2017 Excellence Award Entry
Landfill Management Category

City of Toronto,
Green Lane Landfill

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Statistics
City population: 2.8 million
Cost per household based on
461,000 houses + 409,000
multi-residential units:
$43.68 CDN
(only includes landfill costs)
Approx. actual 2016 expenditure:
Capital: $11 million CDN
Landfill Operations: $27 million CDN
Executive Summary

Green Lane Landfill is an essential component of Solid Waste Management Services’ integrated waste management system.

Toronto’s municipal waste management system focuses heavily on reduction, reuse and diversion. With the implementation of the City of Toronto’s Long Term Waste Management Strategy, it is expected that the operating lifespan of Green Lane Landfill will extend to approximately 2040.

Toronto purchased the Green Lane Landfill in 2007. The landfill was commissioned by the private sector in 1978 as a small local landfill. It has since developed into a large, engineered, sanitary landfill that meets and exceeds regulatory requirements.

Features include a hydraulic trap, leachate collection system, leachate treatment plant, landfill gas collection, enclosed flares, stormwater control and off-site naturalized areas.

Green Lane Landfill provides safe, effective, environmentally sustainable and long term residual waste management.

1.) Site Overview

In 2016, the Site received a total of 552,563 metric tonnes (639,096 tons) of municipal solid waste (MSW), which equates to approximately 2,100 metric tonnes (2,315 tons) daily.

Approximately, 89% (491,474 tonnes) of the quantities landfilled is the City of Toronto's residual municipal solid waste. The remainder is from a number of local communities including First Nations with a combined population of about 78,000 and a few industrial, commercial and institutional (IC&I) customers.

The City of Toronto achieved a total diversion rate of 52%, in 2016, including all customer groups (e.g. apartments, condos, social housing, single family homes, depot customers, etc).
The City of Toronto diverts waste through a number of diversion programs including the collection of source separated Kitchen Organics, Yard Waste, Appliance and Large Metal Items, Blue Bin Recycling, Community Environment Day events, Drop Off-Depots, and Household Hazardous Waste.

The City calculates diversion figures based on generally accepted principals for waste diversion reporting in Ontario, which also includes the diversion of tires, grass clippings, backyard composting, and deposit return programs.

### Green Lane Landfill Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>1978</td>
<td>Green Lane Landfill commissioned as a privately owned, small local landfill</td>
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<tr>
<td>1994</td>
<td>Interim expansion area approved</td>
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<tr>
<td>1994</td>
<td>Hydraulic trap design with active leachate collection introduced</td>
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<tr>
<td>1999</td>
<td>Long-term expansion area approved</td>
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<tr>
<td>2002</td>
<td>Leachate treatment plant began operations</td>
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<td>2004</td>
<td>Flare system for landfill gas commissioned</td>
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<tr>
<td>2006</td>
<td>Site optimization areas approved to optimize available air space</td>
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<tr>
<td>2007</td>
<td>City of Toronto acquired Green Lane Landfill for $230 million (CDN)</td>
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<tr>
<td>2007/2008</td>
<td>Comprehensive air quality monitoring program completed</td>
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<tr>
<td>2011</td>
<td>Effective January 1, 2011, all of Toronto’s City-managed waste is sent to Green Lane Landfill (Toronto stopped shipping waste to Michigan, U.S.)</td>
</tr>
<tr>
<td>2011</td>
<td>Leachate treatment plant and flare capacity expanded</td>
</tr>
<tr>
<td>2016</td>
<td>Toronto City Council approved Solid Waste Management Services’ Long Term Waste Management Strategy</td>
</tr>
<tr>
<td>2016</td>
<td>Flare capacity expanded</td>
</tr>
</tbody>
</table>
2.) Siting, Design & Construction

Site Selection

Green Lane Landfill was first approved before the legislated requirement for alternative site evaluations. The environmental advantages of Green Lane’s characteristics have been subsequently confirmed. The approvals process undertaken in the 1990s included extensive alternative site searches and comprehensive narrowing processes focused on the natural, social, cultural, agricultural, industrial and commercial environments as well as public health and safety.

Exclusionary criteria were applied to geographic sections of Ontario to eliminate sensitive, environmentally protected or populated areas. The long list of candidate sites was shortened by comparative criteria to a short list of five sites that were evaluated and compared in greater detail. That lengthy process confirmed Green Lane Landfill as the preferred site situated within a rural agricultural and open space locality. Surrounding lands are agricultural and open space.

The Site is not located near lakes, rivers, flood plains, natural wetlands, airports, fault lines, or unstable areas. There are no historical, archeological, or social preservation features in the vicinity.

There are no rare, threatened or endangered species of vegetation or wildlife at the Site or environs. The approvals process in the early 2000s reconfirmed these conditions.

We are proud of the Green Lane Landfill for its:

- Ideal hydrogeologic setting with very low hydraulic conductivity soils extending below ground surface to 80 metres (262 ft.) deep
- Testing of tens of thousands of groundwater and surface water samples since 1978 consistently show no landfill related impacts off-site
- On-site leachate treatment facility provides complete treatment for all leachate generated
- Over 11,880 metres (7.38 miles) of horizontal landfill gas collection trenches and 146 vertical collection wells reduce greenhouse gases and minimize off-site odors by burning odor causing compounds and methane
- Clean surface water does not come into contact with waste and is controlled, monitored, and is released in accordance with Ministry of Environment and Climate Change (MOECC) and Kettle Creek Conservation Authority approval
- The Public Liaison Committee and First Nations Liaison Committee, as well as the Green Lane Community Trust Fund, Property Value Protection Plan and No-Fault Small Claims Fund demonstrate our commitment to positive community relations through engagement with local stakeholders and funding mechanisms that support the community.
- An established wildlife habitat restoration area is maintained along Dodd Creek as a result of our partnership with the Kettle Creek Conservation Authority.
Site Capacity

The Site is 129.7 hectares (320 acres) in size; 71.2 hectares (176 acres) are approved for landfilling. The City owns approximately 800 hectares (2,000 acres) of additional buffer landholdings in the vicinity.

The Site’s remaining approved capacity is approximately 9,953,359 m$^3$ (13,018,502 yd$^3$) based on the 2016 year-end air space utilization survey (exclusive of settlement in active areas). In 2016, the compaction rate was 0.969 tonnes/m$^3$ (1,633 pounds/yd$^3$) which is in line with the 10-year average of 0.968 tonnes/m$^3$ (1,632 pounds/yd$^3$). The development of the optimized Site is sequenced into 24 stages or cells.

Design and Construction Feature:
Leachate Containment

In 1978, the Site operated as an attenuation site with toe drains for leachate management. In 1994, the hydraulic trap design with active underdrain leachate collection was introduced. Hydraulic containment is achieved by design, construction, and operating specifications, such that the internal level of leachate is maintained at an elevation lower than the potentiometric elevations of the underlying hydrogeological units. This creates an inward and upward gradient between the underlying hydrogeologic unit’s potentiometric surfaces and the leachate elevation within the landfill. The leachate levels...
within landfilling areas are actively maintained below the piezometric water levels which prevents the potential downward and outward migration of leachate.

Natural Advantage: Hydrogeology and Geology

Hydrogeologically, the Site is underlain by competent low permeability soil in descending order: glaciolacustrine clay and clayey silt, the Port Stanley Till, and older deeper tills extending to bedrock. The limestone bedrock is at a depth of 80 metres (262 ft) below ground surface. Within the silt and clay overburden, there are isolated and discontinuous sand and/or gravel lenses of limited extent both vertically and horizontally. The aquifer unit is the confined bedrock aquifer. The hydraulic conductivity of the fine grained material is $1 \times 10^{-8}$ centimetres/second ($1 \times 10^{-5}$ feet/day). Groundwater in the sand/gravel lenses has been isotope dated as 10,000 years old.

The landfill base consists of native, low permeable, fine-grained soils with an average material content of approximately 82% and hydraulic conductivity of not more than $1 \times 10^{-7}$ cm/sec ($1 \times 10^{-4}$ ft/day).

Cell Design and Construction

Any sand/gravel lenses identified during base and sidewall preparation are over-excavated and backfilled with a minimum of 1.3 metres (4.3 ft) of re-compacted, low permeability, fine-grained native material. The backfill layers are a maximum of 0.6 metres (2 ft) and re-compacted. Cell construction including the leachate and gas collection system are conducted under engineering oversight.

Cells are about 24 metres (80 ft) deep below ground surface with the final design top contours of waste and daily cover about 21 metres (70 ft) above ground surface.

The final elevations and grades of the base and sidewall excavations are within approved specifications. Construction equipment is GPS equipped and surveys are conducted monthly. Sufficient equipment is deployed to achieve an average daily production of 7,600 cubic metres (9,900 yd$^3$) bank of excavated materials per day.

Particle size distribution and hydraulic conductivity are tested at intervals during construction. Excavation works, leachate collection system construction and QA/QC assurance details for each stage in accordance with the approved specifications are documented in Cell Preparation Reports. These reports include geotechnical investigation results and engineering confirmation that all works were completed in accordance with the approved design specifications. Stages are commissioned upon report submission to the provincial regulatory body, which is the Ontario MOECC.

Excavation areas are isolated from active landfilling by strategically placed containment berms to ensure no possible environmental contamination of newly developed areas. On-site buffer areas between the approved landfill
footprint and site boundary vary from 70 to 220 metres (230 to 720 ft) of separation distance. Site perimeter berms between 10 and 15 metres (33 to 50 ft) in height reduce nuisance impacts and sight line for receptors. Site equipment complies with noise by-law requirements. The nearest receptors are approximately 0.48 kilometers (0.3 miles) from active areas.

**Site Closure**

Toronto maintains a perpetual care fund for closure and post-closure requirements based on a potential contaminating life span of 100 years. The adequacy of the fund is reviewed approximately every three years.

3.) Equipment/Systems and Technology

A total maintenance and repair service agreement is in place with a local heavy equipment dealer to ensure equipment is kept in service. Since 2007, up-time of landfilling equipment ranged between 90 and 96 per cent.

Ongoing QA/QC oversight ensures compaction and hydraulic conductivity meet design standards. Licenced mechanics service equipment at the on-site equipment repair bays. Fueling stations have double walled tanks encased with spill containment. Seeders and fertilizer spreaders are deployed to establish vegetation.

Global positioning systems are used for the precise grading of earthworks including the landfill base, which is typically sub-excavated and replaced with re-compacted clay.

The Leachate Treatment Plant (LTP) and Landfill Gas (LFG) systems are designed with active controls and redundancies. A full complement of spare parts is maintained to minimize downtime. The LTP has automatic critical alarms whereby the plant becomes a closed system. The LFG collection system and flares are subject to critical control alarms at a power outage and automatically shut down. During 2016, the flares and LTP were in continuous operation for 99.1% of the time with a time resolution of one minute or better.
4.) Environmental Controls and Monitoring

Leachate Collection
The Site’s underdrain leachate collection system (LCS) includes a 0.3 m (12-inch) thick continuous clear stone drainage blanket on the entire base, underlain by continuous woven geotextile filter fabric and overlain by continuous non-woven geotextile filter fabric. Perforated 0.2 m (8-inch) diameter HDPE header pipes are installed at the base and exterior perimeters. There are clean out pipes, manholes, and pumping stations at designated locations.

Leachate Treatment
The on-site Leachate Treatment Plant (LTP) started operating in 2002 with an approved design capacity of 130 m³/day (0.035 MGD [million US gallons per day]) and was expanded in 2011 to process up to 300 m³/day (0.079 MGD). The LTP is a modified conventional activated sludge facility with aerobic sludge digestion. Primary treatment is physicochemical with pre-aeration, phosphoric acid addition, pH adjustment, flash mixing, flocculation, and coagulation. Secondary treatment is biological with dual anoxic/oxic treatment trains for oxidization and ammonia removal by denitrification.

The health of the microorganisms in the biological treatment is monitored daily. Tertiary treatment involves ozonation for colour removal, with gravity sand filters for final removal of solids. The activated sludge management consists of aerobic sludge digesters, dewatering and sludge screwpress. The dewatered sludge is returned to the landfill. As noted, the treated effluent must meet its approved criteria before it is discharged by forcemain to the stormwater management (SWM) system.

Controls for Leachate Collection and Treatment
Leachate is directed by gravity and forcemain to the holding tank leading to the LTP. The treated effluent is pumped to the Site’s SWM system for testing prior to discharge to the natural environment.

The LTP controls include a programmable logic controller and a supervisory control and data acquisition (SCADA) computer systems with local and remote monitoring and control capability. Non-critical and critical alarm protocols notify the operator if issues arise. Under a critical alarm, the LTP automatically stops all influent and effluent movement until corrective measures are completed. Plant
performance is regulated by the approved effluent criteria as set out in the permit. On-site facilities include a laboratory for basic testing and monitoring performance between bi-weekly sampling of regulated parameters for analysis by an accredited laboratory. The bi-weekly final effluent parameters include CBOD5 (carbonaceous biochemical oxygen demand), total suspended solids, total ammonia nitrogen, total phosphorus, dissolved oxygen, pH, colour, and E. Coli. Volatile organic compounds and metals are sampled semi-annually. Base/neutral and acid extractable compounds are sampled annually. Excellent effluent quality is consistently achieved.

Storm Water Management

The SWM system is designed to control runoff and mitigate the release of sediment. All erosion and sediment control practices were reviewed and approved by regulatory authorities to ensure that the pre-development and post-development flows from the Site are maintained. Drainage swales around active areas of the landfill are directed to perimeter ditches, which drain to several SWM Ponds on the Site. The polishing basin and riparian system provide additional filtration and nutrient uptake before ultimate discharge.

Temporary soil berms are used throughout the active disposal area to prevent runoff from leaving refuse areas and to direct upgradient runoff around the active disposal area. All water in near contact with refuse is directed into leachate containment areas. Silt fences are used throughout the Site to capture sediment from exposed soil. Rock, straw bale check dams, and silt fences are used in numerous drainage swales and on slopes to enhance erosion and sedimentation control. Culvert outlets are lined with riprap to prevent erosion during peak flows. The larger SWM Ponds have forebays for sediment removal. Periodic draining and dredging of the SWM Ponds is undertaken to remove accumulated sediment. SWM samples are tested for specified parameters, before discharge.

Landfill slopes are designed with 5% grades on the landfill top and 25% grades on the side slopes. Interim cover with vegetation is used on previously landfilled areas that are not active to minimize erosion. Silt fences, straw bales, and check dams are also used around the perimeter of soil stock piles to control sediment and minimize erosion.

Since 2001, all surface water runoff from developed areas of the Site diverts away from the natural drainage pattern and watershed due to discussions with the First Nation community. Since 2012, all diverted surface water, including all treated effluent from the LTP, is collected and stored in the SWM ponds for eventual discharge by forcemain.

The SWM system is designed to manage a 1:100 year storm event, and there are
engineered overflows as a contingency to a potential event equal to the rainfall received during the Hurricane Hazel event of 1954.

SWM Pond 3 is operated as a batch discharge facility. Samples are analyzed for established criteria parameters including unionized ammonia, dissolved oxygen, iron, phenols and pH. Discharges occur only if the parameters do not exceed their trigger levels or, in cases of an exceedance, only after approval by the MOECC in consultation with the Kettle Creek Conservation Authority.

Landfill Gas

LFG is currently collected through 146 vertical extraction wells and 54 horizontal collection trenches, which are currently comprised of over 11,880 metres (7.38 miles) of piping. Additional piping make up the sub-header and headers that include approximately 9,480 metres (6 miles) of piping. The LFG collection infrastructure is advanced each year. As of 2016, 80% of the developed areas of the Site contain LFG collection infrastructure.

Horizontal Landfill Gas Trench

Horizontal trenches are installed as landfilling progresses at approximately 30 m (100 ft) spacing with offsets, for every 10 m (33 ft) in landfill height.

Centrifugal blowers at the flare stations extract LFG at the combined approved destruction capacity rate of 17,654 cubic metres per hour (10,400 standard cubic feet per minute). Condensate traps are located strategically for moisture removal. Methane concentrations of 45% to 52% are consistently realized.

Vertical Landfill Gas Wells

LFG wells are sampled monthly for methane, carbon dioxide, oxygen, and pressure. LFG at main header is additionally sampled annually for the same parameters plus non-methane organic compounds. The vertical wells and most horizontals were recently upgraded with individual flow control valves to provide improved balancing of the LFG collection field.

The City is currently investigating the potential for upgrading the landfill gas produced at Green Lane Landfill to Renewable Natural Gas, which can be used to offset traditional fossil fuel thereby generating significant environmental and economic benefits. It is anticipated that a study will be done by May 2017, and a recommendation on how to proceed will follow thereafter.

Odour Control

Off-site odour inspections are conducted regularly. LFG-related odors have significantly decreased with the continuing advancements of the LFG collection and flaring systems.

For example, in 2016 there were 48 odour complaints which represented a 34% decrease compared to 2015 (73 complaints).
The Site is in full environmental compliance under its permits, legislation, regulations, and guidelines. Site conditions are reviewed each day with internal inspection reports daily, weekly, and monthly. Monitoring results since 1978 to the present confirm there have been no adverse environmental impacts to groundwater quality, surface water quality or air quality due to landfilling and related activities.

Current and historical data are contained in the Annual Progress Reports submitted annually to the MOECC. Copies of the Annual Progress Reports are also posted on the City's website (www.toronto.ca/garbage/greenlane) and reference copies are available at the local library.

5.) Regulatory Compliance

Comprehensive environmental monitoring on and off site is summarized in this table.

<table>
<thead>
<tr>
<th>Monitoring Activity</th>
<th>Purpose</th>
<th>Monitoring Frequency</th>
<th>Locations Monitored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater Level Monitoring</td>
<td>Groundwater level</td>
<td>Quarterly</td>
<td>51 wells</td>
</tr>
<tr>
<td>Leachate Level Monitoring</td>
<td>Maintenance and operation of hydraulic trap design</td>
<td>Monthly</td>
<td>8 wells</td>
</tr>
<tr>
<td>Groundwater Quality Sampling</td>
<td>Monitoring of the groundwater based on field &amp; general chemistry parameters, and for dissolved metals, and VOCs</td>
<td>Each May</td>
<td>28 wells</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Each November</td>
<td>11 wells</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Semi-annually</td>
<td>2 private wells</td>
</tr>
<tr>
<td>Leachate Quality Sampling</td>
<td>Monitoring of the groundwater based on field &amp; general chemistry parameters, and for dissolved metals, and VOCs</td>
<td>Each May</td>
<td>1 well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monthly</td>
<td>Leachate holding tank</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leachate holding tank</td>
<td></td>
</tr>
<tr>
<td>Surface Water and Stormwater Sampling</td>
<td>Monitoring the stormwater for field and general chemistry parameters and metals</td>
<td>Each March and August</td>
<td>Dodd Creek (2 stations)</td>
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<tr>
<td></td>
<td></td>
<td>Quarterly</td>
<td>SWM Pond 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Each May and November</td>
<td>Dodd Creek (2 stations)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Semi-Annually</td>
<td>Williams Pond</td>
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<tr>
<td></td>
<td></td>
<td>In conjunction with local Conservation Authority</td>
<td>Dodd Creek (2 stations)</td>
</tr>
<tr>
<td>Surface Water Quality</td>
<td>Surface Water Chemistry</td>
<td>Quarterly</td>
<td>Upstream and downstream of discharge outlet</td>
</tr>
<tr>
<td></td>
<td>Benthic macroinvertebrate community and density, evaluated in accordance with the Province's BioMAP protocol</td>
<td>Annually</td>
<td>Upstream and downstream of discharge outlet</td>
</tr>
<tr>
<td>Landfill Gas quality</td>
<td>Maintenance and operation of collection system – tests for methane, carbon dioxide, oxygen and pressure; and annually for non-methane organic compounds</td>
<td>Monthly</td>
<td>Well heads</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Annually (quality)</td>
<td>At header at Flare compound</td>
</tr>
</tbody>
</table>

An air quality monitoring program was completed in consultation with MOECC in 2007-2008 and confirmed that landfilling and associated operations are not adversely impacting ambient air quality and pose no risk to human health.

Hydraulic monitoring of leachate wells, designated manholes (leachate levels) and groundwater wells (shallow and deep groundwater contours) confirms the proper functioning of the hydraulic trap in accordance with its design.

The treated effluent from the LTP meets its discharge criteria before being pumped to the SWM system. The mixed effluent and clean stormwater must also meet another set of trigger criteria before it can be pumped into to a
SWM Pond and moved by gravity into the Polishing Basin (with constructed wetland, riparian drainage way, channel outlet) designed to enhance the quality of the effluent/stormwater prior to discharge to the receiving stream, Dodd Creek.

6.) Planning and Operations

Long Term Planning

The City of Toronto’s Long Term Waste Management Strategy, approved by Council in 2016, provides a roadmap for the management Toronto municipal waste, including emphasis on reduce, reuse, recycling and other instruments to extend the life of Green Lane Landfill.

ENVIRONMENTAL COMPLIANCE MONITORING

Green Lane Landfill is subject to three primary Environmental Compliance Approval (ECA) permits from the Ministry of the Environment and Climate Change.

⇒ ECA No. A051601 for Waste Disposal Site has 110 conditions, three schedules for detailing monitoring requirements, and five notices of amendment;

⇒ ECA No. 0685-92VMQX for the collection, transmission, and treatment of leachate in the LTP and for industrial sewage works disposal of landfill leachate and industrial wastewater; and

⇒ ECA No 3857-ALRQSR for the landfill gas flare system.

Components of the System and Potential Influences

The City of Toronto’s Solid Waste Management Services and programs are strongly influenced by a number of policies and legislative requirements both internally and externally.
There is a systematic waste screening program at the Site. Waste is screened during the set-up of any private customers. All users are informed of the environmental requirements for solid, non-hazardous MSW. Any contaminated soils must be tested at the generator’s expense in accordance with the legislation and regulations utilizing the Toxicity Characteristic Leaching Procedure methodology for the prescribed parameters. Toronto’s MSW is inspected many times; at collection, at the transfer stations and during loading into the transfer trailers. Every load is visually inspected at the Site’s tipping face. Procedures are in place if questionable materials are observed. The subject load is segregated, secured, and made ready for safe inspection by Toronto staff. If a suspicious or unknown waste is present, the MOECC is contacted for review and instructions.

**Sequenced Development in 24 Stage Areas**

Landfilling is done by the area method. Refuse is placed and compacted over the prepared base in layers. Daily cover is applied at the end of each operating day. The Site’s 24 stages are generally developed in sequence. Track dozers push waste up on a 3H:1V slope to the compactor that compacts the waste up to the horizontal surface of the bench. Waste is spread in 0.6 m (2 foot) layers. Compactors make a minimum of five passes over each layer for maximum in-place density. Dozers and compactors drive beyond the limits of the waste spread layer in each pass. At day’s end the compacted wastes are regraded to fill settled areas/cut high areas to ensure a smooth grade prior to the placement of a minimum of 15 cm (6 inches) of daily cover using native clayey soils. The finished surface is to be free of any depressions or other surface features that might trap or pool water or prevent the flow of water over the surface of the compacted daily cover. The clay daily cover soil is removed or scarified before placement of subsequent lifts of waste.

**Software Compatibility with Toronto’s Transfer Stations**

In 2010, Toronto implemented a shared software program for its transfer stations and Green Lane. This allows incoming Toronto loads to by-pass the inbound scale by using their electronically posted outbound weight from the transfer station as their inbound weight. This provides efficient traffic controls to eliminate line ups outside the Site entrance. Recent improvements to the Site entranceway include the new scale house and dual deck weighscale. As a result, there is better traffic flow and Site entrance aesthetics.
7.) Employee and Customer Safety

The long-term operation, maintenance, and construction are currently contracted to CRA Landfill Operation Limited (CRALOL) with engineering services contracted to WSP Canada Inc. (WSP). City staff at Green Lane include a landfill operations manager, a senior engineer and two site contract managers. City staff are responsible for managing these contracts, environmental compliance including relations with the MOECC and the public.

CRALOL is responsible for preparing and implementing the comprehensive Site-Specific Health and Safety Plan (HASP) in accordance with the Ontario Occupational Health and Safety Act (OHSA) including but not limited to regulations for industrial establishments, construction projects, designated substances, confined space and workplace hazardous materials information system. The HASP also incorporates all relevant City policies. WSP and City staff are subject to the HASP and act in compliance at all times. Although not required due to the seasonally small number of employees, CRALOL maintains its Joint Health and Safety Committee (JHSC) throughout the year. The JHSC meets monthly and conducts workplace inspections at greater frequency than required. JHSC meeting minutes are posted for City access. CRALOL also provides monthly written reports to City staff. CRALOL reports confirm that they are maintaining a zero injury rate.

Training programs are in place for health, safety and environmental compliance through recorded annual training, monthly safety briefings, training refreshers and daily tailgate meetings.

CRALOL key personnel receive training in the SWANA Landfill Operations Basics course every two years, and some have SWANA Manager of Landfill Operations (MOLO) training. City staff also have been MOLO-trained. City staff have recently co-instructed the SWANA Ontario Chapter MOLO course. Additional SWANA seminars attended include Landfill Fires.

Authorized subcontractors received health and safety orientation training before mobilizing. All pre- and post-op inspection reports are maintained.

All visitors must sign in and out. Members of the public including tours are permitted access only when accompanied by City staff. Safe viewing areas are prepared in advance of public tours and Personal Protective Equipment (PPE) is provided. The optimized design of the Site does not include accessible areas for individual customers or the public. Only licensed haulers are permitted access to waste disposal areas.
8.) Public Acceptance, Appearance & Aesthetics

Aesthetics
Green Lane Landfill takes great pride in maintaining a neat and clean appearance with good housekeeping procedures in the forefront of operations. Landscaped grounds are routinely maintained at the Site entranceway and the administration building. Gardens, planters, and rock installations combine for a professional and welcoming site and pride in appearance extends to frontage roadways with daily attention to controlling dust, mud and snow.

Landscaping Plan
A Landscaping Plan is being phased in at the Site that will enhance pollinator habitats through the use of pollinator-friendly seed mixes, vegetation, and different models of pollinator boxes. Other habitat restoration features include strategically-placed tree plantings, thickets, brush piles, swallow nest boxes, and bat boxes.

Litter, Bird and Odour Controls
The comprehensive litter control program includes daily monitoring, collecting and documenting on- and off-site litter. Off-site litter patrols are deployed for the immediate vicinity of the Site including the approximately 5 kms (three miles) of rural arterial road leading to the entrance. Spring cleanup involves an expanded radius for the litter patrols. During high winds, measures are implemented that involve stationary fencing, portable litter fences, working face barriers, relocating activities to more sheltered locations, suspending waste receipt for a period of time and, if necessary, ceasing operations for the period.

Bird control is a priority and is accomplished through a contractor that utilizes trained birds of prey (including eagles, hawks, and falcons) to control gulls. Effective control of nuisance odors is an important factor for community relations. The continuous advancement of the LFG collection and flaring capacities represents a significant and ongoing investment toward odour control and meeting our obligations as a responsible neighbour.
Community Outreach and Engagement

A parcel of GLL's buffer land holdings is provided to the Kettle Creek Conservation Authority for the establishment and maintenance of a wildlife habitat restoration area along a section of Dodd Creek. Since 2007, Toronto has partnered with Kettle Creek Conservation Authority to plant more than 37,000 tree and shrub saplings (native species) with a view to enlarging the Site's interior habitat corridors.

The Green Lane Landfill Public Liaison Committee (PLC), established in 1994, meets quarterly. The PLC serves as a focal point for the distribution, review and exchange of information and monitoring results. Members include local residents, representatives from the host municipality and other area municipalities, Toronto, and the MOECC.

PLC meetings are advertised and open to the public. Toronto provides updates on complaints, operational matters, annual reports, and upcoming projects. Public participation is welcomed and encouraged. Copies of the PLC meeting minutes are available upon request. In addition, a Green Lane reference section at a local library is maintained by Toronto, along with free photocopying service.

The First Nations Liaison Committee (FNLC) meets frequently. The FNLC is made up of elected band councillors from the two participating First Nations; Oneida Nation of the Thames and Chippewas of the Thames First Nation. Other participants include Toronto SWMS representatives and the MOECC.

Community Grants & Property Value Protection

The Green Lane Community Trust Fund, a not-for-profit entity funded by the City and administered by a Board of Directors, provides grants to qualifying groups, activities, projects or initiatives that will benefit community services, social or civic welfare, or the environment.

The Property Value Protection Plan provides assurances to eligible property owners in the vicinity that they will not experience a financial loss due to any potential decrease in their property value due to the proximity of their property to the landfill. Further, a No-Fault Small Claims Fund may provide compensation for eligible nuisance or damage claims related to Site operations, such as a cracked windshield, or losses not otherwise covered by insurance.

Educational presentations and tours are available to both local and international groups. The GLL offices are open to anyone who may wish to review a report or have a discussion with City of Toronto staff.

Green Lane Landfill demonstrates its pivotal role in the City of Toronto's integrated waste management system through its natural and built features, effective use of equipment and technologies and by maintaining the excellent quality of the landfill's environmental controls and monitoring systems. Sensitive to neighbours and committed to accommodating the various communities' needs, Green Lane meets and exceeds all regulatory compliance requirements.