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CITRUS COUNTY DEPARTMENT OF TECHNICAL SERVICES ENGINEERING DIVISION
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Proj: LONG TERM CARE & MAINT. FDER PERMIT - 60 ACRE "OLD" LANDFILL
Subj: OPERATIONS MANUAL - LFG VENTS & STACK BURNERS PORTION D.E.R.

Sixty Acre Site Landfill Gas Control Operations **NACS ID # 39859**
Landfill Gas Vents & Stackburners **MAR 04 1993**
Permit # **5009-111795**

Purpose

This manual is to provide direction to Citrus County **CENTRAL DISTRICT TAMPA** staff whose duties include operation of the vent and stackburner landfill gas (methane) control system on the sixty acre "Old Landfill" site.

Introduction

Landfill gas is generated by the decomposing refuse buried in a landfill. Carbon dioxide is generated at first, with an increasing amount of methane being generated in the second phase until the concentration of methane reaches 50 to 60%. Typically, methane generation will continue at these concentrations for up to 20 years or more. Methane gas is explosive in confined spaces at concentrations of 5 to 15%, and poses an extreme danger at over 15%, even though oxygen is insufficient for an explosion. Also, in confined spaces, methane can cause asphyxiation, and can kill vegetation by asphyxiating the roots.

On the closed sixty acre site, landfill gas (methane) and (odor) control is accomplished by a vent field consisting of, at present, forty-four (44) vents placed on a grid of about 190 feet center-to-center over the closed cells. Constructed of four (4) inch diameter PVC piping extending approximately twenty-nine (29) feet into the ground, the lower twenty (20) feet is perforated and encased in a two (2) foot diameter hole backfilled with coarse aggregate to allow for gas accumulation. Thirteen (13) of the cap vents and the two (2) leachate lift station covers on the Seven (7) Acre Trench have been fitted with galvanized steel pipe ventstacks incorporating flares constructed of a metal perforated burner cone, for additional odor control.

Regulatory Framework

Minimum specifications for gas control at landfills in Florida were formerly (prior to January 6, 1993) found at FAC 17-701.050(5)i, "Gas Control System Performance Standards", and 17-701.050(5)j, "Gas Control System Design Standards". Minimum requirements for operation of gas control systems at landfills in Florida are found at FAC 17-701.050(6), "Operations", subpart 'i', and for closure, at FAC 17-701.073, "Closure Plan Requirements", subpart (4), "Gas migration investigation", and 17-701.073 (6), "Closure Design Plan", subpart (f), "Type of gas or odor control which may be used".

Minimum requirements for gas control at landfills in Florida are currently found at FAC 17-701.400(5)(e); 17-701.400(10), "Gas Control Systems"; 17-701.400(11), "Landfill Gas Recovery Facilities"; 17-701.430(2)(d); 17-701.500(9), "Gas Monitoring"; 17-701.600(4)(d); and 17-701.720(4)(a)4 & (d)1.

Routine Operations

Gas Control System Staffing (Operators)
Office (Admin & Records)

The Solid Waste Technician, has been designated to administer the gas control program under the direction of the Director of Solid Waste Management. He or she shall maintain records pertaining to the 60 Acre gas control system in the Administration Building on the 80 Acre site as directed by the Director.

Field (System Custody & Maintenance)

The Solid Waste Section Chief has custody of the landfill facilities, under the direction of the Director of Solid Waste Management, including the gas control system for the 60 Acre site. Routine maintenance of the system shall be performed by the staff under his supervision as directed.

Gas Generation Monitoring Test Results Procedures

Frequency of testing

Gas generation testing of all vents, not fitted with stack burners, shall be done by the Technician at least semi-annually or "as directed".

Form of records

Records shall be maintained by the Technician in a neat and readily accessible hard copy format as a permanent record, even though they may also exist as an electronic database.

Routine Maintenance Procedures

Routine maintenance is to be performed by Solid Waste Division personnel upon direction of the Solid Waste Section Chief. Components of the stack burners are to be visually inspected for excessive corrosion, leaks, and general deterioration on a monthly basis. Any defects are to be scheduled for repair immediately. Lighting of the vent stack burners is performed by the Chief according to the following procedure:

1. Check atmospheric conditions to determine that there is a "sensible" breeze (approx. 4 - 5 mph),
2. Standing upwind of the burner, test with the hand-held meter that no reading in excess of 25% of the LEL is obtained,
3. Ignite the lighter on the end of the wand (15 ft. long min.),
4. Ignite the burner cone on the stack burner, and
5. Extinguish the lighter on the end of the wand.

The landfill gas vents without stack burners are to be sampled for gas generation by the Solid Waste Technician, with the portable equipment, on a semi-annual frequency as a minimum. Readings are to be taken at each vent with the Gastech Model #GP-204 combustible gas indicator and the maximum levels determined in % LEL recorded as indicated below. A work order for ventstack burner installation is then cut if the readings warrant it.

Emergency Plan (Emergency involving gas control facilities)

Currently, emergencies -potential disasters- are handled through the "911" system. The employee observer of an emergency event is instructed to call "911", from which an appropriate response to the emergency will be dispatched. The employee shall then report to the Chief for emergency assignment.

Sixty Acre Site Landfill Gas Control Operations
Landfill Gas Migration Sampling & Testing

Purpose

This manual is to provide direction to Citrus County Central Landfill staff whose duties include operation of the landfill gas (methane) migration detection system on the sixty acre "Old Landfill" site.

Introduction

Landfill gas is generated by the decomposing refuse buried in a landfill. Carbon dioxide is generated at first, with an increasing amount of methane being generated in the second phase until the concentration of methane reaches 50 to 60%. Typically, methane generation will continue at these concentrations for up to 20 years or more. Methane gas is explosive in confined spaces at concentrations of 5 to 15%, and poses an extreme danger at over 15%, even though oxygen is insufficient for an explosion. Also, in confined spaces, methane can cause asphyxiation, and can kill vegetation by asphyxiating the roots.

Landfill gas (methane) migrates from the source through the voids space present in soil. Therefore, methane detection alarms have been installed both in the scalehouse and in the treatment plant control room. Also, permanent gas migration sampling point stations have been installed at variable spacing around the perimeter of the sixty acre site to detect methane migration. These stations are sampled with portable equipment at a quarterly frequency as a minimum, the results analyzed and reported to the Florida Department of Environmental Regulation.

Regulatory Framework

Minimum specifications for gas control at landfills in Florida were formerly (prior to January 6, 1993) found at FAC 17-701.050(5)i, "Gas Control System Performance Standards", and 17-701.050(5)j, "Gas Control System Design Standards". Minimum requirements for operation of gas control systems at landfills in Florida are found at FAC 17-701.050(6), "Operations", subpart 'i', and for closure, at FAC 17-701.073, "Closure Plan Requirements", subpart '(4)', "Gas migration investigation", and 17-701.073 (6), "Closure Design Plan", subpart (f), "Type of gas or odor control which may be used".

Minimum requirements for gas control at landfills in Florida are currently found at FAC 17-701.400(5)(e); 17-701.400(10), "Gas Control Systems"; 17-701.400(11), "Landfill Gas Recovery Facilities"; 17-701.430(2)(d); 17-701.500(9), "Gas Monitoring"; 17-701.600(4)(d); and 17-701.720(4)(a)4 & (d)1.

Routine Operations

Day-to-day operation of the landfill gas migration detection system and sampling and testing for gas migration is currently performed by Citrus County personnel. Readings are taken at each sampling point station with a Gastech Model #GP-204 combustible gas indicator and the maximum levels determined are recorded as % LEL.

Gas Migration Detection System Staffing (Operators)
Office (Administration & Records)

The Solid Waste Technician, has been designated to administer the gas migration detection program under the direction of the Director of Solid Waste Management. He or she shall maintain records pertaining to the 60 Acre gas migration detection system in the Administration Building on the 80 Acre site as directed by the Director.

Field (System Custody & Maintenance)

The Solid Waste Section Chief has custody of the landfill facilities, under the direction of the Director of Solid Waste Management, including the gas migration detection system for the 60 Acre site. Routine maintenance of the system shall be performed by the staff under his supervision as directed.

Gas Migration Detection Sampling & Testing Results Procedures

Frequency of testing

Sampling and testing of the gas migration station point field shall be done by the Technician on a quarterly frequency, minimum, but may be done more frequently on an "as directed" basis.

Form of records

Records shall be maintained by the Technician in a neat and readily accessible hard copy format as a permanent record, even though they may also exist as an electronic database.

Emergency Plan (Emergency involving gas control facilities)

Currently, emergencies -potential disasters- are handled through the "911" system. The employee observer of an emergency event is instructed to call "911", from which an appropriate response to the emergency will be dispatched. The employee shall then report to the Chief for emergency assignment.