

**REPORT TO ENVIRONMENTAL SERVICES COMMITTEE
MEETING OF WEDNESDAY, NOVEMBER 27, 2013**

SUBJECT **HARTLAND LANDFILL ENVIRONMENTAL PROGRAM – 2012-2013 ANNUAL REPORT**

ISSUE

To present the Hartland Landfill Environmental Program 2012-2013 Annual Report to committee prior to submission to the provincial regulator.

BACKGROUND

Environmental Protection division staff manage environmental programs at Hartland Landfill to assess potential impacts from the landfill and regulate the receipt of waste requiring special handling (controlled waste). These programs include landfill gas monitoring, groundwater, surface water and leachate monitoring, and controlled waste permitting.

Under staff direction, qualified professional consultants experienced in assessing the impacts of landfill operations, assessed and interpreted data from the groundwater, surface water and leachate monitoring program. Capital Regional District (CRD) staff assessed the landfill gas monitoring and controlled waste permitting programs. The annual report provides a summary of key findings and recommendations arising from the consultant and staff assessment reports. The report's executive summary is attached as Appendix A. The full report is available on the CRD website.

ALTERNATIVES

1. That the Environmental Services Committee recommend to the Board:
 - a) that the Hartland Landfill Environmental Program 2012-2013 Annual Report be received for information and the report be forwarded to the BC Ministry of Environment; and
 - b) that staff report EEP 13-46 be forwarded to the Solid Waste Advisory Committee for information.
2. That the Environmental Services Committee request additional information and direct staff to submit the revised report to the BC Ministry of Environment.

ENVIRONMENTAL IMPLICATIONS

The 2012 monitoring data indicate that the gas collection system provides good control in the capped and closed areas, and that the risk of subsurface gas migration offsite is low. Gas continues to escape from uncapped areas of the landfill. The long-term landfill gas management plan is being implemented and will increase efficiency of the gas collection system to meet provincial regulations.

Groundwater monitoring results indicate that landfill leachate is effectively controlled and contained onsite. Ongoing operation of the north and south purge wells continues to contribute to the effectiveness of the leachate containment system. Recent operational challenges with the south purge wells are currently under investigation to optimize the system. Property boundary compliance stations met water quality guidelines with the exception of some aesthetic parameters, including conductivity, iron and manganese. Landfill leachate does not impact any offsite drinking water wells

Surface water monitoring results indicate that leachate is effectively contained onsite. Property boundary stations met water quality guidelines and there is no leachate migration. Total suspended solids and constituents associated with fine sediments are reported at concentrations above the guidelines during some events but have improved relative to previous years. Staff continue to develop sediment control measures for these locations. Water quality at Durrance Lake, Killarney Lake and Tod Creek met water quality criteria and was not affected by landfill leachate.

Throughout the year, leachate was in compliance with the waste discharge permit requirements with the exceptions of sulphide on six sampling dates, and chemical oxygen demand and total polycyclic aromatic hydrocarbons on one sampling date. Staff are investigating the cause of these exceedences.

The controlled waste permitting system continues to provide an effective level of control to protect staff health and safety, and to minimize additional contaminant loading to the landfill and leachate.

The consultant provided several technical recommendations and suggestions to ensure the program remains effective and efficient in meeting ongoing regulatory commitments. These recommendations are discussed at operational meetings associated with the landfill.

FINANCIAL IMPLICATIONS

The program is funded from the Environmental Resource Management annual budget. The implementation of the above technical recommendations will be incorporated through the existing budget and will have no implications on the annual budget.

CONCLUSIONS

The Hartland Environmental Program provides valuable data to assess the effectiveness of collection and containment measures for landfill gas and leachate. Implementation of the landfill gas management plan has been effective at increasing collection efficiency toward ministry targets.

Groundwater and surface water monitoring confirm that landfill leachate is collected and contained onsite. Continued operation of the purge well systems are an effective component of the leachate collection and containment system on site.

The controlled waste permitting system continues to provide an effective level of control for wastes that require special handling.

RECOMMENDATION

That the Environmental Services Committee recommend to the Board:

That:

- a) that the Hartland Landfill Environmental Program 2012-2013 Annual Report be received for information and then the report be forwarded to the BC Ministry of Environment; and
- b) that staff report EEP 13-46 be forwarded to the Solid Waste Advisory Committee for information.

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Attachment: 1

HARTLAND LANDFILL ENVIRONMENTAL PROGRAM 2012-2013 ANNUAL REPORT

EXECUTIVE SUMMARY

The Hartland landfill provides solid waste disposal services for the Capital Regional District (CRD). The operation of a landfill can result in environmental effects and health and safety issues; specifically, effects to surface water and groundwater, and the production of landfill leachate and landfill gas.

Hartland landfill has measures in place to reduce and control releases to groundwater, surface water, leachate and air. An environmental monitoring, assessment and management program assesses the effectiveness of the control measures and identifies potential impacts. In addition, a permitting program regulates the receipt of controlled wastes which require special handling due to operational requirements, potential health and safety risk to workers or adverse effects to the environment.

This annual report presents a summary of the key findings and recommendations for the following Hartland Environmental Program components and reporting periods:

- landfill gas monitoring (January to December 2012)
- groundwater, surface water and leachate monitoring (April 2012 to March 2013)
- controlled waste permitting (January to December 2012)

The reporting period follows the calendar year with the exception of the groundwater, surface water and leachate monitoring component. The reporting period for this component is shifted to improve evaluation of trends through the complete wet winter period which is key to understanding the hydrogeological response in the system.

LANDFILL GAS

Decomposition of refuse creates landfill gas which, if not controlled, escapes to the atmosphere. Even with proper landfill gas collection and control, fugitive landfill gas emissions do escape to the atmosphere. A number of factors influence this, such as atmospheric pressure, groundwater level, gas pressure in the refuse mass and permeability of cover systems. Hartland landfill has a landfill gas collection system to minimize fugitive emissions and a monitoring program is in place to assess the effectiveness of these controls.

Landfill Gas Monitoring Program

Purpose

The landfill gas monitoring program has four main components. The following summarizes these components and their primary purpose:

1. **Collection and treatment system monitoring** assesses the changes in gas quality over time, and evaluates data for gas collection and gas utilization in order to determine collection efficiency and total emissions from the landfill.
2. **Perimeter and building foundation probe monitoring** assesses the potential for subsurface (underground) landfill gas migration at the landfill eastern boundary and at onsite buildings for compliance with criteria and for worker and public health and safety.
3. **Ambient grid and hot spot monitoring** evaluates the effectiveness of cover and landfill gas collection systems and identifies areas of concern where landfill gas is being released to the atmosphere for protection of worker and public health and safety.
4. **Gas Speciation** assesses the composition of gas with regard to volatile organic compounds, sulphur gases and typical landfill gases in order to calculate ambient dilution concentrations for health and safety purposes.

Collection and Treatment System Monitoring

Gas Collection Well Field Operation

Gas collection wells are adjusted to optimize the flow, methane and oxygen content of the gas. By regulation, the well field should be measured and balanced at least once per month; this was accomplished in 2012. Well field balancing should be conducted on a minimum frequency of once per month.

In 2012, the gas collection well field consisted of 109 wells; an increase over the previous year due to wells added as part of a large scale Phase 2 Cell 1 closure. The top 11 collecting wells accounted for just over 60% of the gas collected in 2012. A number of wells did not produce enough gas to be measured. A process to classify the wells to reduce or discontinue monitoring at non-collecting wells has been implemented to optimize staff time spent on well field monitoring.

The amount of gas collected increased in 2012 over the previous three years. In 2012, it is estimated that the Hartland landfill generated 8,293 tonnes of methane (or an average of 1,700 scfm of landfill gas). The collection efficiency in 2012 was estimated at 48.8%, a 14% increase from the previous year due to the implementation of the Landfill Gas Management Plan, which includes installation of several gas wells in the Phase 2 Cell 1 closure. Total greenhouse gas emissions for 2012 are estimated at 87,542 tonnes of CO₂e.

Gas Utilization

More flaring occurred in 2012 due to gas volumes exceeding the needs of the generator and more downtime of the generator due to the presence of siloxane compounds in the gas. The generator is shut down during this time to avoid excessive wear and tear on machinery components. The generator consumed an average of 439 scfm in 2012 and utilized 53% of captured gas. This is a decrease from the previous year as a result of the significant increase in gas collection.

Emission testing of the generator indicated typical emission rates and compliance with applicable standards.

Perimeter and Building Foundation Probe Monitoring

Subsurface gas probes installed along the eastern perimeter property boundary of the landfill and at onsite building foundations measure subsurface landfill gas concentrations. Monitoring evaluates compliance with BC Ministry of Environment (MOE) Landfill Criteria for Municipal Solid Waste. Staff monitored all probes four times in 2012.

The methane concentration for the probes was zero percent on all monitoring events, indicating there is no subsurface landfill gas migration at the eastern property boundary or into onsite buildings.

Ambient Grid and Hot Spot Monitoring

An ambient grid gas monitoring program is in place to evaluate the fugitive emissions of landfill gas. This is accomplished through staff traversing a 50-by-50-metre grid of monitoring points over the surface of the landfill. Staff measure concentrations of total hydrocarbons as methane (THC) and concentrations of hydrogen sulphide at ground level at each grid point. The ambient grid monitoring acts as screening level monitoring. Where elevated readings are discovered, THC greater than 100 ppm, staff activate hot spot monitoring. There were four monitoring events in 2012, two more than in previous years following the recommendation of a qualified consultant. No significant hydrogen sulphide concentrations were recorded; however, 35 grid points were found to exceed 100 ppm THC.

During monitoring for hot spots, if the THC at a location is found to be greater than 1,000 ppm, staff use a GPS unit to spatially locate and record the location as a Z point. Grid sampling includes each active Z point. Staff remove Z points from the monitoring program only after three consecutive sampling events with results less than 1,000 ppm THC.

In 2012, the monitoring program identified 10 new hot spots (Z points) and removed 19 former hot spots. Monitoring for 2013 includes a total of 24 hot spots. The number of hot spots has been significantly reduced due to the Phase 2 Cell 1 closure project in 2011 and the removal of bird poles which act as conduits bringing subsurface gas to the surface.

The closed area of Phase 1 has no suspected cover system failures. Gas continues to escape from Phase 2, particularly from areas that do not have cover systems and at the seams of cover systems.

Monitoring should continue, but revert back to two times per year in 2013 due to time investments involved. Efforts to mitigate hot spots should also be investigated where possible.

Gas Speciation

Landfill gas is primarily made up of methane and carbon dioxide with water vapour, oxygen, nitrogen and trace gases. Trace gases include hydrogen sulphide and volatile organic compounds. Gas speciation for trace compounds is conducted periodically to assess any changes in gas composition. Landfill gas speciation was last conducted in 2011 and significant changes in gas composition were discovered. Speciation should be conducted again in 2013.

Landfill Gas Compliance Summary

The following table has been prepared to summarize the results of landfill gas monitoring programs, whether the results comply with requirements, key findings and actions taken to address non-compliance, and recommendations.

Table 1 Landfill Gas Compliance Summary 2012

Program	Compliance Location	Criteria	Findings	Actions	Recommendations
Perimeter Probe Monitoring	Probes GP-1A, 1B, 2A, 2B, 3A, 3B, 11A, 11B, 12A and 12B	Maximum 5% methane in subsurface soil (MOE Landfill Criteria for Municipal Solid Waste)	No exceedences. Low risk of sub-surface gas migration to adjacent properties.	None	Continue quarterly monitoring.
Building Foundation Probe Monitoring	Probes GP- 4A, 5A, 6A, 6B, 7A, 7B, 8A, 9A, 13A, 14A, 17A, 18A	Maximum 1.25% methane in any onsite facility (MOE Landfill Criteria for Municipal Solid Waste). Maximum 1% methane inside buildings (Landfill Gas Management Facility Design Guidelines)	No exceedences. Low risk of subsurface gas migration to adjacent building.	None	Continue quarterly monitoring.
Ambient Grid Monitoring	N/A	100 ppm THC (CRD internal guideline)	20 grid locations >100 ppm No cover system failures suspected in the closed area of Phase 1.	Investigated hotspots, mitigated were possible.	Conduct monitoring two times in 2013.
Hot Spot Monitoring	N/A	1,000 ppm THC (CRD internal guideline)	10 new hot spots >1,000 ppm, 19 hot spots removed. Currently 24 locations for hot spot investigation. Gas is escaping to atmosphere from Phase 2.	Leachate cleanout capped. Added new locations of hot spots to the monitoring program.	Conduct monitoring two times in 2013. Investigate mitigation measures where possible.
Gas Speciation	N/A	N/A	No monitoring completed in 2012.	None.	Conduct speciation of landfill gas in 2013.
Well Field Monitoring and Balancing	N/A	Monitor monthly. Oxygen <5%	Monitoring completed monthly.	Well field monitoring has been scheduled monthly for 2012.	Conduct monitoring at a minimum frequency of once per month.
Gas Collection	N/A	75% gas collection efficiency commencing in 2016	Gas collection efficiency in 2012 was estimated at 48.8%, based on the MOE gas generation model.	Landfill gas management plan submitted to MOE.	Implement the long-term gas management plan.

GROUNDWATER, SURFACE WATER AND LEACHATE

Groundwater, Surface Water and Leachate Monitoring

The decomposition of solid waste, along with rain and groundwater draining through the landfill, produces leachate. Engineered controls are in place at Hartland landfill to collect and contain leachate to reduce or eliminate potential effects to groundwater and surface water quality. This monitoring program evaluates groundwater, surface water and leachate quality to assess the effectiveness of the leachate management facilities and assess regulatory compliance.

The monitoring program has three main components. The following summarizes these components and their primary purpose:

1. **Groundwater quality monitoring** evaluates the impacts of landfill processes and operations and assesses compliance with water quality guidelines at the property boundary.
2. **Surface water quality monitoring** evaluates whether the landfill processes and operations are affecting water quality and assesses compliance with water quality guidelines at the property boundary.
3. **Leachate quality monitoring** is used to evaluate compliance with the Regional Source Control Program (RSCP) waste discharge permit authorizing discharge to the sanitary sewer and to identify factors that influence changes in leachate chemistry.

Based on monitoring conducted between April 1, 2012 and March 31, 2013, the program continues to provide data needed to assess the effectiveness of the leachate containment and collection system and regulatory compliance, and provides information needed to guide management and operational decisions. The key findings of the groundwater, surface water and leachate monitoring program are summarized below.

Groundwater Quality Monitoring

Groundwater flow and quality data indicates that landfill leachate is effectively contained and controlled onsite, and statistical analysis of water quality trends, at key locations north and south of the landfill, indicates that groundwater quality is gradually improving.

The program includes a total of 86 monitored groundwater wells at the landfill, with 43 groundwater monitoring wells identified as boundary compliance monitoring stations. The wells are primarily clustered along the property boundary and some are located closer to the filling area to monitor potential pathways for leachate movement in groundwater. Water quality results are compared to the BC Approved and Working Water Quality Guidelines to assess compliance with the landfill Operational Certificate.

Table 2 summarizes groundwater quality at boundary compliance stations and discussion of the results follows.

Table 2 Groundwater Quality Compliance Summary (2012-2013)

Well	Exceedence	Number of Exceedences	Recommended Corrective Action
North of the Landfill			
21-1-1	Dissolved iron	1 of 4 sample events	Continued operation of the north purge well system to minimize leachate migration north of the landfill and possible augmentation of the system.
	Dissolved manganese	1 of 4 sample events	
	Ammonia	1 of 4 sample events	
21-1-2	Dissolved iron	4 of 4 sample events	
	Dissolved manganese	3 of 4 sample events	
	Ammonia	4 of 4 sample events	
21-2-1	Dissolved iron	3 of 4 sample events	
	Dissolved manganese	2 of 4 sample events	
	Ammonia	3 of 4 sample events	
29-1-2	Dissolved Iron	1 of 4 sample events	Continued monitoring.
North of Hartland North Pad			
30-1-1	Conductivity	1 of 4 sample events	Continued monitoring.
30-1-2	Conductivity	1 of 4 sample events	
42-1-1	Dissolved iron	4 of 4 sample events	
South of the Landfill			
72-1-1	Dissolved iron	4 of 4 sample events	Continued monitoring.
	Nitrite	1 of 4 sample events	
72-2-1	Conductivity	4 of 4 sample events	Improve leachate collection south of the landfill though augmentation of the pumping capacity in P1.
	Dissolved iron	1 of 4 sample events	
72-3-1	Conductivity	4 of 4 sample events	
	Nitrite	4 of 4 sample events	

- North of the Phase 1 landfill, groundwater quality continued to gradually improve and the operation of the north purge well continued to effectively intercept leachate north of Phase 1. Elevated iron and manganese is common to groundwater in the region and is generally attributed to naturally occurring geologic conditions. Ammonia is a key leachate indicator; however, there is no guideline for ammonia in groundwater, therefore, the guideline for ammonia in surface water is used. Improvements to the north purge well system are reinforcing existing leachate collection and containment measures and contributing to additional water quality improvements in this area.
- At the Hartland north pad, water quality was generally within guidelines with the exception of conductivity at two locations and dissolved iron at one location. In early 2012, an engineered cover was installed on the aggregate stockpile at the Hartland north pad to improve runoff quality. More recent monitoring has shown marked improvements in water quality related to the installed cover system.
- Groundwater quality is stable and gradually improving at key locations south of the landfill. These improvements are attributed to the leachate collection and containment measures, including the operation of the five south purge wells. Upgrades to the purge well system undertaken in 2013, and others planned for 2014, are expected to further improve water quality downgradient of the landfill.
- Groundwater quality was good and no leachate was present in monitors along the eastern property boundary. West of Phase 2, leachate was confined to the landfill footprint.

Surface Water Quality Monitoring

- A total of five surface water monitoring stations have been identified as boundary compliance monitoring stations. These stations are concentrated north and south of the landfill where creeks flow from the landfill property to offsite locations. In addition to these boundary compliance locations, Environmental Protection staff sample 26 surface water stations at upstream and downstream locations to assess potential environmental effects to surface water on the site and flowing from the site. Water quality results are compared to the BC Approved and Working Water Quality Guidelines to assess compliance with the landfill operating certificate.
- Table 3 summarizes surface water quality at boundary compliance stations and discussion of the results follows.

Leachate Quality Monitoring

- Leachate discharges were in compliance with the CRD RSCP waste discharge permit authorizing discharge to the sanitary sewer. Leachate discharges remained in compliance with the waste discharge permit with the exception of total sulphide on six sampling dates and chemical oxygen demand and total polycyclic aromatic hydrocarbons on one sampling date. A review of the causal factors for the waste discharge permit exceedences is recommended.

Domestic Well Monitoring

- Eleven privately-owned domestic wells were monitored. All wells met drinking water quality guidelines. No leachate impacts were identified in the 11 wells sampled.

Leachate Mounding

- Leachate mounding continued to be present in Phase 1 and Phase 2 areas of the landfill. Continued collection of water level information within Phase 2 is important for assessing leachate mounding over time, as waste deposition continues within the Phase 2 basin. Two monitoring wells installed in the Phase 2 basin in 2010 are fully operational with automated water level recording instruments and are providing valuable leachate mounding information for Phase 2.

Table 3 Surface Water Quality Compliance Summary (2012-2013)

Station	Exceedence	Number of Exceedences	Recommended Corrective Action
North of the Landfill			
SW-N-05	Sulphate	3 of 5 sample events	Minimize volume and areal extent of stockpiles. Cover stockpiles where possible. Minimize potential runoff from active construction areas.
SW-N-16	Total iron	1 of 5 sample events	Continued monitoring and continued operation of the north purge wells to capture and contain leachate. Consider augmentation of north purge well system. Minimize use of aggregates adjacent to surface water courses.
	Dissolved iron	1 of 5 sample events	
	Nitrate	1 of 5 sample events	
	Sulphate	1 of 5 sample events	
North of Hartland North Pad			
SW-N-41s1	Sulphate	6 of 6 sample events	Minimize volume and areal extent of stockpiles. Cover stockpiles where possible. Minimize potential runoff from active construction areas.
	Total Suspended Solids	1 of 6 sample events	
SW-N-42s1	Sulphate	5 of 5 sample events	Minimize volume and areal extent of stockpiles. Cover stockpiles where possible. Minimize potential runoff from active construction areas.
South of the Landfill			
SW-S-04	Sulphate	1 of 5 sample events	Continue monitoring.

- North of Phase 1 and Phase 2, water quality at the boundary compliance points met water quality guidelines during 2012-2013, with the exceptions noted above. Elevated sulphate concentrations are related to rock quarrying and aggregate stockpiling operations. The aggregate stockpile upgradient of this site is gradually being reduced in size as it is used for interim cover and onsite construction projects. Elevated iron is common to surface water in the region and is generally attributed to naturally occurring geologic conditions.
- North of the Hartland north pad, surface water met water quality guidelines with the exceptions noted above. Previous monitoring demonstrated that the sulphate concentrations were directly related to runoff from the large aggregate stockpile at the Hartland north pad. In January 2012, an engineered cover was installed on the aggregate stockpile at the Hartland north pad to improve runoff quality. Subsequent monitoring has shown an immediate reduction in sulphate runoff coming from the covered stockpile and additional incremental improvements have been seen over this monitoring period.
- South of the landfill, water quality continued to improve and met water quality guidelines during 2012-2013 with the exception of sulphate on one occasion. Statistical analysis indicates a decreasing trend in sulphate at this compliance station signaling improving water quality.
- Most offsite surface water stations met water quality guidelines and no leachate impacts were identified. Water in Killarney Lake met water quality guidelines and no leachate impacts were identified. Water quality in Durrance Lake met water quality guidelines and was not impacted by landfill leachate. There have been no detectable leachate effects in Tod Creek for many years.

Recommendations

- Continue the monitoring program to provide an effective measure of compliance, and the information required to guide management and operational decisions.

- Operation of the expanded north and south purge well systems should be continued as these wells are an effective component of the leachate control and containment systems. Pumping levels and the extent of the drawdown cone should be validated twice annually according to standard operating procedure. This work is currently underway.
- Efforts should continue to achieve optimal water levels in the south purge wells to mitigate leachate migration towards the south end of the landfill.
- Consideration should be given to sampling the leachate from the individual wells in the south purge well system for a period of one year to enable a comparison with other leachate sources at the landfill and determine the influence of seasonal recharge on leachate quality.
- Water quality downgradient of the quarry and aggregate stockpile locations should continue to be closely monitored to assess the effects of these activities on water quality, as well as to monitor the effectiveness of the stockpile cover on improving runoff quality. Opportunities to reduce the size of stockpiles, cover stockpiles or store stockpiles within the leachate containment area should be considered where possible.
- Groundwater and surface water quality should continue with a focus on several areas, as follows:
 - Groundwater quality should be closely monitored in the area of well 40 to confirm the effectiveness of the expanded north purge well operation.
 - Boundary compliance stations should continue to be sampled at the following frequencies: six times per year for surface water stations; four times per year for groundwater stations; and water levels should be collected 10 times per year.
- The British Columbia Landfill Criteria is currently being revised. In addition, the updated British Columbia Contaminated Sites Regulation came into effect in February 2011, providing additional guidance for determining standards that apply to groundwater use at a given site. The application of the provisions of these documents should be taken into consideration in the preparation for annual reporting in 2013-2014.
- Concentrations of volatile organic compounds (VOC) in leachate have historically been very low. Monitoring of VOC in groundwater at property boundary stations have not identified any VOC at detectable concentrations and are not considered necessary to assess compliance. It is recommended that the sampling and analysis of VOC in groundwater be discontinued until such time that VOC are detected in leachate samples, or at a five-year interval.
- Monitoring of leachate flow and chemistry should continue as it provides an effective measure of compliance with the RSCP permit for leachate discharges to the sanitary sewer. A review of the causal factors for exceedences to the waste discharge permit during 2012-2013 is recommended.
- On an as-needed basis, the operation of the leachate treatment system, using the nitrate amendment to address periodic sulphide spikes in leachate, and monitoring to demonstrate the effectiveness of the leachate treatment system, is recommended.
- The results of the annual monitoring program should continue to be reviewed and interpreted by qualified professionals experienced in assessing the impacts of landfill leachate at large municipal landfills similar to Hartland landfill.

CONTROLLED WASTE

Controlled Waste Permitting

The controlled waste area of the landfill is a designated area that accepts a range of waste requiring special handling due to specific health and safety, operational or environmental concerns. Discharges of controlled waste are regulated through a permit system administered by Environmental Protection staff to provide control over the wastes discharged, protect worker health and safety, meet operational requirements and minimize additional contaminant loading to leachate and landfill gas.

- During 2012, the permit system worked efficiently and provided landfill staff with the information needed to safely receive the permitted wastes.
- In 2012, a total of 164 controlled waste permits were issued.
- Minor violations or inconsistencies with permit conditions were identified through onsite inspections and audits. All issues were corrected through follow-up with the permit holders.

Recommendations

- Continue the permitting program to ensure that only suitable wastes are received and that the needs of operational requirements, environmental protection and worker health and safety are achieved.
- Continue to inspect and audit discharges to ensure that the discharged waste meets permit requirements.