

H.08 Workshop Presentation Material
(August 26, 2019)

**Tour of City Facilities Including W12A Landfill
List of Attendees**

Oneida Nation of the Thames

- Chief Jessica Hill
- Levi Antone, Environment Committee member
- Brandon Doxtator, Consultation Coordinator

Munsee Delaware Nation

- Carol Antone, Executive Assistant to the Chief
- Stacey Phillips, Consultation Coordinator

Chippewas of the Thames First Nation

- Mackenzie Deleary, summer student
- Martina Albert, summer student



Groundwater Workshop/ Information Session

Date: Monday, August 26, 2019

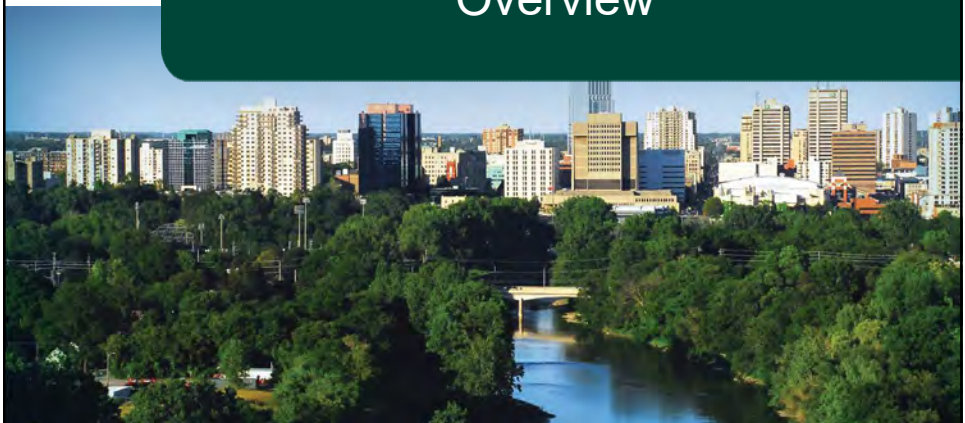
Time: 10 a.m. to 2 p.m.

Location: 328 Chippewa Rd, Chippewas of
the Thames First Nation Community Center

Item #	Item	Initial Comments	Approximate Time (minutes)
1.	Greetings		10
2.	Overview of Environmental Assessment, W12A Landfill and Study Team	City	20
3.	Overview of Groundwater Issues and Proposed Work Plan (Attachment A)	Dillon	20
4.	Review and Comments on Proposed Work Plan (Attachment B)	Dragun	20
5.	Discussion on Changes to Proposed Work Plan to Address Comments	Dragun/ Dillon	20
6.	Lunch (Meeting/discussions will continue during lunch)	-	30
7.	Overview of other Work Plans	City	10
8.	Discussion on Future Engagement/Consultation	City	20
9.	Other Business	-	10



EA and W12A Landfill Overview



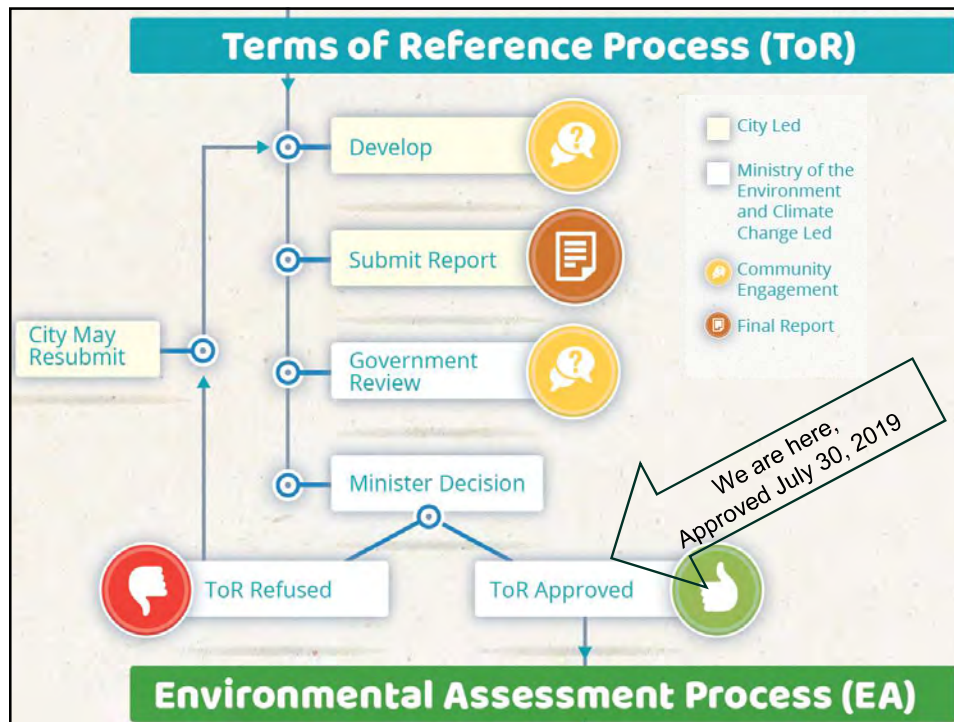
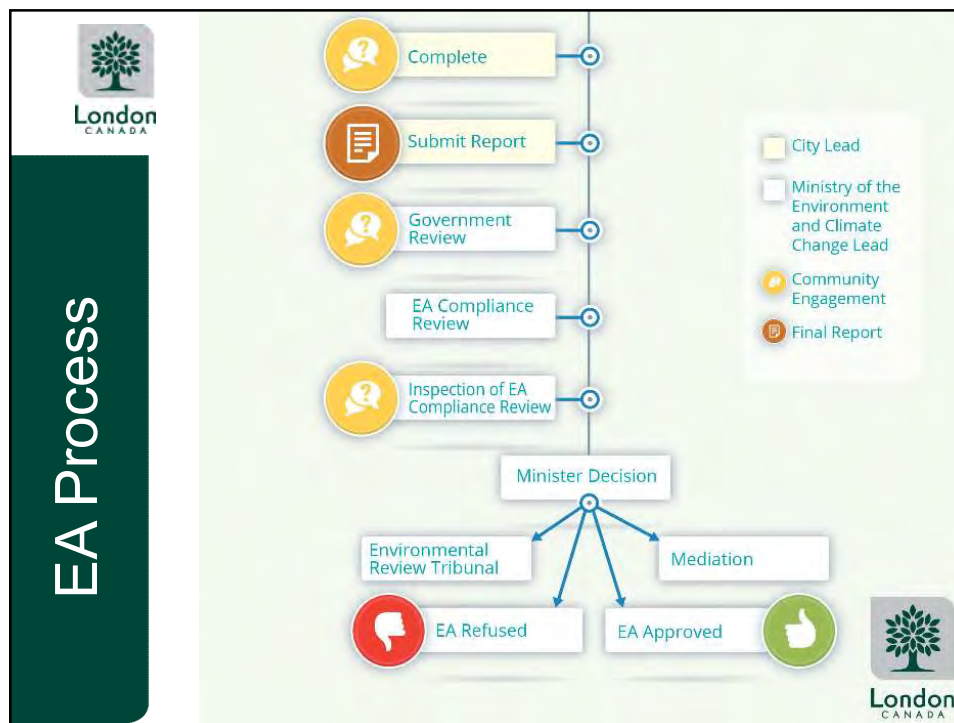
August 26, 2019

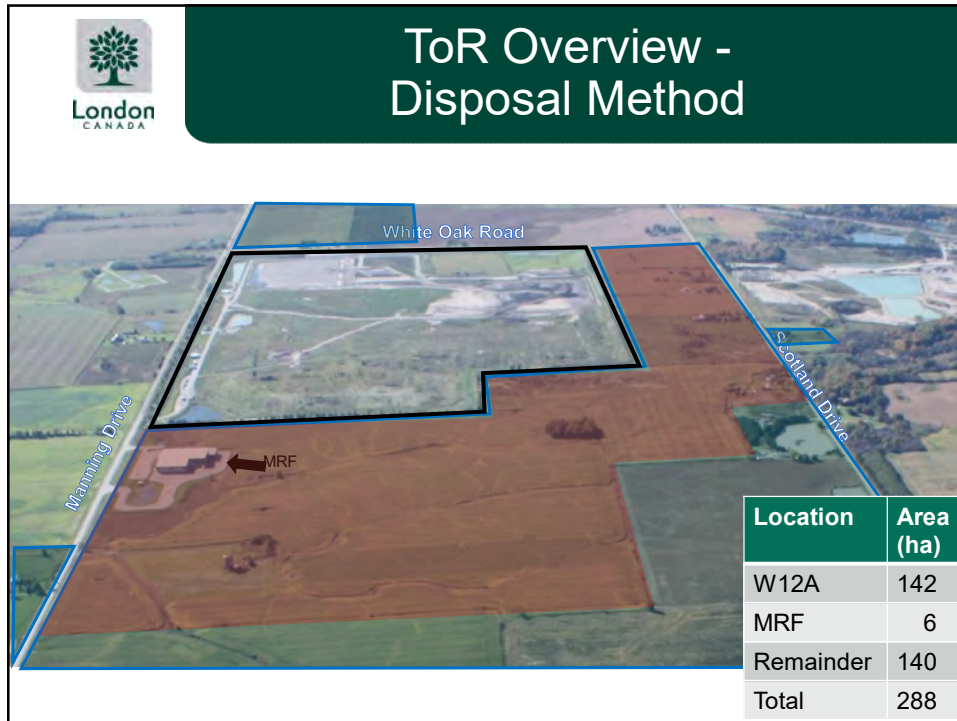
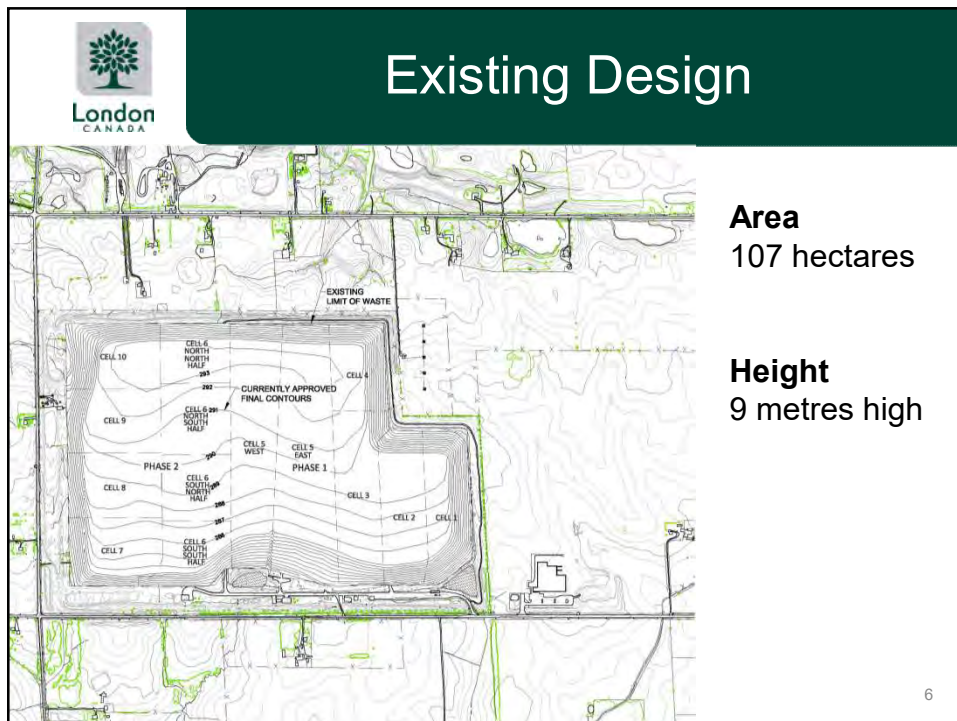


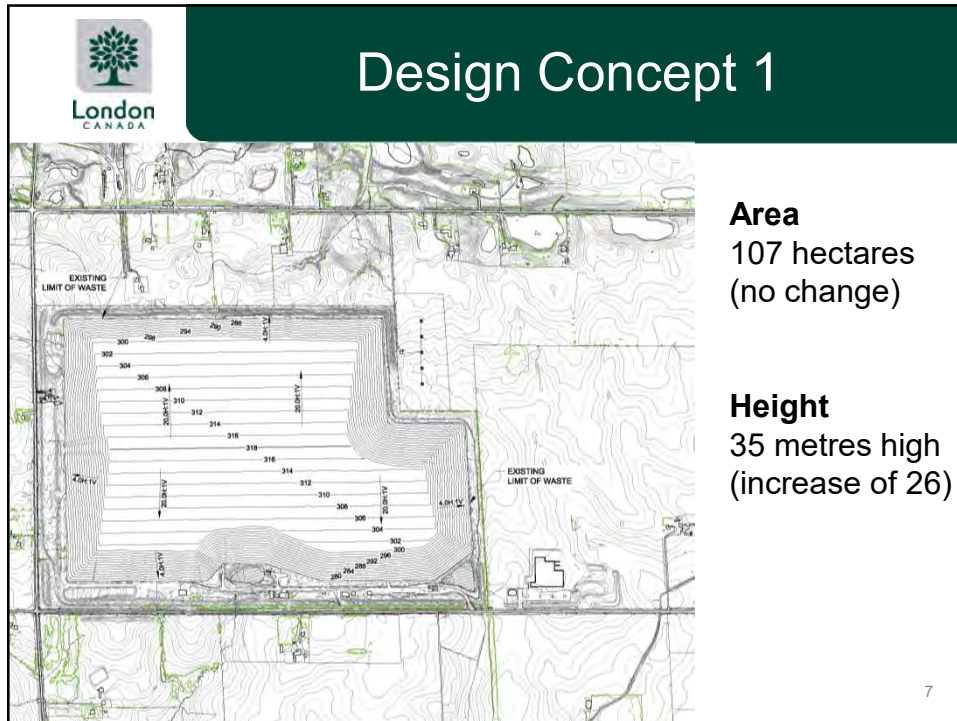
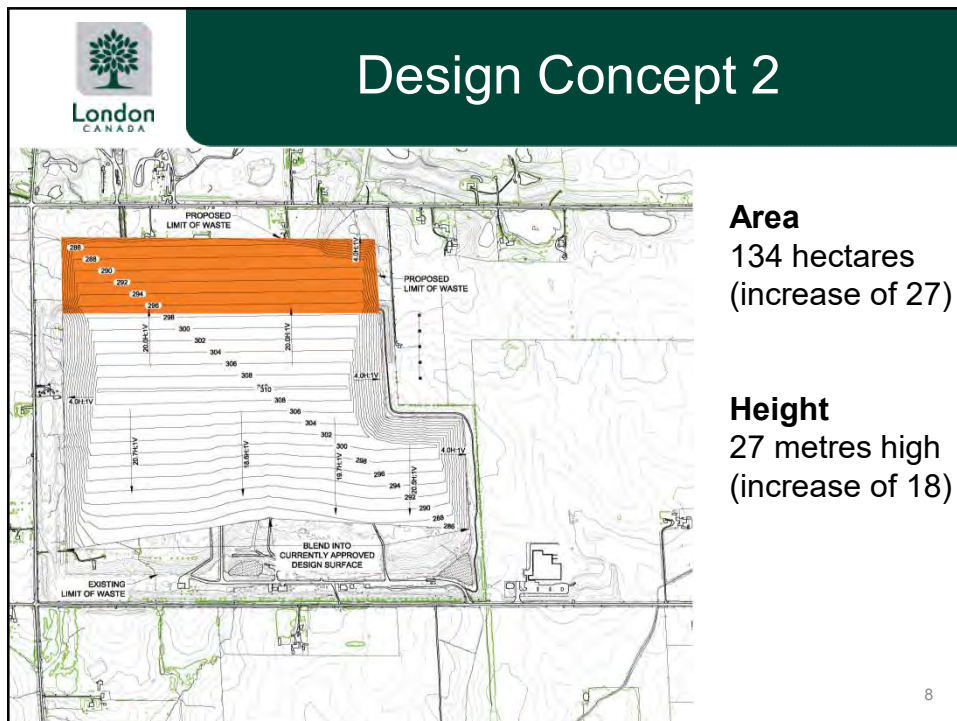
Overview

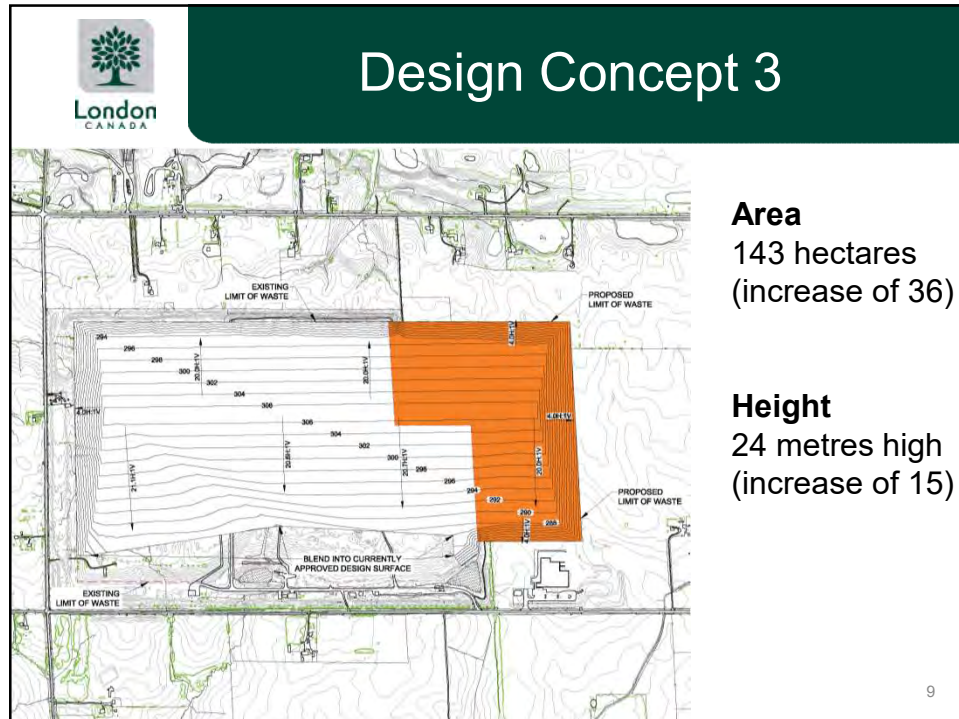
Part A – EA

Part B – W12A Landfill









 **Part B**

- 1. Groundwater**
- 2. Surface Water**
- 3. Air Quality**



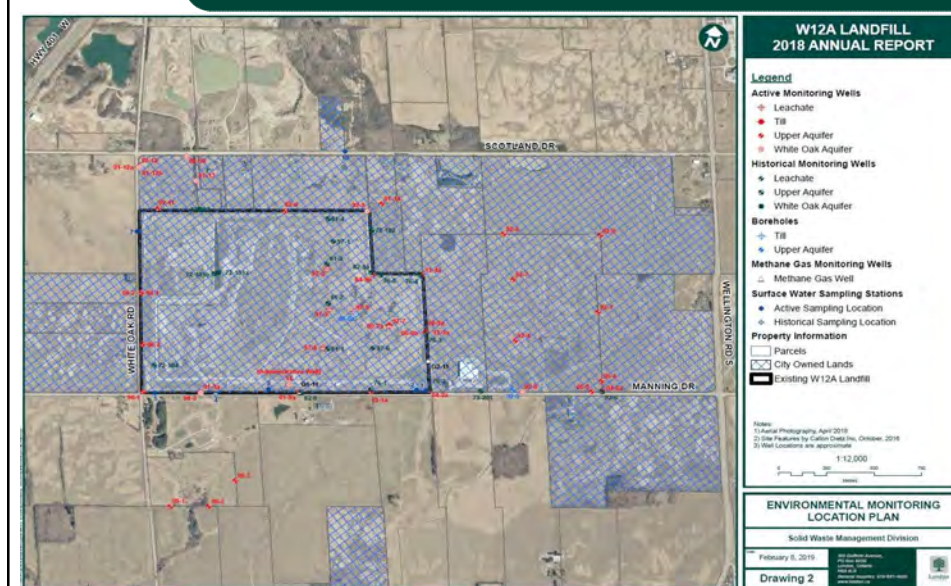
Leachate

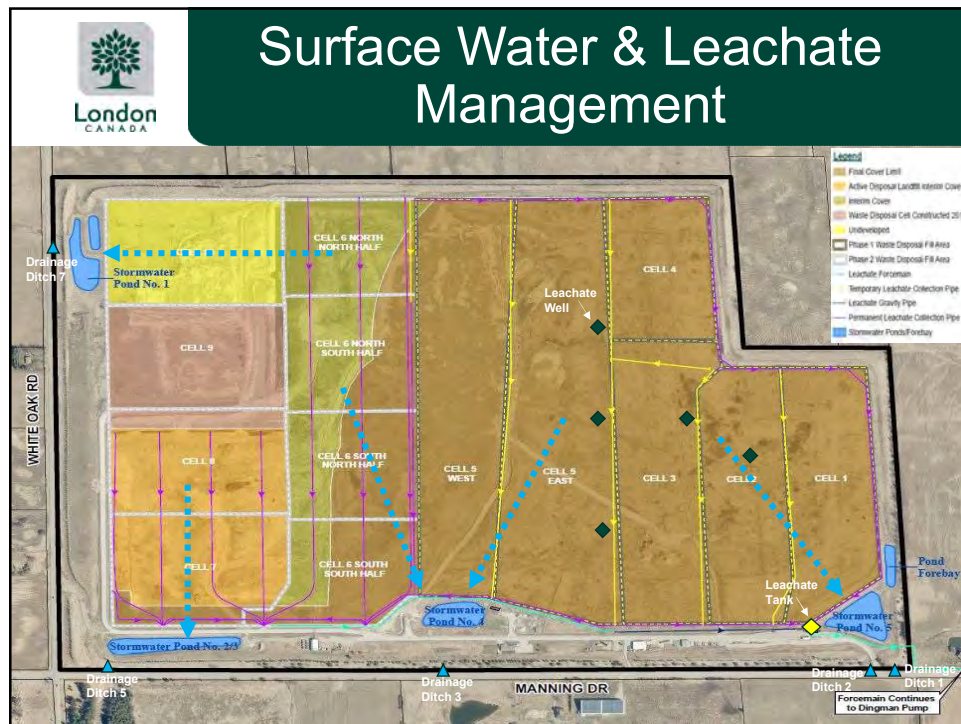
(untreated/have not gone through natural attenuation)

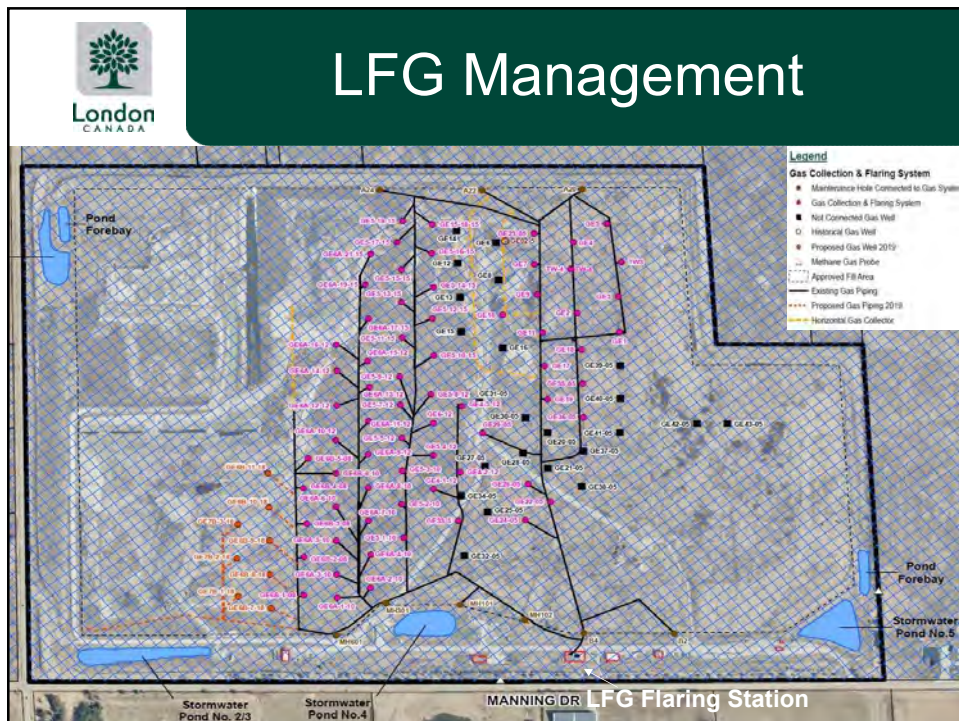
Compound	Detected above Drinking Water Standards
General Chemistry	✓
Metals	✓
Volatile Organics	✓
Pesticides and Herbicides	x
Dioxins & Furans	x
PCBs	x
Other (e.g., PAHs)	x

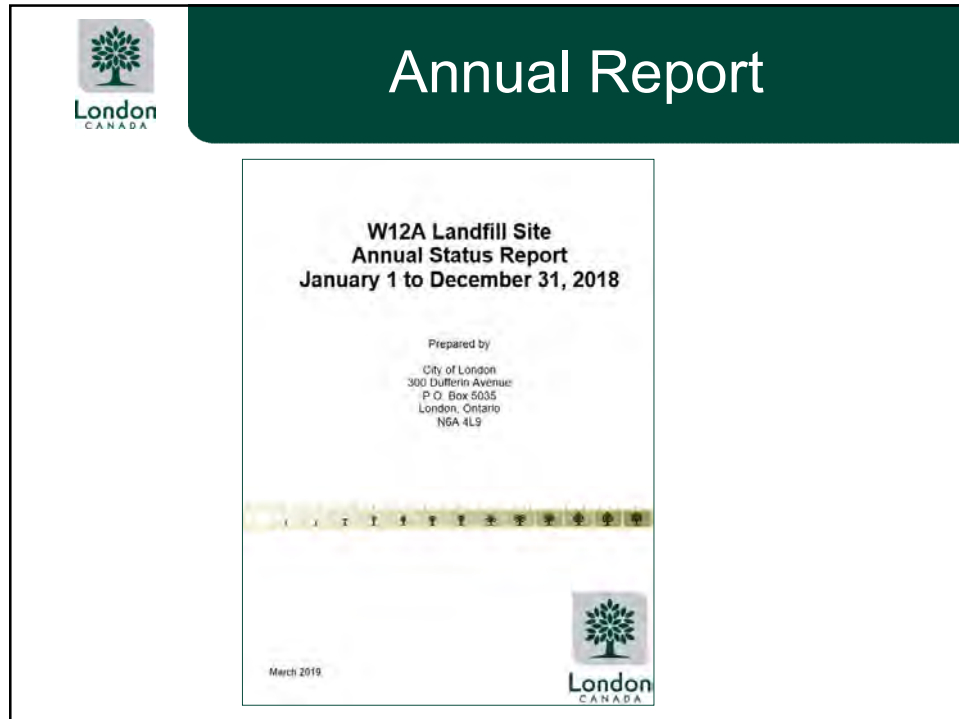


Groundwater Monitoring Wells











Studies with Detailed Work Plans



Atmosphere

Prepare air, noise, dust and odour emission estimates and execute air quality dispersion modelling to predict worst-case effects.

- First Nation Communities
- MECP



Biology

Identify potential impacts to aquatic and terrestrial features (i.e., species at risk, wetlands, woodlands) and identify mitigation measures.

- First Nation Communities
- MECP
- MNFR



Geology/ Hydrogeology

Prepare a contaminant transport model to predict worst-case groundwater impacts at the property boundary.

- First Nation Communities
- MECP



Surface Water

Predict potential impacts on surface water quality and execute surface water model to estimate peak flows and stormwater management requirements.

- First Nation Communities
- MECP
- UTRCA
- KCCA



Other Studies



Agriculture

Determine potential disruption to local farm operations and identify mitigation measures.



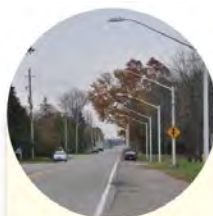
Archaeology

Identify archaeological sites that are anticipated to be impacted.



Cultural

Predict potential impacts to important cultural vistas, views and protected heritage properties or newly identified properties of cultural heritage value or interest.



Socio-economic

Predict impacts on employment and calculate the net economic effect. Evaluate the level of nuisance effect to surrounding residence and communities.



Other Studies



Land Use

Determine potential disruption to sensitive land uses and identify mitigation measures.



Visual

Identify potential effects on views from off-site vantage points using a 3D model.



Design and Operations

Complete a geotechnical assessment. Develop an estimate of the quantity of landfill gas and leachate (water that has come in contact with waste) generated from the expansion. Estimate cost of environmental and engineering controls for the alternative design concepts.



Transportation

Assess traffic operation and safety requirements for the haul route study area.



Environmental Components

Category	Proposed Environmental Components	
	Environmental Component	Environmental Sub-components
Environmental	Atmosphere	<ul style="list-style-type: none"> Air quality (including dust, odour and greenhouse gases) Noise
	Biology	<ul style="list-style-type: none"> Aquatic ecosystems Terrestrial ecosystems
	Geology & Hydrogeology	<ul style="list-style-type: none"> Groundwater quality
	Surface Water	<ul style="list-style-type: none"> Surface water quality Surface water quantity
Social	Agriculture	<ul style="list-style-type: none"> Agriculture
	Archaeology	<ul style="list-style-type: none"> Archaeology
	Culture	<ul style="list-style-type: none"> Cultural heritage landscapes Cultural heritage resources (including built heritage)
	Land Use	<ul style="list-style-type: none"> Current and planned future land uses
	Socio-economic	<ul style="list-style-type: none"> Local economy Residents and community
	Visual	<ul style="list-style-type: none"> Visual
Technical	Design and Operations	<ul style="list-style-type: none"> Technical Considerations Financial Considerations
	Transportation	<ul style="list-style-type: none"> Traffic

Top Ranked

- Groundwater Quality
- Aquatic Ecosystems
- Terrestrial Ecosystems
- Air Quality

Bottom Ranked

- Heritage Landscapes
- Heritage Resources
- Archaeology
- Noise



City of London W12A Landfill Groundwater Workshop

Rob Kell, P.Eng., P.Geo.

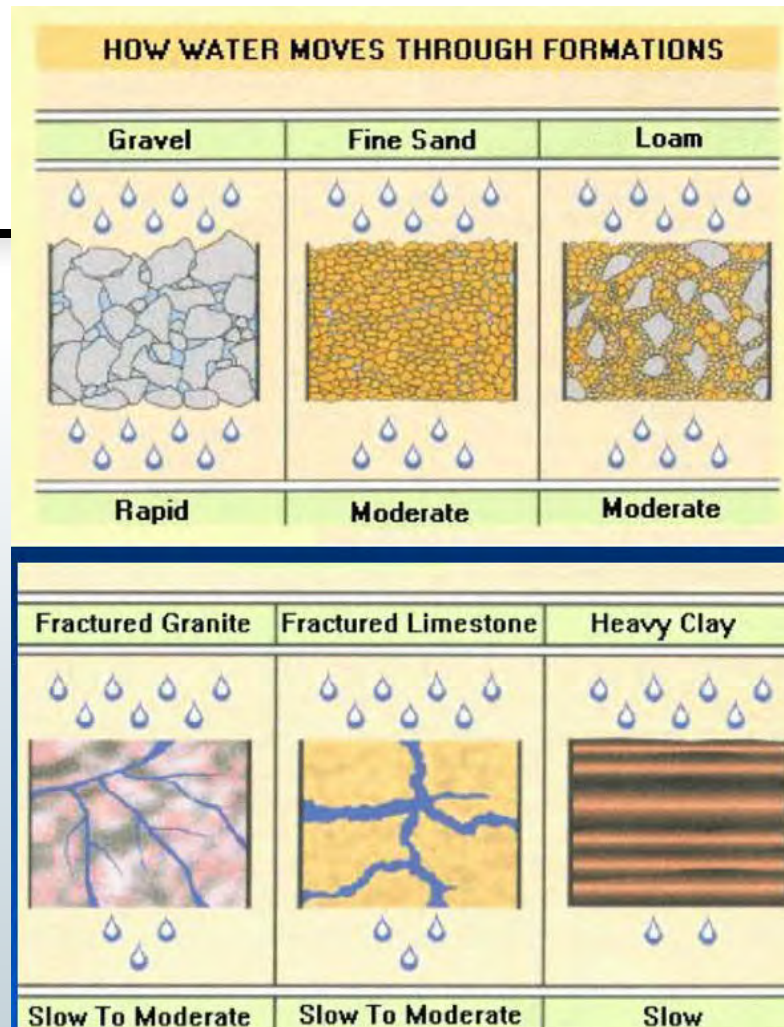
August 23, 2019

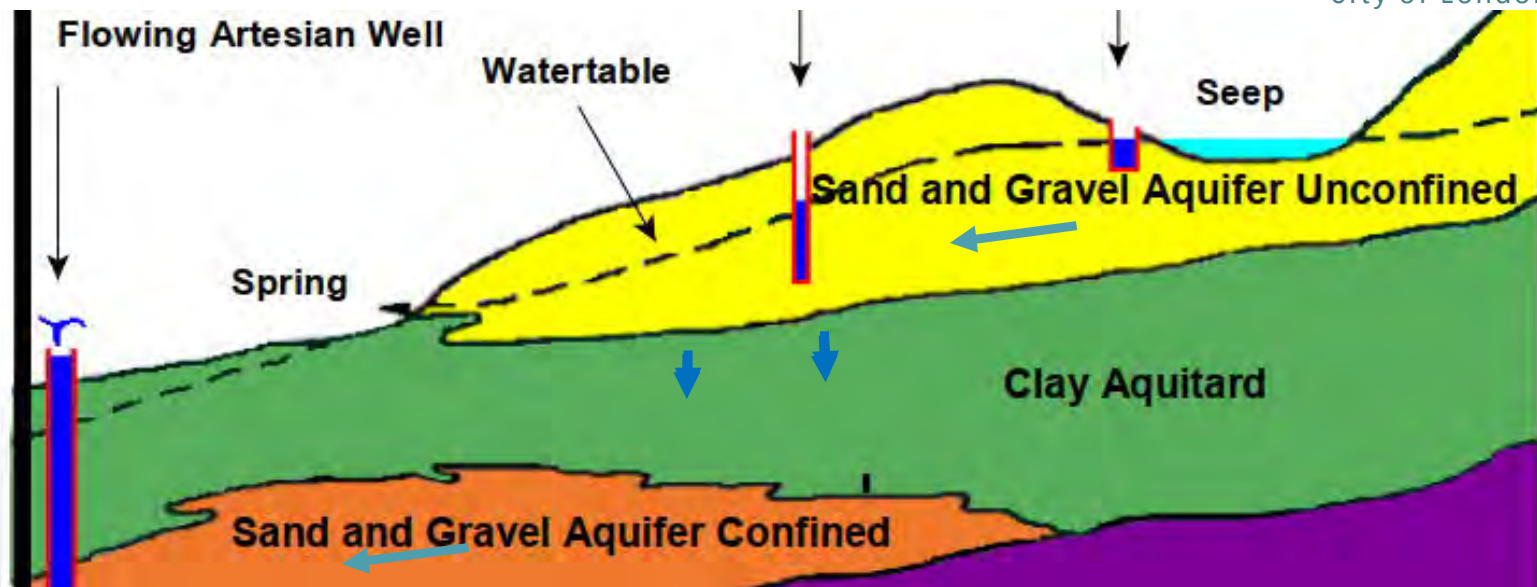
Presentation Summary

- Overview of Groundwater Fundamentals
- Landfill Site Groundwater Conditions (Hydrogeology)
- Proposed Additional Investigations
- Questions??

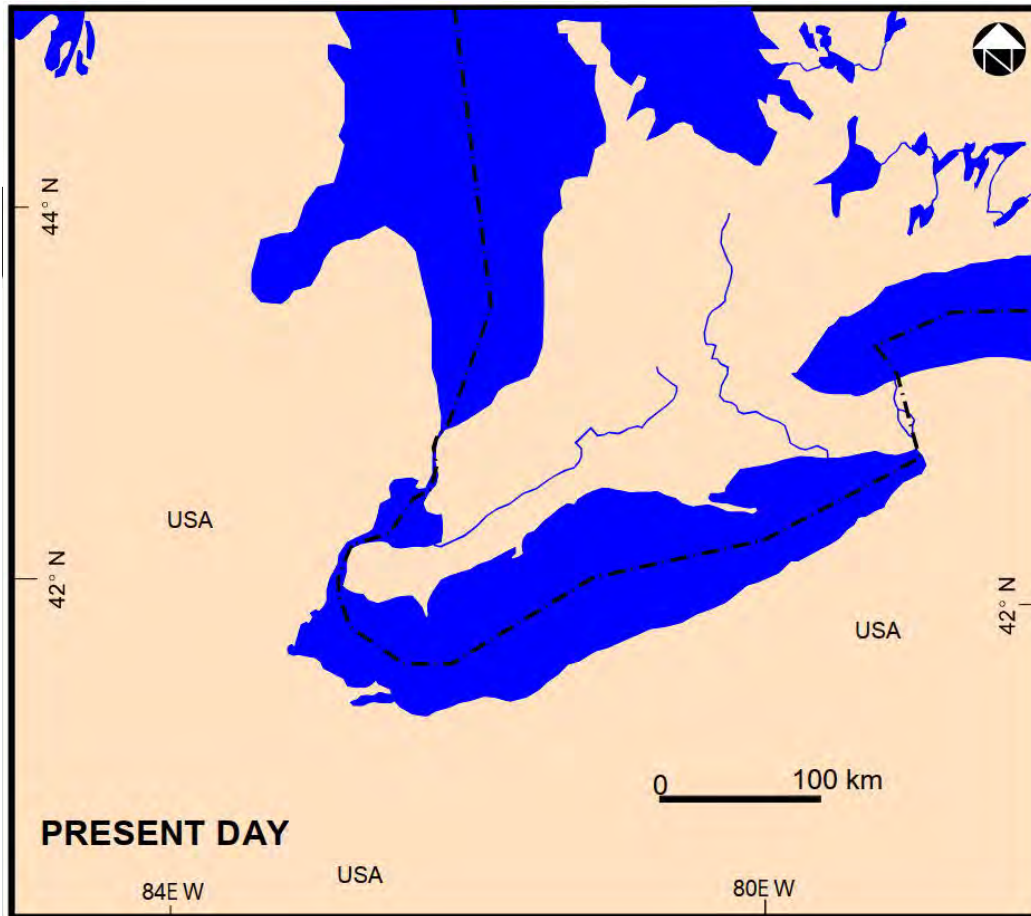
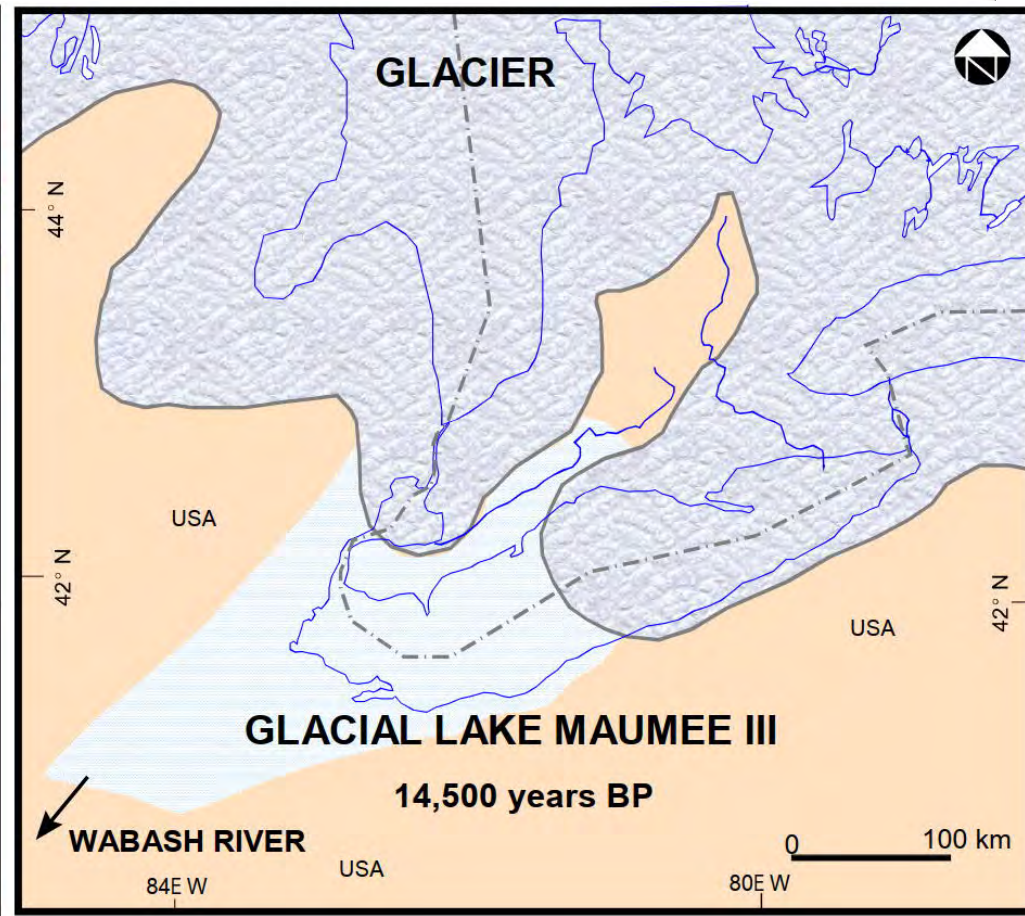
Groundwater Flow Fundamentals

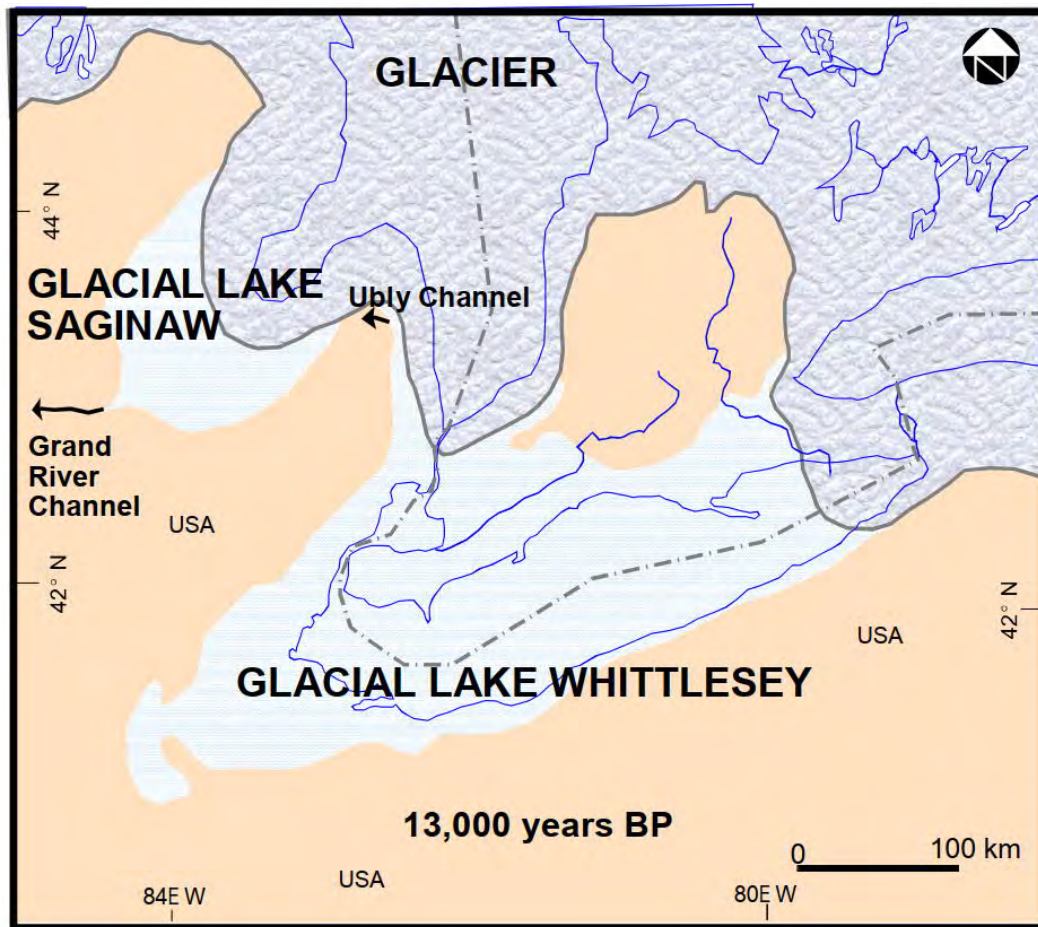
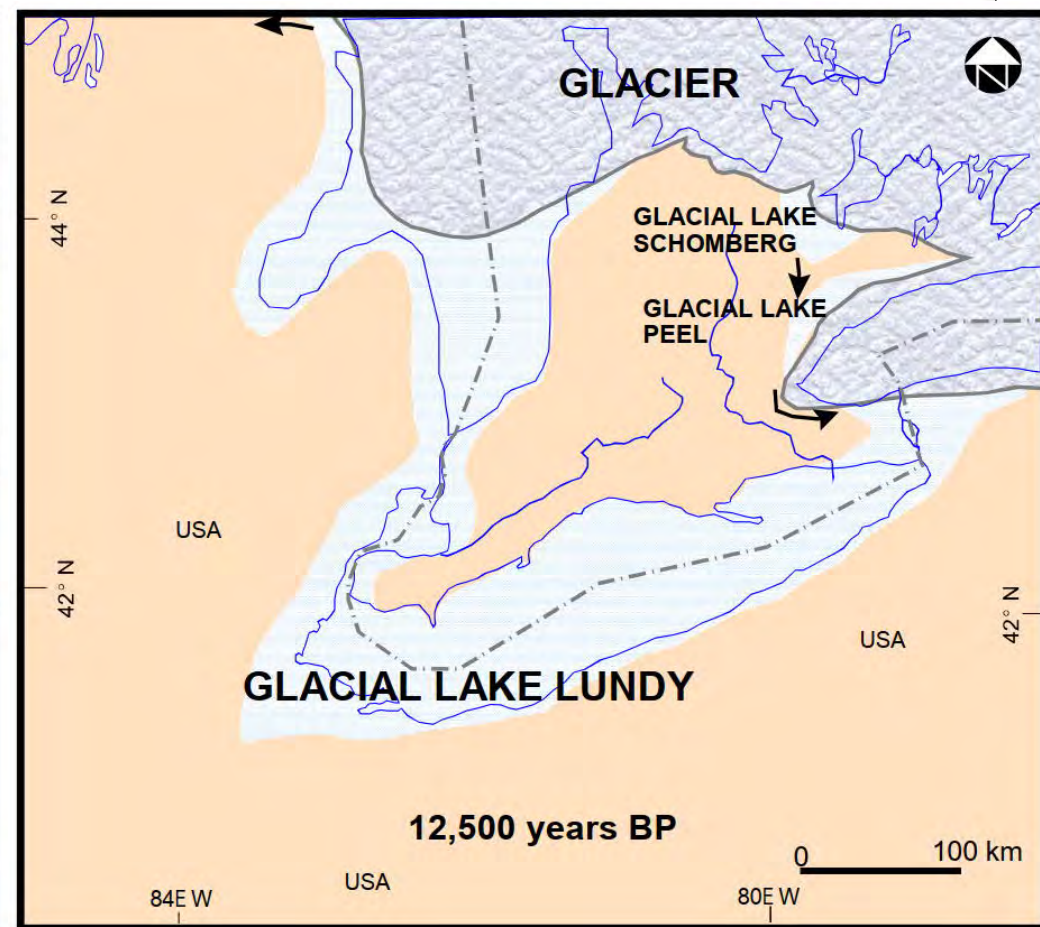
- Unconsolidated Soils
- Glaciation (~12,000 years ago)
- Soil Components (sand, gravel, silt, clay)
- Complex geology (interbedded)
- Variable thickness in Southwestern Ontario (0 to >100 metres)

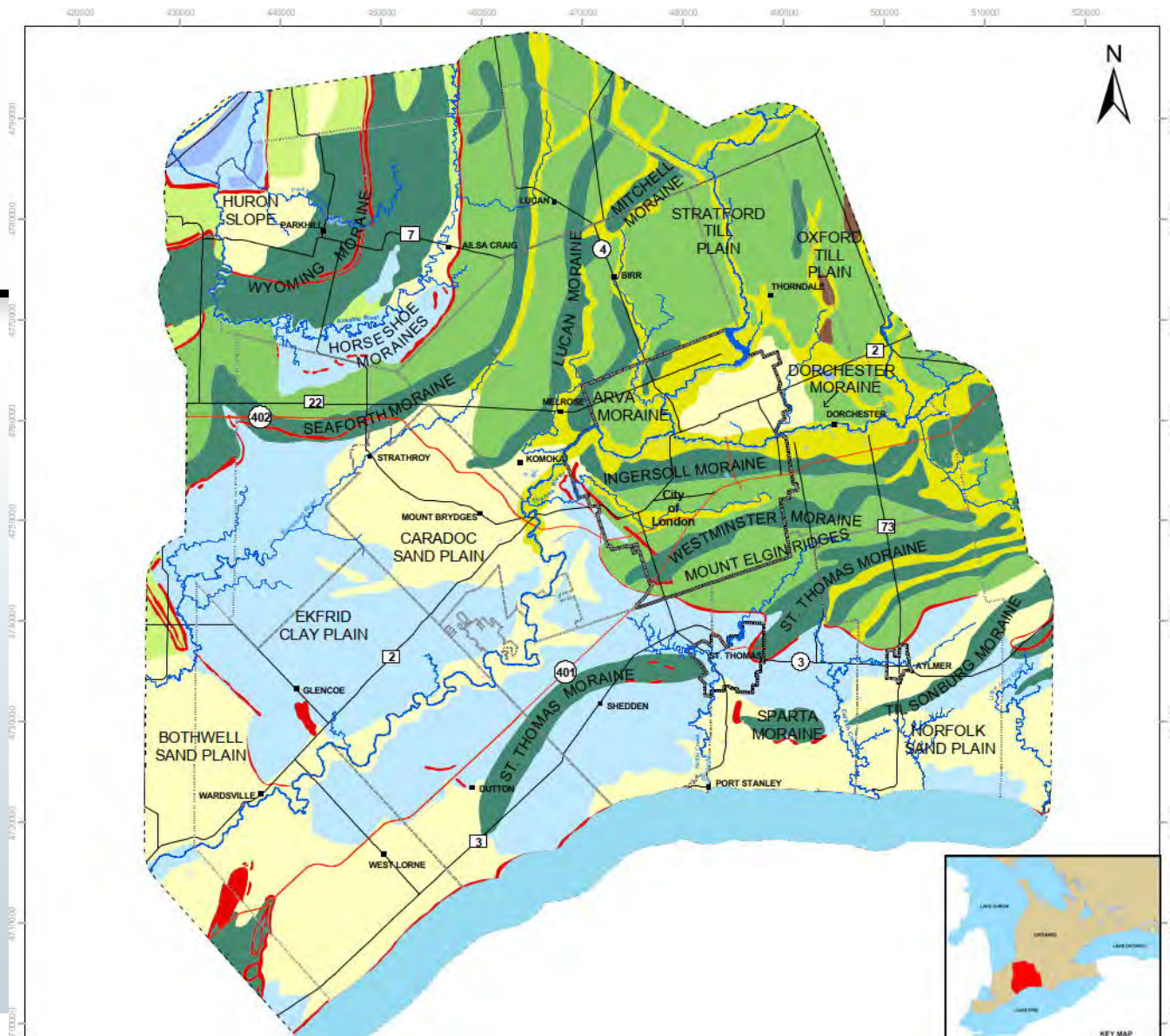


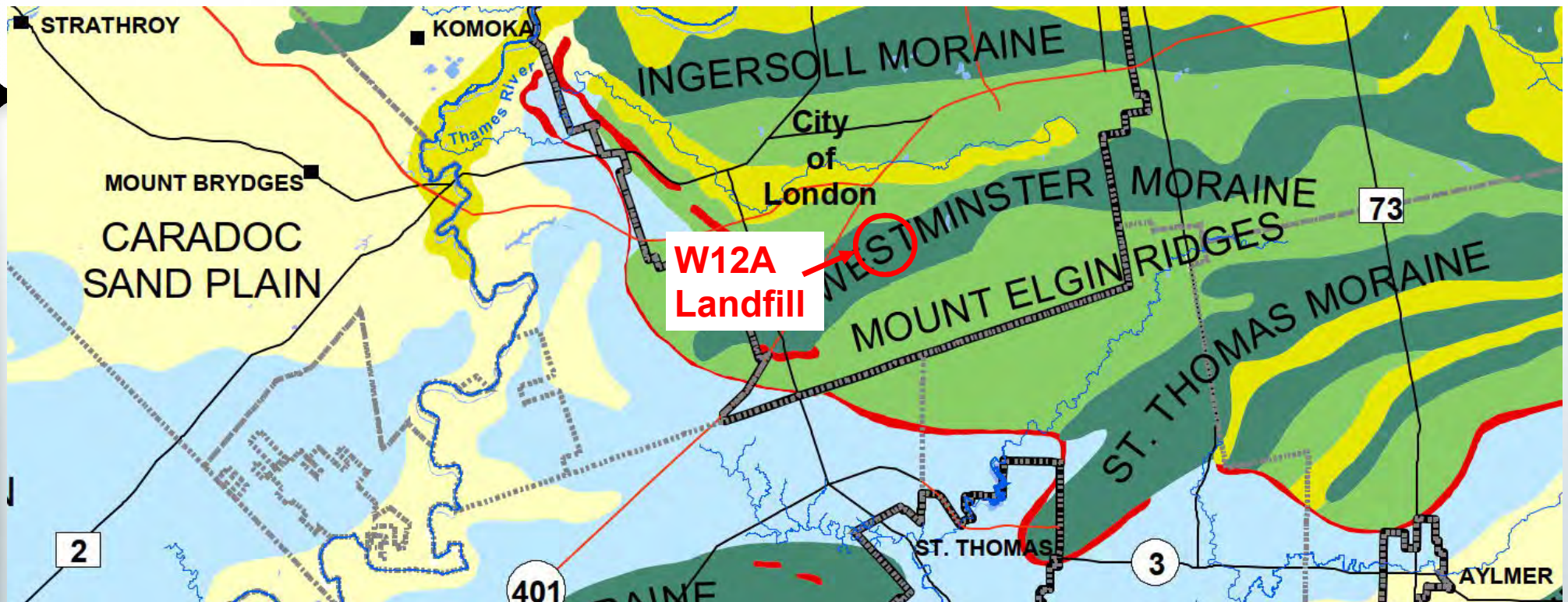


- **Aquifer**: high permeable layer capable of producing significant quantities of water
- **Aquitard**: low permeable layer – low flow
- **Confined**: aquifer where static water level is above the aquifer
- **Unconfined**: aquifer where static level is in aquifer (water table)







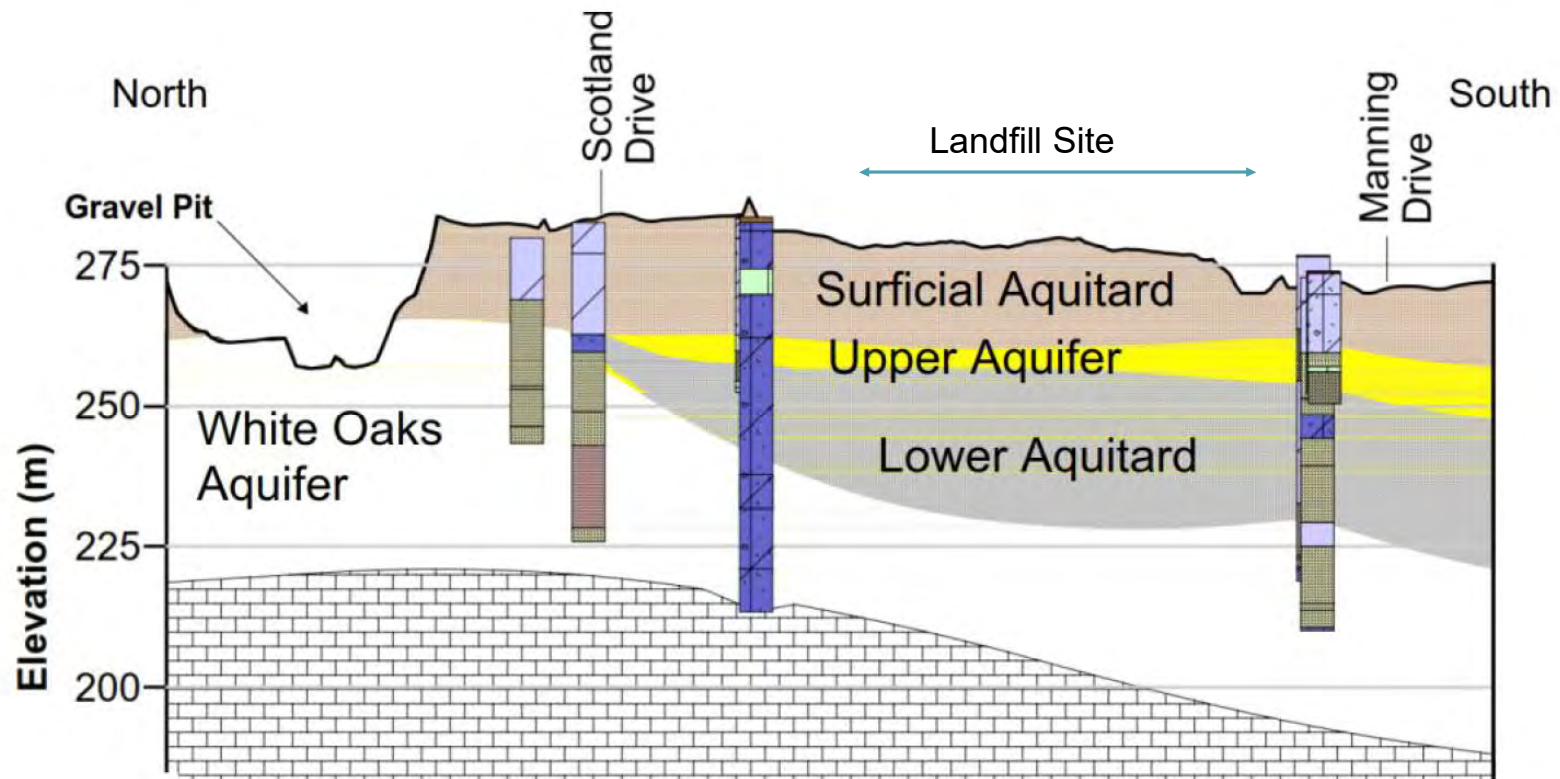


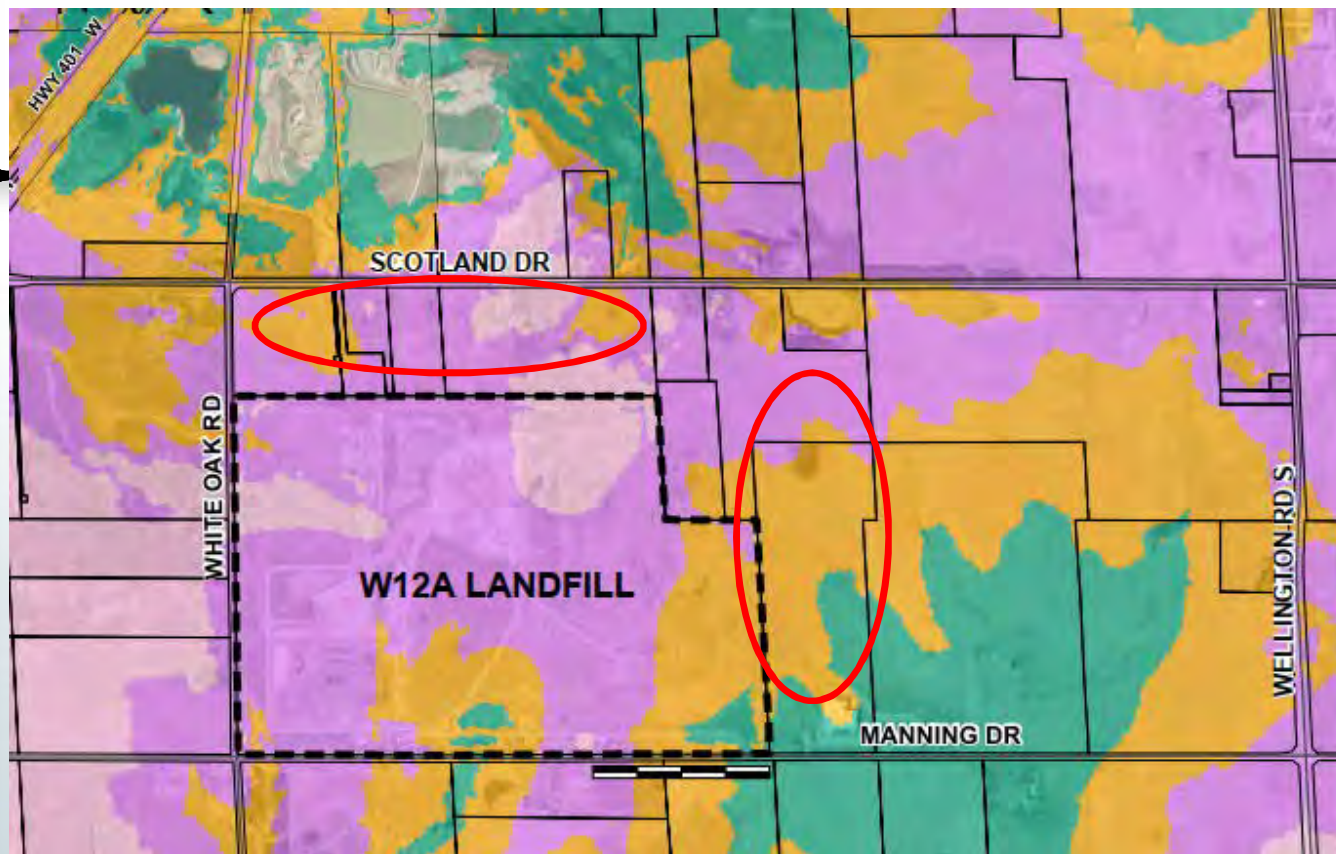




W12A Landfill Hydrogeology

- Generally, the hydrogeology of the W12A Landfill is well understood as a results on several investigations that have been completed from the late 1970's until present
- Four principal hydrogeologic units are present under the landfill site:
 - Surficial Aquitard
 - Upper Aquifer
 - Lower Aquitard
 - White Oaks Aquifer



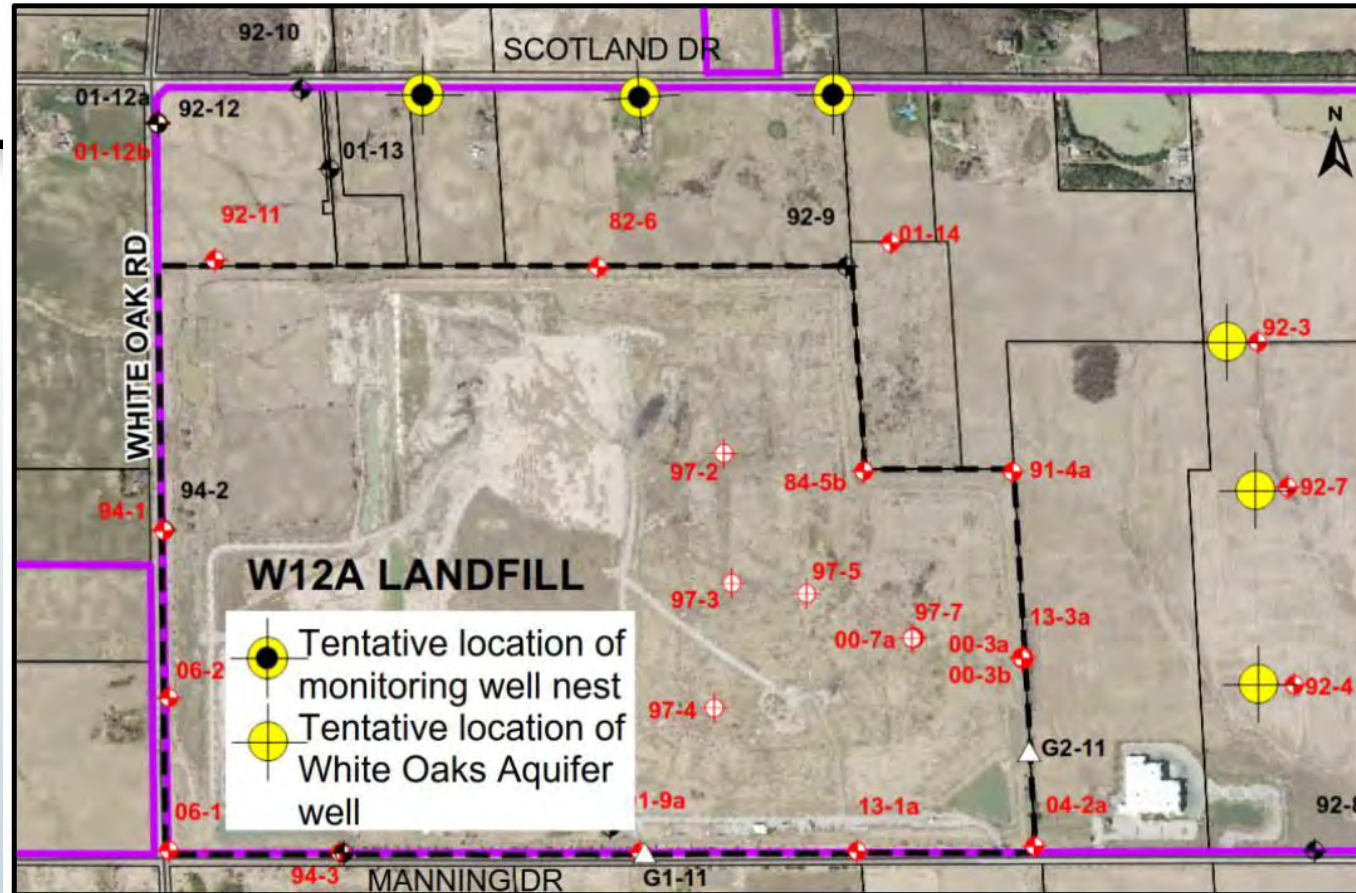
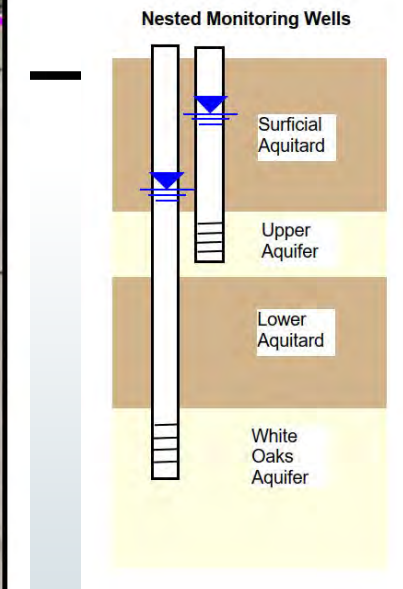
**Legend****Thickness of Surficial Aquitard (m)**

- <5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 30

Property Information

- Existing W12A Landfill
- Parcels

Future Drilling Locations

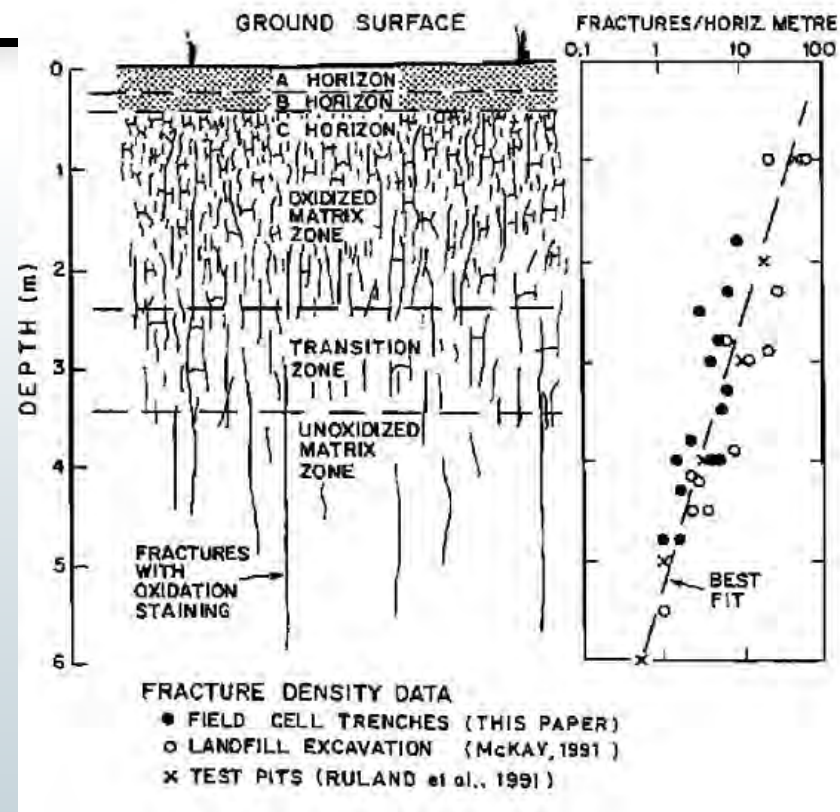


Soil and Aquifer Testing

Table 4.2-1 Approximate Number and Type of Soil and Hydrogeological Tests

Test	Hydrostratigraphic Unit			
	Surficial Aquitard	Upper Aquifer	Lower Aquitard	White Oaks Aquifer
Grain Size Analysis, Moisture Content	20	8	12	8
Fraction of Organic Carbon, Cation Exchange Capacity	6		3	
Geotechnical Parameters (Atterburg Limits)	6			
Triaxial Permeability	6			
Single Well Response Tests		6		6
X-Ray Diffraction	2			
Conventional Water Quality Analysis		6		6
Isotope Analysis (porewater extracted from aquitard soil cores, groundwater from monitoring wells installed in aquifers)	8	2	2	4

Fractured and Weathered Clayey Till Soils



Fractured and Weathered Clayey Till Soils

- Investigation of Surficial Aquitard
- Primary Investigation Method is a large test pit to allow physical examination of fractures - frequency and depth
- May be supplemented by monitoring wells installed in the surficial aquitard

Questions???

Groundwater Workshop - Notes

Environmental Assessment (EA) for the Proposed Expansion of the W12A Landfill

Meeting Details

Date: August 26, 2019

Location: Chippewa Community Centre

Attendees

Aamjiwnaang First Nation (AFN): Sharilyn Johnston (Environment Coordinator),

Chippewas of the Thames First Nation (COFFTN): Kelly Riley (Lands and Environment Director), Rochelle Smith (Events & Promotions Coordinator)

Munsee-Delaware First Nation: Stacey Phillips (Consultation Coordinator)

Dragun Corporation (Dragun): Cliff Lawton (Project Manager), Chris Pare (Project Manager) Corporation)

City of London (City): Wesley Abbott (Project Manager – Solid Waste Management), Mary Alikakos (Project Manager – Wastewater and Drainage Engineering), Jane Kittmer (Solid Waste Planning Coordinator)

Discussion Topics

There were two main discussion topics during the workshop which are summarized below:

1. Importance of the Thames River

All First Nations expressed the importance of the Thames River to their communities. This included from an environmental, cultural (e.g. ceremonies) and fishing perspective.

There was general agreement that the City should take all practical measures to prevent raw leachate being bypassed into the Thames River during have large rainfall events.

2. Peer Review of the Groundwater Work

Dragun Corporation prepared a peer review letter report (*"City of London W12A, Landfill Area Plan Study, Review of Hydrogeological Conditions and Draft Groundwater Work Plan London Ontario"*, dated August 13, 2019) which noted four issues with the proposed *"Groundwater Work Plan for the Environmental Assessment of the Proposed W12A Landfill Expansion"* (Dillon, 2019). These four issues were discussed at the workshop. The issues are listed below along with what was agreed to at the workshop and follow up actions since the workshop.

Issue #1

The Investigation Team is proposing the use of vertical boreholes to investigate the presence of fractures in the surficial aquitard. As Dragun (2019) previously noted: "Even though 80% of the investigation locations in 1972 and 1973 identified fracturing evidence to a maximum observed depth of 18 feet (5.49 m) bgl, the chance of encountering a vertical fracture at depths greater than 10 to 12 feet (3.05 to 3.66 m) bgl using a vertical soil boring is very slim." To maximize the potential to identify deep fractures, the Investigation Team should consider angled drilling of the surficial aquitard.

Workshop – The City agreed that a test pit would be dug to examine fractures in the surficial till soils and the work plan would be revised accordingly.

Follow up Actions since Workshop – The following additional text has been added to the work plan regarding the digging of test pit:

"Presence of Fractures in the Surficial Aquitard"

The presence of fractures within the surficial aquitard is a well-known phenomenon. To evaluate the nature of the fractures and their potential to create a preferred pathway for leachate migration from the landfill expansion, a benched test pit measuring approximately 18 m x 18 m in plan and 6 m in depth, or deeper if fractures are visible, is proposed. The test pit would give a good indication of fracture spacings and depths. Ideally, the location of the test pit should be outside of any potential future cell so that the aquitard is not disturbed and a preferential pathway for future leachate migration is not created. Tentatively the test pit is proposed on the east side of the existing landfill, but outside any contemplated areas for landfill expansion.

Upon excavation of the test pit, the vertical (1.2 m high) walls at the benched sideslopes will be cut into along apparent fractures using a hand trowel. This step is necessary in order to remove clay material smeared by the excavator bucket and fully expose the fractures for measurement of spacings and depths. The fracture network will be logged and photographs taken.

Once the test pit is complete the results will be evaluated and the need for any further monitoring wells within the surficial aquitard will be considered.”

Issue #2

Within the “Review of Hydrogeological Conditions” document, there was a reference to water taking from municipal groundwater in close proximity to the landfill. Can documentation be provided regarding the location of pumping well(s), construction details (well screen length and depth/elevation), timeframe of use, pumping rates, well abandonment documentation, water quality data, and reason(s) why the well(s) was/were taken out of service?

Workshop – At the workshop it was agreed that additional information would be provided on former municipal wells in the area.

Follow up Actions since Workshop – Documents with the requested information were provided to Dragun on September 10, 2019 and are listed in the table below.

Document Title	Description of Document
Water Works System	Document dated May 1969 titled <i>London Public Utilities Commission Waterworks System</i> . Document provides a brief history of London’s water supply system. Document describes the many well fields that were used to supply London with drinking water. With respect to the White Oak well field it notes: <ul style="list-style-type: none">• five wells were drilled in White Oak area in 1959 and one drilled in 1961• the White Oak well field had an iron removal system because of the elevated iron levels• London started using Lake Huron water on June 27, 1967 and by July 27, 1967 all drinking water supply wells were shut down.
Observation Well Data for London	Letter from the Ministry of the Environment to the London Public Utilities Commission dated September 25, 1990 containing water level data from 1959 to 1980 for observation well 513.
Buchanan Letter	First page of letter to Dr. Buchanan dated March 12, 1968 showing pumping capacity of the individual wells in the White Oaks White Field. We do not have the remaining pages of this letter.
Burnell Hodgins Letter	Letter from W.G. Keck & Associates Ltd. to L. Burnell and P. Hodgins of International Water Supply dated April 20, 1965. The letter contains information on water levels and pumping rates at various times.

Document Title	Description of Document
McManamna Letter	Letter from W.G. Keck & Associates Ltd. to T. L. McManamna of International Water Supply dated March 1, 1961. The letter contains information on water levels and pumping rates at various times.
Water Quality Data	Various water quantity reports from 1959 to 1962
Municipal White Oak Well #1	Various well construction documents and decommissioning report. For your information this well is identified as well 67 in City documents (e.g., W12A Landfill Annual Status Reports).
Municipal White Oak Well #2	Various well construction documents and decommissioning report. For your information this well is identified as well 68 in City documents (e.g., W12A Landfill Annual Status Reports).
Municipal White Oak Well #3	Various well construction documents and decommissioning report. For your information this well is identified as well 69 in City documents (e.g., W12A Landfill Annual Status Reports).
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Municipal White Oak Well #5	Various well construction documents and decommissioning report. For your information this well is identified as well 6 in City documents (e.g., W12A Landfill Annual Status Reports).
Municipal White Oak Well #6	Various well construction documents and decommissioning report. For your information this well is identified as well 29 in City documents (e.g., W12A Landfill Annual Status Reports).

Issue # 3

Regarding the high chloride and sodium concentrations at the monitoring well 92-6 (04-6a) location, could shallow soil samples be collected around this wellhead and tested for SAR and conductivity? Is it possible to review historical aerial photographs, if available, they may show areas of salt storage.

Workshop –It was agreed soil samples around monitoring well 92-6 (04-6a) location would be collected and tested for SAR and conductivity. It was noted at the meeting that a previous review of historical photographs did not show any buildings in the vicinity of monitoring well 92-6 (04-6a).

Issue #4 - The work plan does not present any investigation tasks related to installation of monitoring wells within the upper aquitard. The investigation team could consider the installation of three monitoring wells within the upper aquitard.

Workshop –It was agreed that information on existing till monitoring wells would be reviewed before making decisions on the installation of additional till monitoring wells.

Follow up Actions since Workshop – Documents with the requested information were provided to Dragun on September 10, 2019 and are listed in the table below.

Document Title	Description of Document
Monitoring Wells at Location 13-3a	Borehole logs for monitoring wells: <ul style="list-style-type: none"> • 13-3a (screened in top of upper aquifer, approximately 16 metres below grade) • 00-3a (screened in till approximately 10 metres below grade) • 00-3b (screened in till approximately 4 metres below grade)
Historical Water Quality Data for Monitoring Wells at Location 13-3a	Historical water quality data for 13-3a, 00-3a and 000-3b
Hydrograph for Monitoring Wells at Location 13-3a	Hydrograph from 2000 to present
Monitoring Wells at Location 97-7	Borehole logs for monitoring wells: <ul style="list-style-type: none"> • 97-7 (screened in leachate mound) • 00-7a (screened in till approximately 1.5 metres below base of landfill)
Historical Water Quality Data for Monitoring Wells at Location 97-7	Historical water quality data for 97-7 and 00-7a
Hydrograph for Monitoring Wells at Location 97-7	Hydrograph from 1997 to present
W12A Water Levels	Historical water level data for all monitoring wells.

H.09 City of London Comment Response to Dragun Peer Review Letter

From: Abbott, Wesley <WAbbott@London.ca>
Sent: September 10, 2019 2:50 PM
To: Cliff Lawton <clawton@dragun.com>; cpare@dragun.com
Cc: SJohnston@aamjiwnaang.ca; 'Kell, Rob' (rkell@dillon.ca) <rkell@dillon.ca>; Edmond, Trish <Trish_Edmond@golder.com>; Kittmer, Jane <jkittmer@London.ca>
Subject: Environmental Assessment for Proposed Expansion of the W12A Landfill - Follow-up Information

EXTERNAL EMAIL

Cliff, Chris

Your peer review letter report ("City of London W12A, Landfill Area Plan Study, Review of Hydrogeological Conditions and Draft Groundwater Work Plan London Ontario", dated August 13, 2019) noted four issues with the proposed "Groundwater Work Plan for the Environmental Assessment of the Proposed W12A Landfill Expansion" (Dillon, 2019). These issues were discussed at the Groundwater Workshop on August 26, 2019 which was attended by the Aamjiwnaang First Nation, Chippewas of the Thames First Nation, Munsee-Delaware First Nation, Oneida First Nation, City of London, Dragun Corporation, Dillon Consulting and the City of London. The four issues and how they will be addressed are listed below.

Issue #1 - The Investigation Team is proposing the use of vertical boreholes to investigate the presence of fractures in the surficial aquitard. As Dragun (2019) previously noted: "Even though 80% of the investigation locations in 1972 and 1973 identified fracturing evidence to a maximum observed depth of 18 feet (5.49 m) bgl, the chance of encountering a vertical fracture at depths greater than 10 to 12 feet (3.05 to 3.66 m) bgl using a vertical soil boring is very slim." To maximize the potential to identify deep fractures, the Investigation Team should consider angled drilling of the surficial aquitard.

At the workshop it was agreed that a test pit would be dug to examine fractures in the surficial till soils. Below is the additional text that has been added to the work plan regarding the digging of test pit:

"Presence of Fractures in the Surficial Aquitard"

The presence of fractures within the surficial aquitard is a well-known phenomenon. To evaluate the nature of the fractures and their potential to create a preferred pathway for leachate migration from the landfill expansion, a benched test pit measuring approximately 18 m x 18 m in plan and 6 m in depth, or deeper if fractures are visible, is proposed. The test pit would give a good indication of fracture spacings and depths. Ideally, the location of the test pit should be outside of any potential future cell so that the aquitard is not disturbed and a preferential pathway for future leachate migration is not created. Tentatively the test pit is proposed on the east side of the existing landfill, but outside any contemplated areas for landfill expansion.

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Once the test pit is complete the results will be evaluated and the need for any further monitoring wells within the surficial aquitard will be considered."

A copy of the revised work plan is attached.

Issue #2 - Within the "Review of Hydrogeological Conditions" document, there was a reference to water taking from municipal groundwater in close proximity to the landfill. Can documentation be provided regarding the location of pumping well(s), construction details (well screen length and depth/elevation), timeframe of use, pumping rates, well abandonment documentation, water quality data, and reason(s) why the well(s) was/were taken out of service?

At the workshop it was agreed that additional information would be provided on former municipal wells in the area. Documents with the requested information are listed in the table below. The documents will be sent to you via the City's File Transfer Site because of the combined size of all the files. You can expect the files to be sent to you later today.

Document Title	Description of Document
Water Works System	Document dated May 1969 titled <i>London Public Utilities Commission Waterworks System</i> . Document provides a brief history of London's water supply system. Document describes the many well fields that were used to supply London with drinking water. With respect to the White Oak well field it notes: <ul style="list-style-type: none">• five wells were drilled in White Oak area in 1959 and one drilled in 1961• the White Oak well field had an iron removal system because of the elevated iron levels• London started using Lake Huron water on June 27, 1967 and by July 27, 1967 all drinking water supply wells were shut down.
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Issue # 3 - Regarding the high chloride and sodium concentrations at the monitoring well 92-6 (04-6a) location, could shallow soil samples be collected around this wellhead and tested for SAR and conductivity? Is it possible to review historical aerial photographs, if available, they may show areas of salt storage.

At the workshop it was agreed soil samples around monitoring well 92-6 (04-6a) location would be collected and tested for SAR and conductivity. It was noted at the meeting that a previous review of historical photographs did not show any buildings in the vicinity of monitoring well 92-6 (04-6a)

Issue #4 - The work plan does not present any investigation tasks related to installation of monitoring wells within the upper aquitard. The investigation team could consider the installation of three monitoring wells within the upper aquitard.

At the workshop it was agreed that information on existing till monitoring wells would be reviewed before making decisions on the installation of additional till monitoring wells. Documents with the requested information are listed in the table below. The documents will be sent to you via the City's File Transfer Site because of the combined size of all the files. You can expect the files to be sent to you later today.

Document Title	Description of Document
Monitoring Wells at Location 13-3a	Borehole logs for monitoring wells: <ul style="list-style-type: none"> 13-3a (screened in top of upper aquifer, approximately 16 metres below grade) 00-3a (screened in till approximately 10 metres below grade) 00-3b (screened in till approximately 4 metres below grade)
Historical Water Quality Data for Monitoring Wells at Location 13-3a	Historical water quality data for 13-3a, 00-3a and 000-3b
Hydrograph for Monitoring Wells at Location 13-3a	Hydrograph from 2000 to present
Monitoring Wells at Location 97-7	Borehole logs for monitoring wells: <ul style="list-style-type: none"> 97-7 (screened in leachate mound) 00-7a (screened in till approximately 1.5 metres below base of landfill)
Historical Water Quality Data for Monitoring Wells at Location 97-7	Historical water quality data for 97-7 and 00-7a
Hydrograph for Monitoring Wells at Location 97-7	Hydrograph from 1997 to present
W12A Water Levels	Historical water level data for all monitoring wells.

Please let me know if you have any questions regarding the above.

Regards



Wesley Abbott, P. Eng.
Project Manager
Solid Waste Management
City of London

PO Box 5035, 300 Dufferin Ave., London, N6A 4L9
P: 519.661.CITY (2489) x 1812 | Cell: 519.636.8745 | Fax: 519.661.2354
wabbott@london.ca | www.london.ca

H.10 Email Notifications of August 2020 Workshop

From: [Abbott, Wesley](#)
To: SJohnston@aamjiwnaang.ca; kriley@cottfn.com; rsmith@cottfn.com; consultation@munsee.ca; [Oneida Environment](#)
Cc: [Kittmer, Jane](#); [Alikakos, Mary](#)
Subject: Environmental Assessment for Proposed Expansion of the W12A Landfill - City of London

Hello Everyone,

Background - Environmental Assessment (EA) for the Expansion of the W12A Landfill

The City's existing landfill (W12A Landfill) is expected to reach its currently approved capacity in 2024. It is proposed to 1) expand the W12A Landfill by approximately doubling its current capacity and extend its life to 2049 and 2) increase the service area to a regional area, which includes: City of London, County of Huron, County of Perth, County of Elgin, County of Lambton, and County of Middlesex.

First Workshop

In August 2019, you attended a workshop which was initiated by Aamjiwnaang First Nation and hosted by the Chippewas of the Thames First Nation. Several issues were discussed at the workshop including protection of the Thames River, groundwater issues and using native plant species as part of any rehabilitation plans.

Proposed Second Workshop

As agreed to at the first workshop, a second workshop *would* be held for all interested Indigenous Communities in order for the City to present information and receive feedback on the preferred landfill expansion alternative, as well as actions proposed to address the issues previously raised. A planned workshop for the Spring 2020 was postponed due to COVID-19.

With the Province entering Stage 3 of its COVID-19 plan and the limited capacity remaining at the W12A Landfill, we would like to proceed with the second workshop in late August or early September if a suitable way to hold the workshop can be found. One option would be to hold the workshop over a video conference app like zoom or teams. Another option could be an in-person meeting with appropriate Covid-19 safety measures such limiting the number of persons attending, social distancing, face masks, hand sanitizer, etc. You may have other ideas on how best to hold the workshop.

At the workshop we plan to discuss:

- Reasons for selecting the vertical expansion of the W12A Landfill as the preferred expansion alternative
- Results of the groundwater investigations and what it means moving forward
- Key results from the archaeological and biology investigations
- Landfill design features
- Other topics of interest by participants
- Next steps

Questions

What type of workshop would you prefer (virtual, in-person, other format)?

What (if any) dates would you be available to participate in the workshop?

Regards,

Wesley Abbott
226-376-2311 (Cell)

From: [Kittmer, Jane](#)
To: drskoke@wifn.org; chief.duckworth@caldwellfirstnation.ca; jason.henry@kettlepoint.org; denise.stonefish@delawarenation.on.ca
Cc: [Abbott, Wesley](#); [Alikakos, Mary](#)
Subject: Environmental Assessment for Proposed Expansion of the W12A Landfill - City of London
Date: August 18, 2020 11:55:25 AM
Attachments: [image001.png](#)

Hello Everyone,

Background - Environmental Assessment (EA) for the Expansion of the W12A Landfill

The City's existing landfill (W12A Landfill) is expected to reach its currently approved capacity in 2024. It is proposed to 1) expand the W12A Landfill by approximately doubling its current capacity and extend its life to 2049 and 2) increase the service area to a regional area, which includes: City of London, County of Huron, County of Perth, County of Elgin, County of Lambton, and County of Middlesex.

First Workshop

In August 2019, a workshop which was initiated by Aamjiwnaang First Nation and hosted by the Chippewas of the Thames First Nation. Unfortunately, a member of your community was not able to attend. Several issues were discussed at the workshop including protection of the Thames River, groundwater issues and using native plant species as part of any rehabilitation plans.

Second Workshop

As agreed to at the first workshop, a second workshop would be held for all interested Indigenous Communities in order for the City to present information and receive feedback on the preferred landfill expansion alternative, as well as actions proposed to address the issues previously raised. A planned workshop for the Spring 2020 was postponed due to COVID-19.

The second workshop will be held on August 27, 2020 from 1:00 to 3:00 pm using a virtual conference app.

At the workshop we plan to discuss:

- Reasons for selecting the vertical expansion of the W12A Landfill as the preferred expansion alternative
- Results of the groundwater investigations and what it means moving forward
- Key results from the archaeological and biology investigations
- Landfill design features
- Other topics of interest by participants
- Next steps

Please let me know if you are interested in joining the virtual workshop or if you have any questions.

Regards,
Jane



Jane Kittmer
Technician
Solid Waste Management
City of London

300 Dufferin Ave, P.O. Box 5035, London ON N6A 4L9
P: 519.661.CITY(2489) x 2334 | Fax: 519.661.2354
jkittmer@london.ca | www.london.ca

As part of our ongoing efforts to stop the spread of COVID-19, the City of London has made changes to many City services. Visit our [website for the latest information about City services and COVID-19](#).

Join Microsoft Teams Meeting <https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZWRjOGY4OWUwNzNmZC00Njh1LWlwOTYtNWYyNjU0MTk3ODc2%40thread.v2/0?context=%7b%22Tid%22%3a%2203bffd5-8383-4ffd-80d3-77de9409d5ca%22%2c%22Oid%22%3a%22e399a665-226a-4b10-b7b3-bd5930310a53%22%7d>
Learn more about Teams <<https://aka.ms/JoinTeamsMeeting>> | Meeting options <https://teams.microsoft.com/meetingOptions/?organizerId=e399a665-226a-4b10-b7b3-bd5930310a53&tenantId=03bffd5-8383-4ffd-80d3-77de9409d5ca&threadId=19_meeting_ZWRjOGY4OWUwNzNmZC00Njh1LWlwOTYtNWYyNjU0MTk3ODc2@thread.v2&messageId=0&language=en-US>



W12A Landfill Workshop/ Information Session

Date: Thursday, August 27, 2020

Time: 1 p.m. to 3 p.m.

Location: Teams Meeting

Draft Agenda

Item #	Item	Initial Comments	Approximate Time (minutes)
1.	Greetings, Review of Agenda	Everyone	15
2.	Status of Environmental Assessment	City	15
3.	Overview of Groundwater Field Work and Findings	Dillon/Golder	15
4.	Review and Comments on Field Work and Findings	Dragun	10
5.	Biology Findings and Recommendations	AECOM	15
6.	Thames River Protection	City	10
7.	Other Considerations <ul style="list-style-type: none"> • Archeological • Native Plantings • Air quality, cumulative impacts, health impacts 	City	15
8.	Discussion on Future Engagement/Consultation	City	15
9.	Other Business	-	10

General Rules for Virtual Workshop

- Turn video and sound off when not speaking starting at item #2
- Use the chat function to ask to speak or alternatively type your questions/comments.
- You can ask questions or provide comments during the presentation for an item or wait till the end of the presentation.

H.11 Workshop Presentation Material
(August 27, 2020)



W12A Landfill Workshop and Information Session



August 27, 2020

Terms of Reference Process (ToR)

EA Process





Phase 2:

EA Technical Studies & EA Report

Environmental Assessment Process (EA)





Complete Studies & Finalize EA

First
Workshop
Aug. 2019

We
are
here

Steps	Status
1. Characterize the existing environmental conditions	Complete
Work Plans online for review and comment Indigenous community review	
2. Identify the alternatives for landfill expansion (and incorporate conceptual design mitigation measures)	Complete
3. Evaluation of alternatives	Complete
4. Comparison of the alternatives for landfill expansion for each component of the environment and then identify the overall preferred alternative for landfill expansion	Complete
Open House #3 – February 26 & 27, 2020	
5. Refine the mitigation measures and determine the net effects on the environment of the preferred alternative for landfill expansion	90% complete
6. Describe the preferred alternative for landfill expansion	90% complete
7. Consideration of climate change	50% complete
8. Cumulative impact assessment	25% complete
Open House #4 – Fall 2020 Indigenous community review	
9. Preparation of the EA Study Report	25% complete
Various opportunities will be available to comment on the EA Study Report through the City and the Ministry of Environment, Conservation and Parks (MECP)	



Website

getInvolved.london.ca



Meetings

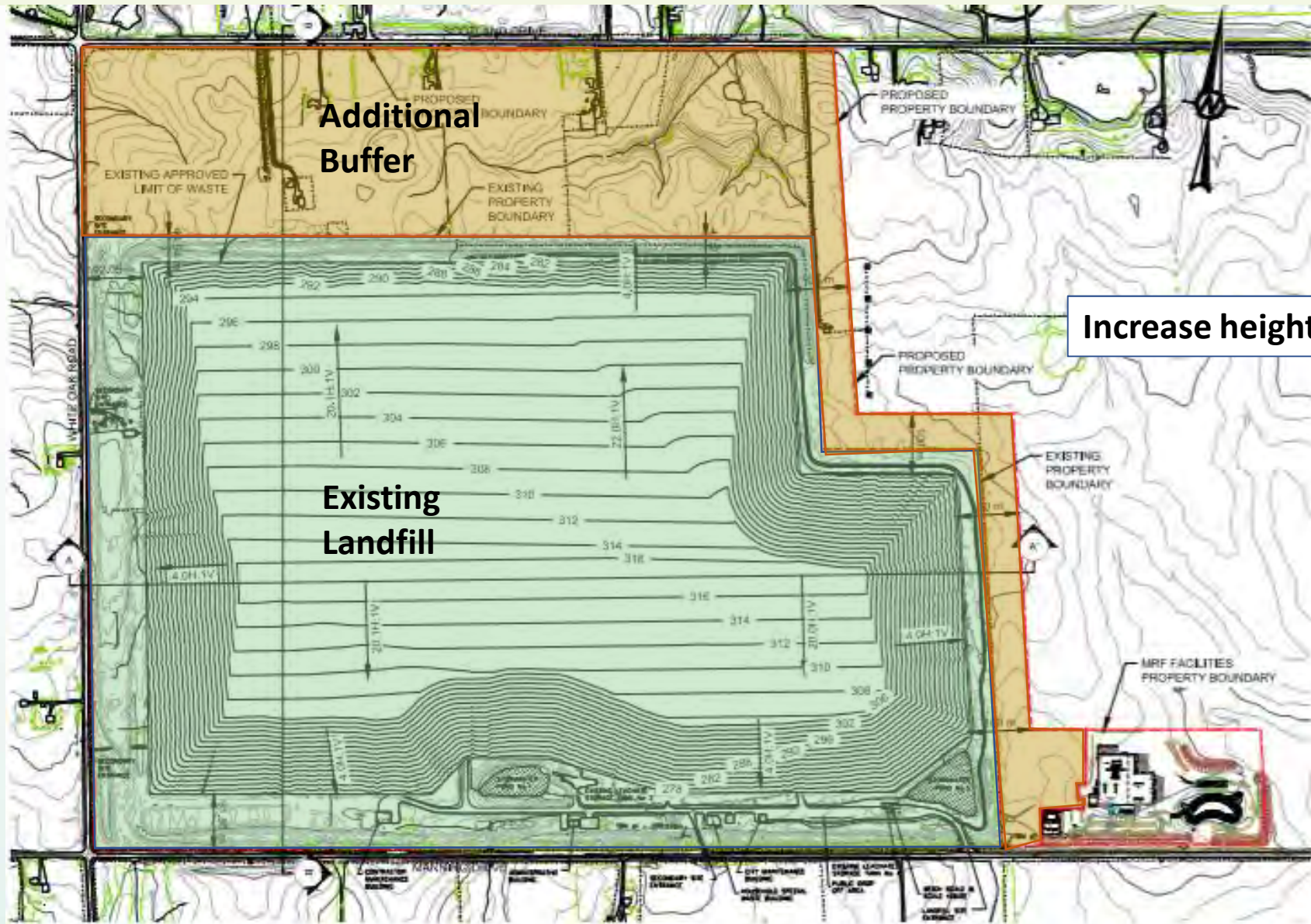
W12A Landfill PLC, Waste Management CLC, Waste Management Working Group



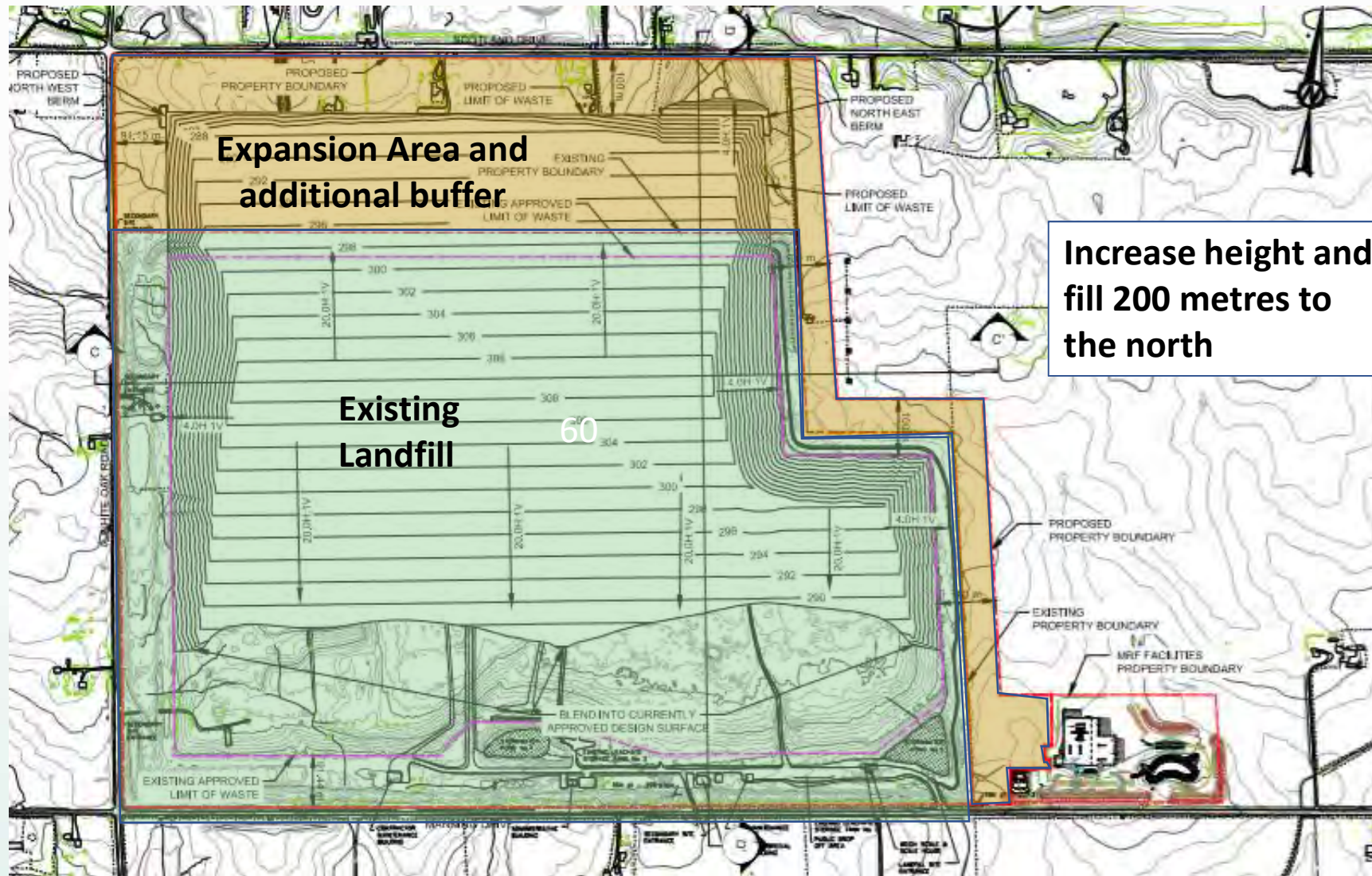
Meet with residents

(If requested)

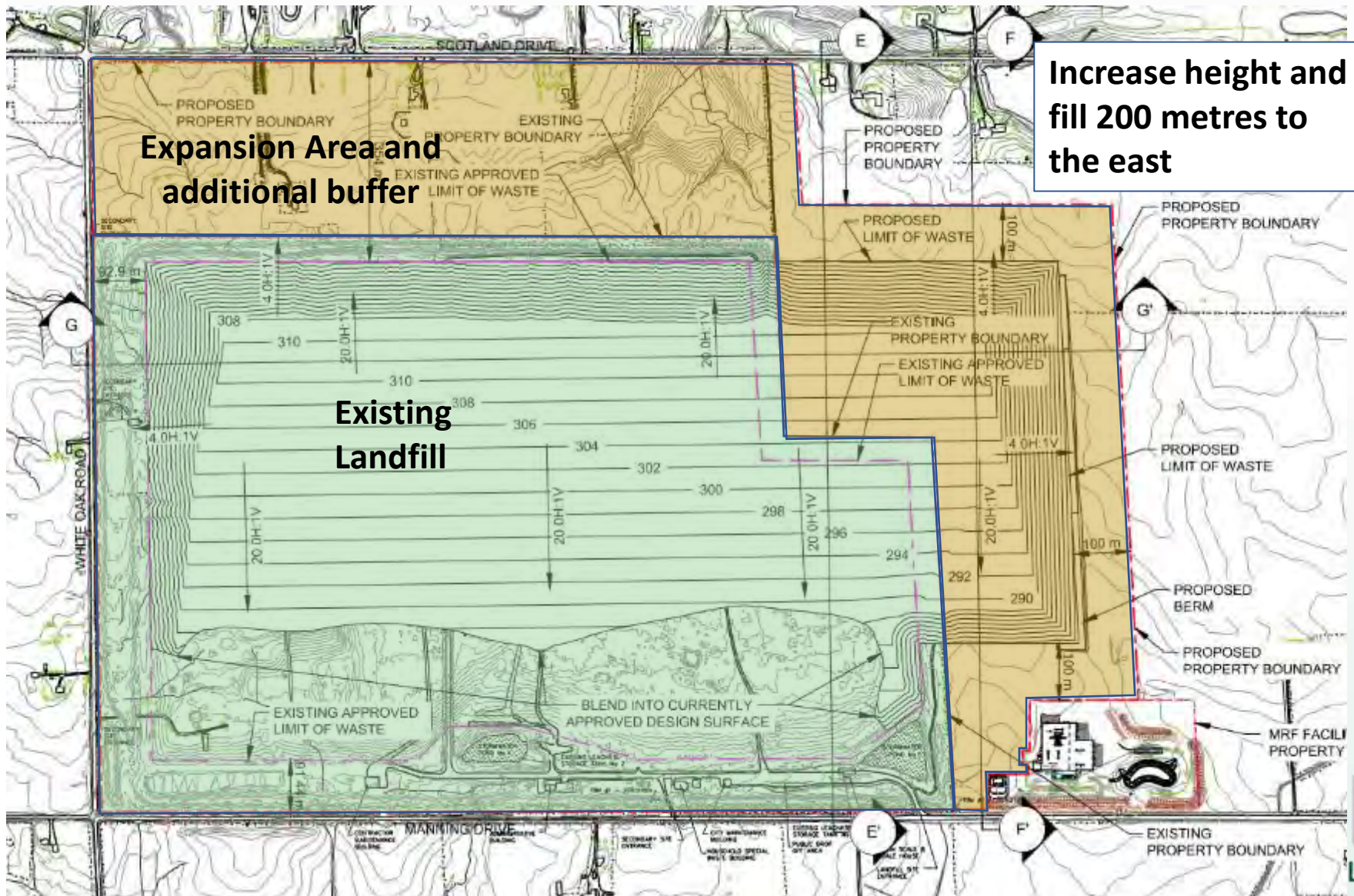
Step 2 Alternative Method 1



Step 2 Alternative Method 2



Step 2 Alternative Method 3





Steps 3 and 4: Compare Alternatives

All work
complete

Environmental Component	Environmental Sub-component	Preferred (Overall Result)			Public Ranking Group
		Alternative 1	Alternative 2	Alternative 3	
Atmosphere	Air quality (including dust, odour and LFG)	✓			More Important
	Noise	✓			Less Important
Geology and Hydrogeology	Ground water quality	✓			More Important
Surface Water	Surface water quality	✓			More Important
	Surface water quantity	✓			Important
Biology	Aquatic ecosystems	✓			More Important
	Terrestrial ecosystems	✓			More Important
Land Use Agriculture	Current and planned future land uses	✓			Important
	Agriculture	✓			Important
Archaeology	Archaeology	✓		✓	Less Important
Cultural Heritage	Cultural heritage resources (including built heritage)	✓	✓	✓	Less Important
Socio-economic	Local economic		✓	✓	Important
	Residents and community	✓			More Important
Visual	Visual			✓	Less Important
Transportation	Traffic	✓	✓	✓	Less Important
Design and Operations	Technical considerations			✓	Important
	Financial considerations	✓			Important



Step 4: Compare Alternatives

Alternative #1 Advantages:

- Highest degree of groundwater protection
- Best alternative to limit odours
- Fewest changes to stormwater management system
- Least potential for air quality, archaeology, agricultural, aquatic ecosystem, community, land use, noise and terrestrial ecosystem impacts
- Lowest cost alternative

Alternative #1 Disadvantages:

- Greatest visual impact
- More complex design



Step 5: Detailed Assessments

	Component	Comments
Environmental	Atmosphere	Detailed impact assessments of noise, odour, health related air quality and noise underway.
	Biology	Mitigation measures being developed to protect Species at Risk and Significant Wildlife habitat located on the landfill footprint and buffer areas.
	Geology and Hydrogeology	Detailed impact assessments underway
	Surface Water	Assessment has determined the need for stormwater management pond improvements.
Social	Agriculture	No detailed assessment required.
	Archaeology	Mitigation measures required for significant archaeology site located within on-site buffer land.
	Cultural Heritage	No detailed assessment required.
	Land Use	No detailed assessment required.
	Socio-economic	No detailed assessment required.
	Transportation	Assessment underway to determine the need (if any) for roadway upgrades.
	Visual	Mitigation measures being developed to reduce visual impact.
Technical	Design and Operations	Design enhancements included to improve leachate management and landfill gas capture.



Thames River Protection



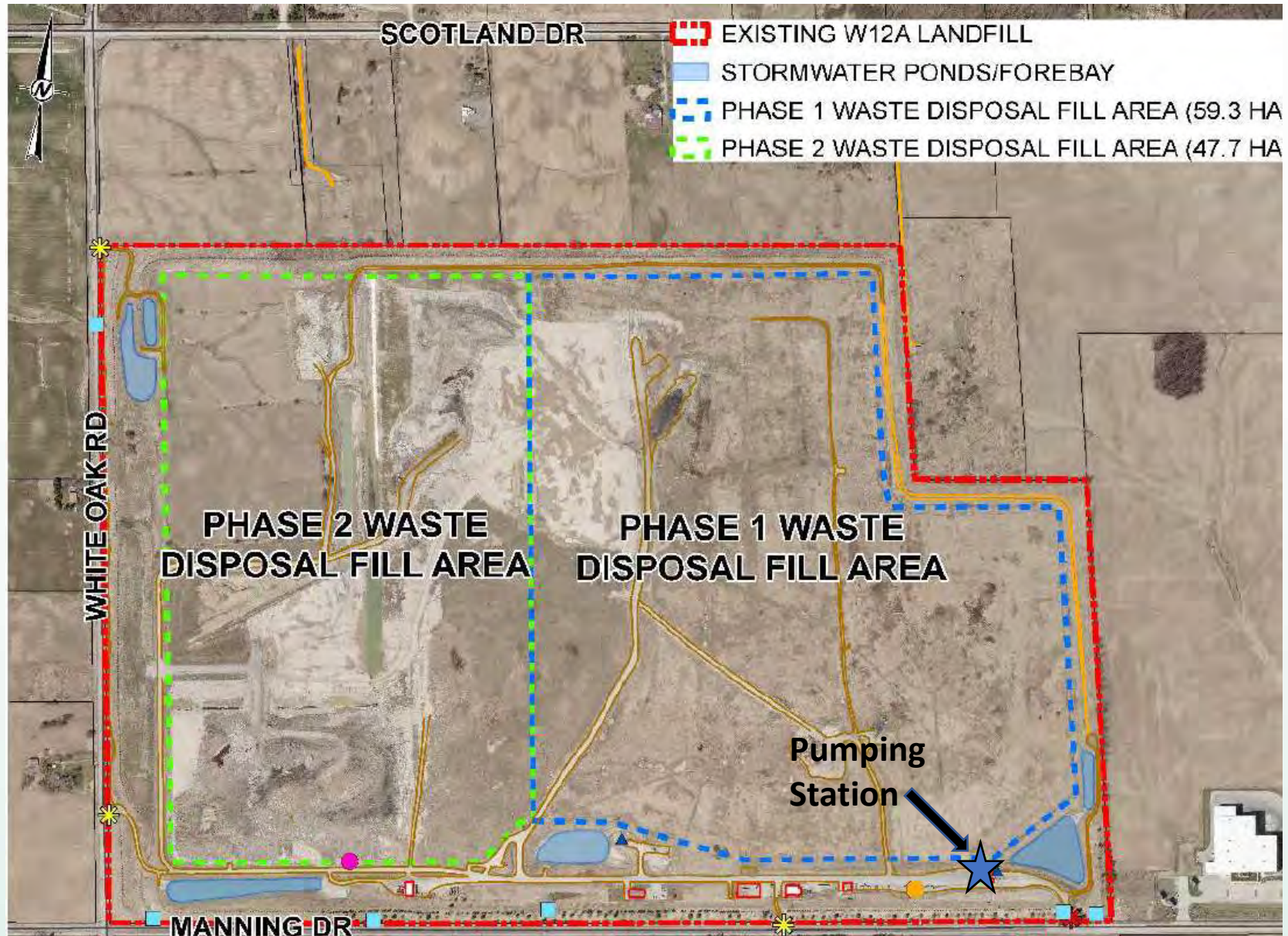


Thames River Protection

- Landfill leachate < 0.5% of Greenway flows
- Integrate (new) landfill pumping station with wastewater system
- Create on-site storage for leachate to be used when by-passes occur
- Minimum of 4 days of leachate storage
- Storage within landfill and tanks
- Estimated cost = \$3 to \$4 million



Thames River Protection

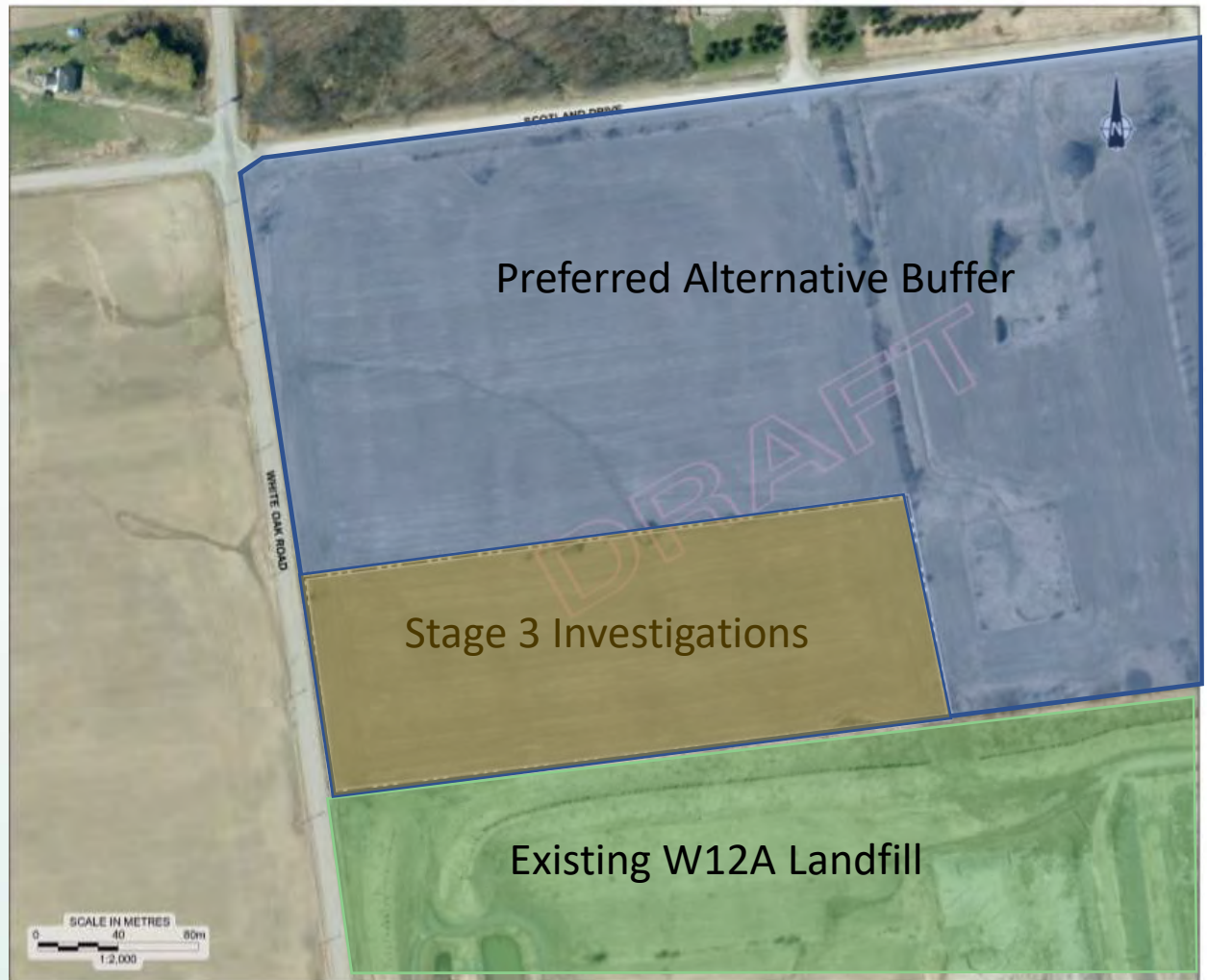




Other Considerations

Archeological

- Significant archaeology site located within on-site buffer land
- Area to remain undisturbed

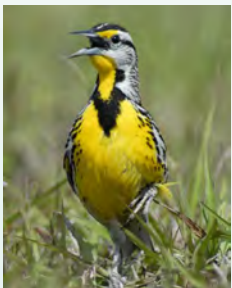
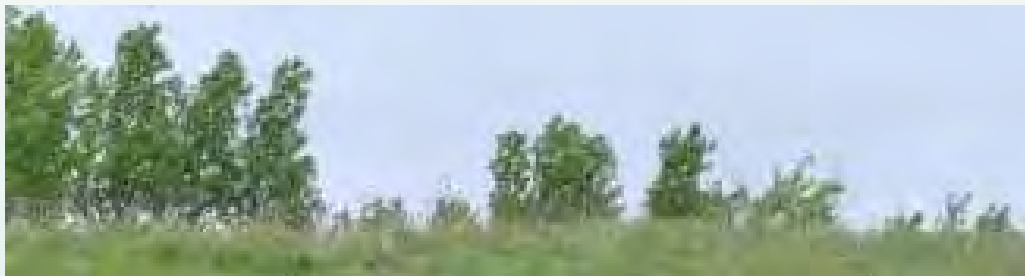
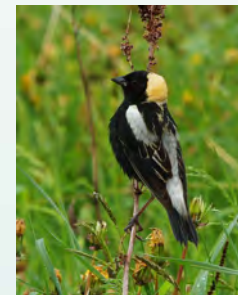




Other Considerations

Native Vegetation

- native vegetation with final cover as part of compensation for natural communities
- consultation with the MECP for Bobolink and Eastern Meadowlark habitat compensation
- include common milkweed for Monarch Butterfly





Other Considerations

Air Quality

- \$13 to \$20 million in gas collection system infrastructure
- Meet provincial standards except odour two locations (see figure)
- Both locations owned by City and homes were demolished in previous years
- May have to place building restrictions on property





Other Considerations

- Undertaking cumulative impact assessment
- Key Landfill Features
 - Placement of garbage to maximize screening
 - Additional leachate storage
 - Gas collection system improvements
 - Stormwater management pond upgrades
 - Replace/upgrade buildings
 - Enhanced public drop-off area
- **Preliminary Cost Estimate for Landfill is \$53 million to \$88 million**



City of London W12A Landfill Overview of Groundwater Field Work and Findings

Rob Kell, P.Eng., P.Geo., Dillon
Frank Barone, P.Eng., Golder

Presentation Summary

- Overview of Groundwater Investigation (Dillon)
 - Investigation Findings (Dillon)
 - Approach for Assessment of Potential Groundwater Impacts (Golder)
 - Questions??
-



W12A Landfill Hydrogeology

- Generally, the hydrogeology of the W12A Landfill is well understood as a results on several investigations that have been completed from the late 1970's until present
 - Four principal hydrogeologic units are present under the landfill site:
 - Surficial Aquitard
 - Upper Aquifer
 - Lower Aquitard
 - White Oaks Aquifer
-

5

5



Drilling

City of London W12A Landfill

6

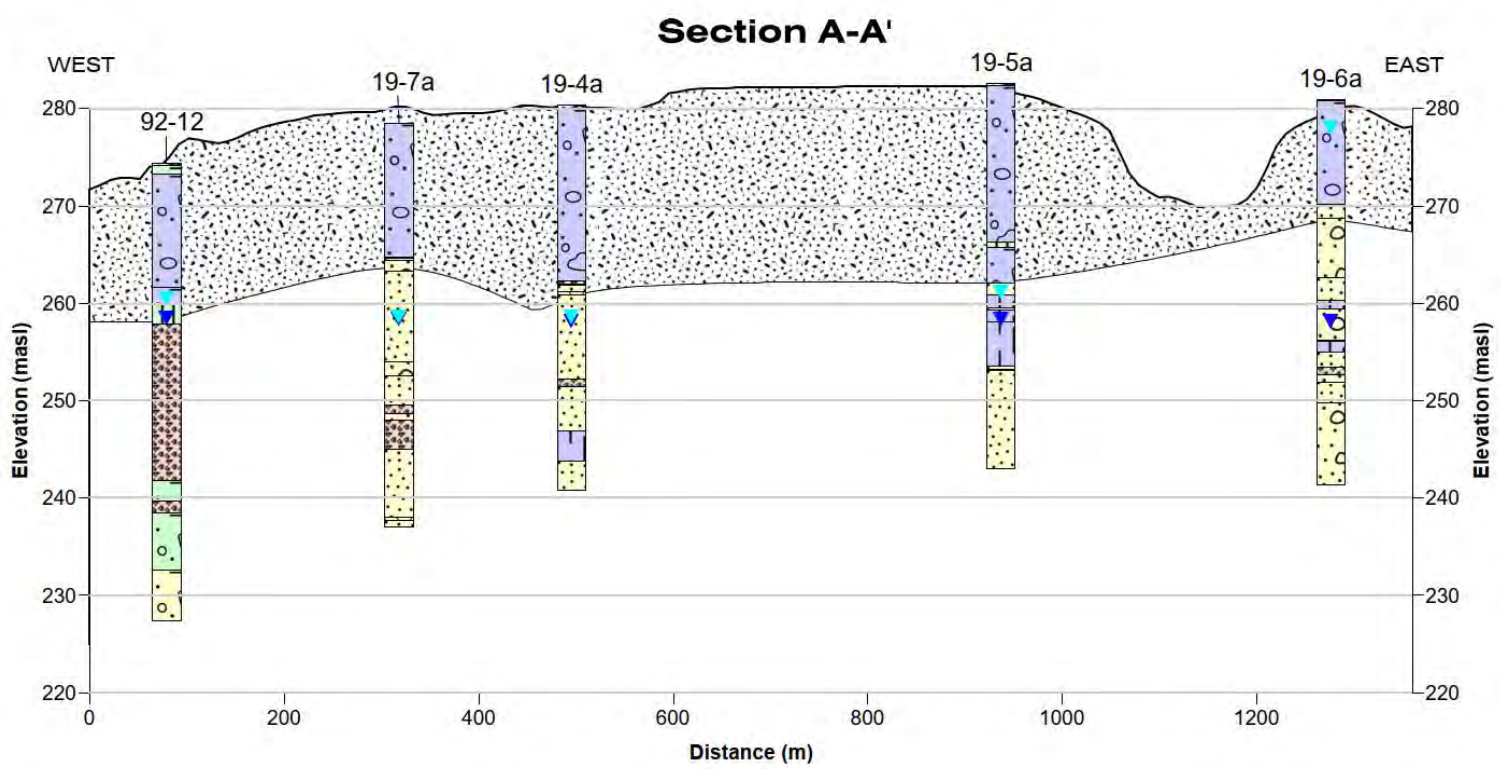


Soil and Aquifer Testing

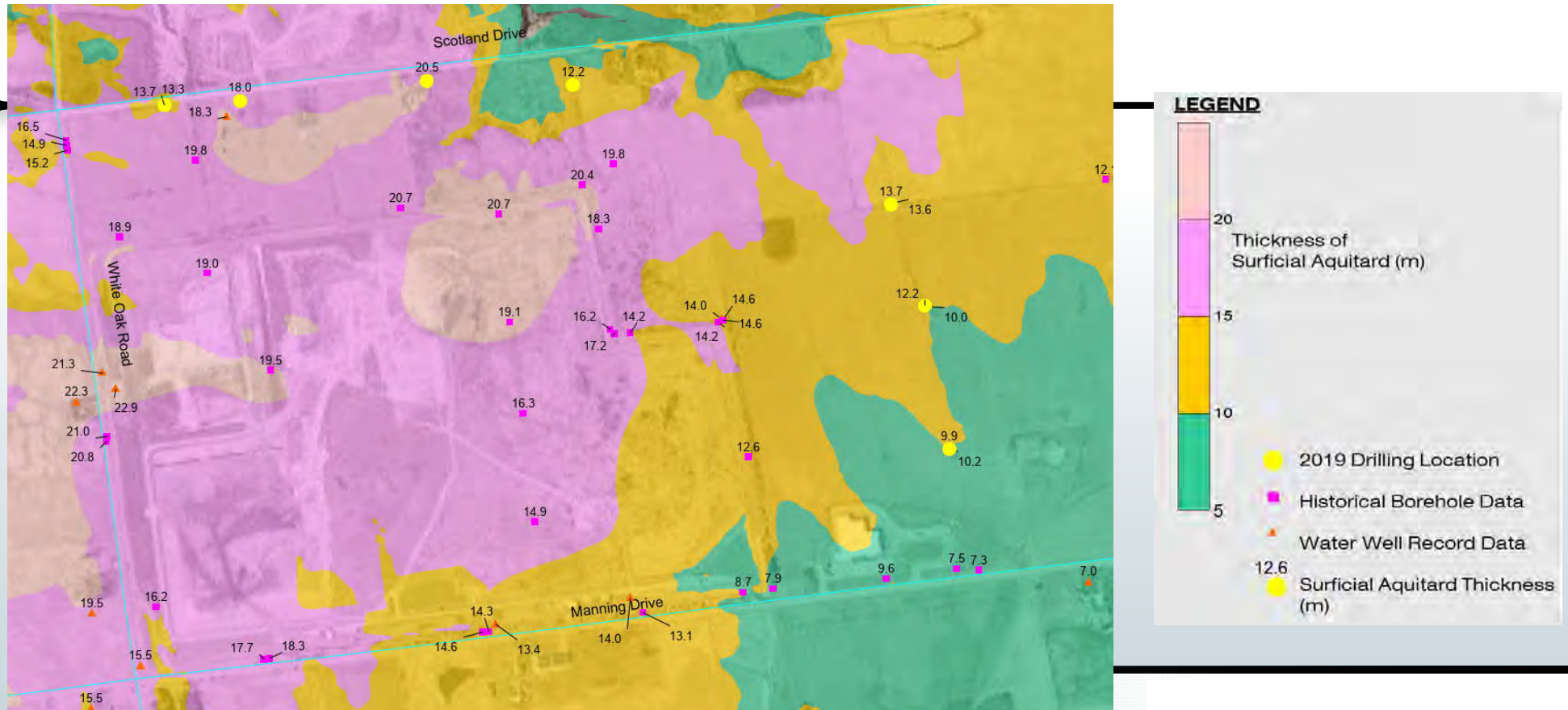
Number and Type of Soil and Hydrogeological Tests

Test	Hydrostratigraphic Unit			
	Surficial Aquitard	Upper Aquifer	Lower Aquitard	White Oaks Aquifer
Grain Size Analysis, Moisture Content	13	4	4	4
Fraction of Organic Carbon, Cation Exchange Capacity	6	1		
Flexible Wall Permeability Tests	6			
Conventional Water Quality Analysis		5		4
Isotope Analysis (porewater extracted from aquitard soil cores)	8			

Cross Section

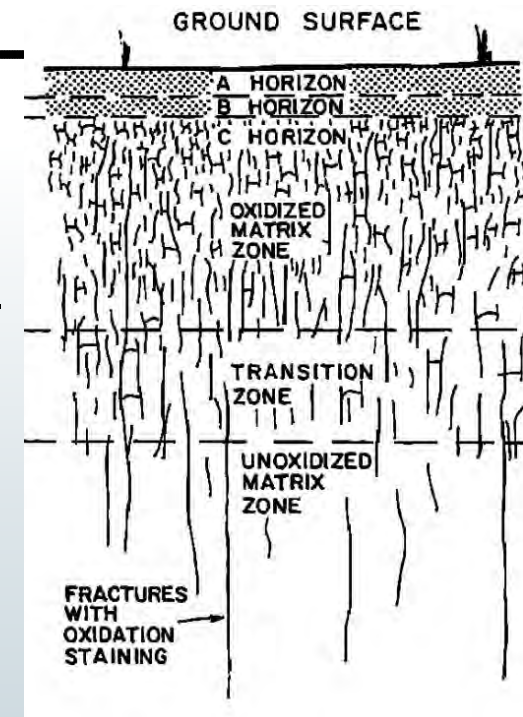


Thickness of Surficial Aquitard



Fractured and Weathered Clayey Till Soils

- Investigation of Surficial Aquitard
- Primary Investigation Method was a large test pit to allow physical examination of fractures - frequency and depth



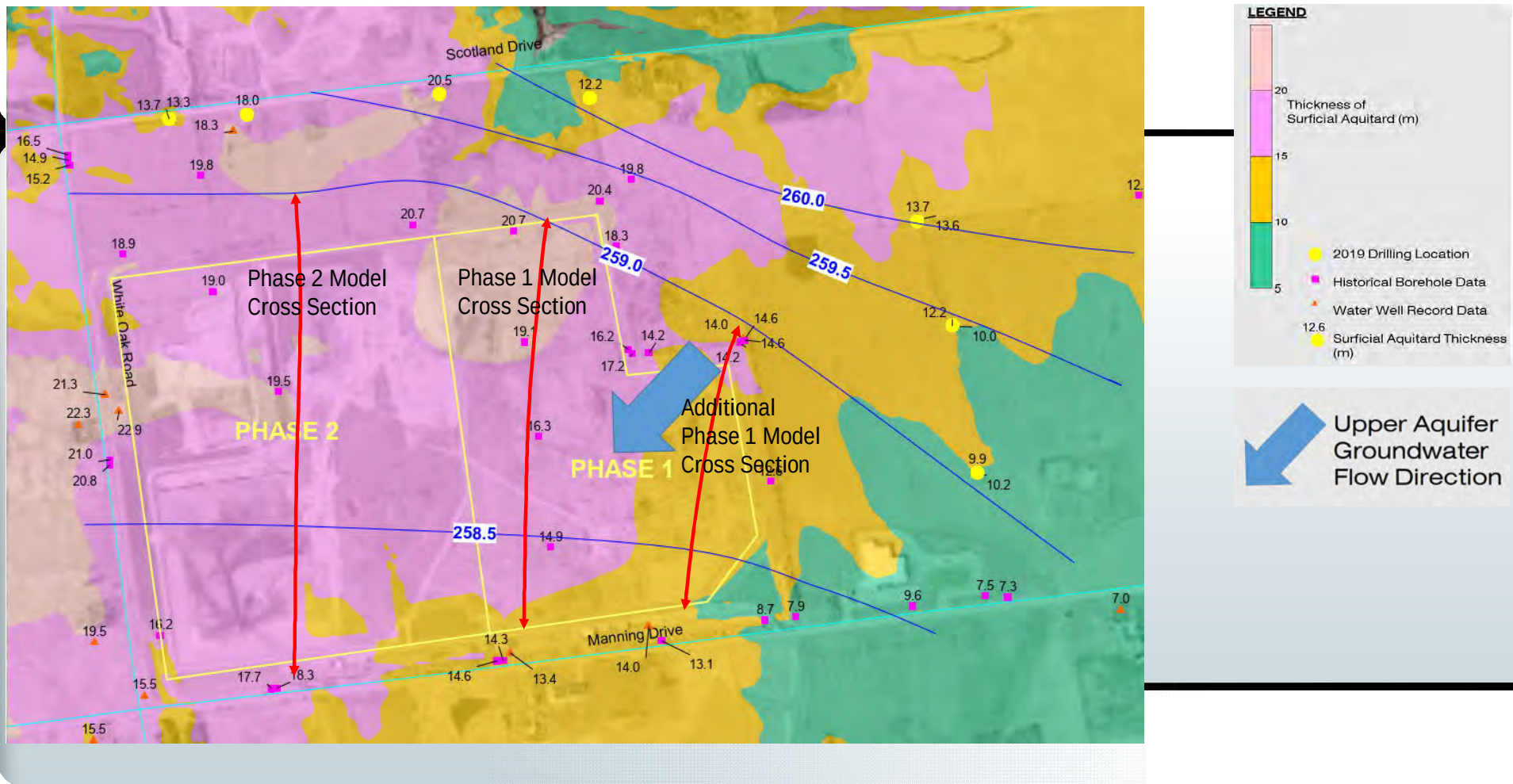
Fractured and Weathered Clayey Till Soils



Groundwater Impact Modelling

City of London W12A Landfill

12



Questions???



W12A Landfill Expansion Environmental Assessment: Biology

Presented by:

Jessica Walker, MES

Ecologist, AECOM Canada Ltd.

Summary of Field Investigations

Aquatic Habitat & Fisheries

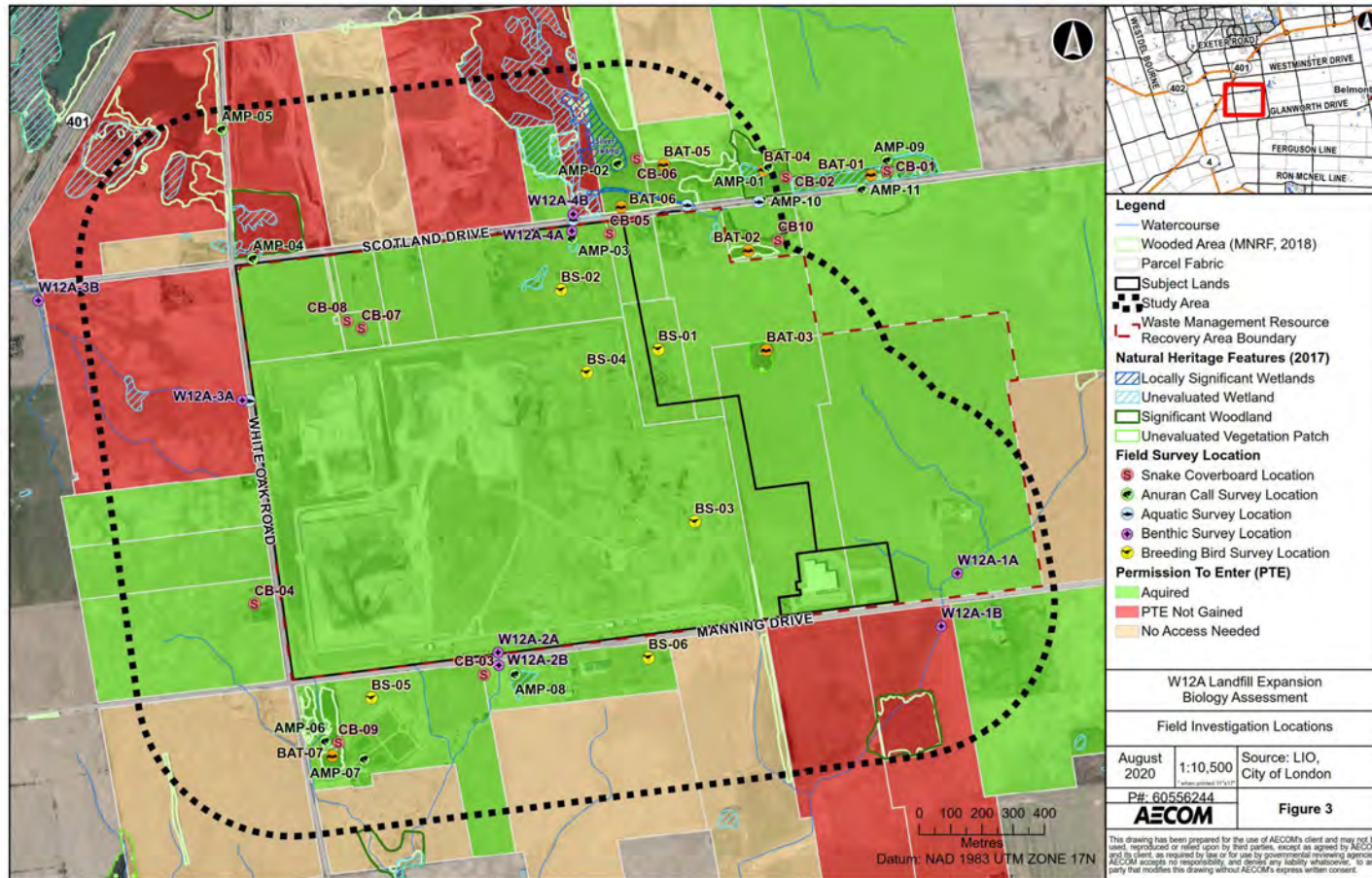
- Aquatic Habitat Assessments
- Benthic Invertebrate Surveys (StraightUp Environmental Consulting – Dave Johnson)



Terrestrial Ecosystems & Species

- Vegetation Community Surveys (ELC)
- Floral Species Inventory
- Snake Visual Encounter Surveys (VES)
- Snake Cover Board Surveys
- Anuran Call Surveys
- Vernal Pool Assessments
- Breeding Bird Surveys
- Bat Habitat Assessments
- Lepidoptera/Odonata Surveys
- Species at Risk (SAR) and Significant Wildlife Habitat(SWH) Assessments

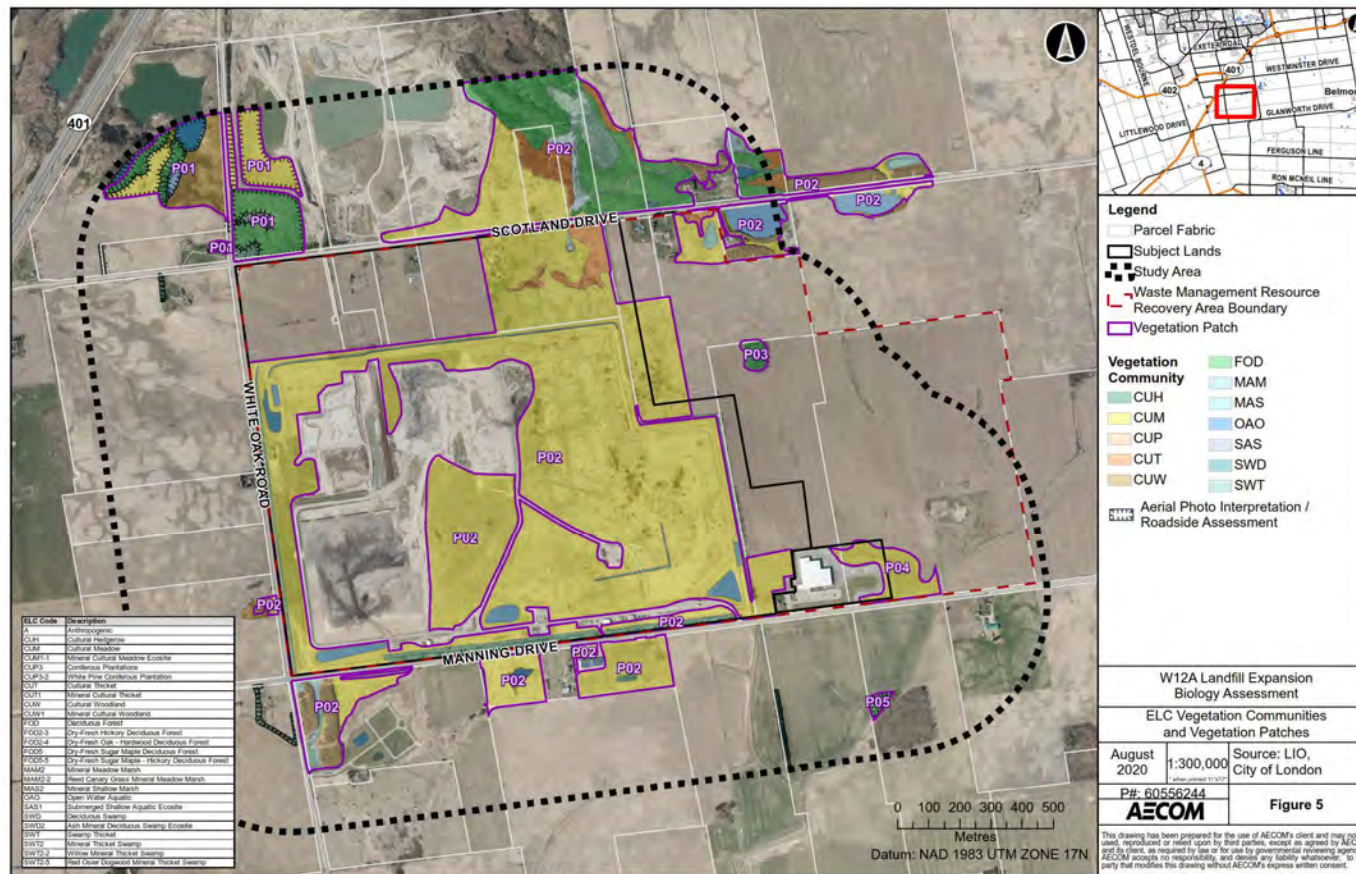
Field Investigations



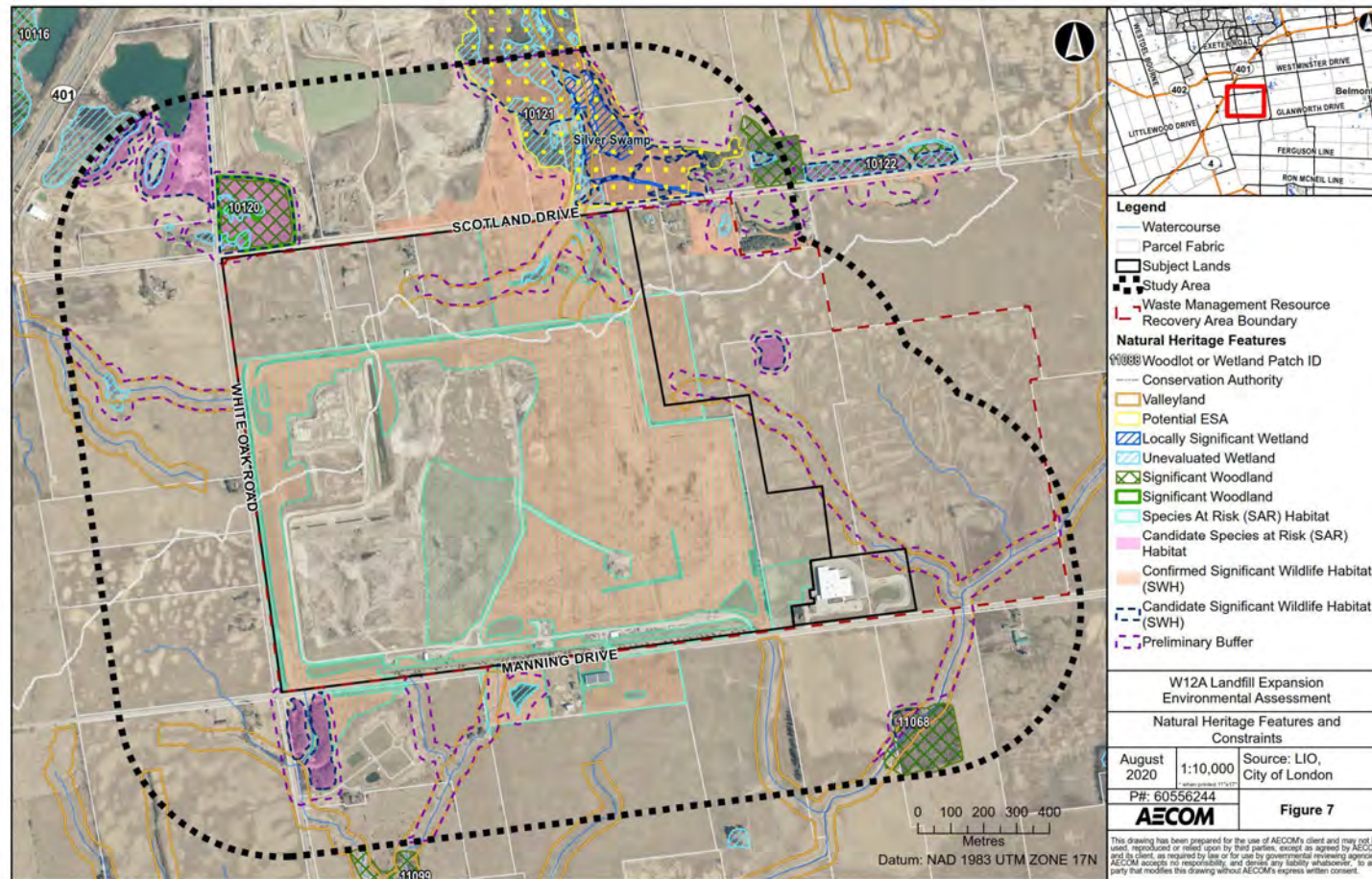
Aquatic Ecosystems & Species

- Bannister-Johnson Drain, Unnamed Pond and Drain (3502 and 3405 Scotland Drive), and C.B. Smith Drain have potential to support fish and fish habitat regulated under the *Fisheries Act*.
- No habitat for critical life stages (i.e., spawning and rearing), no SAR habitat.
- Impaired, very poor water quality with likely severe organic pollution based on water quality assessments (StraightUp Environmental Consulting).

ELC Vegetation Communities and Vegetation Patches



Natural Heritage Features and Constraints



Recommended Mitigation Measures

- Environmental Monitoring and Management Plan
- SAR and Wildlife Handling Protocol
- Vegetation clearing timing restriction – breeding bird window (April 1 – Aug 31)
- Slopes of topsoil or excavated materials piles $<70^\circ$ to deter nesting birds (e.g., Bank Swallow)
- Compensation measures such as habitat enhancement or creation for loss of SAR habitat (Bobolink, Eastern Meadowlark) and SWH (Monarch)

Anticipated Permit Requirements

- *Endangered Species Act* - Notice of Activity or Overall Benefit Permit in consultation with MECP for Bobolink and Eastern Meadowlark Habitat.
- *Planning Act* and *The London Plan* – potential requirement for an Environmental Impact Study to determine impacts under the *Provincial Policy Statement*.
- *Conservation Authorities Act* – potential Section 28 Permit under *O. Reg 157/06* (UTRCA) and *O. Reg 181/06* (KCCA) in consultation with Conservation Authorities.

H.12 Workshop Meeting Summary (August 27, 2020)

W12A Landfill Workshop/Information Session - Notes Environmental Assessment (EA) for the Proposed Expansion of the W12A Landfill

Meeting Details

Date: August 27, 2020

Location: Teams Meeting

Attendees

Aamjiwnaang First Nation (AFN): Sharilyn Johnston (Environment Coordinator),

Chippewas of the Thames First Nation (COTTFN): Fallon Burch
(Consultation Coordinator)

Munsee-Delaware First Nation: Chief Mark Peters, Stacey Phillips
(Consultation Coordinator)

AECOM: Jessica Walker (Terrestrial Ecologist)

Dillon Consulting: Rob Kell (Hydrogeologist, Environmental Engineer)

Dragun Corporation (Dragun): Cliff Lawton (Project Manager), Chris Pare
(Project Manager)

Golder Associates: Frank Barone (Senior Geotechnical Engineer)

Wesley Abbott: EA Technical Project Manager

City of London (City): Mary Alikakos (Project Manager – Wastewater and Drainage
Engineering), Jane Kittmer (Solid Waste Technician)

Discussion Topics

Below is a summary of the main discussion topics during the workshop/information session.

1. EA Process

The City of London is in the first step of the EA Process – completing the studies before moving on to write the draft EA Report.

Consultants were hired to conduct a “study of existing conditions” for various areas (Environmental Components):

- Atmosphere (air quality and noise),
- Geology & Hydrogeology(groundwater quality),
- Surface water (quality and quantity),
- Biology (aquatic & terrestrial ecosystems),
- Land Use and Agriculture,
- Archaeology,
- Cultural Heritage,
- Socio-Economic,
- Visual,
- Transportation
- Design & Operations.

The consultant that prepared the “study of existing conditions” for each Environmental Component identified their preferred landfill expansion alternative for their Environmental Component. Alternative 1 – Vertical Expansion over Existing Footprint is the proposed overall Preferred Alternative.

The consultants are completing more detailed impact assessment studies for key environmental components (e.g., groundwater) as well as looking at overall climate change implications and cumulative effects.

2. Groundwater Field Work

There are four hydrogeologic units under the landfill site:

- Surficial Aquitard
- Upper Aquifer
- Lower Aquitard
- White Oaks Aquifer

Seven new boreholes were drilled into the Upper and White Oak Aquifer to gain more information about the surficial aquitard and the aquifers.

A test pit was dug to examine the fracturing of the clay in the surficial aquitard. The top 3 metres are very fractured and hydraulically active. There is a transition zone from 3 – 5 metres which has less fractures and is less hydraulically active and below 5 metres, there are very few fractures and the zone is not hydraulically active.

Modelling will be done that simulates vertical transport of the chemical compounds found commonly in leachate. This will be completed for two areas: where the leachate mounding is the greatest, where garbage depth is the greatest and where garbage width is the greatest.

Dragun has requested that modelling be completed for a third area in the southeast corner of the landfill where the surficial aquitard is not as thick. Dragun wants to ensure that the worst case scenario is being considered.

The modelling results will be compared with the Reasonable Use Guideline (water quality criteria that landfills must meet and which are more stringent than Ontario's Drinking Water Standards). The consultants are confident that the Reasonable Use Guideline will be met at the property boundary.

3. Biology Field Work

Aquatic ecosystems

- No habitat for critical life stages (i.e., spawning and rearing), no SAR habitat.
- Very poor water quality with likely severe organic pollution based on water quality assessments.

Terrestrial ecosystems

- Two species at risk – Eastern Meadowlark and Bobolink
- 1 species of concern - Monarch butterfly
- Need to implement an Environmental Monitoring and Management Plan and follow SAR and Wildlife Handling Protocol to minimize disruption to species, include compensation measures such as habitat enhancement or creation for loss of SAR habitat (establish new habitat the season prior to removing the existing habitat). There will be 5 years of post-construction monitoring of the new SAR habitat.
- Vegetation clearing will be restricted during the breeding bird window (April 1 – Aug 31).
- Slopes of topsoil or excavated materials piles <70° to deter nesting birds (e.g., Bank Swallow).

4. Thames River Protection

The groundwater flow under W12A Landfill does not flow towards the Thames River. Most of the surface water flow goes to Kettle Creek. All of the leachate is pumped to the Greenway Wastewater Treatment Plant.

Currently, very large storm events could result in a discharge of the mixed leachate/sewage to Dingman Creek or the Thames River if the wastewater treatment plant is in a bypass situation. For the expansion, temporary storage area for the Phase 1 leachate will be created by pumping the leachate to Phase 2 of the landfill or storing leachate in an enclosed structure (underground chamber(s) or tank) located at the southeast corner.

Leachate can be retained within Phase 2 of the landfill because it has an underdrain leachate collection system whereas Phase 1 of the landfill only has a perimeter drain. Based on modelling and historical information, accommodating four days of temporary leachate storage will be appropriate. It is estimated that twelve days of generated leachate could be stored within the Phase 2 leachate collection system if required.

The leachate generated at the W12A Landfill is monitored regularly as part of the Site's ongoing monitoring program. Leachate quality is determined from sampling the monitoring wells installed at the base of the waste, and by analysis of the combined leachate at the main pump station. The leachate quality is considered when treating the wastewater at Greenway Wastewater Treatment Plant. Based on estimates, the W12A Landfill leachate will represent less than 0.5 % of the flow receiving treatment at the wastewater treatment plant. The main factors determining the quantity of leachate generated are the landfill footprint area and the amount of precipitation that infiltrates into the waste.

Leachate is collected within the landfill site and directed to the pumping station. The pumping station pumps the leachate through a forcemain (a pressurized sewer pipe). The forcemain runs eastward along Manning Drive, north along Wellington Road South and then west along Dingman Drive to the Dingman Drive Pumping Station. As part of the expansion, it is proposed to replace the existing main pumping station with a new pumping station that will operate more efficiently. The existing forcemain has adequate capacity to convey the estimated leachate flows associated with the expansion.

5. Archeology

Archeological monitoring was done with the assistance of monitors from COTTEN. Studies in the field north, adjacent to the existing landfill site have determined the area to be a Pre-contact Indigenous archaeological site. Items that were discovered included:

- (Late Archaic Period, ca. 1500 – 500 BC) - Found a total of 132 Indigenous artifacts (a projectile point, a scraper, and 130 stone flakes from tool manufacture and/or maintenance)

The area is to remain undisturbed.

6. Native Vegetation

The final cover will be seeded with native vegetation as part of compensation for natural communities. Aamjiwnaang has offered to assist with this.

MECP will be consulted for Bobolink and Eastern Meadowlark habitat compensation.

Vegetation planted at the landfill will include common milkweed for Monarch butterflies.

7. Air Quality

The W12A Landfill currently uses vertical collection wells to capture landfill gas. The expansion will include both horizontal collection pipes and vertical collection wells to capture landfill gas. The cost of the gas collection system for the landfill expansion is estimated to range from \$13 to \$20 million.

Air quality modelling indicates that there will be no exceedences of any health related parameters, but provincial odour guidelines may be exceeded at two locations immediately adjacent to the landfill. Both of these locations are owned by City and the homes at these locations were demolished in previous years. The City may have to place building restrictions on these lots as part of the approval process.

8. Future Engagement/Consultation

A copy of the draft Environmental Study Report will be provided to Indigenous Communities for comment. This is expected to occur in Fall 2020.

The City is available to meet with anyone to discuss the material presented at the workshop or any other aspect of the Environmental Assessment.

APPENDIX I

Comments Received on the EA

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
Devon Wills, Project Officer, Environmental Assessment and Permissions Branch, MECP February 17, 2021				
General Comments	1	Please ensure that an Executive Summary is provided in the next updated version of the Draft EA document as a requirement under section 4.3 of the Codes of Practice, and was requested during comments on the ToR.	Acknowledged.	An Executive Summary has been added to the draft EASR for circulation to the public stakeholders, Indigenous Communities and GRT.
General Comments	2	Throughout the pre-Draft EA a number of references were made to certain parameters (for example, components and indicators and study areas) where the City makes the statements that they've been carried forward from the approved amended ToR and used in the planning of the EA. Caution should be taken when using the language "approved amended ToR". It should be clear to readers that the parameters considered during the ToR were not finalized, but can be modified as necessary during the EA stage. As per section 4 of the Codes of Practice, flexibility was built into the EA process whereby the City can provide the necessary rationale for any change to parameters or criteria that were outlined during the ToR stage.	Acknowledged. The preliminary draft EASR has been reviewed to clarify language around 'approved Amended ToR' and modified where warranted to ensure the reader understands that certain parameters were not final in the ToR and were further reviewed and possibly updated during the EA.	Sections 2.6, 2.7.2, 3.0, 4.0, 5.1, 7.1, 7.2.1.1, 7.2.1.2, 7.2.2, 7.2.3.1, 7.2.3.2, 7.2.4.1, 7.2.4.2, 7.2.5, 7.2.6, 7.2.7, 7.2.8.1, 7.2.8.2, 7.2.9.1, 7.2.9.2, 7.2.10, 7.2.11, 7.2.12.1, and 7.2.12.2 of the EASR were updated accordingly.

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
General Comments	3	You may wish to consider including amending procedures in the EA. This is not a requirement, but is a tool to provide you with greater flexibility allowing the City to make minor modifications to the approved undertaking without having to fulfil the requirements of the Environmental Assessment Act again.	Acknowledged.	Section 13.1 was added to the EASR to allow for future potential project modifications.
Section 1.0: Introduction	1	Section 1.3.3.4 LFG Monitoring, bullet two states that there is periodic testing of LFG to determine its composition. Please update the EA documentation to include where this periodic LFG testing occurs.	Acknowledged.	Additional text was added to the second bullet to describe the location where the landfill gas is collected for analysis.
Section 1.0: Introduction	2	Section 1.3.2 Landfill Components, the City should provide a summary of the rationale of its need for additional capacity in the landfill's existing service area. Please update the EA documentation to include an overview of the City's justification for its landfill expansion within the existing service area.	Section 1.3.2 of the EASR describes the physical components of the existing landfill site and does not include the rationale for needing the landfill expansion.	Updates to the EASR to address this comment are provided in Sections 2.1, 2.4, 2.5 and 2.6 of the EASR.

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
Section 2.0: Overview of the Environmental Assessment Process, the Project and Environmental Assessment Study Report	3	<p>Section 2.4 Updated Service Area, explains that the City approached nearby municipalities to determine their interest in being included in the landfill's service area. These municipalities confirmed their interest in being included, thus no changes to the proposed regional service area are proposed.</p> <p>In this section the City should also consider including an examination of population growth, per capita waste generation rates and diversion projections for those municipalities within a given planning period. The City must provide sufficient rationale to justify the need to service the surrounding areas in the EA.</p> <p>Please provide a summary of the results of the analysis in the body of the EA, to justify why these areas need to be serviced by this landfill. Additionally, it would be helpful to readers to indicate the expected timelines for municipalities to be included in the landfill's service area.</p>	Acknowledged. All of this requested information was available in Volume III, Appendix C. A summary of the information from Volume III, Appendix C to satisfy this request was added to Section 2.4.	Section 2.4 of the EASR was updated.

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
Section 3.0: Methodology of the Assessment	1	<p>Section 3.3 Step 3 – Evaluation of 'Alternative Methods', please consider rewording of the first sentence in paragraph one for clarity: The effects on the environment were qualitatively and/or quantitatively predicted for each 'Alternative Method' (i.e., including conceptual design mitigation measures). Please provide the rationale for why certain components were listed in Table 3.3-1 were selected for the EA. Since the ToR did not finalize the parameters considered in the EA, the City may modify them as necessary provided a rationale is given. As per section 4.2.4 of the Codes of Practice, the Draft EA should explain the reasons for selecting the criteria and indicators should be clearly explained. This will help all interested persons understand the judgements that were made and allow them to participate more effectively in the process. An outline of the data sources for the criteria and indicators is also required in the EA.</p>	Acknowledged and agreed.	<p>The first sentence of Section 3.3 of the EASR has been re-written as requested. The rationale why certain components were selected and presented in Table 3.3-1 has been added to Section 3.1. The reason for selecting the criteria and indicators has been added directly into Table 3.3-1. The data sources for the criteria and indicators have been added directly into Table 3.3-1.</p>

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
Section 3.0: Methodology of the Assessment	2	The City made decisions on the landfill's alternatives at the ToR stage, since it was "focused" by using the supporting information provided. These alternatives were brought forward as alternative methods at the EA stage. The City should provide more background as to why the ToR was focused, and why these alternative methods selected were brought forward to the Draft EA.	As described in Section 6 of the EASR, during the preparation of the ToR, preliminary design concepts for the 'Alternative Methods' were developed to illustrate possible ways that the landfill site could be expanded to provide an additional 13,600,000 cubic metres of airspace, with these concepts to be refined and confirmed during the EA to provide the expansion alternatives for purposes of comparative evaluation and identification of the preferred alternative." This EA was not focused as it relates to 'Alternative Methods', it was focused as it relates to 'Alternatives To', which is fully described in Section 2.5 of the EASR.	Section 3.2 of the EASR has been amended with text describing that only preliminary 'Alternative Methods' were presented in the ToR and these 'Alternative Methods' were refined and more fully developed in the EA.

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
Section 4.0: Consultation Methods and Activities	1	Section 4.4.2 Indigenous Communities, this section lists a number of Indigenous Communities, however, the Southern First Nations Secretariat that was listed on the ToR's Notice of Completion distribution list was not listed here. Please update this section with the rationale of why they were not included.	As an organization with membership representing five of the Indigenous Communities the Southern First Nations Secretariat involvement in consultation would be initiated by their members and, hence they were not always contacted directly.	Section 4.4.2 has been modified to include the rationale as to why the Southern First Nations Secretariat did not receive notifications.
Section 4.0: Consultation Methods and Activities	2	Section 4.6 Summary of Consultation Events, this section should be updated following circulation of Draft EA to ensure all comments are incorporated into the document if appropriate and how they were addressed in the record of consultation. As per section 4.3.7 of the Codes of Practice, the Draft EA should include a comprehensive description of the consultation activities that took place during the preparation of the environmental assessment. A narrative description of the different activities, rather than just a listing of them, is required.	Acknowledged, the current description of consultation activities is descriptive and not just a listing of activities. After circulation of the Draft EA, Section 4.6 of the EASR will be updated incorporating comments received on the Draft EA and how they were incorporated into the Proposed EASR.	None

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
Section 5.0: Description of the Environment Potentially Affected	1	Section 5.8.2 Archaeological Potential, this section provides an explanation of the site's archaeological assessment to identify known archaeological potential resources. Please update this section to include the results of the Stage 2 assessment (Indigenous artifacts found, etc.).	Acknowledged, information will be added to the EASR.	Section 5.8.2 has been updated to include the findings from the Stage 2 assessment.
Section 5.0: Description of the Environment Potentially Affected	2	Section 5.1 Study Areas and Timeframes, this section defines the Site Study Area, the Site-vicinity Study Area and the Wider Study Area, however, the "regional scale" referred to in Section 5.0 has not been defined here. Please include the definition of "regional scale" in section 5.1 for clarity.	Acknowledged, the regional scale in this EA is defined as the Wider Study Area.	In Section 5.1 of the EASR, text has been updated to clarify that the regional scale is defined as the Wider Study Area.

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
Section 5.0: Description of the Environment Potentially Affected	3	Table 5.1-1: Proposed Preliminary Study Areas, includes a list of components studied and the rationale for including them in the site, site and site-vicinity, and the wider study area, but no rationale for why these components were selected. Please provide an explanation of how these components were selected and the rationale for doing so in this section. As per section 4.2.4 of the Codes of Practice, the Draft EA should explain the reasons for selecting the criteria and indicators should be clearly explained. This will help all interested persons understand the judgements that were made and allow them to participate more effectively in the process. An outline of the data sources for the criteria and indicators is also required in the EA.	Acknowledged and agreed.	The rationale for why the site components were selected has been added to Section 3.1 where they are first introduced in the EASR. An outline of the data sources for the criteria and indicators has been added to Section 3.3 where they are first introduced in the EASR.

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
Section 7.0: Assessment of Net Environmental Effects for 'Alternative Methods' and Component Comparison of 'Alternative Methods'	1	Section 7.2, Please consider rewording the first paragraph for clarity, "It is noted that this assessment did not identify any additional mitigation measures as required, but indicated if additional mitigation measures, beyond those included in the proposed expansion design or normal operating practices at the site, are required to achieve site compliance with provincial standards".	Acknowledged.	The first paragraph of Section 7.2 has been modified as requested.
Section 8.0: Description of the Preferred Undertaking	1	Section 8.1.5.1 Pond 1, this paragraph provides a description of stormwater management Pond 1. Please indicate if this stormwater management feature meets Enhanced Level Protection (80% TSS removal).	The information requested was provided in EASR section 9.3.2; Pond 1 does provide Enhanced Level Protection.	This information has been added into Section 8.1.5.1 of the EASR.
Section 8.0: Description of the Preferred Undertaking	2	Section 8.1.5.4 Pond 5, this paragraph provides a description of stormwater management Pond 5. Please indicate if this stormwater management feature meets Enhanced Level Protection (80% TSS removal).	The information was provided in EASR section 9.3.2; Pond 5 does provide Enhanced Level Protection.	This information has been added into Section 8.1.5.4 of the EASR.

Reference to EA	Reference to Question #	Comments	Proponent's Response	Changes to the EASR
Section 9.0: Impact Assessment and Net Effects	1	Section 9.2 Geology and Hydrogeology, this section provides the assessment of impacts on groundwater quality and quantity for the proposed expansion of the Landfill. Please add a citation in this paragraph to the Appendix of where these discussions with Indigenous communities can be found.	Acknowledged.	Section 9.2 has been updated to include reference to the August 2020 meeting summary in which feedback was received to consider additional transport modelling (Volume V Appendix H.12).