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## **APPENDIX 6**

OPERATIONS PLAN FOR CMS LANDFILL V PHASE 3  
PLAN FOR THE LEACHATE COLLECTION SYSTEM CLEANING, INSPECTION  
AND RECORD KEEPING

## Inspection Schedule for the Leachate Collection System

Frequency	Description
Weekly	Operating condition of leachate collection and removal system (pump control panels, flow meters, valves, pumps, risers, cleanouts, manholes, etc.).
Annually	Inspection and maintenance of leachate pumps and pump control system equipment.
Every two years	Leachate collection piping cleaned with high pressure water jetting. A variance from further jet cleaning can be requested after 5-years from the Division of Waste Management – Solid Waste Section unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.
Every five years	Leachate collection piping closed-circuit televised (CCTV) inspection. The piping shall be high pressure water jet cleaned if obstructions are observed during the CCTV inspection. After the 5-year leachate collection piping CCTV inspection, a variance from further CCTV inspection and cleaning can be requested from the Division of Waste Management – Solid Waste Section unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.
Following a new landfill cell construction. Part of issuance of a Permit to Operate.	Leachate collection piping closed-circuit televised (CCTV) inspection. The piping shall be high pressure water jet cleaned if obstructions are observed during the CCTV inspection. Documentation of the CCTV inspection should be included as part of the construction quality assurance (CQA) documentation submitted to the Division of Waste Management – Solid Waste Section for the Permit to Operate.

### Leachate Collection System Inspection Plan

The landfill bottom liner system leachate collection system (LCS) is placed over the landfill's bottom liner system geomembrane utilizing a drainage geocomposite, 24 inches of a native soils protective cover layer, collection pipes and side-slope riser pipes with submersible pumps. The LCS external to the landfill consists of pump control panels, force main pipes, valves, manholes, cleanouts and a storage lagoon. Care must be taken when inspecting all leachate facilities. There is the potential for the build-up of methane gas in structures and pipes, and there is a potential for dermal contact with leachate. Guidelines for inspection and maintenance of the leachate collection system are as follows:

#### **Leachate Collection and Pumping System Inspection Program (includes pump control panels, flow meters, valves, pumps, risers, cleanouts, manholes, etc.)**

The landfill shall institute an inspection and maintenance program for the leachate collection and pumping system. The program shall contain at a minimum the following:

1. Yearly inspection and maintenance of the pumps and pump control system equipment by an outside company familiar with the equipment or similar type of equipment. A report shall be generated from the yearly inspection and maintenance and kept in the landfill operating record.

2. Continuously monitor the high water and pump failure alarms on each of the pump control panels.
3. On a weekly basis monitor and record the general operating condition of the leachate collection pumps, pump control panels, leachate level transducers, and flow meters. In addition, when applicable on a weekly basis from each landfill cell, monitor and record leachate flow, leachate level on the bottom liner system, and pump run time. The weekly monitoring information shall be recorded in a log kept in the landfill operating record.
4. At variable intervals, review the weekly monitoring information for early warnings and to determine if the leachate collection and pumping system is working properly. (Monitoring early warning examples: if a pump has excessive run times with little or no reduction in leachate levels then the leachate collection sump may be clogged; if a pump has low run times with consistent high leachate levels on the bottom liner system then the pump is not working correctly or the leachate collection sump or piping is clogged; if the pump is constantly operating and the flow meter shows little or no flow then the pump discharge pipe check valve may not be working correctly or a valve may be closed or partially closed).

### **Leachate Collection Piping Inspection Program**

1. Leachate collection piping located in newly constructed landfill cells will be closed-circuit televised (CCTV) following completion of construction and documentation as to the CCTV inspection included as part of the construction quality assurance (CQA) documentation for issuance of the Permit to Operate from the NCDENR Division of Waste Management. In addition, if during the leachate piping CCTV inspection a blockage is observed, the piping with the blockage at a minimum will be cleaned with high pressure water jetting and CCTV to verify that the blockage is removed.
2. Leachate collection piping will be cleaned with high pressure water jetting 2-years after the most recent jet cleaning. A variance from further jet cleaning can be requested after 5-years from the Division of Waste Management – Solid Waste Section unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.
3. After the initial closed-circuit televised (CCTV) inspection for the new landfill cell construction, the leachate collection piping will be CCTV 5-years after the most recent CCTV inspection. In addition, if during the leachate piping CCTV inspection a blockage is observed the piping with the blockage at a minimum will be cleaned with high pressure water jetting and CCTV to verify that the blockage is removed. After the 5-year leachate collection piping CCTV inspection and cleaning, a variance from further CCTV inspection and cleaning can be requested from the Division unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.

## **Leachate Collection and Pumping System Contingency Plan**

The landfill shall institute an contingency plan that if a determination is made from the monitoring of the leachate collection and pumping system that the collection piping or sump may have a blockage, the sump and/or collection piping for the landfill cell will be cleaned with high pressure water jetting and closed-circuit televised (CCTV). In addition, leachate pump removal and visual inspection will be completed during the yearly inspection and maintenance of the equipment and if deemed necessary a pump drawdown test will be completed.

The leachate pumping system is determined to be working correctly when the pump flow rate and reduction in leachate level is consistent with the manufacture pump design flow rate and design level reduction.

## **Monitoring and Recordkeeping for the Leachate Collection System**

The landfill will maintain records about the leachate collection system inspection and maintenance for the following items:

1. Continuously monitor the high water and pump failure alarms on each of the pump control panels.
2. On a weekly basis monitor and record the general operating condition of the leachate collection pumps, pump control panels, leachate level transducers, and flow meters. In addition, when applicable on a weekly basis from each landfill cell, monitor and record leachate flow, leachate level on the base liner system, and pump run time. The weekly monitoring information shall be recorded in a log and kept in the landfill operating record.
3. At variable intervals, review the weekly monitoring information for early warnings and to determine if the leachate collection and pumping system is working properly.
4. Leachate collection piping CCTV inspection and high pressure water jet cleaning results.

## Records and Reporting for the Leachate Collection System

Table below displays a list of items/events which must be routinely recorded and kept in the landfill’s operating record or submitted to NCDENR Division of Waste Management for the leachate collection system.

Type of Record	Frequency of Recording	Submitted To	Frequency of Submission
Climatic and Precipitation	Daily	Kept in the landfill operating record	To NCDENR upon request
Leachate Generation (per cell) – Pumped Flows	Weekly	Kept in the landfill operating record	To NCDENR upon request
Leachate Collection and Removal System Operations, Pump Run Times (per cell), and Liquid Levels on Bottom Liner (per cell).	Weekly	Kept in the landfill operating record	To NCDENR upon request
Leachate Collection Piping High Pressure Water Jet Cleaning Results	Two years <sup>(1)</sup>	Kept in the landfill operating record	To NCDENR upon request
Leachate Collection Piping CCTV Inspection Results	At the conclusion of landfill cell construction and five years thereafter <sup>(1)</sup>	Kept in the landfill operating record and to NCDENR Division of Waste Management as part of construction quality assurance (CQA) documentation for issuance of the Permit to Operate	Initial CCTV inspection included as part of the construction quality assurance (CQA) documentation for issuance of the Permit to Operate from the NCDENR Division of Waste Management and to NCDENR upon request
	(1) After the 5-year leachate collection piping CCTV inspection, a variance from further CCTV inspection and cleaning can be requested from the Division unless a blockage or problem is detected during the leachate collection and pumping inspection and maintenance program.		

A standard checklist for landfill inspections and monitoring is to be developed and appropriately updated as cells and facilities are brought on-line. Landfill Inspection Records shall be kept in the Facility’s operating record.

A record of observed climatic and precipitation conditions shall be maintained at the landfill. Such observations need not include detailed statistical data but rather are to present qualitative observations. Climatic conditions shall be recorded daily at the landfill. A rain gauge is to be maintained for determining daily precipitation.

All information contained in the operating record must be easily assessable and furnished upon request to the NCDENR Division of Waste Management.