

H.03 Email Update (April 23, 2019)

Abbott, Wesley

From: Abbott, Wesley
Sent: Tuesday, April 23, 2019 2:13 PM
To: sjohnston@aamjiwnaang.ca
Cc: cjackson@aamjiwnaang.ca; Kittmer, Jane (jkittmer@London.ca); Alikakos, Mary; Stanford, Jay (JSTANFOR@London.ca)
Subject: Proposed Landfill Expansion
Attachments: Volume I Proposed Amended ToR Draft Feb2019_final_black line.pdf; Volume I Proposed Amended ToR Draft Feb2019_final.pdf; Water Well Monitoring Program 2005.pdf; Final W12A_Water Quality Review_north of landfill_2015.pdf

Aanii Sharilyn,

I thought I would forward you a brief update on the status of the proposed W12A Landfill expansion since our meeting on February 1, 2019.

Amended Terms of Reference

Background - The City formally submitted the *Proposed Terms of Reference for the Expansion of the W12A Landfill* to the Ministry of the Environment, Conservation and Parks (MECP) on October 12, 2018. Following submission the MECP had a 30 day comment period for stakeholders and First Nations which ran from October 12, 2018 to November 12, 2018. Aamjiwnaang First Nation (AFN) provided comments which resulted in our February 1, 2019 meeting.

Update - The City had the option to amend the *Proposed ToR* to address comments received during the government review period. On February 8, 2019, the City submitted the *Proposed Amended ToR* to the MECP. The key changes to the Proposed Amended ToR were:

- the proposed regional service area will be further assessed during the EA;
- information from one of the supporting documents, *W12A Landfill Area Plan* (IBI Group, 2008), on the rationale why expansion of the W12A Landfill was the preferred alternative was included in the main body of the Proposed Amended Terms of Reference; and,
- the list of commitments (Section 11.1) was expanded to include additional key activities that were mentioned in the Proposed ToR.

The City also submitted a black-line copy to the MECP which shows all the changes that were made to the original Proposed ToR.

The Amended Proposed TOR and the black-line copy are attached. They are also available on the project website (www.getinvolved.london.ca/WhyWasteDisposal).

It is expected a Ministry Decision on whether to approve or refuse the Proposed Amended ToR will be made in the next couple of weeks.

Hydrogeological Assessment

At the February 1, 2019 meeting, AFN requested a “real time” peer review of the existing hydrogeological conditions and proposed EA work plan for the hydrogeological assessment in order to share the information with the community in a timely fashion. Please note the following with respect to this request:

- Attached are the additional hydrogeological reports that were discussed at the February 1, 2019 meeting and were requested.
- There has been a delay in preparing the detailed hydrogeological work plan for the Environmental Assessment (EA). It is expected that the work plan will be available for review by the end of May.
- Dragun Corporation had previously provided a price to do a peer review of Proposed Terms of Reference Documents in their letter dated November 20, 2018. We have set aside the sum of \$10,000 (the previous price) and would like to know how much would be allocated to complete the peer review of the proposed hydrogeological work plan?
- An invoice (#108803) for \$5,765 was forward to the City on March 12, 2019. The invoice included consulting fees of \$4,740. Is the \$4,470 part of Dragun's original estimate of \$9,700 or is this in addition to the estimate of \$9,700. Could this invoice be revised and send to:

Rob Kell, , P.Eng., P.Geo.
Dillon Consulting Limited
130 Dufferin Avenue Suite 1400
London, Ontario, N6A 5R2

- Future invoices related to consultation on hydrogeology should also be sent to Dillon Consulting as they are responsible the hydrogeological work at the W12A Landfill.

Miigwech,



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

From: Alikakos, Mary
Sent: Monday, March 04, 2019 12:00 PM
To: Sharilyn Johnston <SJohnston@aamjiwnaang.ca>; Courtney Jackson <cjackson@aamjiwnaang.ca>
Cc: Abbott, Wesley <WAbbott@London.ca>; Stanford, Jay <JSTANFOR@London.ca>
Subject: W12A meeting 1 Feb 19

Aanii Kwewag,

Please find attached meeting notes from our February 1, 2019 meeting for your review. Let us know if you want any changes or additions.

At the meeting we discussed Dragun Corporation doing a peer review of the proposed hydrogeological work plan for the environmental assessment. Dragun Corporation had previously

provided a price to do a peer review of Proposed Terms of Reference Documents in their letter dated November 20, 2018. We have set aside the sum of \$10,000 (the previous price) and would like to know how much would be allocated to complete the peer review of the proposed hydrogeological work plan?

Please feel free to share with Councillors Nahmabin and Williams.

Baa maa pii miinwaa koobminam,
Mary



Mary Alikakos

Project Manager, Environmental Assessment
Wastewater and Drainage Engineering
City of London

300 Dufferin Ave. P.O. Box 5035

P: 519.661.CITY(2489) x 1846 | Cell: 226.268.9573 | Fax: 519.661.2355

malikakos@london.ca | www.london.ca

Anishinaabekwe from Manitoulin Island, happy to be working and living on the traditional territory of the Anishinaabeg, Haudenosaunee and Huron, and honouring the communities of the Chippewas of the Thames First Nation, the Oneida Nation of the Thames and the Munsee-Delaware Nation.

Abbott, Wesley

From: Abbott, Wesley
Sent: Tuesday, April 23, 2019 1:58 PM
To: chief@caldwellfirstnation.ca
Cc: reception@caldwellfirstnation.ca; Alikakos, Mary; Kittmer, Jane (jkittmer@London.ca)
Subject: Proposed W12A Landfill Expansion
Attachments: Volume I Proposed Amended ToR Draft Feb2019_final.pdf; Volume I Proposed Amended ToR Draft Feb2019_final_black line.pdf

Aanii Chief Duckworth,

I thought I would forward you a brief update on the status of the proposed W12A Landfill expansion.

Terms of Reference

Background - The City formally submitted the *Proposed Terms of Reference (ToR) for the Expansion of the W12A Landfill* to the Ministry of the Environment, Conservation and Parks (MECP) on October 12, 2018. Following submission the MECP had a 30 day comment period for stakeholders and First Nations which ran from October 12, 2018 to November 12, 2018.

Update - The City had the option to amend the *Proposed ToR* to address comments received during the government review period. On February 8, 2019, the City submitted the *Proposed Amended ToR* to the MECP. The key changes to the Proposed Amended ToR were:

- the proposed regional service area will be further assessed during the EA;
- information from one of the supporting documents, *W12A Landfill Area Plan* (IBI Group, 2008), on the rationale why expansion of the W12A Landfill was the preferred alternative was included in the main body of the Proposed Amended Terms of Reference; and,
- the list of commitments (Section 11.1) was expanded to include additional key activities that were mentioned in the Proposed ToR.

The City also submitted a black-line copy to the MECP which shows all the changes that were made to the original Proposed ToR.

The Proposed Amended ToR and the black-line copy are attached. They are also available on the project website (www.getinvolved.london.ca/WhyWasteDisposal).

It is expected a Ministry Decision on whether to approve or refuse the Proposed Amended ToR will be made in the next couple of weeks.

Review of Hydrogeological Work Plan

Aamjiwnaang First Nation (AFN) has requested a peer review of the existing hydrogeological conditions and the work plan for the hydrogeological assessment that will be completed as part of the Environmental Assessment. It is expected that AFN will be engaging Dragun Corporation to undertake the peer review. It is proposed to share the information with all First Nation communities via either a workshop or working group format. Let us know if you are interested in being involved. The City will cover travel and staff costs for one person to attend.

Going Forward

We are happy to meet to discuss Caldwell First Nation's involvement in the project at your convenience. There will also be other opportunities for engagement as we proceed with the environmental assessment.

Miigwech,



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

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Abbott, Wesley

From: Abbott, Wesley
Sent: Tuesday, April 23, 2019 2:01 PM
To: consultation@cottfn.com
Cc: Alikakos, Mary; Kittmer, Jane (jkittmer@London.ca)
Subject: Proposed W12A Landfill Expansion
Attachments: Volume I Proposed Amended ToR Draft Feb2019_final.pdf; Volume I Proposed Amended ToR Draft Feb2019_final_black line.pdf

Aanii,

I thought I would forward you a brief update on the status of the proposed W12A Landfill expansion since our meeting on January 15, 2019.

Amended Terms of Reference

Background - The City formally submitted the *Proposed Terms of Reference (ToR) for the Expansion of the W12A Landfill* to the Ministry of the Environment, Conservation and Parks (MECP) on October 12, 2018. Following submission the MECP had a 30 day comment period for stakeholders and First Nations which ran from October 12, 2018 to November 12, 2018. Chippewas of the Thames First Nation (COTTFN) provided comments.

Update - The City had the option to amend the *Proposed ToR* to address comments received during the government review period. On February 8, 2019, the City submitted the *Proposed Amended ToR* to the MECP. The key changes to the Proposed Amended ToR were:

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January 15, 2019 Meeting Update

At the January 15, 2019 meeting, it was noted by the City that the Oneida Nation of the Thames (Oneida) had also requested to have monitors on site during the archeological field work. COTTFN advised they wanted a monitor during the archeological field work and did not want to schedule monitors with Oneida or other First Nations. The City has consider this request and will provide funding for on-site monitors from both the Oneida FN and COTTFN. Funding for two monitors is considered warranted for projects requiring an Individual Environmental Assessment.

COTTFN requested electronic copies of historical documents related to the ToR and that only electronic copies be sent in the future. Historical documents related to the ToR will be sent via the City's Large File Transfer site within the next 2 days.

Review of Hydrogeological Work Plan

Aamjiwnaang First Nation (AFN) has requested a peer review of the existing hydrogeological conditions and the work plan for the hydrogeological assessment that will be completed as part of the Environmental Assessment. It is expected that AFN will be engaging Dragun Corporation to undertake the peer review. It is proposed to share the information with all First Nation communities via either a workshop or working group format. Let us know if you are interested in being involved. The City will cover travel and staff costs for one person to attend.

Going Forward

Let us know if you have any questions. We will be in touch in the future to set up another meeting once the Minister of Environment, Conservation and Parks has made a decision on the Proposed Amended ToR.

Miigwech,



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

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wabbott@london.ca | www.london.ca

Abbott, Wesley

From: Abbott, Wesley
Sent: Tuesday, April 23, 2019 1:57 PM
To: Denise.stonefish@delawarenation.on.ca
Cc: Alikakos, Mary; Kittmer, Jane (jkittmer@London.ca)
Subject: Proposed W12A Landfill Expansion
Attachments: Volume I Proposed Amended ToR Draft Feb2019_final.pdf; Volume I Proposed Amended ToR Draft Feb2019_final_black line.pdf

Koolamalsi Chief Stonefish,

I thought I would forward you a brief update on the status of the proposed W12A Landfill expansion.

Terms of Reference

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Update - The City had the option to amend the *Proposed ToR* to address comments received during the government review period. On February 8, 2019, the City submitted the *Proposed Amended ToR* to the MECP. The key changes to the Proposed Amended ToR were:

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Review of Hydrogeological Work Plan

Aamjiwnaang First Nation (AFN) has requested a peer review of the existing hydrogeological conditions and the work plan for the hydrogeological assessment that will be completed as part of the Environmental Assessment. It is expected that AFN will be engaging Dragun Corporation to undertake the peer review. It is proposed to share the information with all First Nation communities via either a workshop or working group format. Let us know if you are interested in being involved. The City will cover travel and staff costs for one person to attend.

Going Forward

We are happy to meet to discuss Delaware Nation's involvement in the project at your convenience. There will also be other opportunities for engagement as we proceed with the environmental assessment.

Anushiik,



London
CANADA

Wesley Abbott, P. Eng.

Project Manager
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City of London

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wabbott@london.ca | www.london.ca

Abbott, Wesley

From: Abbott, Wesley
Sent: Tuesday, April 23, 2019 1:57 PM
To: jason.henry@kettlepoint.org
Cc: Alikakos, Mary; Kittmer, Jane (jkittmer@London.ca)
Subject: Proposed W12A Landfill Expansion
Attachments: Volume I Proposed Amended ToR Draft Feb2019_final.pdf; Volume I Proposed Amended ToR Draft Feb2019_final_black line.pdf

Aanii Chief Henry,

I thought I would forward you a brief update on the status of the proposed W12A Landfill expansion.

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Going Forward

We are happy to meet to discuss Chippewas of Kettle and Stony Point's involvement in the project at your convenience. There will also be other opportunities for engagement as we proceed with the environmental assessment.

Miigwech,



London
CANADA

Wesley Abbott, P. Eng.

Project Manager

Solid Waste Management

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wabbott@london.ca | www.london.ca

Abbott, Wesley

From: Abbott, Wesley
Sent: Tuesday, April 23, 2019 1:56 PM
To: chief@munsee.ca
Cc: Stacey Phillips; Alikakos, Mary; Kittmer, Jane (jkittmer@London.ca)
Subject: Proposed W12A Landfill Expansion
Attachments: Volume I Proposed Amended ToR Draft Feb2019_final.pdf; Volume I Proposed Amended ToR Draft Feb2019_final_black line.pdf

Koolamalsi Chief Thomas,

I thought I would forward you a brief update on the status of the proposed W12A Landfill expansion.

Terms of Reference

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It is expected a Ministry Decision on whether to approve or refuse the Proposed Amended ToR will be made in the next couple of weeks.

Review of Hydrogeological Work Plan

Aamjiwnaang First Nation (AFN) has requested a peer review of the existing hydrogeological conditions and the work plan for the hydrogeological assessment that will be completed as part of the Environmental Assessment. It is expected that AFN will be engaging Dragun Corporation to undertake the peer review. It is proposed to share the information with all First Nation communities via either a workshop or working group format. Let us know if you are interested in being involved. The City will cover travel and staff costs for one person to attend.

Going Forward

Stacey Phillips has been in touch with the City regarding a tour of the W12A Landfill. We are happy to meet to discuss Munsee-Delaware's Nation involvement in the project at your convenience. There will also be other opportunities for engagement as we proceed with the environmental assessment.

Anvshiik,



London
CANADA

Wesley Abbott, P. Eng.

Project Manager
Solid Waste Management
City of London

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wabbott@london.ca | www.london.ca

Abbott, Wesley

From: Abbott, Wesley
Sent: Tuesday, April 23, 2019 2:03 PM
To: environment@oneida.on.ca
Cc: jessica.hill@oneida.on.ca; hgrant.doxtator@oneida.on.ca; jason.cornelius@oneida.on.ca; Alikakos, Mary; Kittmer, Jane (jkittmer@London.ca)
Subject: RE: City of London - Proposed Landfill Expansion
Attachments: Volume I Proposed Amended ToR Draft Feb2019_final.pdf; Volume I Proposed Amended ToR Draft Feb2019_final_black line.pdf

Shekoili Chief Hill,

I thought I would forward you a brief update on the status of the proposed W12A Landfill expansion since our meeting on January 28, 2019.

Amended Terms of Reference

Background - The City formally submitted the *Proposed Terms of Reference (ToR) for the Expansion of the W12A Landfill* to the Ministry of the Environment, Conservation and Parks (MECP) on October 12, 2018. Following submission the MECP had a 30 day comment period for stakeholders and First Nations which ran from October 12, 2018 to November 12, 2018. Oneida Nation of the Thames (Oneida) provided comments.

Update - The City had the option to amend the *Proposed ToR* to address comments received during the government review period. On February 8, 2019, the City submitted the *Proposed Amended ToR* to the MECP. The key changes to the Proposed Amended ToR were:

- the proposed regional service area will be further assessed during the EA;
- information from one of the supporting documents, *W12A Landfill Area Plan* (IBI Group, 2008), on the rationale why expansion of the W12A Landfill was the preferred alternative was included in the main body of the Proposed Amended Terms of Reference; and,
- the list of commitments (Section 11.1) was expanded to include additional key activities that were mentioned in the Proposed ToR.

The City also submitted a black-line copy to the MECP which shows all the changes that were made to the original Proposed ToR.

The Amended Proposed ToR and the black-line copy are attached. They are also available on the project website (www.getinvolved.london.ca/WhyWasteDisposal).

It is expected a Ministry Decision on whether to approve or refuse the Proposed Amended ToR will be made in the next couple of weeks.

January 28, 2019 Meeting Update

Topic	Status
City will organize a tour of the Greenway Wastewater Treatment Facility, Manning	Recommend tour take place in summer (better weather) and in the morning (best time to see MRF operation). City will be able to accommodate any

Drive Regional Material Recovery Facility (MRF) and the W12A Landfill site.	day in July or August. Tour likely to last 2 to 3 hours.
Oneida requested a number of documents both in hardcopy and electronic form.	The attached documents are the last of the electronic copies requested. The remaining requested hardcopies of documents will be forwarded this week.
Oneida requested to have on-site monitors during the archeological field studies. The Chippewas of the Thames First Nation (COTTFN) has also requested to have on-site monitors.	The City will provide funding for on-site monitors from both the Oneida FN and COTTFN. Funding for two monitors is considered warranted for projects requiring an Individual Environmental Assessment.
Oneida will consider if they want to become a member of the Waste Management Community Liaison Committee	No change.
An update was requested on the status of the Vauxhall EA as well as potential work that may be occurring within the Dingman Creek Subwatershed	In progress

Review of Hydrogeological Work Plan

Aamjiwnaang First Nation (AFN) has requested a peer review of the existing hydrogeological conditions and the work plan for the hydrogeological assessment that will be completed as part of the Environmental Assessment. It is expected that AFN will be engaging Dragun Corporation to undertake the peer review. It is proposed to share the information with all First Nation communities via either a workshop or working group format. Let us know if you are interested in being involved. The City will cover travel and staff costs for one person to attend.

Going Forward

Let us know if you have any questions. We will be in touch in the future to set up another meeting once the Minister of Environment, Conservation and Parks has made a decision on the Proposed Amended ToR.

Yaw^ko,



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

From: Abbott, Wesley
Sent: Thursday, February 07, 2019 2:46 PM
To: 'environment@oneida.on.ca' <environment@oneida.on.ca>
Cc: 'jessica.hill@oneida.on.ca' <jessica.hill@oneida.on.ca>; 'hgrant.doxtator@oneida.on.ca' <hgrant.doxtator@oneida.on.ca>; 'jason.cornelius@oneida.on.ca' <jason.cornelius@oneida.on.ca>; Alikakos, Mary <malikakos@london.ca>
Subject: City of London - Proposed Landfill Expansion

Thank you for meeting with us on Monday January 28, 2019 to discuss the proposed expansion of the W12A Landfill.

We have attached the meeting notes from the meeting for your review. Let us know if you would like any part of the meeting notes revised.

At the meeting there was a request for electronic and hard copies of a number of reports. Below is a table listing the reports and when/how they will be delivered to you.

Report	Electronic Copy	Hard Copy
Terms of Reference	Not required	Provided at meeting Jan. 28, 2019 meeting
2017 annual report for the W12A Landfill	File too large to attach to email. Will send via City's Large File Transfer Site this week.	Will forward next week with cover letter.
City's 60% Waste Diversion Action Plan	Attached.	Will forward next week with cover letter.
Amended Terms of Reference	Not completed. Will forward next week.	Not completed. Will forward next week with cover letter.

We will be in touch with you in the future about the other matters discussed.

Regards,



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

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wabbott@london.ca | www.london.ca

Abbott, Wesley

From: Abbott, Wesley
Sent: Tuesday, April 23, 2019 1:59 PM
To: dean.jacobs@wifn.org
Cc: Alikakos, Mary; Kittmer, Jane (jkittmer@London.ca)
Subject: RE: Proposed W12A landfill - expansion
Attachments: Volume I Proposed Amended ToR Draft Feb2019_final_black line.pdf; Volume I Proposed Amended ToR Draft Feb2019_final.pdf

Aanii Dean,

I thought I would forward you a brief update on the status of the proposed W12A Landfill expansion.

Terms of Reference

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Update - The City had the option to amend the Proposed ToR to address comments received during the government review period. On February 8, 2019, the City submitted the Proposed Amended ToR to the MECP. The key changes to the Proposed Amended ToR were:

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Going Forward

We are happy to meet to discuss WIFN's involvement in the project at your convenience. There will also be other opportunities for engagement as we proceed with the environmental assessment.

Miigwech,



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

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wabbott@london.ca | www.london.ca

From: Alikakos, Mary
Sent: Friday, December 14, 2018 8:10 AM
To: dean.jacobs@wifn.org
Cc: Stanford, Jay <JSTANFOR@London.ca>; Abbott, Wesley <WAbbott@London.ca>
Subject: Proposed W12A landfill - expansion

Aanii Dean,

Hope this email finds you well!

I've recently joined the City of London team and am writing to enquire if you'd be willing to meet in January 2019 to discuss WIFN's involvement in the abovementioned project. Wes Abbott, Project Manager and Jay Stanford, Director of Environmental Fleet and Solid Waste would likely be in attendance and I'd also be happy to participate.

We look forward to working with you and wish you and your family a well-deserved holiday and a Happy New Year!

Mary



Mary Alikakos
Project Manager, Environmental Assessment
Wastewater and Drainage Engineering
City of London

300 Dufferin Ave. P.O. Box 5035
P: 519.661.CITY(2489) x 4703 | Cell: 226-268-9573 | Fax: 519.661.2355

malikakos@london.ca | www.london.ca

Anishnaabekwe from Manitoulin Island, happy to be working and living on the traditional territory of the Anishnaabeg, Haudenosaunee and Huron, and honouring the communities of the Chippewas of the Thames First Nation, the Oneida Nation of the Thames and the Munsee-Delaware Nation.

H.04 Dragun Corporation peer review letter of
Hydrogeological Background Study
(July 8, 2019)

July 8, 2019

Ms. Sharilyn Johnston
Environmental Coordinator
Aamjiwnaang First Nation Environmental Department
978 Tashmoo Avenue
St. Clair Township, ON N7T 7H5

SUBJECT: Peer Review Letter
City of London
W12A Landfill Area Plan Study
Hydrology/Hydrogeological Background Study
London, Ontario
Project #C30874-02

Dear Ms. Johnston:

Dragun Corporation (Dragun) reviewed the report titled "City of London, W12A Landfill Area Plan Study, Hydrology/Hydrogeological Background Study, Final Report" dated December 5, 2005 (Hydrogeological Study). Dillon Consulting Limited, a consulting company, prepared the Hydrogeological Study for the Corporation of the City of London (City) W12A Landfill facility located at 3502 Manning Drive in London, Ontario (Site).

Based on Dragun's review of this document, the following concerns were identified:

1. FRACTURING

One of the identified concerns for the landfill is leachate breaching through the Surficial Aquitard into the Upper Aquifer.

- Breaching can occur through preferential pathways (deep fractures).
- Fracturing or desiccation of the clay was described at six soil boring locations. Fracturing or desiccation was identified to a maximum depth of 18 feet (5.49 metres [m]) below grade level (bgl) at 80% of the soil borings (four of five locations) advanced in 1972 and 1973. Subsequent soil boring investigation locations did not discuss fracturing or desiccation features. However, two soil borings (BH00-5a and BH00-7a), advanced in locations that previously did not identify fractures (BH97-5 and BH97-7), were logged as having fractures by a different consultant when these features were the focus of the soil borings.

- Clay pore water chloride profiles on wells installed in 2000 suggest a conventional advective diffusive transport, with the exception of the upper 0.6 m of clay below landfill refuse (i.e., fractures do not extend deeper than 0.6 m below the landfill refuse).

However,

- 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.
- It is Dragun's opinion that fractures in the surficial clayey soils are present across the entire region.
- Starting in 2015, a significant increase in iron concentration was noted at the wells (94-3, 05-1, 05-2, and 13-1a) hydraulically down gradient of the landfill.
- Deep fractures (>10 feet [3.05 m] to a maximum observed depth of 18 feet [5.49 m] bgl) will increase the vertical hydraulic conductivity and, therefore, would need to be incorporated into any predictive modelling regarding leachate vertical migration time travel estimates. The presence of iron at these wells is a matter requiring additional investigation.

Recommendations

1. Continuously sample any additional soil borings to be installed with a focus on evidence of fractures.
2. Extract pore water from clay to establish vertical profiles.
3. Analyze pore water for environmental isotopes (O18, H2, H3) in addition to chloride.
4. Analyze groundwater for environmental isotopes (O18, H2, H3) in addition to chloride.

2. UPPER AQUIFER NORTHERN EXTENT

The Hydrogeological Study states that "the Upper Aquifer is generally absent north of Scotland Drive."

- This statement is based only on information from water well records.
- No geotechnical boreholes or monitoring wells confirmed the presence of a separate Upper Aquifer north of Scotland Drive.
- Confirmation of the surficial clay layer thickness is needed between the northern extent of the current landfill and Scotland Drive, especially if the W12A landfill will be extended to the north or east.

Recommendations

1. Investigate the presence and thickness of the surficial clay layer south of Scotland Drive by drilling a number of soil borings.

3. "CRITICAL" CONTAMINANT PARAMETER

Currently, chloride is the "critical" contaminant (i.e., the parameter expected to be detected in the hydraulically downgradient monitoring wells).

- Chloride concentrations are in an increasing trend in the hydraulically upgradient Oaks Aquifer monitoring wells (92-12 and, to a lesser degree, 92-10).
- Chloride concentrations are also in an increasing trend in the hydraulically upgradient Upper Aquifer monitoring well (92-11).
- Increasing trends at 92-11 and 92-12 suggest that the Upper Aquifer and the Oak Aquifer are connected north of Scotland Drive.
- Using chloride as the "critical" parameter is problematic since the Upper Aquifer and the Oak Aquifer are hydraulically connected.
- Further, the source of chloride-impacted groundwater may be from hydraulically upgradient sites such as the site with aggregate operations. Therefore, chloride-impacted groundwater unrelated to the landfill activities would ultimately be present under the landfill.

Recommendations

1. Use of chloride should be abandoned and replaced with a suitable tracer.

If you have any questions or require any additional information, please contact either of us at (519) 979-7300.

Sincerely,

DRAGUN CORPORATION



Khaled Chekiri, Ph.D., P.Eng.
Air Quality Specialist



Christopher G. Paré, P.Geo.
Hydrogeologist

KC/CGP/amr

H.05 Facility Tour and Presentation Material

Abbott, Wesley

From: Abbott, Wesley
Sent: Thursday, July 04, 2019 10:04 AM
To: 'Oneida Environment'
Cc: Alikakos, Mary; Kittmer, Jane
Subject: RE: City of London - Proposed Landfill Expansion
Attachments: Greenway PCP Directions.pdf; Recycling Centre & Landfill Directions.pdf; Safety Overview - Recycling Centre and Landfill Tours.pdf

Brandon

I want to do confirm that we are still on for a tour of Greenway Water Pollution Control Plant, Manning Drive Material Recovery Facility and W12A Landfill on Tuesday July 16.

We are expecting 13 to 17 persons (Chief (if she is available) 5 interns, council portfolios (3), interested committee members (7 potential), and yourself).

Below is the information previously provided about the proposed tour. We can start earlier or later and change the order of the tours if you prefer. The only restriction is the best time to tour the Material Recovery Facility is in the morning if you want to see all the equipment running.

Timetable - Below is a draft timetable:

Item	Time	Comments/Potential Guides
Greenway Pollution Control Plant (PCP)	9:30 am	<ul style="list-style-type: none">• Greeting/Opening comments• Tour normally takes 1 to 1.5 hours depending on questions but we will reduce to keep overall tour to 3.5 hours• Walking on ring road to various tanks/equipment; we can provide separate tour (with a vehicle) for the clam mothers if you want
Travel	10:30 am	<ul style="list-style-type: none">• 20 minutes travel• 10 minutes in/out
Material Recovery (recycling) Facility tour	11:00 am	<ul style="list-style-type: none">• Split into 2 groups for tour• Walking/stairs
Lunch/ Presentations	11:45 pm	<ul style="list-style-type: none">• Light lunch• Short presentation on EA and landfill• Q & A on all topics
Landfill	12:30	<ul style="list-style-type: none">• Drive in cars to various landfill locations

End	1 pm	• -
-----	------	-----

Safety Overview

Attached is safety information for the landfill and MRF tours. General comments in this document also apply to the Greenway PCP tour.

All required personal protection equipment for the tours will be provided by the City. Persons on the tour should:

- Wear closed toe and non-slip shoes
- Wear long sleeves and long pants
- Take off or tuck in any loose clothing and jewelry prior to the tour
- Dress weather appropriate (some of the tours will be outside).

Directions -

Attached are directions to Greenway PCP, W12A Landfill and Material Recovery Facility.



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

From: Kittmer, Jane

Sent: Tuesday, June 11, 2019 2:34 PM

To: 'Oneida Environment' <environment@oneida.on.ca>; Abbott, Wesley <WAbbott@London.ca>

Cc: Alikakos, Mary <malikakos@london.ca>

Subject: RE: City of London - Proposed Landfill Expansion

Sure. I will set things up for July 16. See you then!



Jane Kittmer
Technician
Solid Waste Management
City of London

300 Dufferin Ave, P.O. Box 5035, London ON N6A 4L9
P: 519.661.2489 x 2334 | Fax: 519.661.2354
jkittmer@london.ca | www.london.ca

From: Oneida Environment [<mailto:environment@oneida.on.ca>]
Sent: Tuesday, June 11, 2019 2:21 PM
To: Kittmer, Jane <jkittmer@London.ca>; Abbott, Wesley <WAbbott@London.ca>
Cc: Alikakos, Mary <malikakos@london.ca>
Subject: [EXTERNAL] RE: City of London - Proposed Landfill Expansion

Hello Jane,

Yes, could I suggest Tuesday, July 16th.

Thank you,

*Brandon Doxtator
Environment and Consultation Coordinator
Oneida Nation of the Thames
Oneida Public Works Office
2706 Nicholas Rd, Oneida
(519)-652-6922*

From: Kittmer, Jane [<mailto:jkittmer@London.ca>]
Sent: June-11-19 9:27 AM
To: Oneida Environment <environment@oneida.on.ca>; Abbott, Wesley <WAbbott@London.ca>
Cc: Alikakos, Mary <malikakos@london.ca>
Subject: RE: City of London - Proposed Landfill Expansion

Hi Brandon,

Thanks for getting back to us. The week of July 15 – 19 will work. Is there a day within that week that will accommodate everyone who wants to come tour the facilities?

Thanks,
Jane



Jane Kittmer
Technician
Solid Waste Management
City of London

300 Dufferin Ave, P.O. Box 5035, London ON N6A 4L9
P: 519.661.2489 x 2334 | Fax: 519.661.2354
jkittmer@london.ca | www.london.ca

From: Oneida Environment [<mailto:environment@oneida.on.ca>]
Sent: Monday, June 10, 2019 10:40 AM

To: Abbott, Wesley <WAbbott@London.ca>
Cc: Alikakos, Mary <malikakos@london.ca>; Kittmer, Jane <jkittmer@London.ca>
Subject: [EXTERNAL] RE: City of London - Proposed Landfill Expansion

Hello Wesley, Mary and Jane,

I hope everyone is doing well,

Yes I think we might have to change the date for some time in July. June seemed to become a crazy busy month and I don't think everyone who wanted to come can make it. If I could propose a couple dates in July, I would like to suggest the week of July 15th to the 19th if that works for you.

Thank you for accommodating us,

*Brandon Doxtator
Environment and Consultation Coordinator
Oneida Nation of the Thames
Oneida Public Works Office
2706 Nicholas Rd, Oneida
(519)-652-6922*

From: Abbott, Wesley [<mailto:WAbbott@London.ca>]
Sent: June-03-19 7:27 AM
To: Oneida Environment <environment@oneida.on.ca>
Cc: Alikakos, Mary <malikakos@london.ca>; Kittmer, Jane <jkittmer@London.ca>
Subject: RE: City of London - Proposed Landfill Expansion

Brandon

Just following up on my earlier email enquiring if Tuesday June 18 would work for the tour. As mentioned we can accommodate other dates if it does not.

Also, going forward your contacts for organizing the tour will be Mary Alikakos and Jane Kittmer (both copied on this email) as I will be on vacation.

Yaw^ko,



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

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wabbott@london.ca | www.london.ca

From: Abbott, Wesley
Sent: Tuesday, May 21, 2019 3:59 PM
To: Oneida Environment <environment@oneida.on.ca>
Cc: Alikakos, Mary <malikakos@london.ca>
Subject: RE: City of London - Proposed Landfill Expansion

Brandon

Tour

Date - Tuesday June 18 works best for us. Let us know if this works for you. We can accommodate other dates if it does not.

Timetable - Below is a draft timetable...

Item	Time	Comments/Potential Guides
Greenway Pollution Control Plant (PCP)	9:30 am	<ul style="list-style-type: none">• Greeting/Opening comments• Tour normally takes 1 to 1.5 hours depending on questions but we will reduce to keep overall tour to 3.5 hours• Walking on ring road to various tanks/equipment; we can provide separate tour (with a vehicle) for the clam mothers if you want
Travel	10:30 am	<ul style="list-style-type: none">• 20 minutes travel• 10 minutes in/out
Material Recovery (recycling) Facility tour	11:00 am	<ul style="list-style-type: none">• Split into 2 groups for tour• Walking/stairs
Lunch/ Presentations	11:45 pm	<ul style="list-style-type: none">• Light lunch• Short presentation on EA and landfill• Q & A on all topics
Landfill	12:30	<ul style="list-style-type: none">• Drive in cars to various landfill locations
End	1 pm	<ul style="list-style-type: none">• -

We can start earlier or later and change the order of the tours if you prefer. The only restriction is the best time to tour the Material Recovery Facility is in the morning if you want to see all the equipment running.

Safety Overview

Attached is safety information for the landfill and MRF tours. General comments in this document also apply to the Greenway PCP tour.

All required personal protection equipment for the tours will be provided by the City. Persons on the tour should:

- Wear closed toe and non-slip shoes
- Wear long sleeves and long pants
- Take off or tuck in any loose clothing and jewelry prior to the tour
- Dress weather appropriate (some of the tours will be outside).

Directions -

Attached are directions to Greenway PCP, W12A Landfill and Material Recovery Facility.

Environment Committee Meeting

Unfortunately, I already have a meeting with the W12A Landfill Public Liaison Committee on Thursday June 27 from 6 to 8 pm. Can we come to the next Environment Committee meeting?

Yaw^ko,



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

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wabbott@london.ca | www.london.ca

From: Oneida Environment [<mailto:environment@oneida.on.ca>]
Sent: Tuesday, May 14, 2019 3:53 PM
To: Abbott, Wesley <WAbbott@London.ca>
Cc: Alikakos, Mary <malikakos@london.ca>
Subject: [EXTERNAL] RE: City of London - Proposed Landfill Expansion

Hi Wesley,

Yes the tour will include the Chief (if she is available) 5 interns, council portfolios (3), interested committee members (7 potential), and myself. So we are looking at between 13-17 people for the tour from Oneida.

In terms of the tour length, I think that the length is fine, but we do have 2 clan mothers who sit on our committee so they might need a break in between. I will follow up with them though and see if that's okay.

Yes no problem, our next committee meeting after that is scheduled for Thursday, June 27th from 4-8pm, I have lots of room for that meeting.

Thank you for letting me know, I appreciate it

Brandon Doxtator

*Environment and Consultation Coordinator
Oneida Public Works
2706 Nicholas Rd, Oneida
(519)-652-6922*

From: Abbott, Wesley [<mailto:WAbbott@London.ca>]
Sent: May-14-19 11:33 AM
To: Oneida Environment
Cc: Alikakos, Mary
Subject: RE: City of London - Proposed Landfill Expansion

Brandon

Tour

The week of June 17 to 20 should work.

I just want to confirm a few details.

- Will there be others joining the tour besides the interns?
- I would estimate the tour (including travel time between facilities) would take 3 to 3 ½ hours. Is this okay? We can shorten the length of the tours if you want.

I will send you a draft schedule and potential days for the tour by early next week.

Environment Committee Meeting

Can we come to the meeting after June 13th, 2019? I am on vacation that week.

Also, we are still waiting to hear back from the MECP on whether they are going to approve or reject the Terms of Reference. They were supposed to have made a decision by March 29 (according to the Deadlines Regulation - Ontario Regulation 616/98) but are 6 weeks late and counting.



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

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wabbott@london.ca | www.london.ca

From: Oneida Environment [<mailto:environment@oneida.on.ca>]
Sent: Tuesday, May 14, 2019 10:58 AM
To: Abbott, Wesley <WAbbott@London.ca>
Cc: Chief Jessica Hill <jessica.hill@oneida.on.ca>; HGrant Doxtator <hgrant.doxtator@oneida.on.ca>; Jason Cornelius

<jason.cornelius@oneida.on.ca>; Alikakos, Mary <malikakos@london.ca>; Kittmer, Jane <jittmer@London.ca>

Subject: [EXTERNAL] RE: City of London - Proposed Landfill Expansion

Good Day Wesley,

I have received both the digital and hard copies of the TOR and Annual Status Report.

Today I am emailing about setting up the tours for the W12A Landfill. I am going to have 5 interns coming on the environment unit for the month of June and I was wondering if we could set up the tour for the Greenway Wastewater Treatment Facility, Manning Drive Regional Material Recovery Facility (MRF) and the W12A Landfill site. I am just putting the schedule together for the interns now, so I was looking at the week of June 17th – 20th but any day until July 5th will work.

Our next environment committee meeting that I can fit you on is scheduled for Thursday, June 13th 2019 if that gives you enough time, I can arrange for you to attend that meeting.

Thank you, I hope you hear from you soon.

*Brandon Doxtator
Environment and Consultation Coordinator
Oneida Public Works
2706 Nicholas Rd, Oneida
(519)-652-6922*

From: Abbott, Wesley [<mailto:WAbbott@London.ca>]

Sent: April-23-19 2:03 PM

To: Oneida Environment

Cc: Chief Jessica Hill; HGrant Doxtator; Jason Cornelius; Alikakos, Mary; Kittmer, Jane

Subject: RE: City of London - Proposed Landfill Expansion

Shekoili Chief Hill,

I thought I would forward you a brief update on the status of the proposed W12A Landfill expansion since our meeting on January 28, 2019.

Amended Terms of Reference

Background - The City formally submitted the *Proposed Terms of Reference (ToR) for the Expansion of the W12A Landfill* to the Ministry of the Environment, Conservation and Parks (MECP) on October 12, 2018. Following submission the MECP had a 30 day comment period for stakeholders and First Nations which ran from October 12, 2018 to November 12, 2018. Oneida Nation of the Thames (Oneida) provided comments.

Update - The City had the option to amend the *Proposed ToR* to address comments received during the government review period. On February 8, 2019, the City submitted the *Proposed Amended ToR* to the MECP. The key changes to the Proposed Amended ToR were:

- the proposed regional service area will be further assessed during the EA;
- information from one of the supporting documents, *W12A Landfill Area Plan* (IBI Group, 2008), on the rationale why expansion of the W12A Landfill was the preferred alternative was included in the main body of the Proposed Amended Terms of Reference; and,
- the list of commitments (Section 11.1) was expanded to include additional key activities that were mentioned in the Proposed ToR.

The City also submitted a black-line copy to the MECP which shows all the changes that were made to the original Proposed ToR.

The Amended Proposed ToR and the black-line copy are attached. They are also available on the project website (www.getinvolved.london.ca/WhyWasteDisposal).

It is expected a Ministry Decision on whether to approve or refuse the Proposed Amended ToR will be made in the next couple of weeks.

January 28, 2019 Meeting Update

Topic	Status
City will organize a tour of the Greenway Wastewater Treatment Facility, Manning Drive Regional Material Recovery Facility (MRF) and the W12A Landfill site.	Recommend tour take place in summer (better weather) and in the morning (best time to see MRF operation). City will be able to accommodate any day in July or August. Tour likely to last 2 to 3 hours.
Oneida requested a number of documents both in hardcopy and electronic form.	The attached documents are the last of the electronic copies requested. The remaining requested hardcopies of documents will be forwarded this week.
Oneida requested to have on-site monitors during the archeological field studies. The Chippewas of the Thames First Nation (COTTFN) has also requested to have on-site monitors.	The City will provide funding for on-site monitors from both the Oneida FN and COTTFN. Funding for two monitors is considered warranted for projects requiring an Individual Environmental Assessment.
Oneida will consider if they want to become a member of the Waste Management Community Liaison Committee	No change.
An update was requested on the status of the Vauxhall EA as well as potential work that may be occurring within the Dingman Creek Subwatershed	In progress

Review of Hydrogeological Work Plan

Aamjiwnaang First Nation (AFN) has requested a peer review of the existing hydrogeological conditions and the work plan for the hydrogeological assessment that will be completed as part of the Environmental Assessment. It is expected that AFN will be engaging Dragun Corporation to undertake the peer review. It is proposed to share the information with all First Nation communities

via either a workshop or working group format. Let us know if you are interested in being involved. The City will cover travel and staff costs for one person to attend.

Going Forward

Let us know if you have any questions. We will be in touch in the future to set up another meeting once the Minister of Environment, Conservation and Parks has made a decision on the Proposed Amended ToR.

Yaw^ko,



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

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From: Abbott, Wesley
Sent: Thursday, February 07, 2019 2:46 PM
To: 'environment@oneida.on.ca' <environment@oneida.on.ca>
Cc: 'jessica.hill@oneida.on.ca' <jessica.hill@oneida.on.ca>; 'hgrant.doxtator@oneida.on.ca' <hgrant.doxtator@oneida.on.ca>; 'jason.cornelius@oneida.on.ca' <jason.cornelius@oneida.on.ca>; Alikakos, Mary <malikakos@london.ca>
Subject: City of London - Proposed Landfill Expansion

Thank you for meeting with us on Monday January 28, 2019 to discuss the proposed expansion of the W12A Landfill.

We have attached the meeting notes from the meeting for your review. Let us know if you would like any part of the meeting notes revised.

At the meeting there was a request for electronic and hard copies of a number of reports. Below is a table listing the reports and when/how they will be delivered to you.

Report	Electronic Copy	Hard Copy
Terms of Reference	Not required	Provided at meeting Jan. 28, 2019 meeting
2017 annual report for the W12A Landfill	File too large to attach to email. Will send via City's Large File Transfer Site this week.	Will forward next week with cover letter.

City's 60% Waste Diversion Action Plan	Attached.	Will forward next week with cover letter.
Amended Terms of Reference	Not completed. Will forward next week.	Not completed. Will forward next week with cover letter.

We will be in touch with you in the future about the other matters discussed.

Regards,

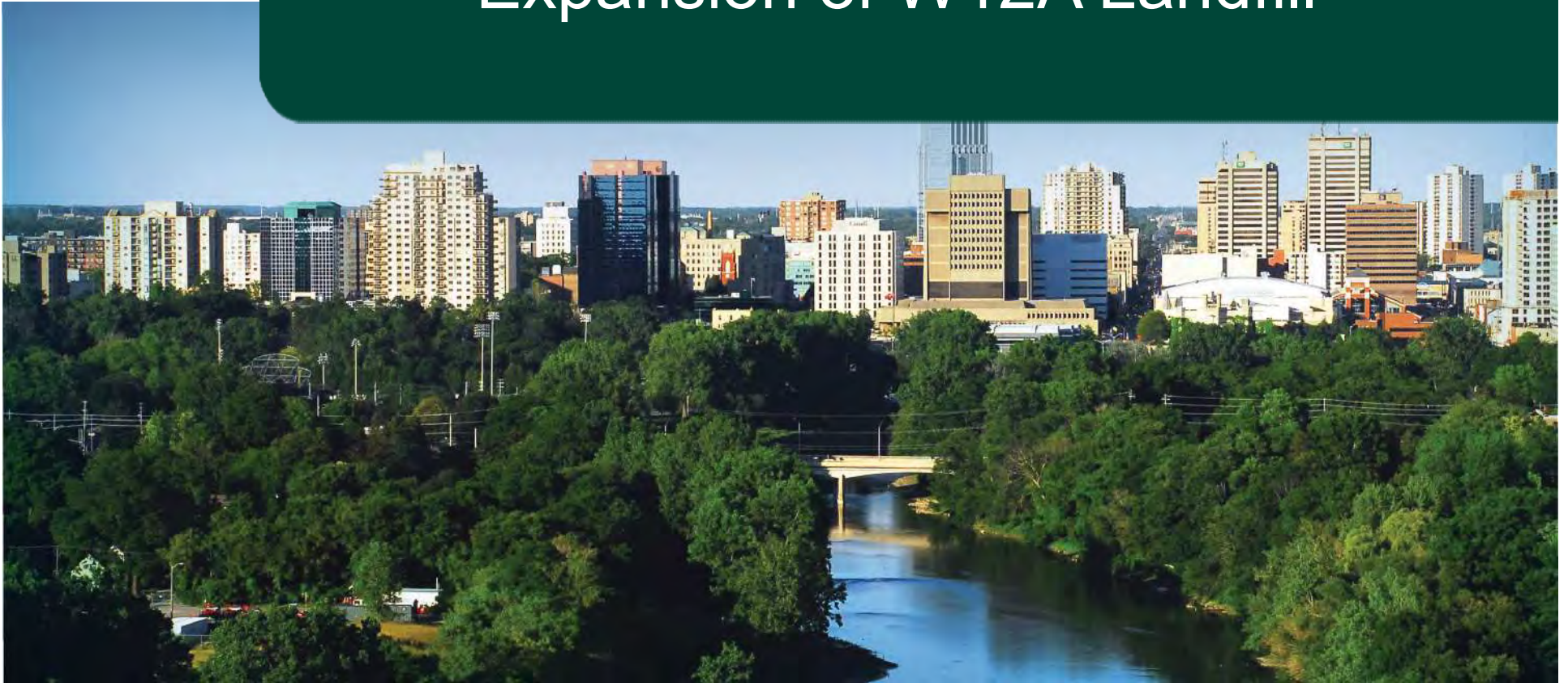


Wesley Abbott, P. Eng.
Project Manager
Solid Waste Management
City of London

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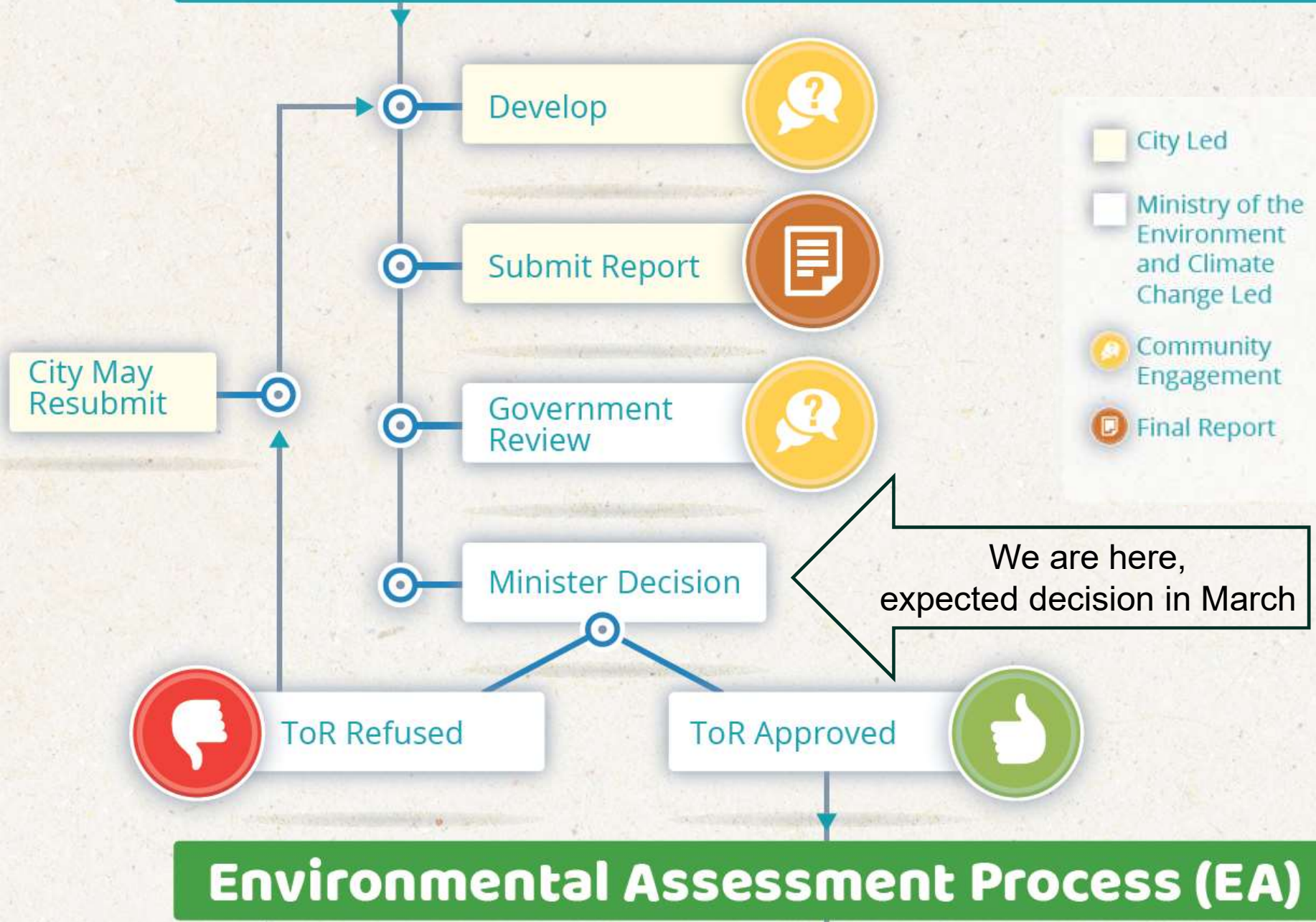
Terms of Reference (ToR) Overview Expansion of W12A Landfill



Oneida Nation of the Thames

July 16, 2019

1. Terms of Reference Process (ToR)





ToR Overview - Disposal Method

**Expansion of the
W12A Landfill is
the most
appropriate
disposal option
based on previous
waste plan studies
(2008)**



The Corporation of the City of London

W12A LANDFILL AREA PLAN

REPORT
OCTOBER 2008



ToR Overview - Disposal Method



Location	Area (ha)
W12A	142
MRF	6
Remainder	140
Total	288



Key Parameters - Diversion

Setting a new goal for Waste Diversion by 2022.





Key Parameters - Planning Period

Plan for additional 25 years (2025 – 2050)

- Maximum supported by MECP staff
- The London Plan in effect until 2035
- Consistent with *Waste-Free Ontario Act*
- Supported by residents

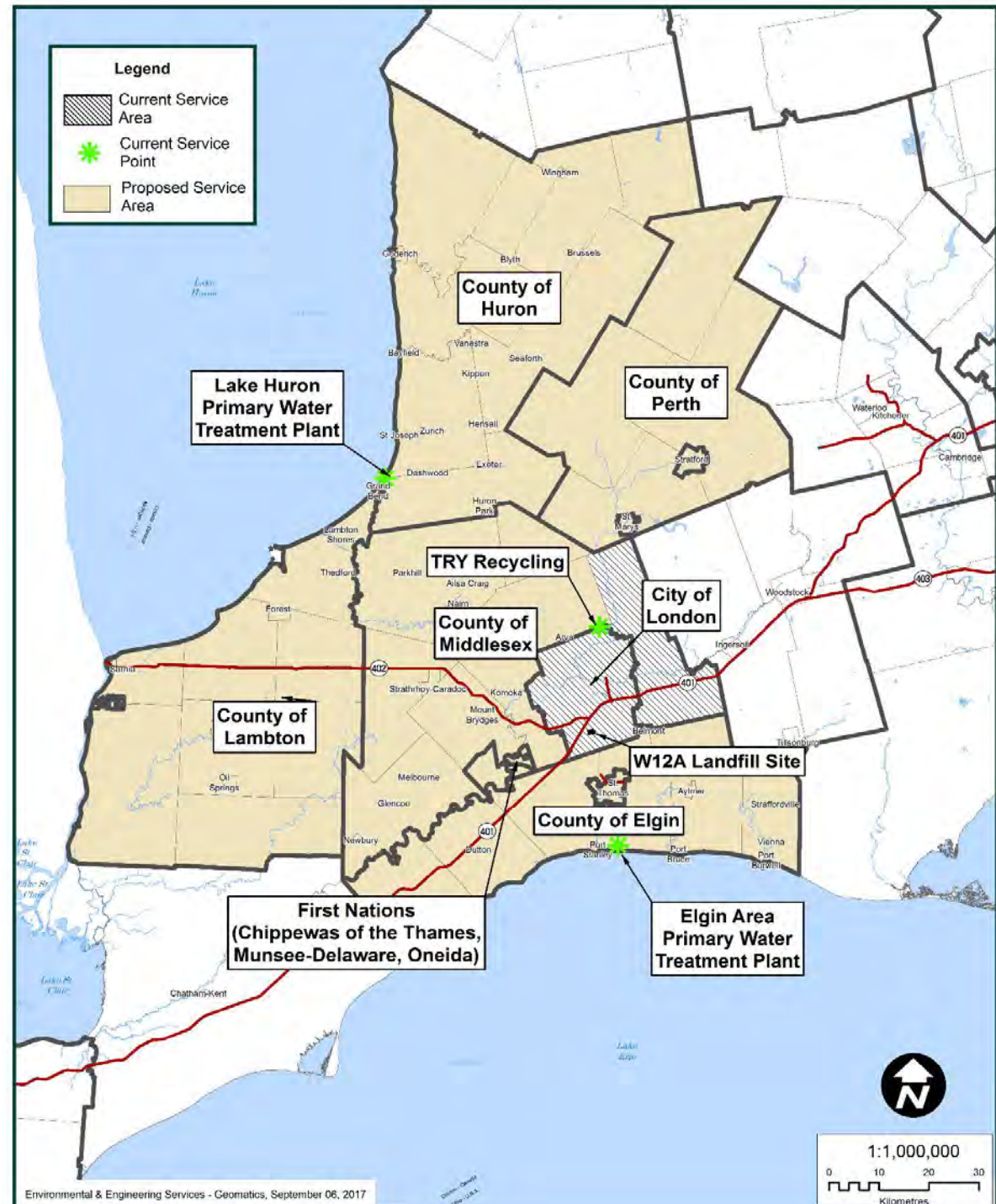


Key Parameters - Limit on Annual Tonnage

- Current limit = 650,000 tonne/year
- **Proposed limit = 500,000 tonne/year**

Consideration	Average (Tonnes)	Peak (Tonnes)
Existing Service Area	370,000	380,000
Expanded Service Area	24,000	40,000
Contingency	-	80,000
Total	-	500,000

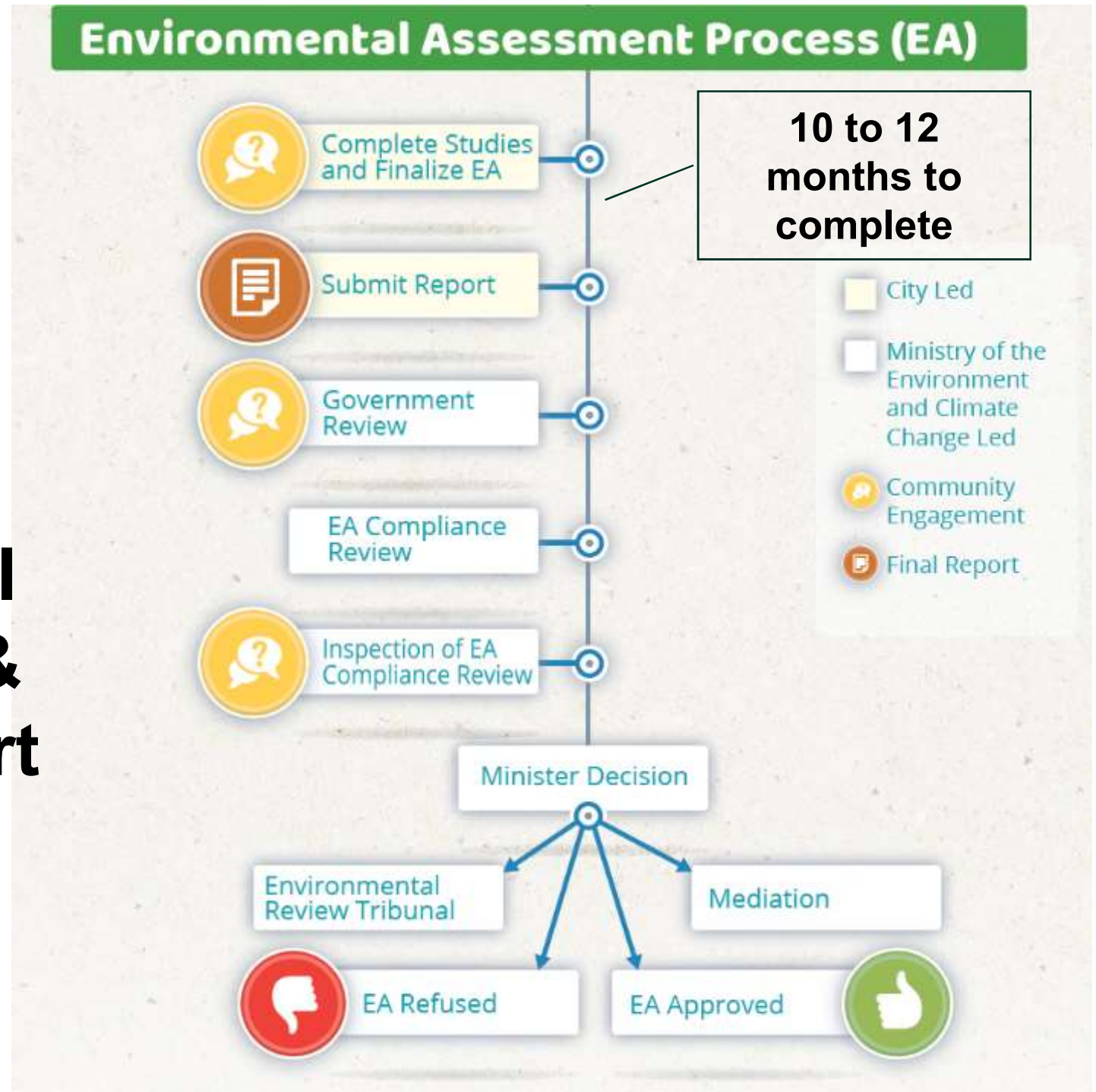
Key Parameters - Regional Service Area





Phase 2:

EA Technical Studies & EA Report



Proposed Studies

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



Proposed Community Engagement

- Two Open Houses
- Project Website
- Direct Mailings (e.g., residents with 2 km of Landfill, project mailing list, etc.)
- Community requests for meetings
- Waste Management CLC, W12A Landfill PLC, First Nations & GRT
- Traditional & Social Media
- PPM at CWC





Proposed Schedule

Time Frame	Task
Spring 2018 to Winter 2020	Ongoing Field Studies/Assessments
Fall 2019	Open House #3 - EA Overview
Winter 2020	Open House #4 – Preferred Expansion Alternative
Spring 2018 to Spring 2020	Other ongoing public engagement (e.g., First Nations, GRT, PLC, etc.)
Winter/Spring 2020	Preparation of EA Reports
Spring/Summer 2020	Submit EA Reports to MECP



Questions – we are here to help

August 16, 2018

Volume I

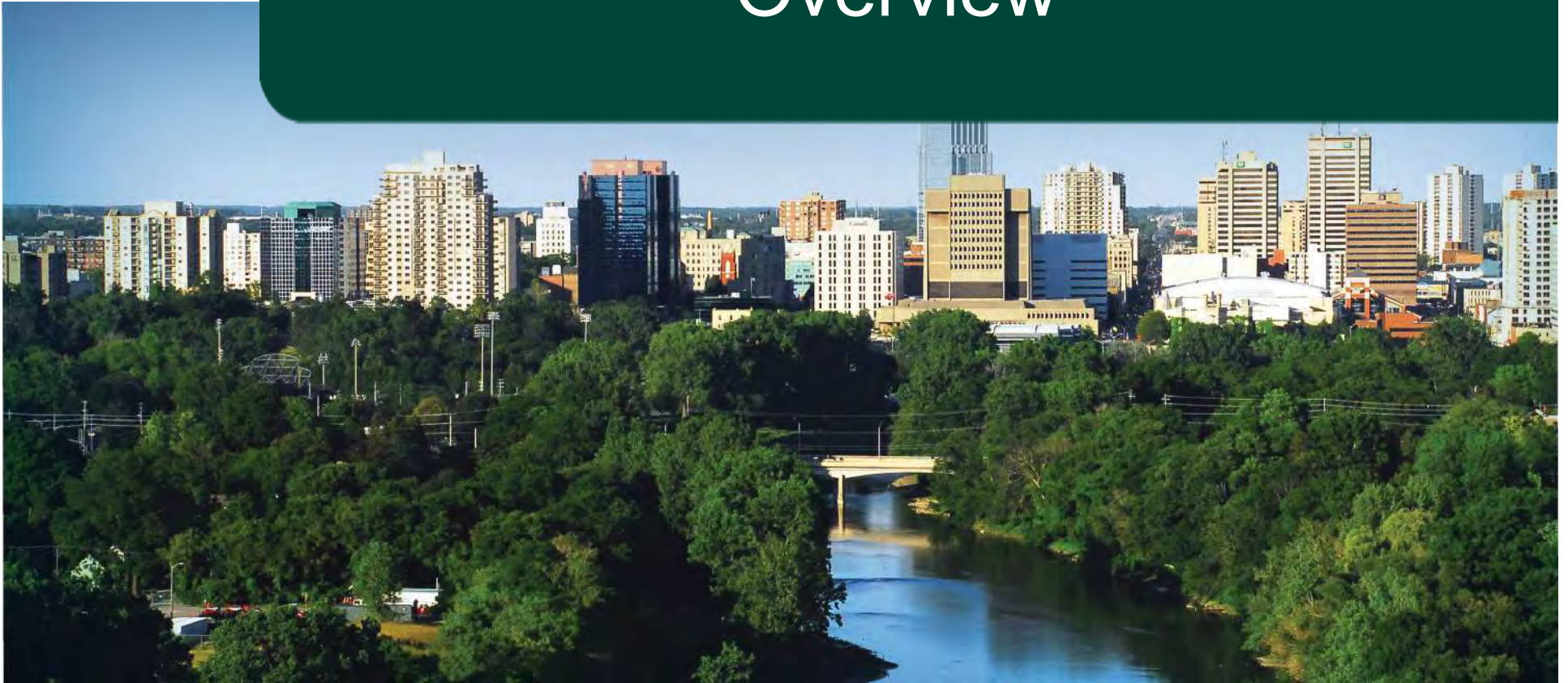
Proposed Terms of Reference

Environmental Assessment of the Proposed W12A Landfill
Expansion, City of London





W12A Landfill Overview



Oneida Nation of the Thames

July 16, 2019



Overview

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



Leachate

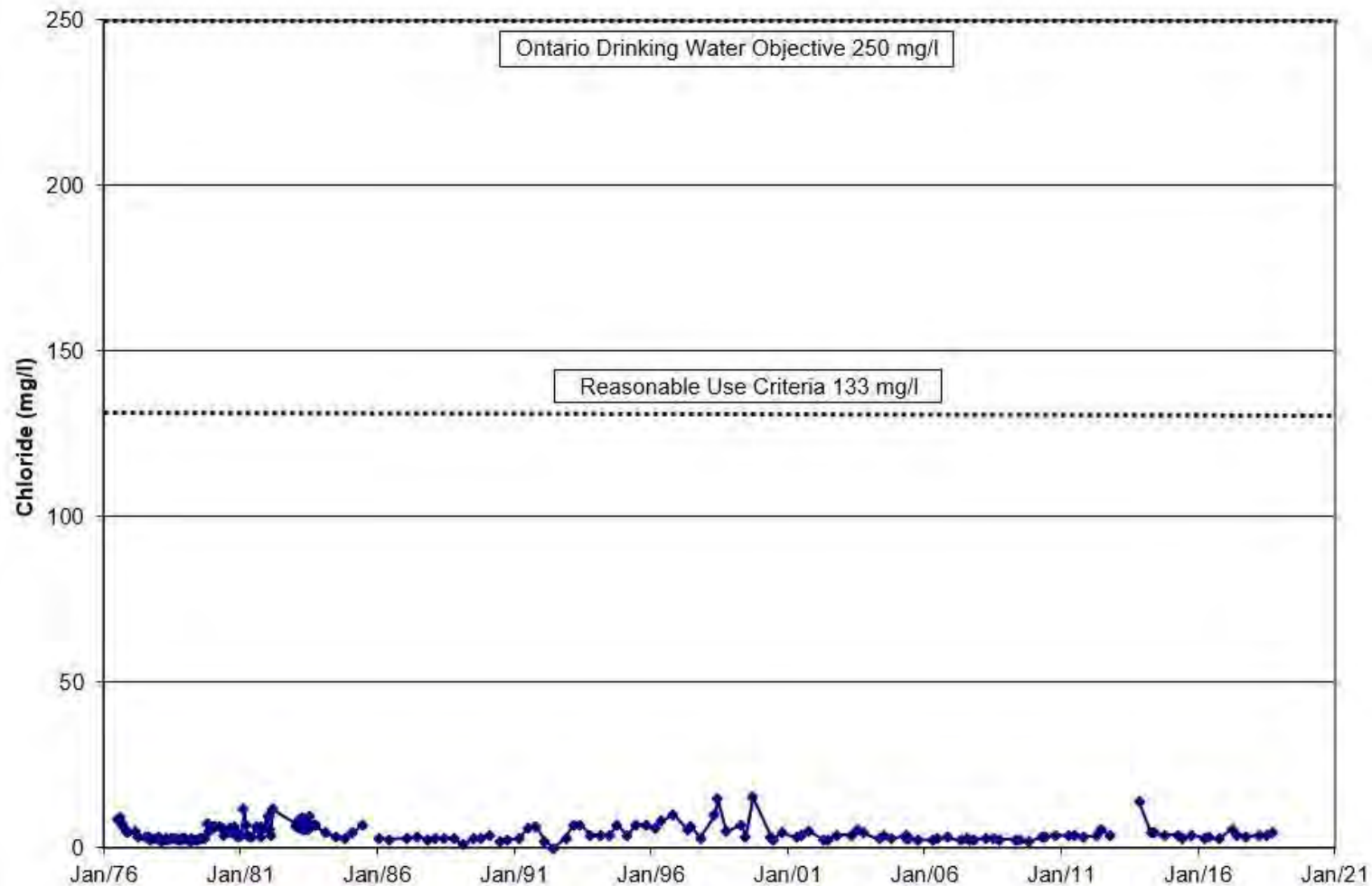
(untreated/have not gone through natural attenuation)

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



Monitoring Well 13-1a Upper Aquifer

W12A Landfill
Upper Aquifer Monitoring Well #13-1a

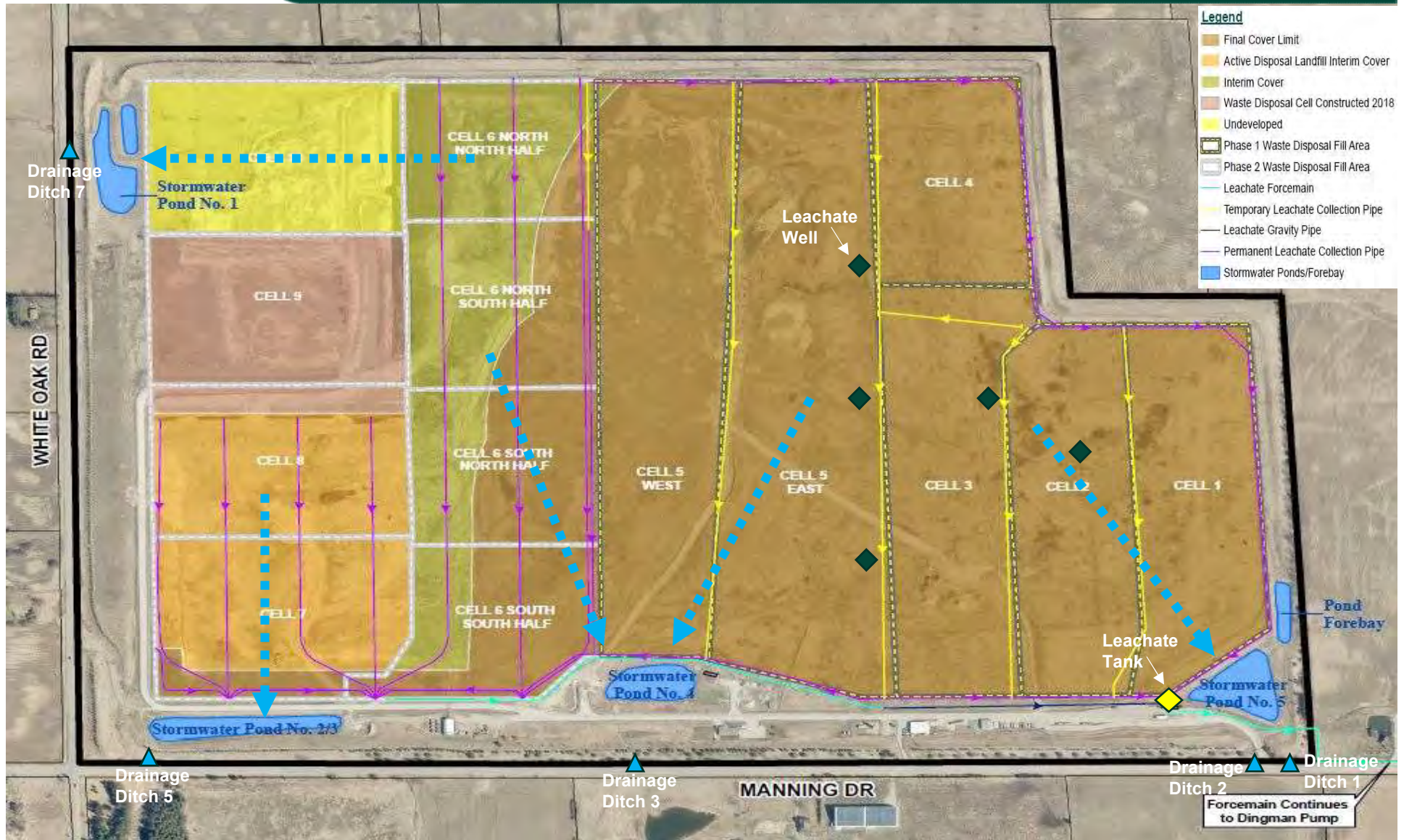




Future Groundwater Study

- Additional field investigations as part of EA
- Aamjiwnaang has engaged consultant to do peer review of additional work
- Propose to present findings to all First Nation communities who are interested
- Expect to happen in 1 to 2 months

Surface Water & Leachate Management





Leachate Collection System

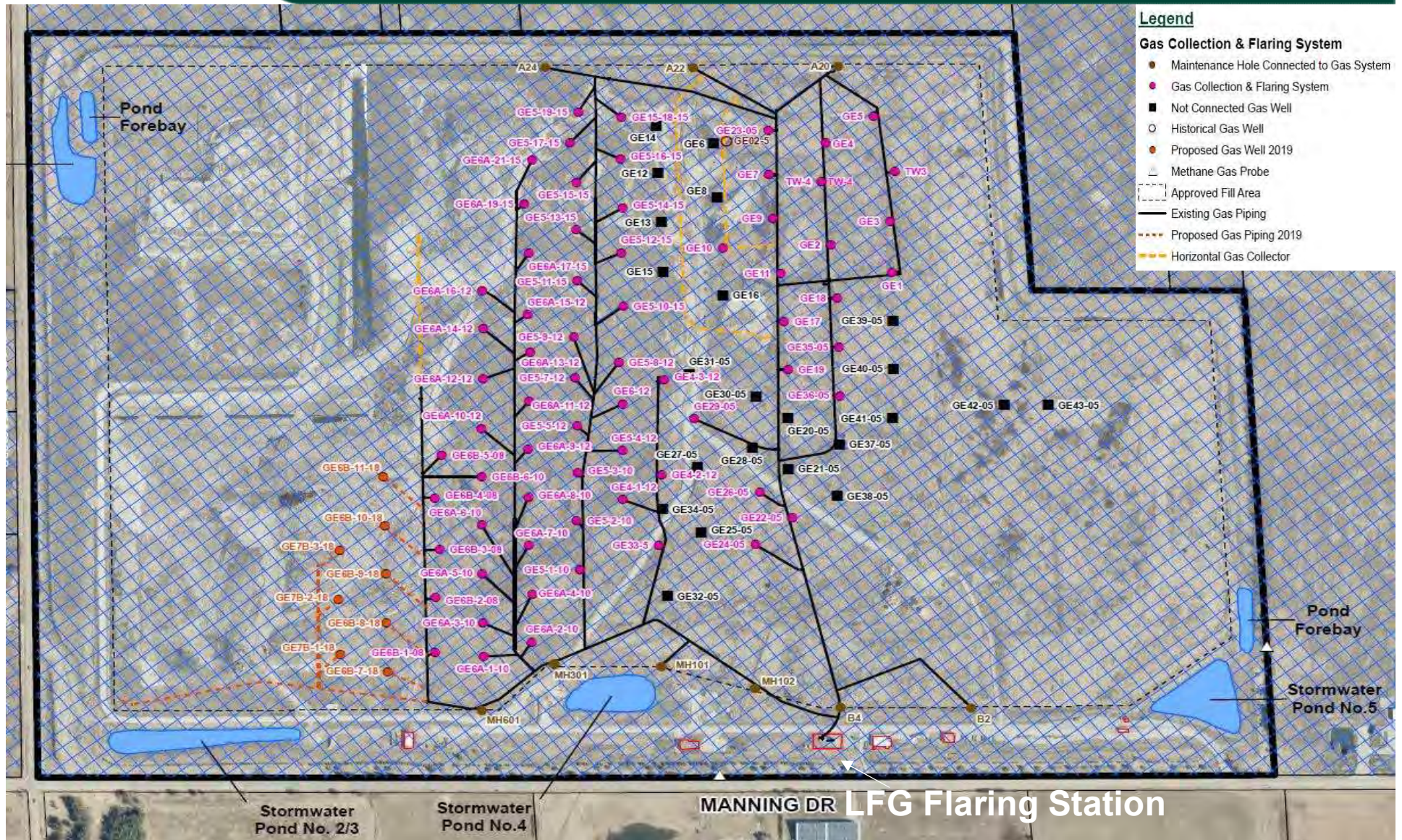




LFG Management



LFG Management





Annual Report

W12A Landfill Site Annual Status Report January 1 to December 31, 2018

Prepared by

City of London
300 Dufferin Avenue
P.O. Box 5035
London, Ontario
N6A 4L9



March 2019





Questions – we are here to help

W12A Landfill Annual Status Report January 1 to December 31, 2016

Prepared by

City of London
300 Dufferin Ave
P.O. Box 5035
London, Ontario
N6A 4L9



March 2016



H.06 Dragun Corporation Peer Review Letter of
Hydrogeological Background Study
(August 13, 2019)

August 13, 2019

Ms. Sharilyn Johnston
Environmental Coordinator
Aamjiwnaang First Nation Environmental Department
978 Tashmoo Avenue
St. Clair Township, ON N7T 7H5

SUBJECT: Peer-Review Letter
City of London
W12A Landfill Area Plan Study
Review of Hydrogeological Conditions and Draft Groundwater Work Plan
London, Ontario
Project #C30874-03

Dear Ms. Johnston:

Dragun Corporation (Dragun) reviewed the following documents:

- “Review of Hydrogeological Conditions Groundwater Issues at the W12A Landfill Site,” dated May 28, 2019. Dillon Consulting Limited, a consulting company, prepared this report for the Corporation of the City of London (City) W12A Landfill facility located at 3502 Manning Drive in London, Ontario (Site).
- “Draft Groundwater Work Plan, Environmental Assessment of the Proposed W12A Landfill Expansion, City of London,” dated July 2019. Dillon Consulting Limited, Golder, and the City of London (Investigation Team) prepared the draft work plan document for the Site.

Based on Dragun’s review of these documents, it was noted that the Investigation Team is proposing to conduct a number of tasks that were recommended by Dragun in the July 8, 2019, Peer-Review Letter (Dragun 2019). These tasks include the following:

- Extract pore water from clay.
- Analyze clay pore water for environmental isotopes.
- Analyze groundwater for environmental isotopes.
- Install additional soil borings north of existing landfill near Scotland Road.
- Install nested wells (only deeper wells required) east of the existing landfill.

Further review of both documents was conducted, and the following concerns were identified:

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.

Rationale: The predictive modeling used assumes 15.5 metres (m) of unfractured soil within the upper aquitard. If the angled drilling documents the presence of fractured soils to a depth of 5 to 6 m below grade, then it would not be valid to assume the entire thickness of the upper aquitard (15.5 m) has the same hydraulic conductivity values. If only unfractured hydraulic conductivity values are used, it may underestimate the chance of early breaching along preferential pathways (deep fractures).

We know that the difference in the hydraulic conductivity values for fractured versus unfractured clay could be orders of magnitude. Therefore, it is recommended that new data from the angled and vertical soil borings be used to change the model input values (till thickness, unfractured zone thickness), and we recommend updated predictive modelling runs.

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?

Rationale: There are data presented that show the influence of the municipal groundwater taking on the water levels at monitoring wells located 250 m northwest of the landfill. The zone of capture and zone of influence from this pumping activity is unknown and could have extended beneath the landfill. These pumping activities could have influenced interpretations of groundwater flow direction, chemical transport pathways, and hydraulic gradients. Therefore, evaluation of the above-listed data and information is recommended.

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.

Rationale: This issue has been ongoing for an extended period of time. We are recommending this as a potential way of resolving the 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.

Rationale: These upper aquitard wells could be constructed and installed at depths: (1) near the base of the aquitard (short well screen 1 m in length), (2) middle section (short well screen, 1 m in length), and (3) near the top of the aquitard (longer screen, 1.5 to 3 m in length). Installation of these monitoring wells within the upper aquitard allows for collection of groundwater samples for water quality and isotopes. Data collected from these wells could be used to calculate insitu hydraulic conductivity values within fractured and unfractured zones, and vertical gradients (additional modifications to the model input values). Data from the well installation could be used to verify the thickness of aquitard.

If you have any questions or require any additional information, please contact one of us at (519) 979-7300.

Sincerely,

DRAGUN CORPORATION

Christopher G. Paré, P.Geo.
Hydrogeologist

Allan Clifford Lawton, M.Sc.
Environmental Scientist

ACL/CGP/amr

H.07 Email Notifications of August 2019 Workshop

From: Abbott, Wesley <WAbbott@London.ca>
Sent: August 22, 2019 10:52 AM
To: SJohnston@aamjiwnaang.ca; fburch@cottfn.com; Oneida Environment; Stacey Phillips
Cc: Kittmer, Jane; Alikakos, Mary; 'Kell, Rob' (rkell@dillon.ca); Cliff Lawton; cpare@dragun.com
Subject: August 26 Workshop
Attachments: Attachment A -London EA-Detailed Work Plan Groundwater-DRAFT.pdf; Attachment B - 3 Peer Review Letter 2019-08-13 Draft.pdf; Groundwater Workshop Agenda August 26 2019.pdf

Aanii/Sheko:li/Hello,

Please find attached the tentative agenda for the August 26 groundwater workshop/information session. Let me know if there any changes you would like.

As mentioned in an earlier email from me (April 23, 2019), the City will cover travel and staff costs for one person to attend. Invoices for these expenses should be sent to Rob Kell, Dillon Consulting, 130 Dufferin Avenue, Suite 1400, London, ON N6A 5R2.

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



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

Subject: Peer Review of Groundwater Work Plan workshop - W12A
Location: Portables - 328 Chippewa Rd, Muncey, ON

Start: Mon 2019-08-26 10:00 AM
End: Mon 2019-08-26 2:00 PM
Show Time As: Tentative

Recurrence: (none)

Organizer: Alikakos, Mary

Aanii/Sheko:li/Hello,

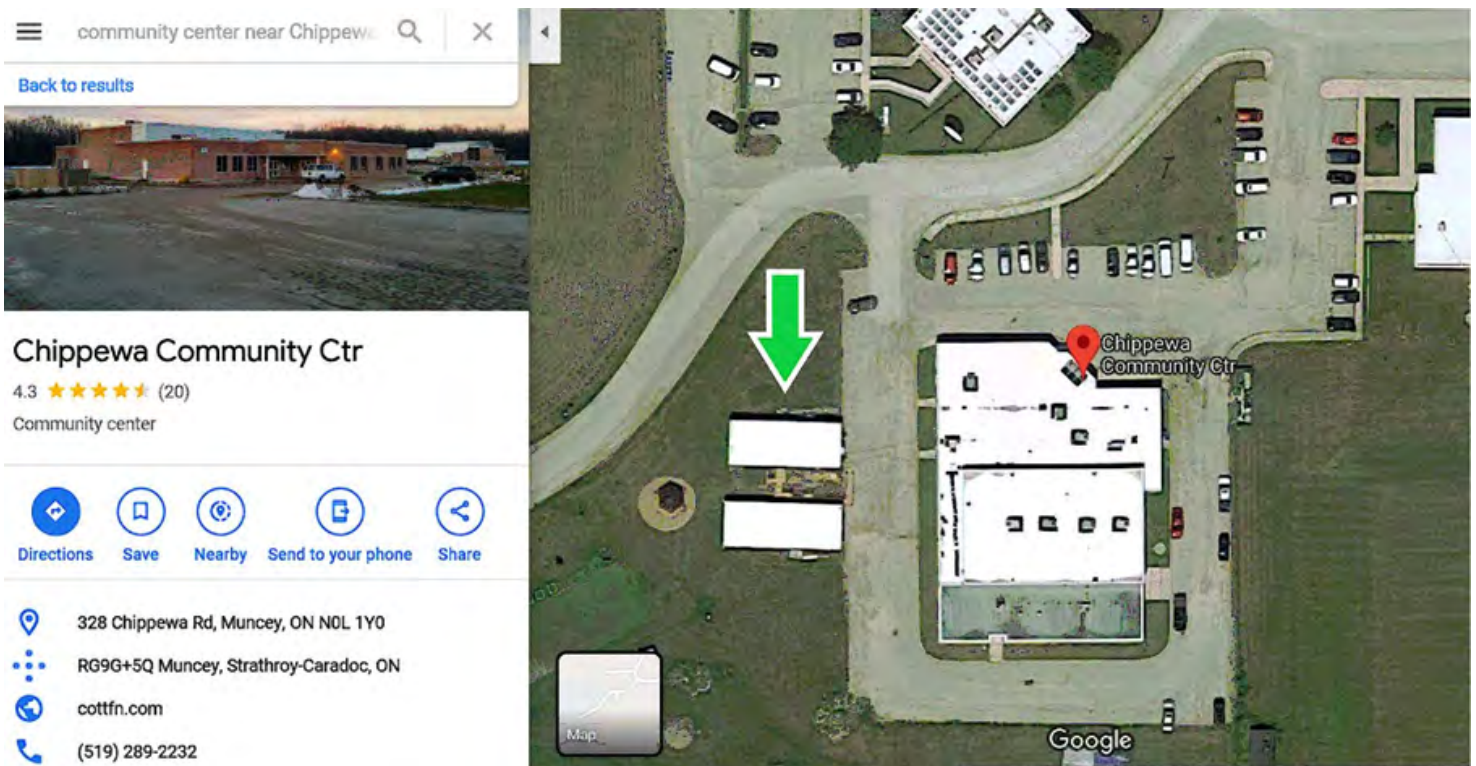
Please attend a workshop designed to discuss a peer review of the groundwater work plan for the expansion of the W12A environmental assessment, as included in the Residual Waste Disposal Strategy. Agenda to follow.

Lunch will be provided, so please indicate # of attendees and any dietary restrictions to me by COB **August 20th**.

Attached is a graphic of the location (indicated by the green arrow) and directions are as follows:

<https://goo.gl/maps/J2TZVfw2PrevtXz6> (from London)

<https://goo.gl/maps/6nc38Fg8iUqi96Rv5> (from Sarnia)



Have a good day,
Mary