



ODOR CONTROL PLAN

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INTRODUCTION

Over the summer of 2015, odor complaints from communities around the Orange County Solid Waste Management Facility (Facility) increased notably. Orange County has allocated additional resources and implemented administrative/engineering controls to minimize potential impacts to the surrounding community in accordance with Rule 62-701.530 of the Florida Administrative Code (F.A.C.), Gas Management Systems and Rule Subsection 62-296.320(2) F.A.C., Objectionable Odor Prohibited. To aide Facility operations, the existing Odor Control Plan is being updated to better respond to odor issues in the future.

Existing Landfill Gas Collection System at Cell 9-12 and Regulatory Requirements

The Facility is subject to Title V requirements under the Federal Clean Air Act. In accordance with the requirements of the Title V regulations (40 CFR Part 60), Orange County constructed and operates a landfill gas (LFG) collection and control system (GCCS) in the active bays of Cell 9-12. The active GCCS is operated in accordance with Florida Department of Environmental Protection (FDEP) Permit No. 0950113-008 AV (Title V) issued in April 2014 Permit No. 0128169-037-SO-01 (Solid Waste) issued in September 2014.

Orange County began disposal operations in Cell 9-12 in January 2005. Approximately 112 acres of the Cell 9-12 landfill have at least one lift of waste disposed in it. From the beginning of construction of Cell 9-12 and before requirement by permit, LFG collection was initiated for odor control as a good-neighbor initiative by the County. The system included constructing horizontal gas collection pipelines to draw the gas from the landfill and convey it to an onsite flare station. The GCCS was continually expanded with additional horizontal collectors and new vertical gas extraction wells as waste lifts were completed. In 2009, the County entered into a long-term agreement with OUC for beneficial use of the LFG generated in Cells 9-12 as supplemental fuel for the generation of power at the Curtis H. Stanton Energy Center (Stanton). By December 2011, OUC completed construction of a processing facility adjacent to the Cell 9-12 landfill to dry and pressurize the LFG for transmission to Stanton. As of the writing of this report in early 2016, OUC is expanding the processing facility to double the amount of LFG that can be collected from the landfill. This will create additional odorous gas control.

Cell 9-12 is filled with solid waste in a stair-step fill sequence in accordance with permitted operations. As of mid-2014, the County has deposited approximately 7.3 million cubic yards of solid waste in Cell 9-12.

IDENTIFYING THE PRESENCE OF ODOR

Community Odor Complaints

All community odor complaints received by the landfill are logged in an electronic database. Individuals are encouraged to provide their name, address, date, and time of the odor occurrence. Complaints that do not provide this basic information cannot be investigated. However, these complaints will be logged in the record of complaints.

Complaints are investigated as soon as practical, within the limits of safety protocols and site logistics. The following actions are taken:

- Complaints received during the typical workday are investigated by the Landfill's Environmental Management staff.
- If a community odor complaint is verified by the Landfill's Environmental Management staff, then Operations personnel at the landfill are notified.
- Operations personnel will perform the onsite odor source investigation.

Results of the investigation will be analyzed for odor trends. This information is useful to schedule self-inspections and understand potential site problems.

Odor Complaint Investigation

A Jerome meter (i.e. Arizona Instrument's Jerome 631-X Hydrogen Sulfide Analyzer) is used to measure hydrogen sulfide (H₂S) levels at suspected odorous locations. H₂S serves as a surrogate for odor because it is a common component of LFG, noticeable and recognizable to the human nose at low concentrations, and detectable by instrumentation below the odor threshold. H₂S has a distinctive rotten egg odor and is produced from the biodegradation of landfill contents.

Self-Inspection

The primary objective of self-inspection is to identify and minimize odors from the Facility before it affects the surrounding communities. This is accomplished through the use of routine self-inspections by Facility personnel.

Routine Daily Odor Monitoring

Odor monitoring will be performed at least 3 days during the work week by Facility personnel. One of the monitoring days shall be Friday. The monitoring will be conducted along the perimeter of Cell 9-12 during the morning and before the landfill closes. The location and intensity of odors will be documented in a daily log, with verbiage such as "no odor", "slight odor", "moderate odor", or "strong odor". In addition, wind intensity and direction will be estimated.

When Facility personnel detect an elevated odor of sufficient intensity that could lead to detection offsite, they will report the elevated odor to their Supervisor. The Supervisor then investigates the source. The investigator will inform the proper staff so that the problem area can be addressed by Operations personnel.

Weekly Odor Monitoring

Approximately once per week, Environmental staff performs monitoring of selected sites within the Facility and surrounding communities. The results will be documented in a log. The weekly odor monitoring sites have been selected based on complaint history, and sites will be added as necessary based on monitoring results and historical complaint records.

The weekly monitoring events are typically completed within two hours of sunrise. This is because as the day progresses, rising temperatures create erratic wind shifts and increased wind velocity. The collection of early morning samples creates a worst case bias. Winds are relatively calm and the heavier LFG components (including H₂S) have settled to the ground causing the highest potential for odor problems. In order to allow some leeway in sampling, sites are not exact latitude/longitude coordinates. Therefore, a site location may vary by a few hundred feet.

Collection of Weather Data

The Facility has three weather stations capable of recording rainfall, temperature, and wind direction. This data is used to assist in determining the potential impact of weather on gas emissions. Additionally, the weather data is useful to determine potential downwind odor impacts, the source of odor, and its severity. This is because calm winds tend to equate with higher offsite odor potentials. Strong winds tend to increase mixing and dilute H₂S concentrations.

Weather data records help sort multiple complaints occurring on the same date. Complaints received by the Facility will be crossed checked with the weather data recorded. Weather data records are stored on file at the Facility.

BEST MANAGEMENT PRACTICES FOR ODOR CONTROL

Operational Best Management Practices (BMP)

Current and past landfill operations at the Facility follow approved industry standards. However, changes to landfill operations over the past three years have inadvertently contributed to odor generation. As a result of the odor, the Facility has implemented the following BMPs to minimize odors:

- No mixing of Class I waste with Class III waste is allowed at the Facility because of its propensity to increase H₂S generation.
- Six-inches of daily soil cover instead of FDEP approved reusable tarps.
- Additional cover and sod will be added to landfill slopes and top area to help reduce wind and water erosion.
- Daily placement of additional soil cover material in areas suspected of generating odors.
- Construction of final cover on portions of the landfill as it reaches final elevation.
- Utilize as small an active face as practical to minimize open garbage areas and reduce potential odor release.
- No waste disposal operations at top of landfill (above treeline) during rainy/hot season. Heat during summer causes additional odors during waste disposal operations.
- To help minimize odors generated from sludge received from the wastewater treatment plants, the Facility will not accept sludge after 3:00 pm. This time limitation allows

sludge to be mixed with regular waste at the active area during placement and covered with additional waste before being covered with the soil at the end of the day.

- Mobile and stationary misting systems are used around the Facility to mitigate odors from the landfill. Solutions placed through the misting system have the ability to neutralize odorous particles.

Gas System Expansion and Operations

The existing GCCS consists of horizontal collection pipelines and vertical extraction wells that convey the LFG to a processing facility and then is sent to OUC for use as fuel. The County continues to install horizontal collectors within each lift of waste. Vertical wells are also installed during the filling of the cells as waste depths increase. The horizontal collectors and vertical wells are connected to the existing perimeter gas collection header.

- Trained LFG technicians identify maintenance issues and equipment/materials onsite for repairs.
- An operation and maintenance program for the GCCS includes expansion of the system, required scheduled maintenance, and preventative maintenance. The preventative maintenance program includes inspections of the gas extraction wells, wellhead assemblies, lateral and header pipes, gas condensate removal units, and control valves.
- The County will continue to expand the GCCS as needed.
- Horizontal collection pipelines are constructed at the Facility specifically for odor control. Horizontal collectors normally work for a limited period of time and are eventually abandoned when efficiency decreases to an unacceptable level. Abandoned horizontal collectors are replaced by vertical wells.

Stormwater Runoff Management

Moisture introduced into the landfill through rainfall can reduce gas recovery and increase bacteriological activity, which can result in odor release long after a rain event.

- A preventative maintenance program includes timely inspection and maintenance of the stormwater management devices (e.g. step terraces, letdown pipes, and terminal structures on the active landfill cells) as well as inspecting and testing facility equipment and systems for conditions that could contribute to the breakdown or failure of the stormwater system. The program includes inspections of the stormwater retention system for vegetation, sediment buildup or debris deposited in the pond structure, and any erosion damage to pond structures. Inspections are conducted by qualified personnel trained in the design and construction of the stormwater system. Although the inspection program outlines monthly observations, more frequent inspections will occur during the rainy season. Additionally, all employees make observations of problems with the stormwater systems during their daily duties.
- Continue to upgrade and maintain stormwater drainage system.
- Continue to monitor proper operation of the leachate collection system.
- Maintain slopes from 2% to 5% to encourage runoff and minimize erosion.

REPORTING

Quarterly Reports

The Facility will prepare and submit quarterly reports to the FDEP. This report will include the following items gathered over the previous 3 months.

- Log of odor complaints, with time and address of odor, received by County personnel.
- Log of weekly landfill odor monitoring results.
- Log of weekly community H₂S monitoring results.
- Summary of odor control activities.

Quarterly reports will be submitted to the FDEP within 30 days after each quarter (e.g. the January through March report would be due to the FDEP by April 30).

ODOR MITIGATION EFFORTS

When offsite odors necessitate the implementation of the odor mitigation and control practices outlined in this plan, the effectiveness of these methods will be evaluated and documented for use by the management staff in determining the effectiveness of each method.

In the event that a mitigation method is attempted and found to be ineffective, another mitigation method will be attempted and/or outside experts will be contacted until the facility is successful in controlling odor.

UPDATING OPERATIONS PLAN

This Odor Control Plan will be continuously updated to ensure that all activities available to help monitor and combat odors at the landfill are documented. Additionally, the Solid Waste Operation Plan will be updated with the Odor Control Plan and submitted to the FDEP.