



STAFF REPORT FOR INFORMATION

Rapid Health Impact Assessment for Biosolids Management at the Highland Creek Treatment Plant

Date:	April 7, 2011
To:	Public Works and Infrastructure Committee
From:	Medical Officer of Health
Wards:	Ward 44 - Scarborough East
Reference Number:	

SUMMARY

The 2009 Biosolids Master Plan Update considered several options to manage biosolids at Toronto's four sewage treatment plants and identified fluidized bed incineration as the preferred option for the Highland Creek Treatment Plant. At its meeting of June 8, 2010 City Council approved the beneficial use of biosolids as the primary biosolids management strategy for the Highland Creek Treatment Plant with the landfill disposal as a contingency option.

Toronto Public Health has undertaken a rapid health impact assessment of biosolids management options at the Highland Creek Treatment Plant to provide the Public Works and Infrastructure Committee with a summary of the potential health impacts of various biosolids management options.

The most important and quantifiable health impact of biosolids management is through air quality. All of the options considered will reduce the release of air pollutants during operations compared to the current situation. Since the air quality in Toronto is still contributing to illness, from a health point of view, the option that has the lowest release of air pollutants is preferred. Beneficial use options are likely to have the lowest impact on air quality, including releases of greenhouse gasses. Additional pollution control measures proposed for use with the incineration option may reduce the difference in air quality impacts between incineration and beneficial use.

Beneficial use options could have greater negative impacts on quality of community life factors (for example, noise, traffic, and odours) than incineration. The health impact of quality of community life factors are difficult to access and quantify.

Financial Impact

There are no financial impacts from the adoption of this report.

DECISION HISTORY

On March 23, 2011 the Public Works and Infrastructure Committee considered the January 21, 2011 letter from Councillor Ron Moeser (Ward 44 - Scarborough East) to reconsider the June 8, 2010 decision of Council to approve the beneficial use option as the primary biosolids management strategy for the Highland Creek Treatment Plant and the landfill disposal option as a contingency option. The Committee deferred its decision and requested the Medical Officer of Health to report back on the potential health impacts of the available biosolids management options at the Plant.

ISSUE BACKGROUND

Toronto has four sewage treatment plants: Ashbridges Bay Treatment Plant, Highland Creek Treatment Plant, Humber Treatment Plant, and North Toronto Treatment Plant. The Ashbridges Bay Treatment Plant generates an average of 106 dry tonnes per day of biosolids, which includes the biosolids from both the Humber and North Toronto treatment plants. The Highland Creek Treatment Plant, which is situated in the community of West Hill, generates about 30 dry tonnes per day.

In the fall of 2002, the City of Toronto initiated a Biosolids and Residuals Master Plan that was to provide direction on the future management of biosolids and water residuals generated by the City's water and wastewater treatment plants to the year 2025. The Plan was undertaken using the Class Environmental Assessment process as defined in the *Environmental Assessment Act*. A draft Plan was released for public comment on September 16, 2004.

As a result of public concerns regarding the recommended biosolids management strategies identified in the draft Master Plan, the Works Committee requested that the General Manager of Toronto Water, together with the Medical Officer of Health, undertake a peer review of the decision-making model and methodology used to assess the various biosolids management options in the Master Plan. The peer review was completed in February 2008 and the draft master plan was then updated based on the Peer Review Panel's recommendations. The updated report was completed in September 2009.

The 2009 Biosolids Master Plan Update considered several options to manage biosolids at Toronto's sewage treatment plants. It used a multi-criteria analysis decision-making model that weighed environmental, social and economic factors to identify the preferred management options for each of the plants. The environmental and social components were each given 40 percent of the overall weight, and the economic component 20 percent.

The Master Plan Update identified incineration using fluidized bed incinerators as the preferred management options for biosolids at the Highland Creek Treatment Plant. At

its meeting of June 8, 2010 City Council approved the beneficial use of biosolids as the primary biosolids management strategy for the Highland Creek Treatment Plant with the landfill disposal as a contingency option.

Currently, biosolids generated at the Highland Creek Treatment Plant are managed using two 35 year old multiple hearth incinerators. The resulting inorganic non-hazardous ash is stored in lagoons on site and hauled once a year over a weeklong period to the City's Green Lane Landfill. In 2009, these incinerators were found to be in need of urgent repair. Major maintenance and refurbishment work, which is currently underway, will extend the service life of the incinerators for another 5 to 10 years.

COMMENTS

In response to the March 23, 2011 request of the Public Works and Infrastructure Committee, Toronto Public Health conducted a rapid health impact assessment for biosolids management options at the Highland Creek Treatment Plant.

1.0 The Approach Used To Assess Health Impacts

A health impact assessment framework was developed in 2008 for the evaluation of options for managing Toronto's solid waste¹. A screening tool which is part of the framework was used to identify ways that different biosolids management options might affect human health (see Attachment 1).

The health impact assessment was done for two approaches to biosolids management:

- On-site incineration identified in the Master Plan Update as the preferred option
- Beneficial use (biosolids cake and pellets) as City Council recommended option

Most of the data used to inform this assessment can be found in the 2009 Biosolids Master Plan Update documents.²

2.0 Health Impact Assessment of the Incineration Option

2.1 Environmental Factors

The Master Plan ranked on-site incineration as 7th best of 11 options on the environmental index.

¹ Toronto Public Health, 2008. TPH Health Impact Assessment Framework Final Draft Report. Prepared by Jacques Whitford for Toronto Public Health.

http://www.toronto.ca/health/hphe/pdf/draft_hia_framework.pdf

² Toronto Water, 2009. City of Toronto Biosolids Master Plan Update, September 2009. Prepared for the City of Toronto by AECOM Canada Ltd. <http://www.toronto.ca/wes/techservices/involved/www/biosolids/>

2.1.1 Air quality

All of the options considered in the Master Plan will reduce the release of air pollutants during operations compared to the current situation. However, air releases from incineration are expected to be higher than those from beneficial uses.

Toronto Water has proposed to install additional air pollution control devices that would reduce releases of nitrogen oxides, sulphur dioxide and hydrogen chloride more than what was assumed in the Master Plan. These proposed additional pollution controls would go beyond regulatory requirements and would reduce the health impacts of the incinerator. The extent of this reduction of health impacts and how it would affect comparisons with other options has not been quantified.

2.1.2 Greenhouse Gases

The various options were also assessed for their releases of greenhouse gasses. The release of greenhouse gasses from incineration was estimated as the highest of all the options considered.

2.1.3 Toxic chemicals

The Master Plan did not specifically compare the air releases of toxic chemicals between the various options. Fluidized bed incinerators release much smaller quantities of toxic pollutants than the older multiple hearth technology, which is currently being used at the Highland Creek Treatment Plant. More advanced technologies, such as such as pyrolysis and plasma arc, could reduce the release of air pollutants even more.

An important factor in the release of toxic chemicals is their presence in the sewage sludge that is being processed. The Sewer Use Bylaw was adopted to ensure biosolids produced in Toronto are of good quality and to minimize any release of toxic chemicals into the environment.

From a point of view of health, persistent chemicals, such as metals, that can accumulate over time in the environment are of greater concern. Replacement of the current incinerators with more modern technology would greatly improve the environmental performance of the Highland Creek Treatment Plant, and thus reduce any potential health impacts. Non-incineration technologies that reduce the air release of toxic chemicals even more would likely offer the most health benefit for this parameter.

2.1.4 Odour

The impacts of odour on health are not well quantified, however, odour does have an impact on overall quality of life. The Master Plan identifies incineration as the option with the lowest level of odour concern.

2.1.5 Surface and ground water quality

The Master Plan indicates that incineration was one of the options with the least concern for water quality impacts.

2.1.6 Soil quality

The Master Plan indicates that incineration was one of the options with the least concern for impacts on soil quality. However, air emissions of persistent toxic chemicals could result in accumulation of these substances into the soil around the incinerator. A more detailed evaluation would be needed to fully assess the impacts of incineration on soils.

2.1.7 Land use and built environment

Noise and odours are the two most likely adverse impacts related to land use that could have an adverse impact on health. The Master Plan indicates that incineration at the Highland Creek Treatment Plant would have the least impact on land use since the new incinerators would replace the existing ones in the current building.

2.1.8 Noise

The Master Plan indicates that incineration at the Highland Creek Treatment Plant would have the least impact on noise since the new incinerators would replace the existing ones in the current building.

2.2 Social and economic factors

2.2.1 Housing and Community/social cohesion

Factors that affect quality of community life such as odours, noise, truck traffic, could have an impact on the desirability of the neighbourhood. This could have a negative impact on the value of homes in the area and may also affect the sense of community among people who live in the neighbourhood. Replacing the current incinerators at the Highland Creek Treatment Plant with newer and less polluting technology would likely have a neutral or positive impact on both housing values and community or social cohesion.

2.2.2 Traffic

The Master Plan indicates that incineration is the option with the least amount of truck traffic.

2.3 Lifestyle factors

2.3.1 Physical activity

The various biosolids management options only have an indirect impact on physical activity. Odours might discourage physical activity outside and increased truck traffic could discourage walking or playing. Given that replacing the current incinerators would improve the environmental performance of the Highland Creek Treatment Plant and not change the nature of the operations at the plant this option would have no additional impact on the level of physical activity among people in the neighbourhood.

2.4 Access to services

2.4.1 Leisure

Impacts on leisure are most likely related to impacts on the physical environment that would make the neighbourhood less pleasant for outside leisure activities or for people to visit or use facilities in the neighbourhood. These environmental factors include odour, noise, reduced amount of green space, increase in traffic. Given that replacing the current incinerators would improve the environmental performance of the Highland Creek Treatment Plant and not change the nature of the operations at the plant this option would have no additional impact on leisure in the neighbourhood.

2.5 Equity

The average income in West Hill is lower than the Toronto average; the proportion of new arrivals to Canada and members of racialized communities are similar to that of Toronto as a whole (See Attachment 2). Given that replacing the current incinerators would improve the environmental performance of the Highland Creek Treatment Plant and not change the nature of the operation, this option is not expected to have any additional adverse impacts on equity.

3.0 Health Impact Assessment of Beneficial Use Options

3.1 Environmental Factors

The Master Plan ranked the beneficial use of biosolids cake as second best, and on-site pelletization as ninth for environment considerations overall.

3.1.1 Air quality

All of the options considered will reduce the release of air pollutants during operations compared to the current situation. The Master Plan indicates that beneficial use options are likely to have the lowest impact on air quality. Since the air quality in Toronto is still contributing to illness, from a health point of view, the option that has the lowest release of air pollutants is preferred.

3.1.2 Greenhouse Gases

The various options were also assessed for their releases of greenhouse gasses. Beneficial use of biosolids cake was estimated be an option with the lowest emissions of greenhouse gasses. Because of the energy needed to create biosolids pellets, pelletization was estimated to have similar level of greenhouse gas emissions as incineration. However, the net impact on greenhouse gasses from the manufacture of pellets could be smaller than what has been estimated, since pellets would replace other products, such as fertilizers, some of which are also energy intensive when produced.

From a health point of view the option with the lowest potential for greenhouse gas emissions is preferred: this would be beneficial use of biosolids cakes or the use of biosolids as a feed to industry.

3.1.3 Toxic chemicals

The Master Plan did not specifically compare the air releases of toxic chemicals between the various options. Beneficial use of biosolids are expected to have minimal releases of toxic chemicals to air, and thus would have the smallest negative impacts related to the release of toxic chemicals to air.

3.1.4 Odour

The impacts of odour on health are not well quantified, however, odour does have an impact on overall quality of life. Odour is of concern when biosolids are transported and used. This means that odour will affect people along transportation routes as well at the point of destination. Pelletization will reduce the odour impacts of biosolids.

While it is not possible to estimate the health impacts of odour, it is still important to minimize the negative impacts of odours when managing biosolids.

3.1.5 Surface and ground water quality

Using biosolids cakes in agriculture or silviculture could result in surface or ground water pollution from both chemicals and pathogens, but good environmental practice should minimize any of these impacts. Use of biosolids pellets can also reduce these effects. A more detailed assessment would be needed to quantify potential impacts of health due to water pollution from the use of biosolids, though good environmental practice should adequately mitigate potential adverse impacts.

3.1.6 Soil quality

One reason to apply biosolids to soil is to improve soil quality. However, there is a potential for accumulation of contaminants from the addition of biosolids to soils. It is for this reason that the use of biosolids is regulated. The Sewer Use Bylaw aims at maintaining the quality of biosolids produced in Toronto, and thus reduce any potential adverse impacts from the use of biosolids to amend or fertilize soils. The Human Health and Ecological Assessment of Toronto Biosolids Pellets study showed that pellets could be used without adverse impacts to public health.³

3.1.7 Land use and built environment

The beneficial use of biosolids cakes would have the greatest impact on the built environment since a storage facility would need to be built and because of concerns related to odour during their application on land. The building of a pelletizer on-site would reduce on-site and off-site impacts as compared to the beneficial use of biosolids cake. Good planning could mitigate most of the negative health impacts related to land use.

3.1.8 Noise

While the Master Plan identifies traffic, haulage of biosolids, and storage as contributing to noise from beneficial uses of biosolids, it notes that these can be mitigated. Overall,

³ Toronto Public Health, 2004. Biosolids Pellet Review Study – Human Health and Ecological Risk Assessment. Prepared for Toronto Public Health by Jacques Whitford Limited.
<http://www.toronto.ca/health/hphe/waste/biosolids.htm>

use of cakes was assessed as moderate risk with some mitigation required. Pelletization would likely have lower impacts than use of biosolids cake.

3.2 Social and economic factors

3.2.1 Housing and Community/social cohesion

Factors that affect quality of community life such as odours, noise, truck traffic, could have an impact on the desirability of the neighbourhood. This could have a negative impact on the value of homes in the area and may also affect the sense of community among people who live in the neighbourhood. The impacts of the beneficial use options could be negative, given the greater potential of these options, especially storage and transportation of biosolids cakes, to create unpleasant odours and a small increase in truck traffic to transport this material out of the site. Due to the very qualitative nature of these two factors, their impact on health is difficult to estimate or predict. However, these impacts could be considered part of the negative impacts of environmental factors such as odours and noise.

3.2.2 Traffic

The Highland Creek Treatment Plant is located in a residential area. Trucks must travel about six kilometres in mostly residential neighbourhoods before reaching the highway. Beneficial use of biosolids would increase the number of trucks moving on and off the site. Creating pellets on site would reduce this impact since pelletization reduces the volume of material that has to be shipped. Incineration has the lowest volume of material to be shipped off site – about 1.4 trucks per week. The on-site pelletization option would result in about one truck per day, and the shipment of biosolid cakes a little more than three trucks per day. This increase in traffic is not likely to result in a large increase in direct adverse health impacts.

3.3 Lifestyle factors

3.3.1 Physical activity

The various biosolids management options only have an indirect impact on physical activity. Odours might discourage people to spend time doing physical activity outside and increased truck traffic could discourage walking or playing. Impacts on the level of physical activity of people in the neighbourhood of beneficial use options are difficult to assess. It is however noted that this impact would be the result of other factors such as odours, noise and truck traffic, which have been discussed above. Compared to beneficial use of biosolid cakes, the manufacture of pellets on-site would likely reduce overall impacts related to odours and traffic.

3.4 Access to services

3.4.1 Leisure

Impacts on leisure are most likely related to impacts on the physical environment that would make the neighbourhood less pleasant for outside leisure activities or for people to visit or use facilities in the neighbourhood. These environmental factors include odour,

noise, reduced amount of green space, and increase in traffic. Impacts of beneficial use options on leisure are difficult to assess. It is however noted that these would be the result of other factors such as odours, noise, built environment and truck traffic, which have been discussed above. The manufacture of pellets on-site would likely result in smaller negative impacts than beneficial use of biosolid cakes.

3.5 Equity

The average income in West Hill is lower than the Toronto average; the proportion of new arrivals to Canada and members of racialized communities are similar to that of Toronto as a whole (See Attachment 2). Beneficial use options could have greater negative impacts on quality of community life factors (for example, noise, traffic, and odours) than incineration.

4.0 Overall Assessment and Conclusions

A public opinion survey that Ipsos Reid undertook for Toronto Water in 2009 found that application of biosolids to land is the preferred approach for people living in Toronto (72 percent support), with incineration second (56 percent) and landfilling third (36 percent). There are some differences among people living near the different treatment plants. Residents near the Highland Creek Treatment are just as favourable to incineration as land application, for example. The most important factors that influence the preferred approach to managing biosolids among people living near Highland Creek are health, environment and pollution. Concern about traffic was relatively the least important.

4.1 Air quality

Impacts on air quality are the clearest and most quantifiable healthy impacts of the biosolids management options. All of the options considered will reduce the release of air pollutants during operations compared to the current situation. As well, any of the selected options would meet Ministry of the Environment standards and guidelines.

Levels of various pollutants such as fine particulate matter, nitrogen oxides and ozone exceed health standards on some occasions in Toronto. These pollutants are known to contribute to illness in Toronto even when they are below air quality standards or guidelines. The Clarkson airshed study,⁴ which the Ontario Ministry of the Environment undertook, shows that even when individual industrial facilities meet ambient air quality standards and guidelines, the cumulative impact of these sources can result in levels of air pollutants that are of health concern.

Since poor air quality in Toronto continues to contribute to illness, from a health point of view, the option that has the lowest release of air pollutants is preferred. The Master Plan indicates that beneficial use options are likely to have the lowest impact on air quality. The difference in air quality impacts between the incineration and beneficial use options may be reduced by the proposed additional pollution control measures.

⁴ Reports on the Clarkson Airshed Study can be found on the Ontario Ministry of the Environment website http://www.ene.gov.on.ca/environment/en/local/southwest_gta_air/STDPROD_080607.html.

The option with the lowest potential for greenhouse gas emissions is also preferred: this would be beneficial use of biosolids cakes or the use of biosolids as a feed to industry.

4.2 Quality of community life

The on-site incineration option would result in new incinerators being installed at the Highland Creek Treatment Plant. These new incinerators would improve the environmental performance of the plant. Since biosolids are already being incinerated at the plant, installing new incinerators would not have any additional negative impacts on factors affecting community life. Beneficial use options could have greater negative impacts on quality of community life factors (such as, noise, traffic, and odours) than incineration does. The impacts of quality of community life factors on health are more difficult to assess and quantify.

4.3 Equity Considerations

The average income in West Hill is lower than the Toronto average; the proportion of new arrivals to Canada and members of racialized communities are similar to that of Toronto as a whole. Since biosolids are already being incinerated at the Plant, installing new incinerators would reduce the air quality impacts to the community. Beneficial use options could have greater negative impacts on quality of community life factors (for example, noise, traffic, and odours) than incineration. Such concerns could make the neighbourhood less desirable and thus increase the disparity in income between this neighbourhood and the rest of Toronto over time. However, air pollution impacts from beneficial use are expected to be lower, which would benefit people in this neighbourhood.

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SIGNATURE

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ATTACHMENTS

- Attachment 1: Factors possibly affected by biosolids management options that could have an impact on health
- Attachment 2: Neighbourhood Characteristics for West Hill

Attachment 1: Factors possibly affected by biosolids management options that could have an impact on health

Potential Impact on Determinants of Health				Potential Impact on Equity Factors			
Determinant of Health	Potential Impacts				Potential Impacts		
	Positive	Neutral	Negative		Positive	Neutral	Negative
Environmental Factors				Equality			
Air quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Age	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Odour	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sex	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Surface water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Minorities or disadvantaged group	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Groundwater quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ability	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Soil quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sub-populations affected – within Toronto			
Land use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Children (0-18 years)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Seniors	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Noise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Marital status	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Built Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Persons with dependents	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Social and economic factors				Political opinion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Income	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Religious belief	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Crime	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Chronically ill	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Education	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Unemployed/living in poverty	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Family cohesion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Gender (specify male/female)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Housing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Homeless/underhoused	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Community/social cohesion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sexual orientation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Poverty	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	People with disabilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Employment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Racialized communities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Social exclusion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	New arrivals to Canada	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Traffic	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Socially excluded	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lifestyle factors				Sub-populations affected – groups outside Toronto			
Diet	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Residents of neighbouring municipalities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Physical activity	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Residents of non-neighbouring municipalities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Smoking	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Rural population	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Alcohol	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Regular commuters into Toronto	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sexual behaviour	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Occasional business visitors to Toronto	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Drugs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Canadian tourists	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Access to services				Foreign tourists	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Health services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Total Canadian population	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Education	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
Social services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
Transportation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
Leisure	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				

Attachment 2: Neighbourhood Characteristics for West Hill

The Highland Creek Treatment Plant is in Ward 44 in the part of Toronto known as the community of West Hill. Families living in this neighbourhood have lower average income than the City as a whole (see Table 1). The number of recent immigrants is similar to Toronto as a whole, but there is a larger proportion of people who are Canadian citizens and who can speak one of the official languages.

Table 1: Population Characteristics for the West Hill Neighbourhood compared to Toronto as a whole⁵

Average family income	Much lower
% Households with income over 100,000	A bit Lower
% Low income families	A bit Higher
% Renters spending more that 30% of income on rent	Lower
% Aboriginal Origin	Lower
% Immigrants	Same
% Recent Immigrants	Same
% Canadian Citizenship	Much Higher
% Non-Official Home Language	Lower
% No Knowledge of Official Languages	Much Lower
% Visible Minority	A bit Higher
% Renters	A bit Lower
% Lone Parents	Higher
% Lone Seniors	A bit Higher
% One-Family Dwellings	A bit Higher
% Multi-Family Dwellings	Same
% Dwellings Requiring Major Repairs	Higher

⁵ Source: Neighbourhood profiles for West Hill
http://www.toronto.ca/demographics/cns_profiles/cns136.htm
 and 2006 Census Barckgrounders <http://www.toronto.ca/demographics/reports.htm>