TECHNICAL ADVISORY GROUP (TAG) MEETING MINUTES

Township of Woolwich
Thursday, March 24, 2022
Video Conference Hosted in Council Chambers
2nd Floor 24 Church Street West, Elmira

Present from TAG:

Tiffany Svensson, Chair
Susan Bryant, Voting Member*
Sebastian Siebel-Achenbach, Voting Member*
Katharina Richter, Voting Member*
Linda Dickson, Voting Member*
Wilson Lau, Voting Member*
Sandy Shantz, Mayor and RAC Chair
David Hofbauer, Voting Member*

Present from Staff:

Lisa Schaefer, Committee Support Specialist
Ilidia Sa Melo, Deputy Clerk*

Other:

Alan Marshall, Public*
Jason Rice, MECP*
Jamie Petznick, LANXESS*

Regrets:

Dustin Martin, TAG Voting Member

*Indicates remote participation.

Disclosures of Pecuniary Interest

No pecuniary interests were declared.

Approval of Previous Minutes

February 24, 2022

MOVED by Sebastian Siebel-Achenbach
SECONDED by Susan Bryant
THAT the February 24, 2022 Meeting Minutes be adopted.

…CARRIED

TAG reviewed page five of the meetings which stated the following:

"TAG noted that there has never been a human health risk assessment completed for the Creek."

While this was stated at the last meeting, TAG members discussed that there was a HHRA completed by the CRA in 2003 for Crompton. There was a discussion as to what was included in the 2003 HHRA. Chair Svensson will follow-up on this and report back to TAG.

New Business

Written Submissions Review

None

Territory/Land Acknowledgement for Committee and Boards of Council - Ilidia Sa Melo, Woolwich Township Deputy Clerk

Ms. Ilidia Sa Melo presented on behalf of Woolwich Township. Refer to Appendix A for a copy of her presentation. Going forward, all TAG meetings will include a territory/land acknowledgement.

Detailed Discussion and Documents Review

Project Emission Summary Table – LANXESS

Mr. Jamie Petznick presented on behalf of LANXESS. Refer to Appendix B for a copy of his presentation.

During and following his presentation, several questions were asked by TAG. Mr. Petznick confirmed that the first two contaminants (isobutanol) are the exact same compound. The difference is that the Ministry has a 10 minute averaging limit and a 24 hour averaging limit requirement. They must model against these different averages to show compliance to both

the odour thresholds and the health thresholds. He also confirmed that compounds are measured for odour standards only if Ministry regulated.

In terms of toxicity to health, Mr. Petznick responded that isobutanol tends to be on the lower hazard side from a health perspective as it will behave in the body similar to any alcohol. Primene is a higher hazard chemical. However, the risk of it getting outside where it is being handled is lower as it has lower vapor pressure.

TAG stated that the last time there was modeling, LANXESS used the rural meteorological data set for the modeling, but that suburban is more accurate for the plant. TAG would like to know which meteorological data set was used. Mr. Petznick is confident that suburban modeling was used but will confirm and report back to TAG. [Note: Mr. Petznick confirmed this via email following the meeting on March 31, 2022.]

Mr. Petznick confirmed that the four contaminants addressed in his presentation are only emitted by this new production.

Collection Treatment Systems Overview – LANXESS

Mr. Jamie Petznick presented on behalf of LANXESS. Refer to Appendix C for a copy of the presentation. During and following his presentation, discussion and several questions were asked by TAG.

Mr. Petznick confirmed that the E7 extraction well ultimately discharges to the Canagagigue Creek somewhere south of the normal effluent discharge point. He also confirmed that the 20 B Rayox UV system is an older version of the Trojan UV system. Rayox and Trojan are brand names. Rayox is the original system. The Trojan system is significantly more energy efficient from a UV perspective.

TAG noted that carbon was regenerated in a kiln on site in the past and asked if this was still the case. Mr. Petznick said yes, partially. They have been swapping out carbon and not regenerating it onsite within the 44D and 44C carbon systems. The UA system they have has not been regenerating as of late. They do regenerate wastewater carbon. The kiln is in 44B with round the clock monitoring. Carbon is mainly treating chlorobenzene; UV is for NDMA, and the ATS is for ammonia. He also confirmed that the terminology ‘trains’ refers to the UV systems and that they are housed in various buildings.

TAG asked about the connection between PW1 and PW3 to PW4 and PW5. PW1 and PW3 are no longer active. Mr. Petznick said that he could not comment on how the connection would work but did note that the lines are probably still underground, and the well hoses are still physically present. But the wells are turned off and the lines will be blanked and valved shut. He could not confirm when PW1 and PW3 were last pumped. They are mapped because they are still present. TAG requested that he report back to them on when and why these wells were

deactivated. TAG also suggested that LANXESS use different colours on the maps to indicate PW1 and PW3 are no longer active, in order to differentiate them from the active wells.

TAG discussed the rate limits of the system. They are going to refer to Ms. Linda Dickson's ECA summary that outlines details on this. Once reviewed, if there are additional questions, they will reach out to LANXESS. Mr. Petznick reminded TAG that rate limits are determined by the Ministry in the ECA.

TAG asked if there is a life expectancy on the CTS as it has already been in existence for 20 years. Mr. Petznick said that it varies by each piece of equipment. They are constantly updating and doing maintenance on the system and that overall replacement of equipment is equipment specific. He noted that parts such as the pumps have been completely replaced. The vessels themselves will have a long life span as they manage them as part of the mechanical integrity program. The pieces of the system have life spans, but they are working to ensure there are no shutdowns with a preventative plan. Items can be replaced individually over time. He said that the system is in good order.

TAG discussed the mass and how much is left based on what has been removed. Chair Svensson explained how you calculate that and noted that it is very complex but can be done. In regards to questions regarding the difference between average concentration and mass indicator, Chair Svensson said this refers to the Ricker Method Plume Stability Analysis and referred TAG members to the presentation from Mr. Joe Ricker (from October 2020) as well as the 2020 AMR.

Regarding the 2021 AMR, TAG assumes the NDMA and chlorobenzene figures are reflective of data from the initial startup of the system in 1994. In the last AMR, the report also referenced data from year to year and the last two years. This should be the case this time as well in terms of mass removal in 2021 given the capacity of the system as it will provide an effectiveness of the pulse pumping. In short, evaluating the next steps of optimization of how to run these wells from one year to the next is what TAG will be looking for as opposed to an overall number from 1994 (as the system was very efficient at the front end compared to now). Mr. Petznick indicated that Mr. Ramin Ansari is prepared to respond to this. He also referred TAG to Mr. Ramin Ansari when asked if LANXESS has a timeframe for when the CTS will have fulfilled its remediation role.

HHERA TAG Response

Mr. Wilson Lau led this section of the meeting for TAG. Refer to Appendix D for a copy of his draft technical comments for more details. Mr. Lau stated that overall, the report was very well written. He said that the difficult part of a risk assessment is always going to be the risk communication aspect. The way the information was laid out was well done and easy to read compared to other risk assessments he has come across. With that said, he outlined a few

areas of concern. His comments provided at the document are a more comprehensive version of what was discussed at the TAG February 24, 2022 meeting.

Regarding Section 3.1, a map was briefly reviewed that is an excerpt from the Township Official Plan (OP). Refer to Appendix E for a copy of the map. It was noted that the Regional Plan is much more detailed. TAG discussed that there is a hatched area in the corner of Elmira that looks to be part of the site but it is not clear. It has been recognized in the plan and the LANXESS consultant should be made aware of it in the OP. TAG noted that the wetlands onsite are not provincially significant and are not evaluated. That said, they are wetlands and should be protected. Further, in Section 3.1 it was identified that "high value forest and wetland areas" are present in the central and northeastern portion of the gravel pit area on the east side of the property. TAG feels that it should be clarified if these areas are considered to be provincially significant or areas of natural significance.

A discussion took place with all of TAG following the concerns that Mr. Lau raised regarding Section 5.1.1. A TAG member suggested a health assessment be conducted on the citizens that have lived along the shore of the creek for the past 30 years as they have been exposed at a higher rate. It was suggested that this would be better than using models. While this has been done in other assessments, it was agreed that this would be a difficult endeavor to undertake. Even asking for historical data or reviewing medical reports would be difficult given the citizens that live along the shore – the information does not necessarily exist. Even if there is data, it is difficult to tease out exposure to the creek from any number of lifestyle decisions that contribute to health history. One also has to consider genetic health predispositions and other exposures such as open fireplaces, etc. In other words, it is difficult to determine how familial health settings impact the residents in comparison to one's exposure by proximity. The Ministry has not moved forward with these types of studies as one cannot sort out the data easily and even if they could, you cannot prove in a court of law that the chemical exposure by Uniroyal caused health impacts. Sample populations are also problematic as there are not enough families to have a reliable study. A possible option would be to do an invasive test on women who live along the creek but even so, there is very little base information to go on. TAG noted that toxicological assessments look at these types of studies to establish toxicological effects and exposure. All factors that contribute to body burden are considered when they select the most sensitive, lowest threshold value. The assumption is that it is protective against that potential, but it is a data gap because we don't have a way to determine the intergenerational transfer of a chemical based on a point of exposure in time – at least not simply and quantitatively. For a toxicity assessment, TAG feels that this could be elaborated on.

In regards to Section 5.1.2, TAG discussed PPE in general. It was noted that PPE in an RA is more conceptual and that one would assume that there would be a follow-up document with a

safety plan for workers on site. TAG noted that from mapping of the site in 2005, the surface soil is contaminated with very high levels of dioxins and DDT on the east side of the property.

When discussing Section 5.3 and toxicity, it was noted that the World Health Organization states that there is no safe exposure level to dioxins. Dioxins have a very peculiar dose response depending on age and phase of life.

When discussing Section 5.4.3.2, cow pastures along the creek were confirmed to have been in existence in the past and could still exist in a limited capacity today. The Region of Waterloo's Rural Water Quality Program and the GRCA worked on getting cattle that were pastured along the creek fenced out. The GRCA did tree planting to prevent erosion as well. However, several years ago, there was a microburst and half of Elmira was flooded. The fencing was impacted and cattle were seen in the creek.

It was also discussed and agreed that Mr. Lau's statement would be augmented to include the following language (in bold):

"Furthermore, the conclusion of negligible risk for vegetation/garden produce potentially cultivated in contaminated sediment/soil ***which locally is sourced*** from the creek cannot be justified based on these observations related to farm products from animals- as chemical uptake for plants and animals are fundamentally different."

TAG discussed the hotspots that Ms. Susan Bryant suggested be removed at the TAG meeting on February 24, 2022. All hotspots are small depositional areas. They have been confirmed even after the spring freshet (flush). They are low hanging fruit in terms of removing the areas where there is recognized elevated contamination. The areas are vegetated but not treed. The potential damage to the ecology of the area by this type of remediation was raised. TAG agreed that contaminants are going to escape no matter what you do but it will all escape if there are no controls. One must be mindful of potential future risks and TAG will consider everyone's concerns as they move forward with feedback to LANXESS.

TAG noted that since the early 1990s, a huge amount of effort has been spent on the contaminated aquifers. However, the only exposure to the wider environment that anyone has to the impacts from Uniroyal is the creek (other than air). And yet, nothing has been done to address the creek contaminants that are much more toxic than NDMA or chlorobenzene to human beings and creatures and last in the environment for a very long time. While the aquifers are important, we need to focus on both as if the contaminants in the creek could be mobilized, they will go into the Grand River and will impact our Region's water supply. All sources of drinking water should be a priority.

It was agreed that Chair Svensson will use Mr. Wilson's Lau's comments from tonight as well as Ms. Susan Bryant's comments regarding hotspot removal from the TAG February 24, 2022

meeting to develop TAGs official written response to LANXESS. Once drafted, TAG will further discuss if needed. It not required; Chair Svensson will submit the feedback on behalf of TAG.

LANXESS Monthly Progress Report - February 2022

This was deferred to the next TAG meeting.

Correspondence and Documents received since last TAG meeting

The Township keeps a list of all documents received. To review any documents, contact Ms. Lisa Schaefer.

Next Meeting

It was agreed that RAC would meet next month and TAG in May and possibly June.

Adjournment

The meeting adjourned at 9:17pm
Recorder: L Schaefer

Appendix A, TAG Meeting -
March 24, 2022

Meaningful Territory Acknowledgements

- We have adopted this long-standing practice from Indigenous Peoples who use them to acknowledge hosts, express gratitude, and state intentions.
- We do this to reaffirm our commitment and responsibility in improving relationships between nations and to improving our own understanding of local Indigenous peoples and their cultures.
- We do this to actively work toward reconciliation.

WHEN DO WE DO A TERRITORY ACKNOWLEDGMENT?

- Council and Committee of the Whole meetings at the Township of Woolwich
- At Committee of Council meetings – Advisory Committees.
- At Township board meetings – Business Improvement Area (BIA)
- Other Events as appropriate.

DO

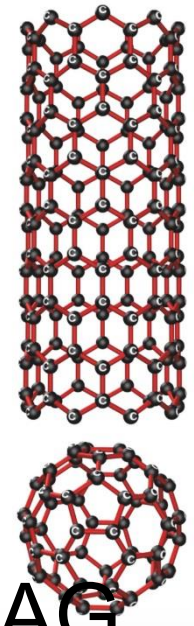
1. Township is on Territorial Land. Acknowledgement is done at the start of the meeting.
2. Practice pronunciations.
3. Keep it simple, stay on topic, and speak from the heart.
4. Recognize that Indigenous Peoples continue to have a relationship to the land, it is not only historical.
5. Focus on resiliency of Indigenous Peoples.

DON'T

Don't stray	Don't stray too far from the purpose of a territory acknowledgement.
Don't feel	Don't feel pressure to innovate every time.
Don't read	Don't read a script, do use notes to help guide you.
Don't feel	Don't feel bad if you make a mistake – acknowledge, apologize, and remember for next time.
Don't let	Don't let this be your only action to advance reconciliation with Indigenous Peoples.

TERRITORY STATEMENT

“The land on which we meet has been here from time immemorial. People have inhabited southern Ontario for about 10,000 years and we acknowledge the Neutral people also called Attawandaron *(Add-a-won-da-run),* Anishnaabe *(pronounced Ah-nish-naw-bay)* and Haudenosaunee *(pronounced Ho-den-oh-show-nee)* people who lived here when settlers arrived and who share this land with us. May we together learn to care for and respect each other, our flora and fauna, and the land we inhabit together.”



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Appendix B, TAG
Meeting, March 2022

Elmira – New Additin RC 3740 Production

March 22, 2022

TAG & CAP March/April 2022

PUBLIC

LANXESS Elmira Site ECA Requirements

- 12.1 The Company shall notify CPAC thirty (30) days prior to or as soon as possible of any Modification which increases the contaminant emission and/or discharges new contaminants from the Facility.
- 12.2 The Company shall notify CPAC on any Modification, specified in Condition No. 12.1, by providing CPAC the following:
  - (a) written description of the Modification;
  - (b) a summary of contaminant emission sources;
  - (c) a summary of dispersion modelling results, including:
    - (i) the contaminants discharged from the facility;
    - (ii) the CAS numbers, estimated emission rates, calculated maximum point of impingement concentrations and Ministry standards for the contaminants;
    - (iii) the dispersion calculations and the type of model used for the calculations.

Modification Summary

All emissions are calculated from Bldg. 19 vent stack

Production of Additin RC3740

- The site plans to initiate production of Additin RC3740 sometime in May.
- This product is currently manufactured at a LANXESS site in Europe.
- ADDITIN® RC 3740 is an ashless antiwear and EP additive for metal-free metalworking fluids. The treatment levels are in the range 0.2 to 1.5 % by weight depending on application. Its use can enhance the surface finish of the workpiece and improve the tool life.

Additin RC 3740 Process Emissions

Parag

Additin RC 3740

Project Emission Summary Table
LANXESS Canada Co./Cie.
Elmira, Ontario

Contaminant	CAS No.	Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu g/m^3$)	Averaging Period (hours)	MECP POI Limit ($\mu g/m^3$)	Limiting Effect	Regulation Schedule #	Percentage of POI Limit
Isobutanol	78-83-1	2.67E-03	AERMOD v. 19191	11.2	10-min	2340	Odour	Sch. 3 - B1	0.5%
Isobutanol	78-83-1	2.50E-04	AERMOD v. 19191	0.037	24	4600	Health	Sch. 3 - B1	<0.1%
Primene	68955-53-3	1.13E-06	AERMOD v. 19191	0.00015	24	2	Health	Sch. 3 - B2	<0.1%
sec-butanol	78-92-2	4.30E-04	AERMOD v. 19191	0.064	24-min	1500	Health	Sch. 3 - B2	<0.1%

Notes:

Sch. 3: Refers to Standards in Schedule 3 of O. Reg. 419/05.
B1: Benchmark 1 Value - Standards and Guidelines
B2: Benchmark 2 Value - Screening Levels

POI = Point of Impingement

Appendix C, TAG Meeting,
March 24, 2022

QUALITY WORKS.

LANXESS Elmira TAG Update

Jamie Petznick

Technical Advisory Group; March 24, 2022

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Agenda

Overview of the LANXESS Groundwater Treatment Systems

History of the Treatment System

Target Rates and Well Capacity

AMR Summary

Path Forward for 2022

Overview of the LANXESS Groundwater Treatment Systems

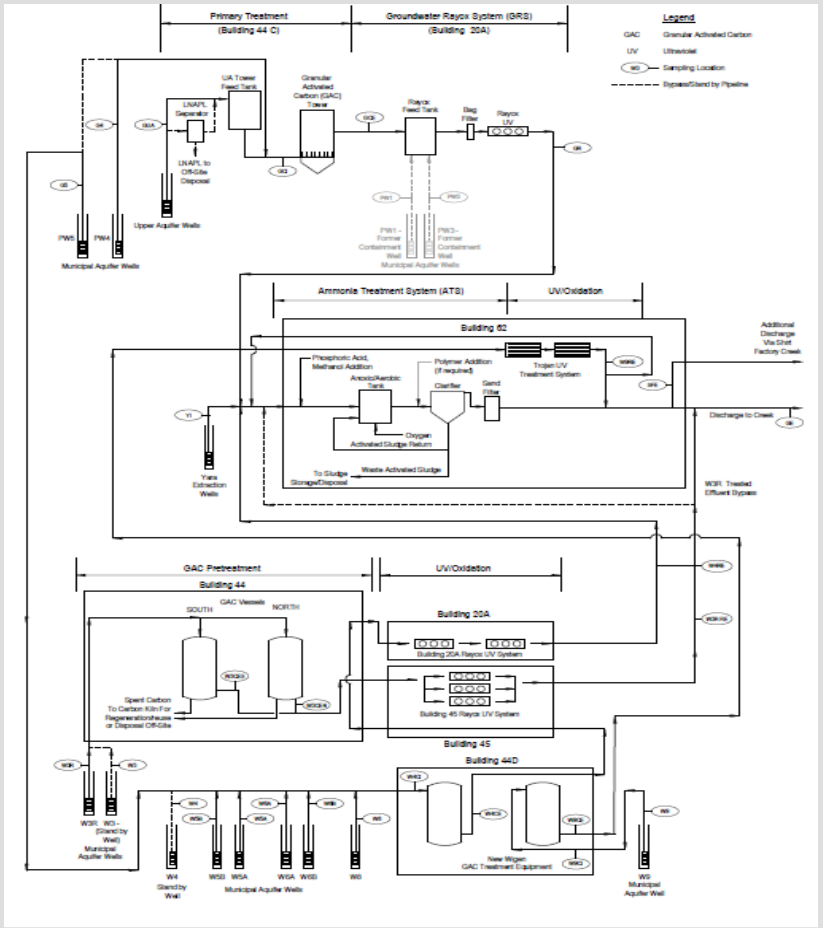
- The Combined Treatment System (CTS) at LANXESS is comprised of the following:
  - On-site Containment System
    - > PW4, PW5*, Upper Aquifer (UA) Wells (9 wells in total plus RPW8)
    - > UA Carbon Feed Tower
    - > Building 20A “A” Rayox (Ultra Violet [UV] treatment)
  - Off-site Groundwater Extraction and Treatment System
    - > W3R, W5A/B, W6A/B, W8, W9
    - > Building 44C and 44D Carbon Adsorbers
    - > Building 20A “B” Rayox, Building 45 Rayox, Trojan UVPhox
  - Ammonia Treatment System
  - E7 Well and Rayox System

    * Groundwater from PW5 is directed to off-site treatment system components due to treatment capacity restrictions under normal operating conditions

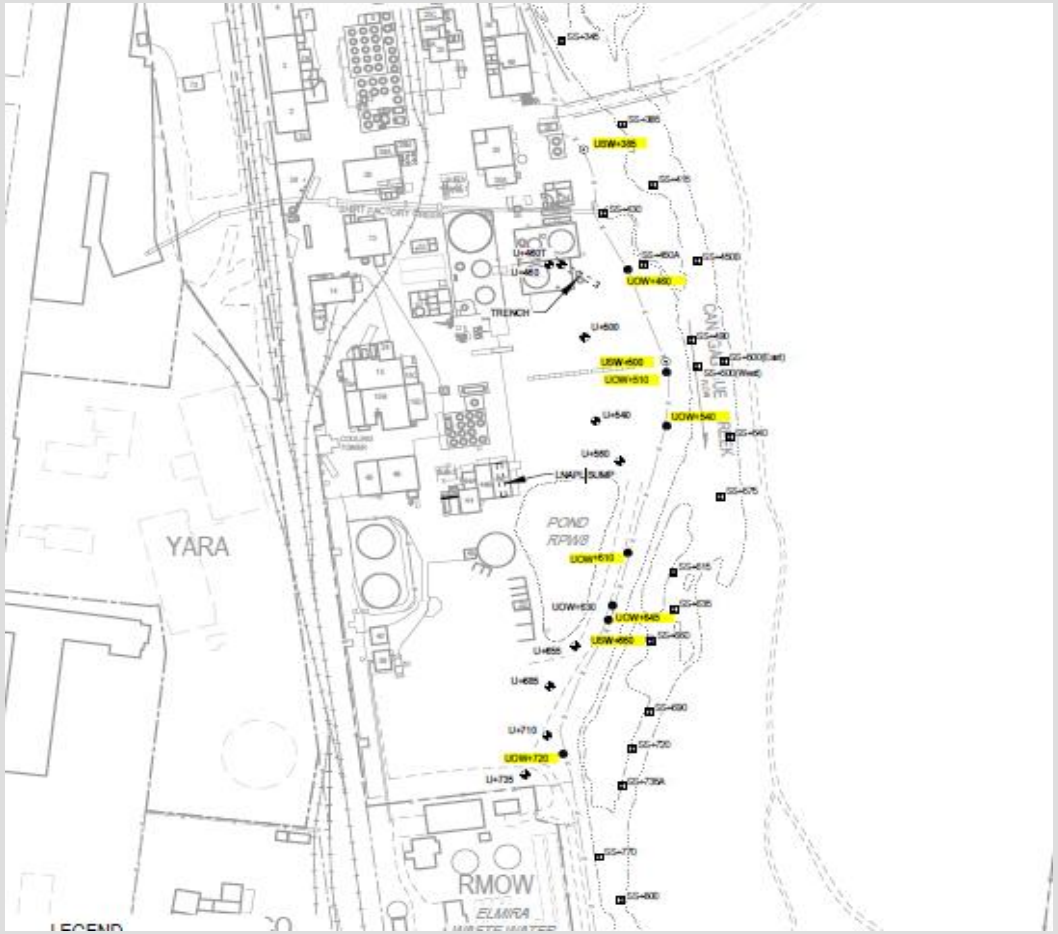
General Layout of the LANXESS CTS

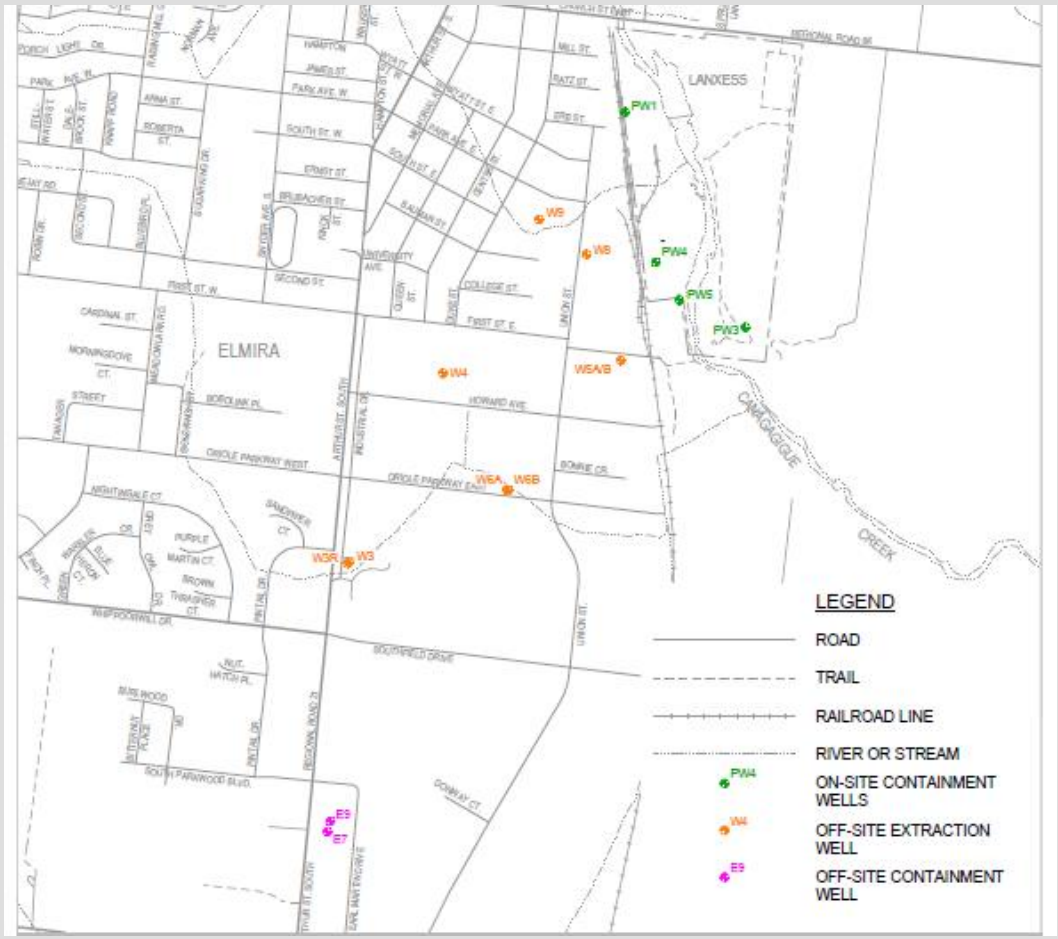
- PW5 (MU) - 44D carbon, 20 B Rayox UV, ATS
- PW4 (MU) – 44C UA carbon, 20 A Rayox UV, ATS
- UA CTS wells - (UA) – 44C UA carbon, 20 A Rayox UV, ATS
- W3R (MU) – 44C carbon, 45 Rayox UV – discharged
- W4 (ML) – Turned off
- W5A (ML) – 44D carbon, 20 B Rayox UV, ATS
- W5B (MU) – 44D carbon, 20 B Rayox UV, ATS
- W6A (ML) – 44D carbon, 20 B Rayox UV, ATS
- W6B (MU) – 44D carbon, 20 B Rayox UV, ATS
- W8 (MU) – 44D carbon, 20 B Rayox UV, ATS
- W9 (ML) – 44D carbon, Trojan UV– discharged

Notes: UA = upper aquifer MU = upper municipal aquifer, ML = lower municipal aquifer



On-Site & Off-Site Containment System Well Locations





Evolution of the CTS

- On-site Containment and Treatment System (UA CTS) commissioned in 1991.
- RMOW constructed and commissioned E7/E9 UV/oxidation system in 1991.
- Ammonia Treatment System (ATS) system constructed in 1998.
- Off-site CTS commissioned in 1998 (W3 & W4) and 1999 (W5A/B).
- PW5 added in 2008.
- ATS upgraded in 2011 to accommodate increased off-site groundwater flows
- Expanded in 2017 as a result of the 2015 Modelling Report recommendations
- W4 shut down in 2017 as chlorobenzene concentrations in this well were consistently below the Ontario Drinking Water Standards
- E7 commenced with pulse pumping in 2020 as NDMA concentrations are consistently below detection limits after a few months of pumping.

Target Rates and Well Capacity

- Off-site target pumping rates historically set at 90% of calculated well yield determined immediately after initial well development and testing
- PW4 and PW5 have a combined target rate because they interfere with each other
  - PW4 and PW5 target rate based on their maximum well yield, not their capture zone, and includes a very significant buffer
- UA CS has no target pumping rates, compliance is performance based
- Historic pumping target rates at W5B were curtailed to prevent interference with PW4 and PW5
- Recently target rates have been established considering using well yield, capture zones, and have considered the potential for any interference between wells.

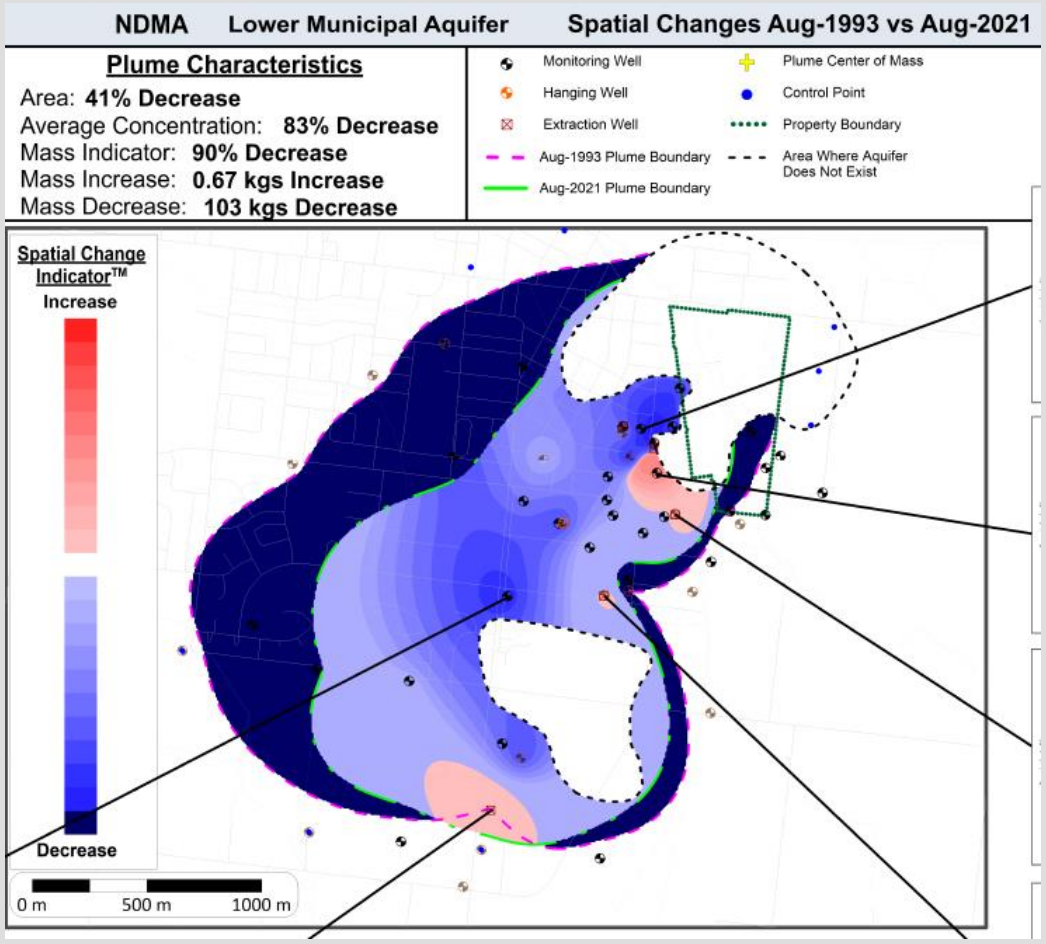
LANXESS Groundwater Treatment Systems

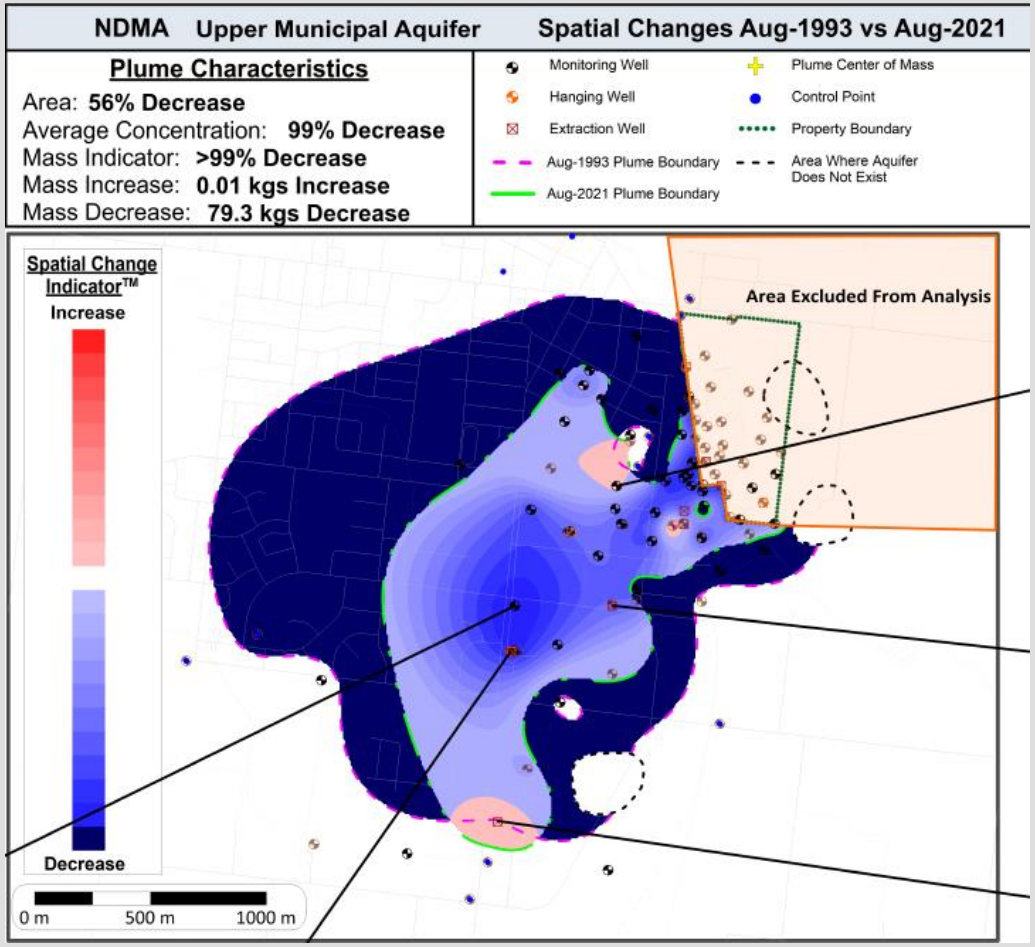
- Each well and treatment system has a specific flow and treatment capacity.
- Wells are limited by their yield which generally reduces over time and necessitates rehabilitation
- UV treatment systems have flow and chemical loading limits and require constant maintenance and repair
- Carbon Adsorption Systems have minimum residence times and flow limits. Over time the chemical binding sites on activated carbon become depleted and require frequent backwashing and eventually need to be replaced

Annual Monitoring Report (AMR) Summary

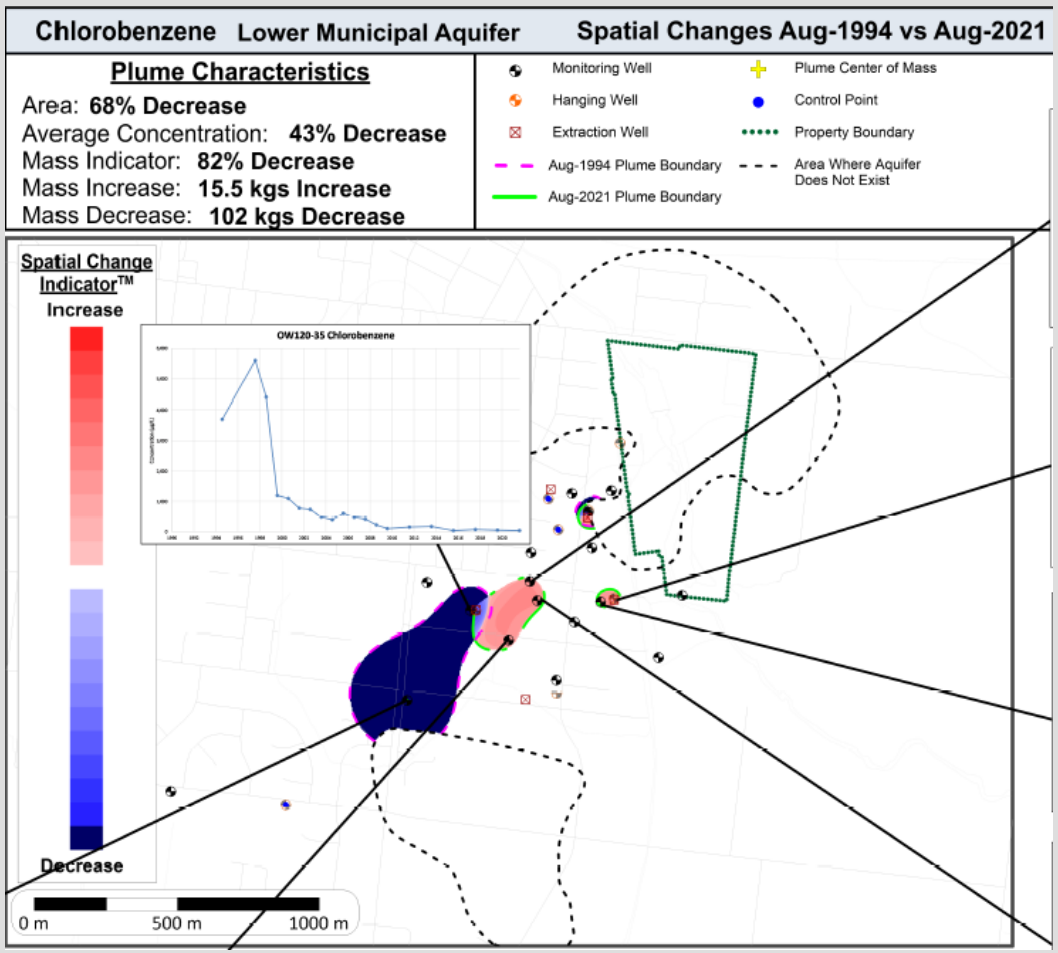
- Surface water sampling of Canagagigue Creek has revealed **no evidence of adverse effects** from surface water runoff, storm water outfall discharges, groundwater discharge and treated groundwater effluent discharges from the site in 2021.
- Containment wells PW4 and PW5 provided hydraulic containment of on-site MU groundwater beneath the southwest corner of the site.
- Capture zones of the off-site wells are larger than the extent of the plume.
- The pulse pumping at E7 along with W3R effectively contained the southern limit of the MU and ML NDMA plumes.

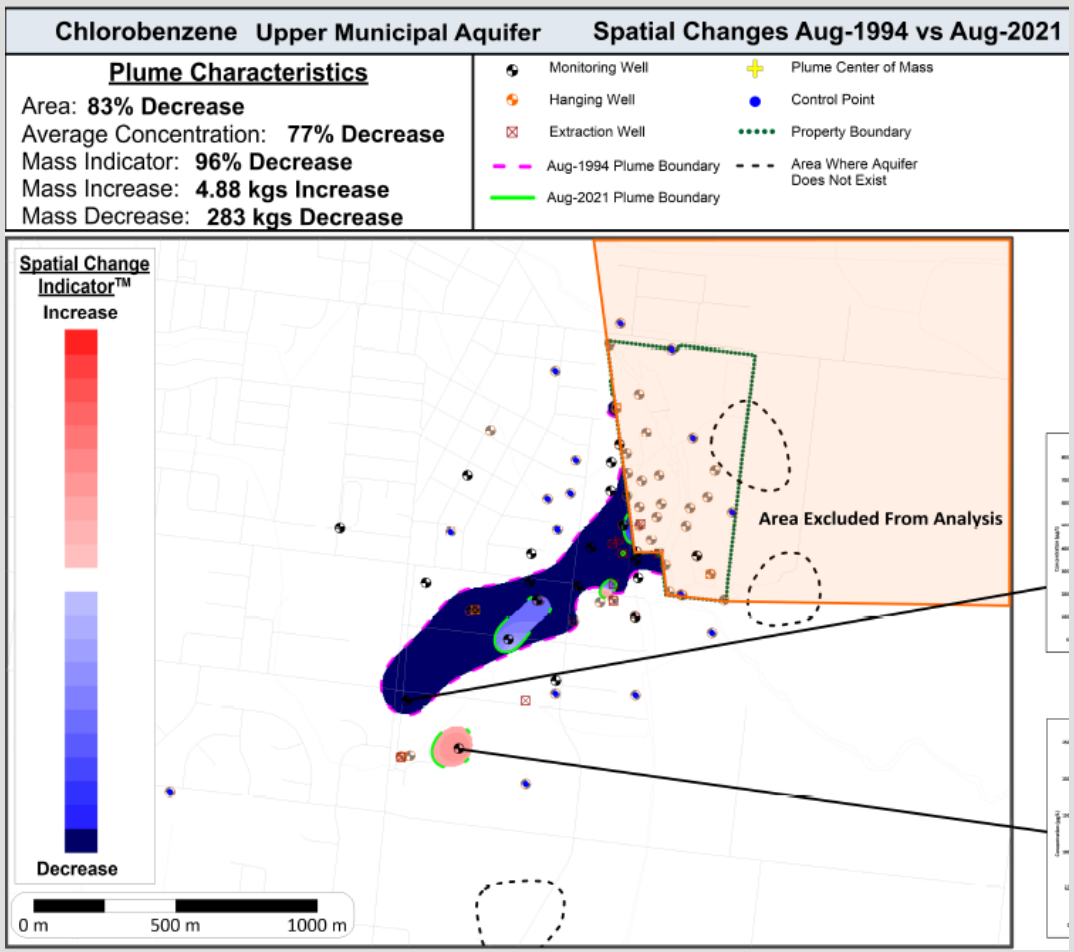
NDMA Plume Over Time





Chlorobenzene Plume Over Time





Path Forward for 2022

- The average daily pumping rates are designed to provide hydraulic containment of the plume and extract contaminant mass from the plumes. In general, the wells are pumped at the maximum rate they can sustain.
- The off-site CTS extraction wells should operate with the goal of maximizing off-site contaminant mass removal without compromising on-site groundwater containment.
- UA groundwater elevations are monitored, and UA CTS pumping rates are adjusted to optimize containment accordingly.
- Pulse pumping of E7 will continue in 2022 to maximize remaining mass removal from this well location. At some point in the near future, this well will be expected to be shut-down (but monitored) once ODWS are achieved.

Summary of Anticipated CTS 2022 Work

- Weekly sampling of the CTS
- Continuous monitoring and operation of the combined CTS
- Updating and maintaining Combined CTS standard operating procedures
- Continuous monitoring UA CTS and adjustment of pumping as required
- Rehabilitation of PW4, PW5 and select off-site and UA CTS Wells
- Continue with the Pulse Pumping of E7 in 2022
- Replacement of UV lamps on an as needed basis
- Inspection and replacement of pressure relief devices on the combined groundwater treatment system
- Cleaning of PW4 and PW5 force main
- Inspection and cleaning of air relief and drain chambers associated with the off-site groundwater extraction wells
- Replacement of Activated Carbon in building 44D and 44C as required
- Inspection of treatment system tanks and vessels as required
- Completion of replacement UA CTS extraction wells
- Verification of combined CTS instrument interlocks and safeties as required by LANXESS
- Repairs and upgrades to the UA Carbon Tower
- Scheduled shutdown and inspection of CTS electrical and instrumentation systems
- Shutdown and inspection of the Trojan UVPhox system

QUALITY WORKS.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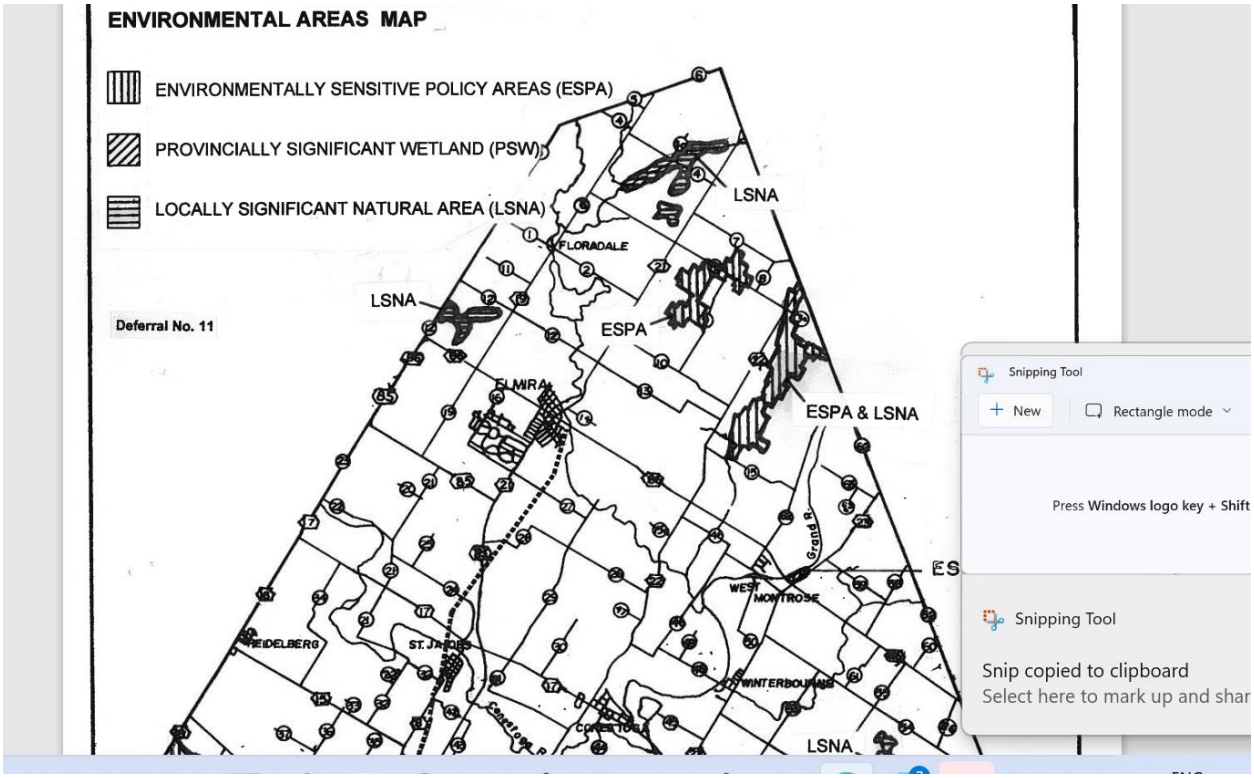
Appendix D, TAG March 24, 2022 Meeting



APPENDIX E, TAG MARCH 24, 2022 MEETING

TAG COMMENTS ON HHERA

On February 16, 2022, LANXESS Canada Co./Cie (LANXESS) provided a Draft Human Health and Ecological Risk Assessment (HHERA) document for review by TAG, entitled "Risk Assessment – Canagagigue Creek, Elmira, Ontario" (Draft Report) (Stantec, February 16, 2022). Stantec and GHD, on behalf of LANXESS, also presented the overall findings of the HHERA to TAG during the February 24, 2022 TAG meeting. TAG provided preliminary feedback on the draft HHERA findings following a question and answer period during this meeting.

The following written submission provides TAG's supplemental comments on key aspects of the February 24th detailed discussions for the draft HHERA report. TAG looks forward to LANXESS's consideration of these comments.

Section 3.1 - Physical Setting of the Study Area

In page 3.4, it was identified that "high value forest and wetland areas" are present in the central and northeastern portion of the gravel pit area in the east side. It should be clarified if these areas are considered to be provincially significant or areas of natural significance.

Section 4.3.1 – Sediment Screening

Sediment PAHs exceeded their respective ISQG values, but were not considered to be COPCs as the concentrations were below CCME PELs or MECP LELs (where available). Both the CCME SeQG and MECP PSQGs indicate concentrations of chemicals in sediment that can affect fish or sediment-dwelling organisms; however, they make no consideration of the potential for adverse human health effects. Furthermore, the sediment sampling location with elevated concentrations of PAHs, 0+494, is downgradient of MISA0800 and near historical municipal landfills. Municipal solid waste can be a potentially contaminating activity (burning waste, etc.) which could lead to sediment contamination by PAHs. Given that there may be situations where potential human health concerns can be associated with contact to PAH-contaminated sediment (i.e. swimming, wading, ingestion) or by other exposure routes (e.g. fish/shellfish consumption, flooding resulting in sediment transfer to soils), the absence of suitable screening levels for human health presents a data gap in the HHERA.

Section 4.5 – Identification of COPCs in Groundwater

Shallow groundwater and water table information from the 2021 Comprehensive East Side GW Report and GHD Draft Creek CSM should be included in this section. It is noted that for sites where the depth to the water table is shallow (e.g. less than 3 mbgs), the Table 8 SCS may not be suitable, due to concerns associated with the vapour intrusion pathway.

Section 5.1.1. Identification of Receptors (HHRA)

The HHRA makes the assumption of a Farmer/Resident being exposed to DDT in soil/sediment for 60 days a year (i.e. seasonally, mostly during the summer months and then less frequently in the fall months); this is considered to be a short-duration exposure as opposed to a chronic exposure. DDT cancer risks are then estimated by dose averaging over a lifetime and comparing to a cancer slope factor which was derived from chronic (i.e. lifetime) animal studies – potentially underestimating short-term health risks and/or lifestage-dependant sensitivities. Generally, dose averaging for carcinogens can only be supported when the short-duration exposure and the dose averaged daily exposure can be demonstrated to be

toxicologically equivalent, e.g. by considering mode of action, duration of effects, and elimination half-life of the chemical. In this regard, the Toxicity Assessment in Section 5.3 does not provide sufficient rationale to support the TRV and anticipated exposure scenario for DDT.

Section 5.1.2 – Identification of Human Health Exposure Pathways

In Table 5-1, "Potential Exposure Pathways for Human Receptors - Reach 4". The following concerns were noted:

i. The decision was made to evaluate direct contact to soil for Commercial/Industrial workers qualitatively by assuming the presence of risk management (i.e. PPE) to mitigate exposures. Typically, risk assessments in Ontario would be required to evaluate the potential for risk in the absence of risk management measures. Without this consideration, it is unclear how LANXESS will be able to establish suitably protective measures in the recommended HASP (i.e. risk management performance objectives, required exposure reduction, etc.).

ii. Incidental Ingestion and Dermal contact with groundwater may occur from splashing or hand-to-mouth activity during ground-intrusive activities such as excavation below the water table. If this pathway is considered to be incomplete, it should be clarified that no such work would occur in the future (e.g. utility conduit installation/maintenance, foundation repair/excavation, trenching, etc.)

iii. It was stated that no volatile COPCs were identified; however, the determination of sufficient volatility was not provided. The MECP has established that if either one of the following conditions is met, then the chemical is considered sufficiently volatile:
   - Henry's Law constant is greater than $1x10^{-5}$ atm-m^3/mol; or,
   - Vapour pressure is greater than 1.0 millimeter of mercury (equivalent to 1.0 Torr).

   Accordingly, both dioxin/furan (TEQ) with Henry's Law constants of 4.99×10^{-5} atm-m^3/mol and DDE of 4.16×10^{-5} atm-m^3/mol are potentially volatile.

Section 5.2.3 Receptor Characterization

The default skin surface areas for soil exposure from MECP (2011) were applied to sediment exposure pathways. Typically, representative skin surface areas for sediment exposure differ from those recommended for soil exposure due to the nature of activities at aquatic sites. Additional rationale should be provided justifying the application of default soil values for sediment exposures.

Section 5.3 – Toxicity Assessment

It was expected that comprehensive toxicity profiles (or selection rationale documents) for DDT and dioxins/furans would be provided in the Toxicity Assessment. Although it is acknowledged that MECP was the preferred source for TRVs, it appears that there was no critical evaluation or justification provided for final TRV selection in the draft HHRA. At a minimum, the following information should be provided for each COPC carried forward for quantitative assessment in the HHRA:

i. Information on the nature of toxicity (i.e. potential adverse health effects, threshold or non-threshold characteristics, mutagenicity, sensitive populations, etc.)

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ii. Dose response assessment (i.e. relationship between the magnitude of exposure to the contaminant from each route of exposure and the probability of the occurrence of the adverse health effects)

iii. Toxicity reference value selection (i.e. identification of toxicity limits from credible agencies, description of critical studies, point of departure, uncertainty factor, justification for selection)

Based on the information provided, the current toxicity assessment does not present sufficient rationale to support the TRV and short-term exposure scenario for DDT as discussed in the comment above.

Section 5.2.5 Exposure Estimation and Section 5.4.2.1 LOE 1: Quantification of Potential Risk

It is difficult to verify the calculated exposure estimates for composite receptors from the tables in Appendix H. For non-threshold carcinogenic effects (i.e. DDT) the calculation of the lifetime average daily dose for each life stage and any factors used to address potentially varying sensitivities, were not presented in the Appendix H tables. For transparency, it is recommended that the revised HHERA include these and any other intermediate calculations and equations used to derive exposure (and ultimately risk). For this reason, a worked example of cancer risk characterization for a composite receptor would also be appreciated in Appendix H – HHRA Calculations.

Section 5.4.2.2 LOE 2: Fish Consumption

The MECP sport fishing database were relied upon to arrive at tissue-residue concentrations which were then compared against Health Canada limits. The EMRB sampling program collects lean, dorsal, skinless, boneless muscle tissue of the fish and the consumption advisories are based on the results of this portion. Consuming any other portion may increase exposure to contaminants. For organics like DDT and dioxins and furans, partitioning coefficients in organic carbon suggest those organic chemicals would accumulate in fatty tissue, eggs, or organs. The HHRA should identify if there is any potential bias for reliance on this type of data with references to the traditional practices of the Mennonite community (e.g. whole fish consumption, organs, and/or roe).

Section 5.4.2.3 LOE 3: Consumption of Farm Products

For the consumption of farm products pathway, the qualitative assessment arrived at a conclusion of negligible risk for livestock/egg consumption based on several key assumptions: free-range chickens are not allowed to wander onto bank/floodplain soils and sediments, limited transit time of cattle crossings/grazing, and the capacity for dilution of sediment mixed with native soils in field amendments. Currently, there are no restrictions or covenants on farmland properties that would prohibit or control any of these activities. Unless there are mechanisms that prevent exposures or that efforts are taken to ensure that the community understands that these activities should be avoided or minimized, it is difficult to conclude that these risks will remain negligible based solely on the current qualitative assessment.

Furthermore, the conclusion of negligible risk for vegetation/garden produce potentially cultivated in contaminated sediment/soil sourced from the creek cannot be justified based on these observations related to farm products from animals- as chemical uptake for plants and animals are fundamentally different. There needs to be further rationale to support that conclusion, whether that is based upon review of scientific literature discussing the potential for plant uptake, or quantitative modelling.

Section 5.5 Recommendations

APPENDIX E, TAG MARCH 24, 2022 MEETING

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For the Commercial/Industrial Worker in Reach 4, it is agreed that implementation of a HASP is a sound recommendation. However, it is recommended that the HASP be developed under the supervision of a Canada Registered Safety Professional (CRSP) or equivalently qualified person.