 1 Check that there are no unsafe conditions present
- 2 Initiate shutdown sequence by one or more of the following
 - 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

TREATMENT SYSTEM MALFUNCTION ABATEMENT PLAN - OPERATING PARAMETERS

EQUIPMENT	OPERATING PARAMETER	RANGE
Datagraph	Check Recorder Operation	Power on/enabled; accurate records
Datagraph	Datagraph Records	Recording accurately in 10-minute increments
Condensate Knockout	Condensate Knockout Pot's Liquid Level	visible on site glass
Condensate Knockout	Condensate Knockout Pot's Differential Pressure	(0 - 28 in. wc)
Blower	Motor Amperage Draw	(240 - 270 amps)
Blower	Bearing Temperature	(<220 F)
Blower	Vibration	Per Gardner Denver specification
Coolers/Blowers	Inspect for Oil Leaks	correct and clean
Cooler	Post-compression gas temperature	< 20 F above ambient (80 - 120 F)
Cooler	Visual Inspection of Belts on Cooler	free of cracks, squeals
Cooler	Lubricate Cooler Motor and Fan Bearings	per manufacturer's recommendation
Cooler	Check Tension/Tighten Belts on Gas/Oil Cooler	proper tension, deflection
Cooler	Inspect cooler tubes for leakage	leakage
Cooler	Inspect fan blades	structurally sound, no deflection
Cooler	Clean Cooler Tubes, Fins, and Fan Blades (powerwash)	visually free of dirt/debris
Coalescing Filter	Differential Pressure	< 1-psi

SPARE PARTS MAINTAINED IN INVENTORY

Yokogawa datagraph, 1-um (Graver-brand) coalescing filter cartridges, 0.3-um (Pall-brand) coalescing filter cartridges, panel indicator bulbs, grease, bearing oil, bearing and seal kits, mesh filter for KOPs, PLC cards and carriers

NOTES:

As of 9/20/2012, Treatment System I, dedicated to the LES 1 Plant, has been placed in stand-by. Piping modifications allowed delivery of treated landfill gas to the LES I from the Central Blower Station (aka - Treatment System II). Maintenance inspections of Treatment System I will be conducted as needed (minimum annually) based on actual usage.

Pine Tree Acres
Malfunction Abatement Plan

Treatment System

Inspection/Service	Equipment	WEEKLY	MONTHLY	3 MOS.	6 MOS.	YEARLY
Check Recorder Operation	Datagraph					
Download Datagraph	Datagraph					
Check Condensate Knockout's Liquid Level	Condensate KOPs					
Check Condensate Knockout's Differential Pressure	Condensate KOPs					
Check and Record Motor Amperage Draw	Blowers					
Landfill Gas Blower Lubrication	Blowers					
Check Blower Bearing Temperatures	Blowers					
Lubricate Blower Motor Bearings	Blowers					
Check Condition of Motor Isolation Pads	Blowers					
Check Blower Motor Alignment	Blowers					
Perform Vibration Analysis	Blowers					
Inspect for Oil Leaks	Coolers/Blowers					
Check Post-compression Gas Temperature	Coolers/Blowers					
Visual Inspection of Belts on Gas Cooler	Cooler					
Visually Check Cooling Fins	Cooler					
Lubricate Cooler Motor and Fan Bearings	Cooler					
Inspect fan blades	Cooler					
Clean Cooler Fins and Fan Blades	Cooler					
Coalescing Filter Changes	Filter Vessels					