

Municipality of West Elgin

WEST ELGIN LANDFILL SITE UPDATE



MUNICIPALITY OF
West Elgin

June 23, 2022

Presentation Outline

Topic 1: 2021 Environmental Monitoring Program

Topic 2: 2021 Design and Operations Overview

Topic 3: 2022 Spring Update

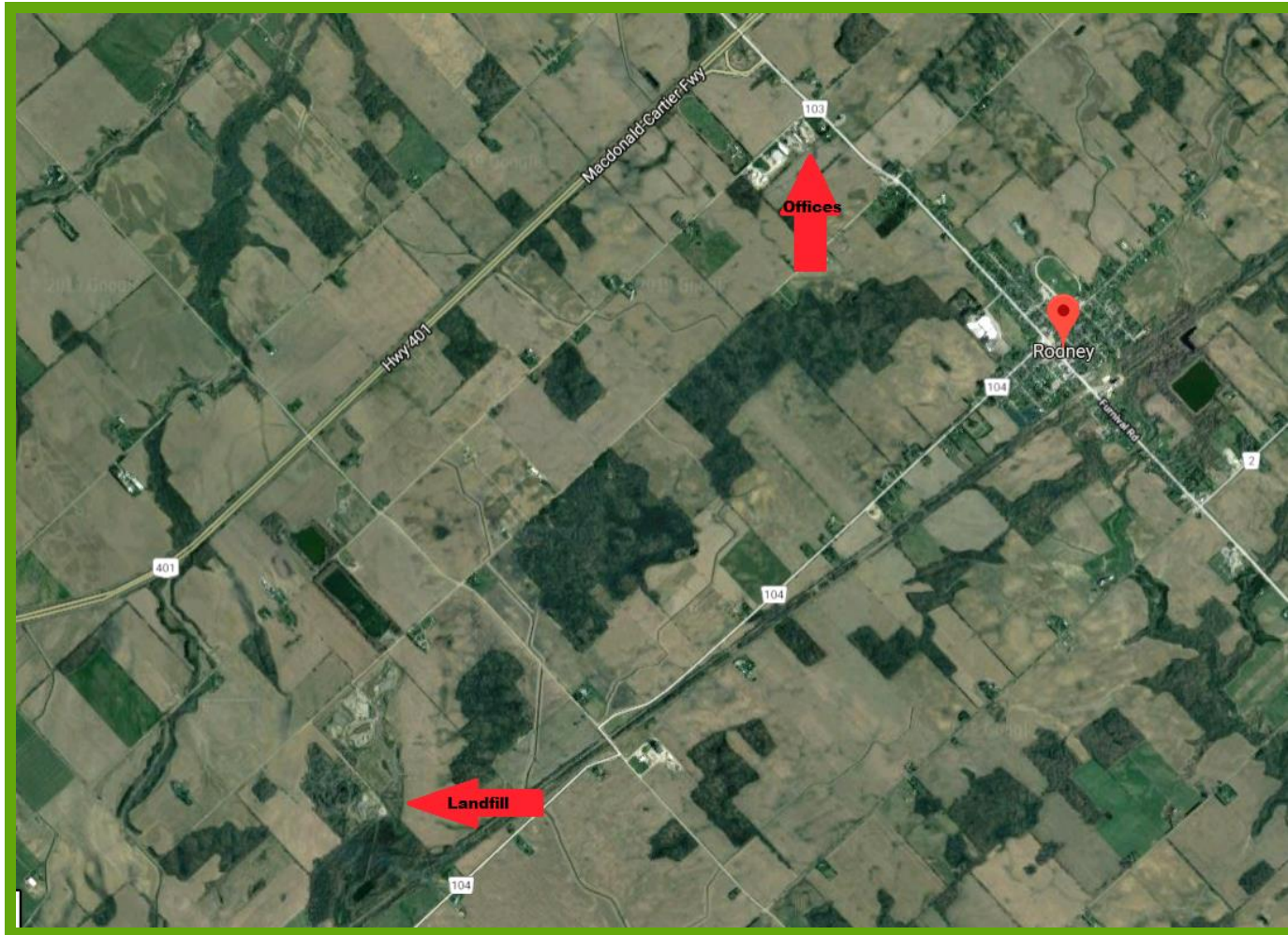
Topic 4: Future Considerations & Recommendations

Topic 1:

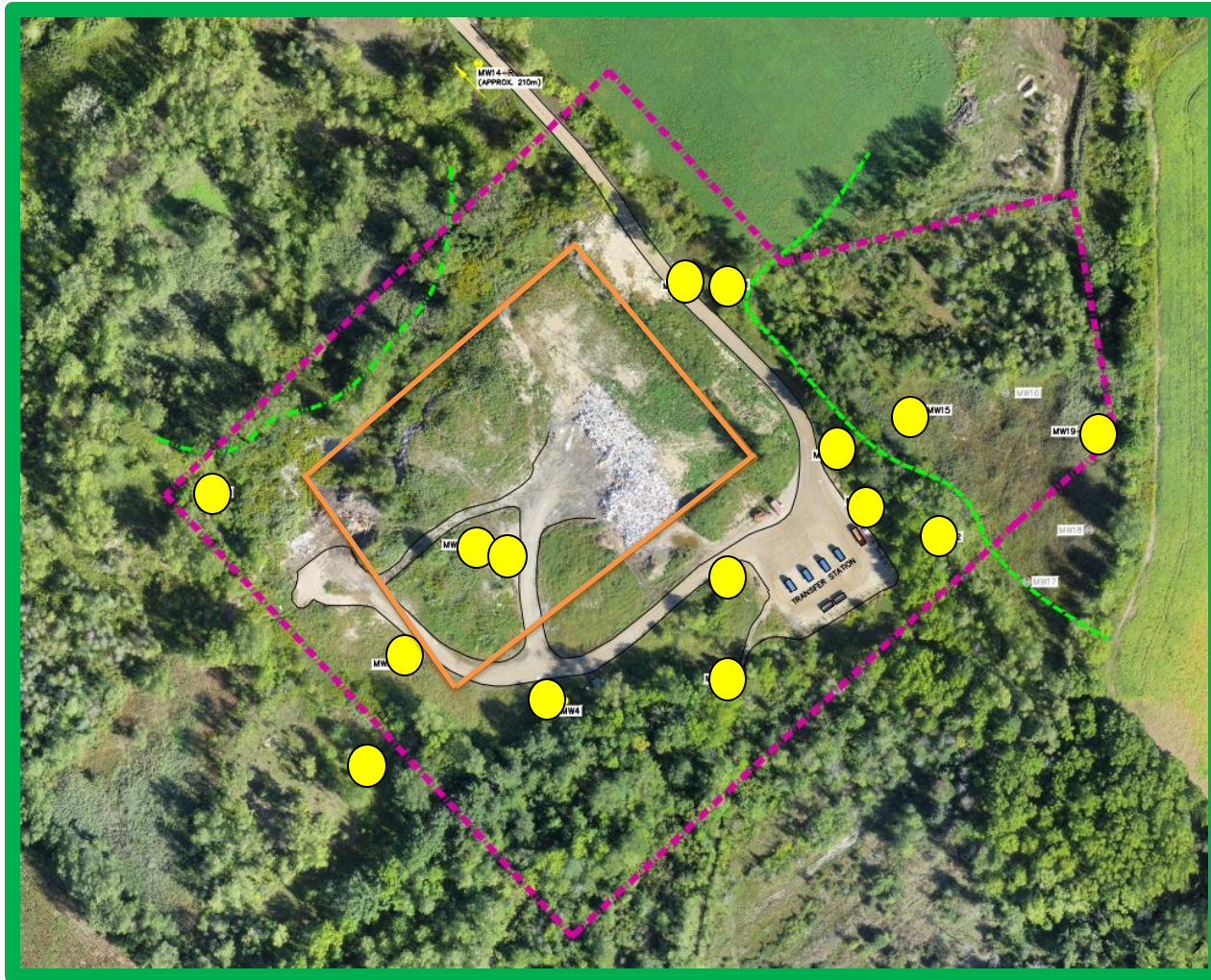
2021 Environmental Monitoring Program



West Elgin Landfill Location



West Elgin Landfill Site Plan



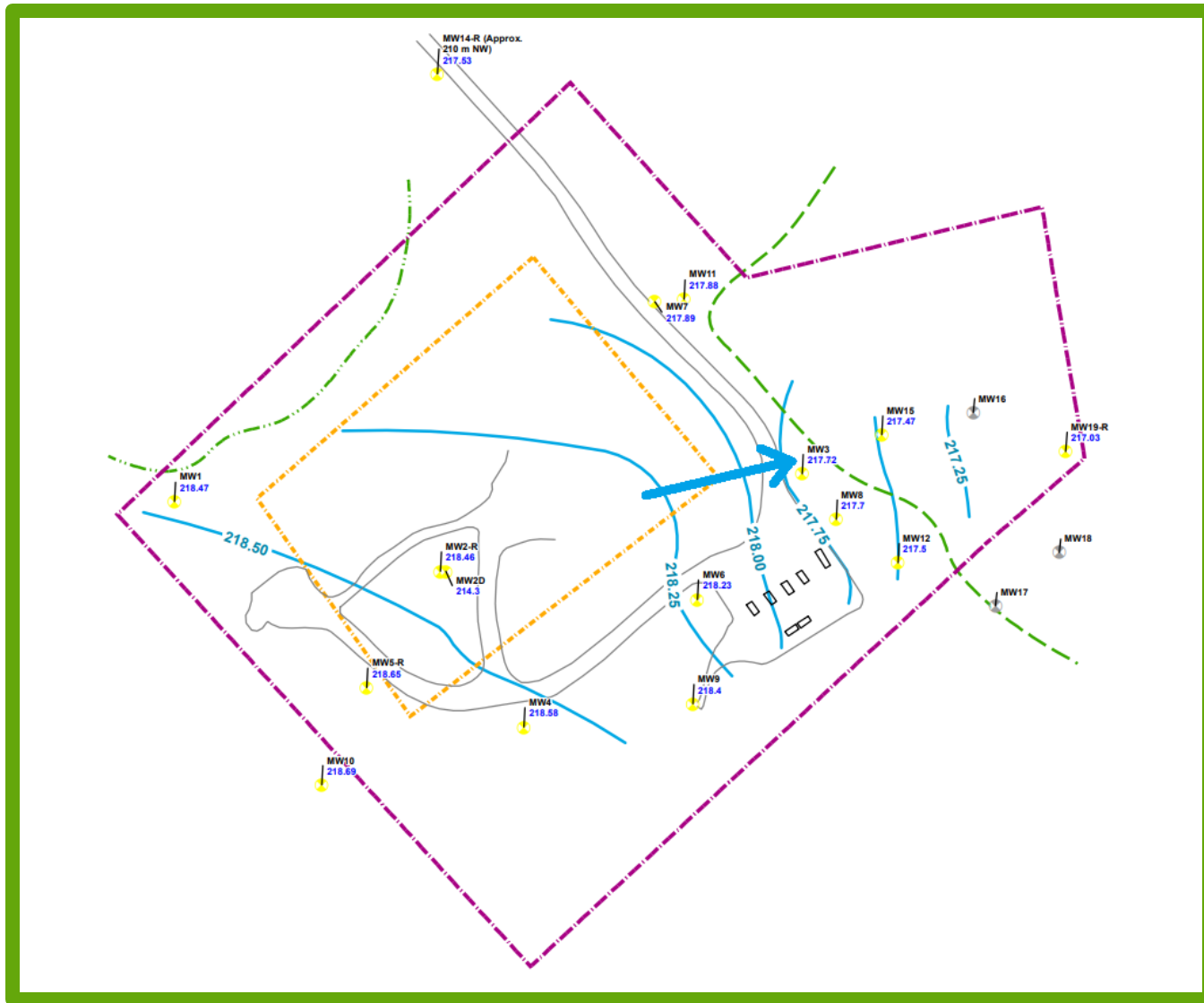
2021 Environmental Monitoring Program and Design & Operations

- Groundwater Flow Measurement, Collection of Methane Level Readings, and Groundwater Sampling (Semi-Annual)
- Operations Inspection (Semi-Annual)
- Semi-Annual Interim Reporting (to the Municipality only) and Annual Reporting to the MECP

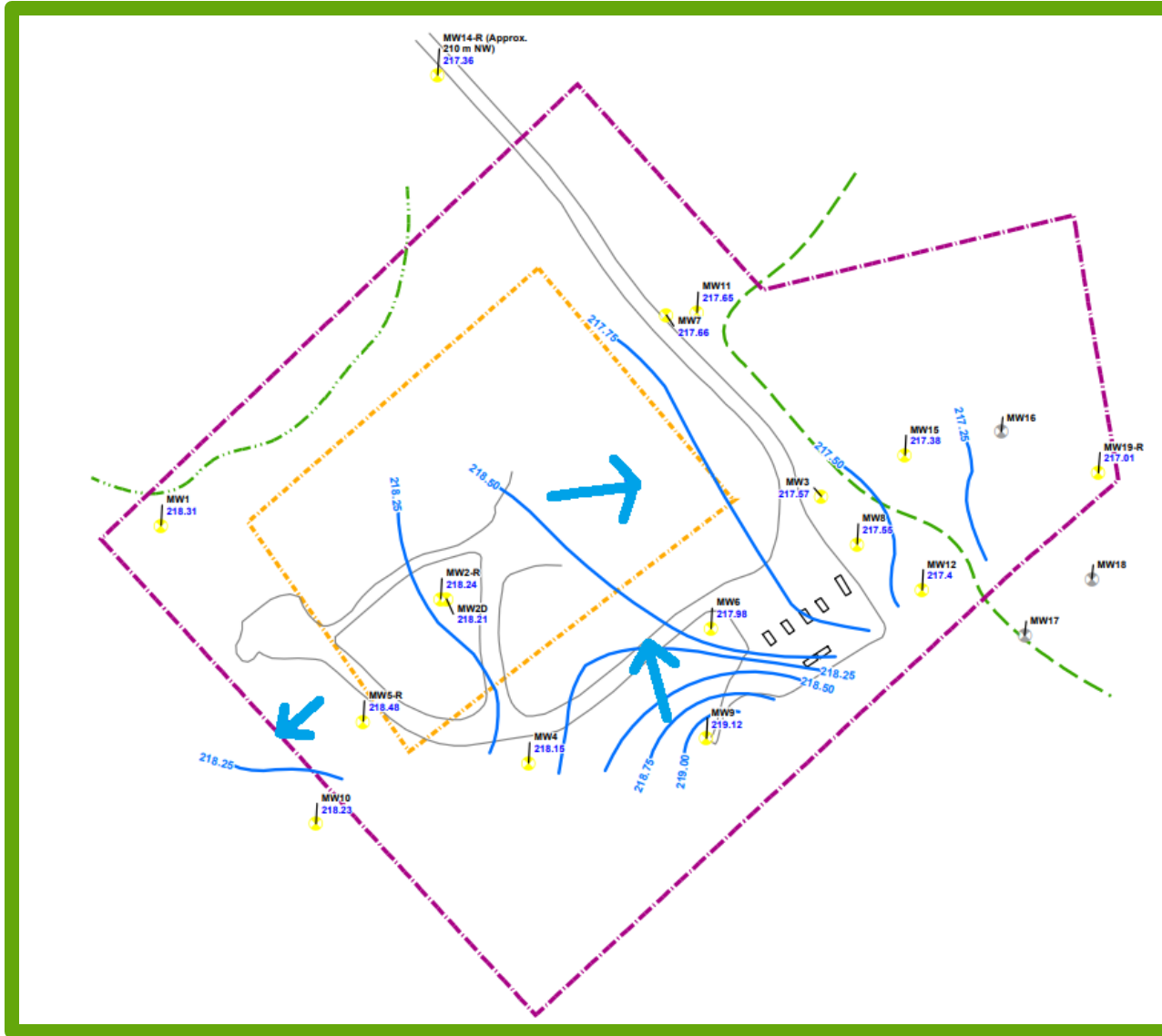
Groundwater Levels and Flow Direction



Groundwater Flow Direction- 2021 Spring



Groundwater Flow Direction – 2021 Fall



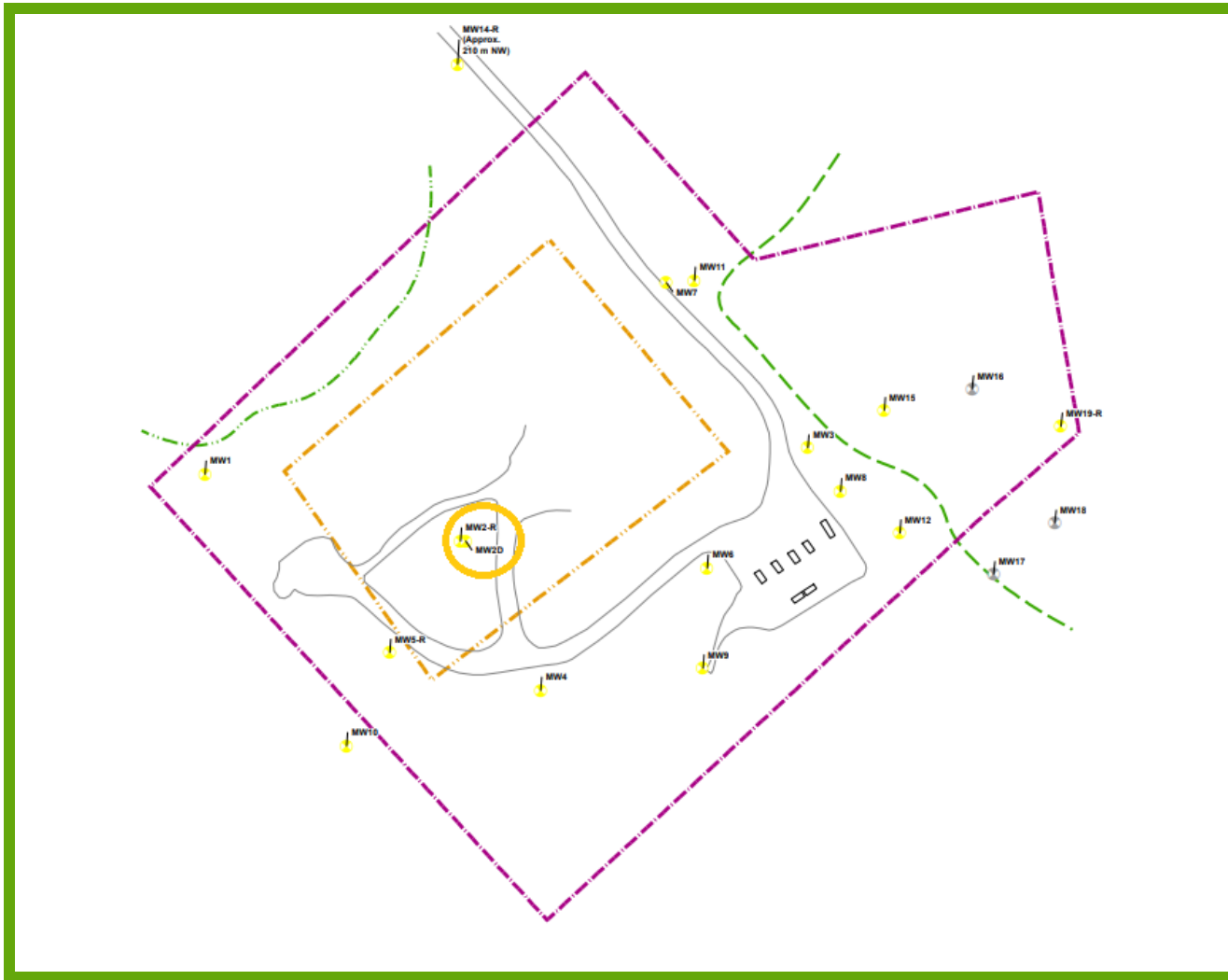
Methane Vapour Readings



2021 Methane Vapour Readings

- Highest methane readings typically in wells located within landfill material (MW2/ MW2-R and MW2D) or near landfilling operations (MW4 and MW5-R)
- In 2021, the highest readings were at MW2-R and MW2D as per usual. The rest of the results were below the detection limit of 0.5%.
- No concern for gas building in the former on-site attendant trailer or the sea container (wells in the vicinity are $< 0.5\%$).

2021 Methane Vapour Readings



Groundwater Quality Assessment



2021 Groundwater Quality Assessment

- Leachate Indicator Parameters (LIPs) include: *alkalinity, arsenic, chloride, DOC, iron, and sodium*
- Also consider: *ammonia, Organic N, colour, hardness, TDS, turbidity, fluoride, nitrate, nitrite, manganese and zinc, Volatile Organic Carbons (VOCs)*
- Chloride is the most mobile and conservative leachate indicator parameter

2021 Groundwater Quality Trigger Mechanism and Contingency Plan



1. **Tier 1 Alert** – 3 consecutive exceedances of 75% RUL at a trigger well of the LIPs



2. **Tier 2 Assessment** – consider trends in LIPs. Confirm increasing trends in concentrations. Confirm likely landfill-related.



3. **Tier 3 Confirmation** – monthly samples for 3 months



4. **Tier 4 Compliance** – communication between MECP and Municipality within 6 months to assess if remedial measures are required.

2021 Groundwater Quality

Tier 1 – Trigger or Boundary Wells



2021 Groundwater Quality Tier 1 - Trigger Alerts

- Background Well Concentration (MW14-R)
- Ontario Drinking Water Quality Standards (ODWQS)
- Reasonable Use Guideline/ Limits
- 75%
- Three Consecutive Occurrences

2021 Groundwater Quality Results

- All RULs were calculated using historical data from background monitoring well
- Tier 1 Alerts:
 - *MW1 for alkalinity;*
 - *MW9 for DOC;*
 - *MW19-R for iron;*
 - *all other trigger/ boundary wells were in compliance.*

2021 Groundwater Quality

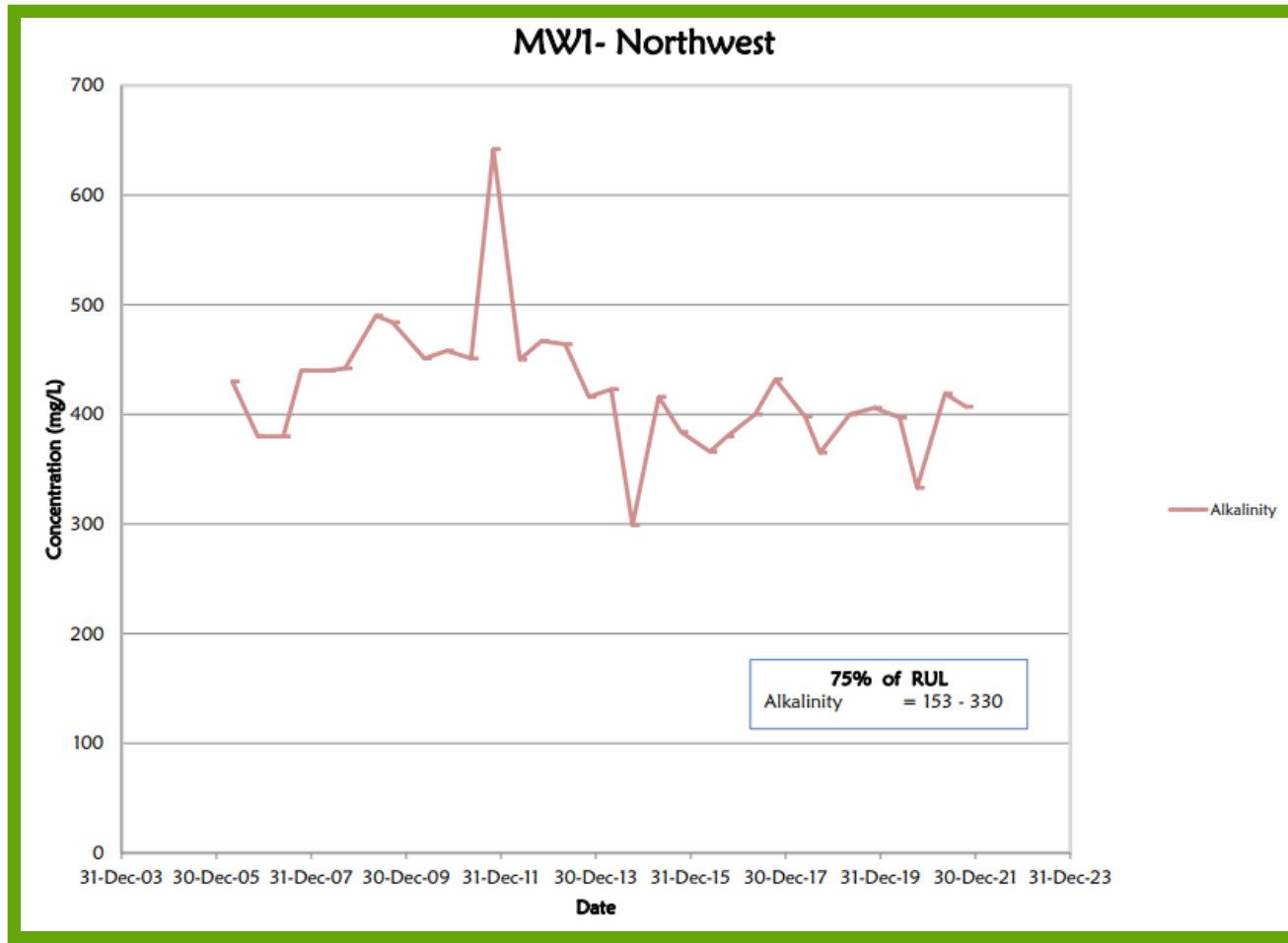
Tier 2 Assessment – MW1 (Alkalinity)

Tier 2 Assessment Discussion for MW1

- Results are less than 100% of the RUL
- Alkalinity is the measure of the water's ability to neutralize acid (versus pH that measures how acidic or basic the water is)
- Alkalinity results show a decreasing trend, however, LIPs chloride and sodium are slightly increasing (still below 75% of the RUL)
- No Tier 3 Confirmation required at this time.

2021 Groundwater Quality

MW1- Alkalinity



2021 Groundwater Quality

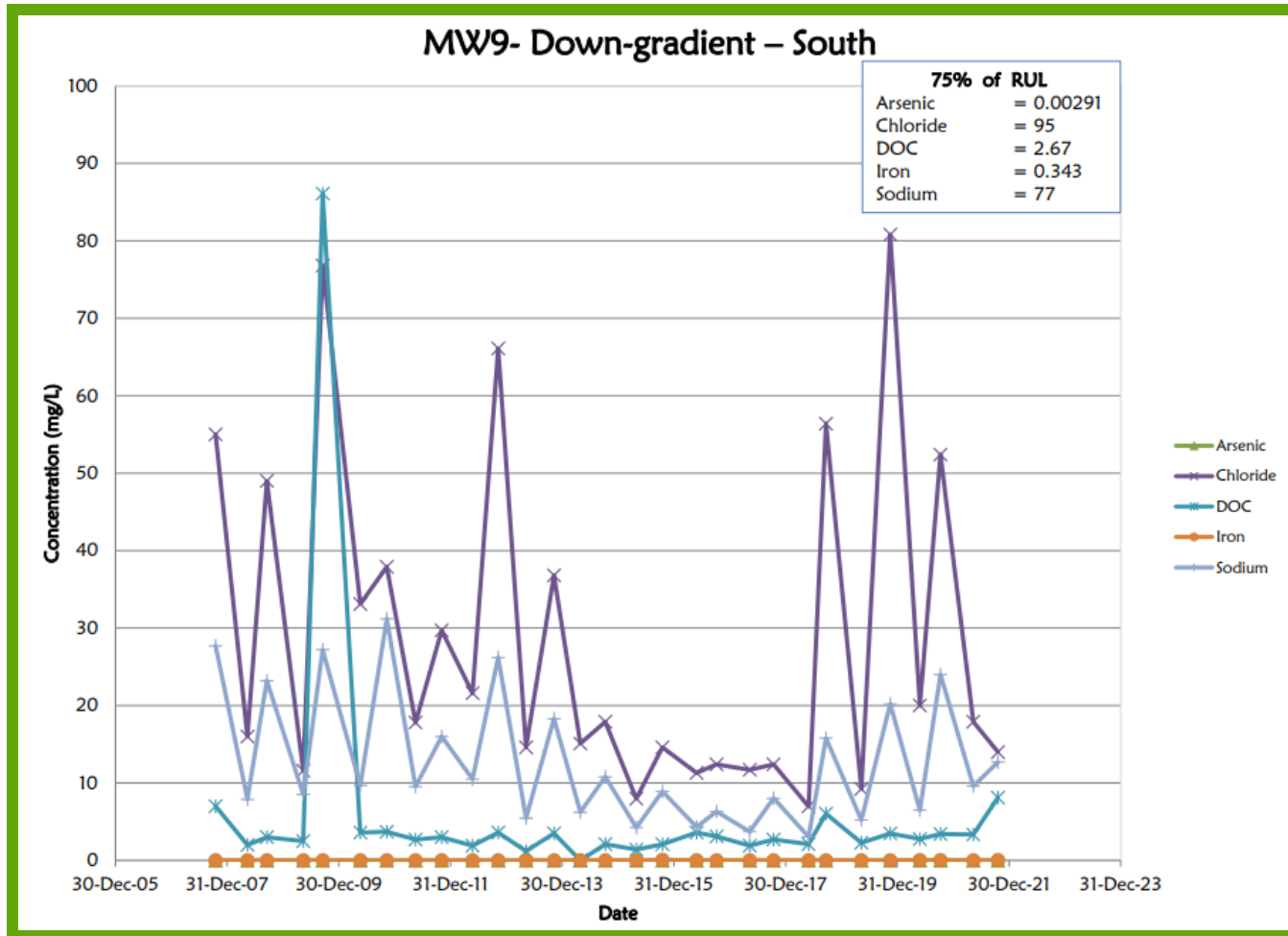
Tier 2 Assessment – MW9 (DOC)

Tier 2 Assessment Discussion for MW9

- Results are still less than 100% of the RUL
- DOC measures organic matter in the dissolved phase and does not solely represent leachate impacts
- No definite trend is noted in the LIP concentrations over time.
- No Tier 3 Confirmation required at this time.

2021 Groundwater Quality

MW9 – DOC and Other LIPs



2021 Groundwater Quality

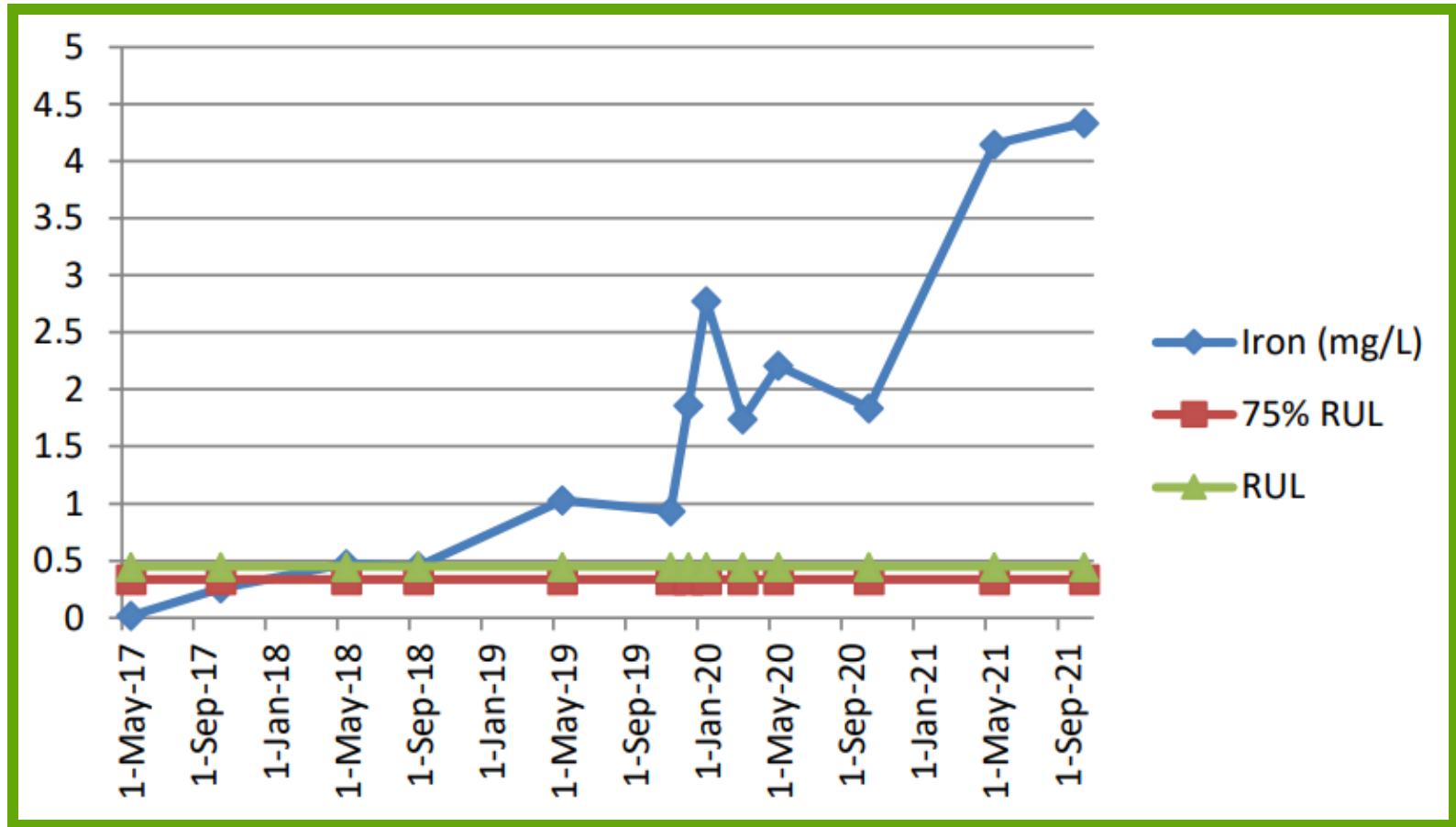
Tier 2 Assessment – MW19-R (Iron)

Tier 2 Assessment Discussion for MW19-R

- This alert was first noted in 2019 and resulted in Tier 3 Monitoring.
- Iron on its own are not fully attributed to landfill activities, but may be a sign of localized impacts (i.e. due to metals storage)
- No definite trend is noted in the LIP concentrations over time.

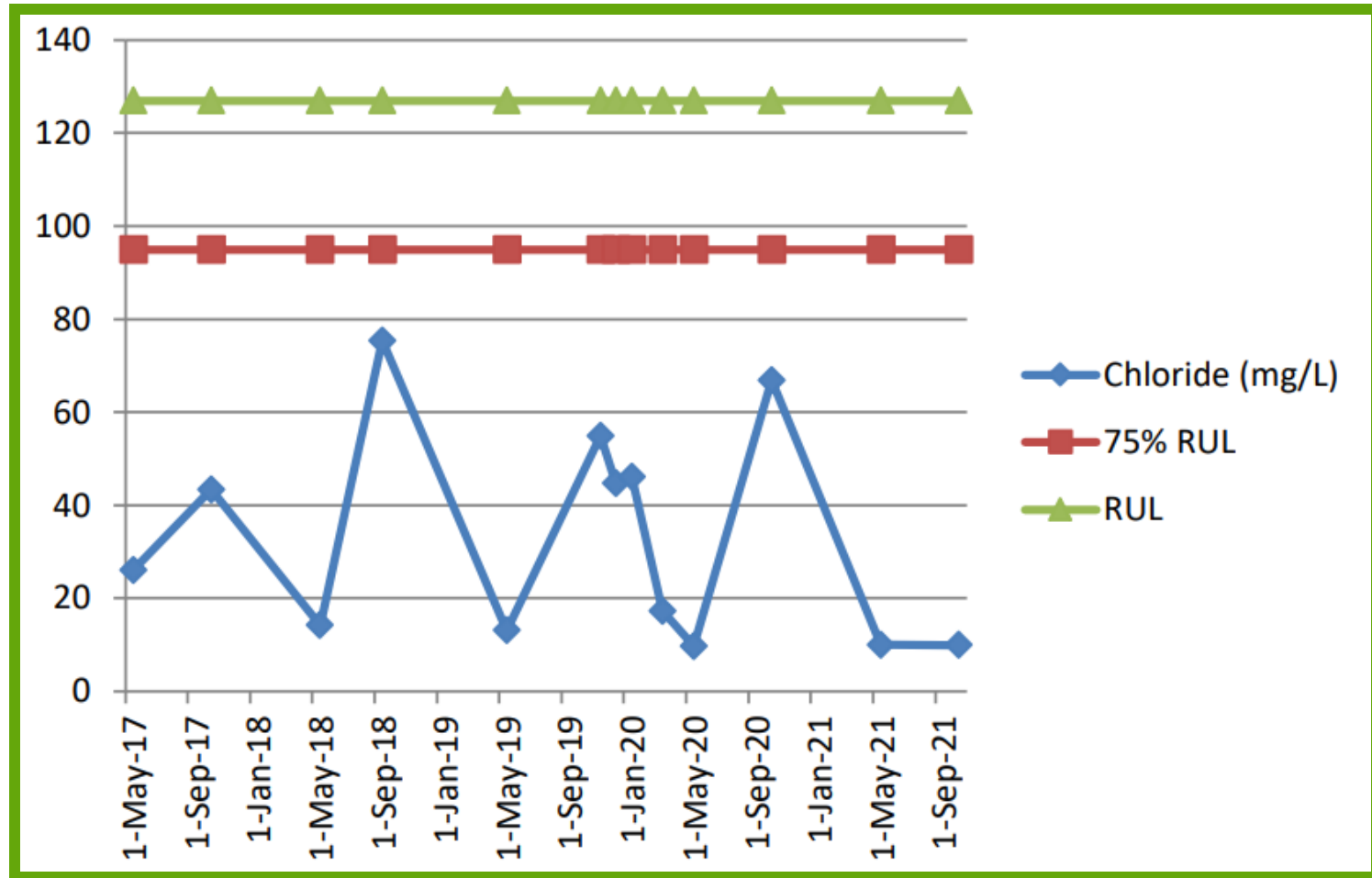
2021 Groundwater Quality

MW19-R- Iron



2021 Groundwater Quality

MW19-R- Chloride



Topic 1 Summary & Recommendations

- Overall groundwater flow continues to be to the east (towards CAZ); however, in Fall 2021, a mound at MW9 indicates a component of flow to the north.
- No methane concerns.
- Tier 1 Alerts at MW1, MW9, and MW19-R initiated Tier 2 Discussions that indicate no further action required.
- Submitted recommendation to identify LIPs as primary or secondary indicators and only trigger alerts when more than one parameter demonstrates an increasing trend beyond the trigger limit.

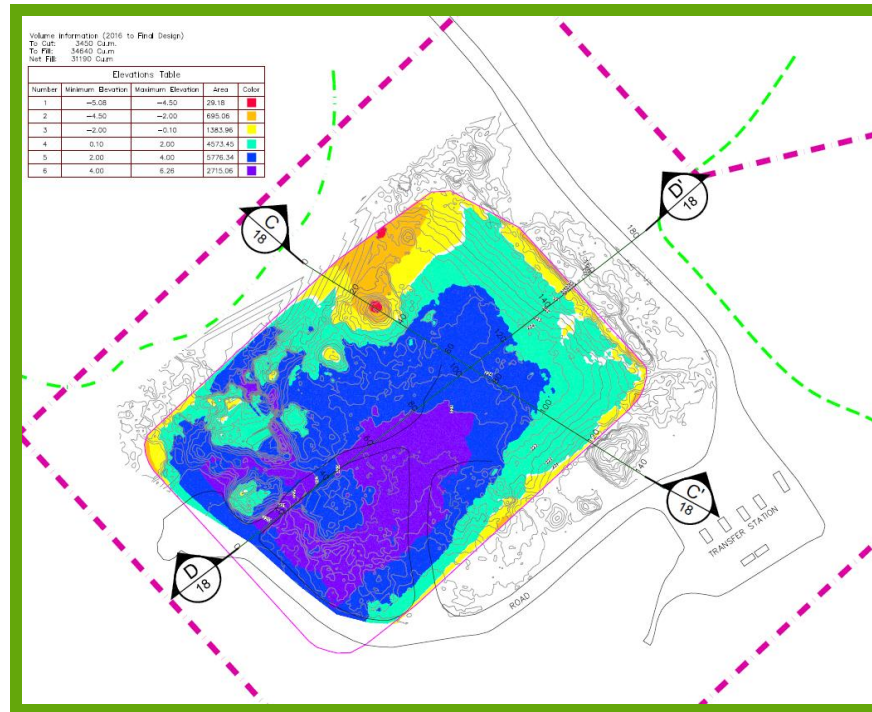
Topic 2:

2021 Design and Operations



2016 Landfill Unmanned Aerial Vehicle (UAV) Survey

- In September 2016, BluMetric completed a UAV survey of the landfill



2021 Landfill Capacity



Factors used to determine capacity:

- annual waste input rate (213 metric tonnes – down from 430 metric tonnes in 2020)
- a compaction density of 0.5 tonne/m³
- waste to cover ratio of 4:1
- estimated quantity of in-place waste
- a projected annual population (i.e. waste) growth rate of 0.5% over the next 25 years

The estimated life of the landfill is 36 years (that is, until December 2056).


2021 - Waste Collection

Waste Source	Measured/ Tracked	Weight (Metric Tonnes)
Municipal-Wide Curbside	Measured (Scale)	1,060
Waste Transfer Site	Tracked Acceptance/ Assumed Weights	215
Large Item Collection (from Rodney & West Lorne)	Tracked Acceptance/ Assumed Weights	0 (Cancelled due to Covid)
TOTAL		1274

In 2021, the total recorded amount of waste brought to the landfill has decreased as material is diverted to Green Lane Landfill.



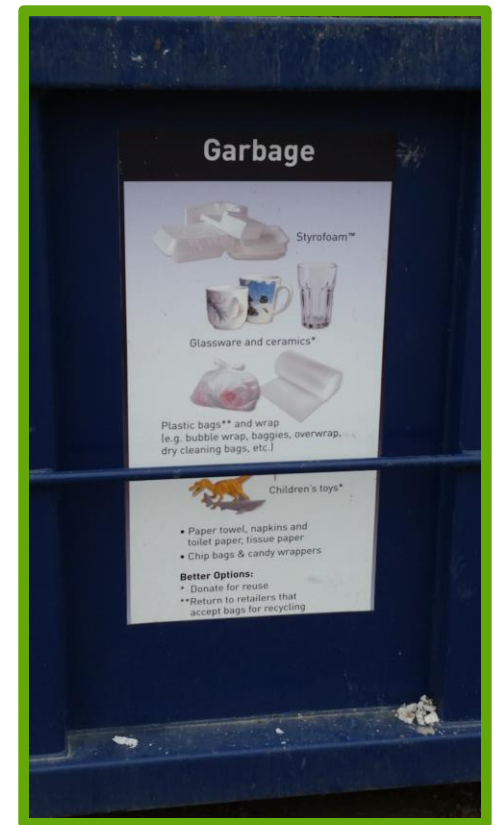
2021 - Waste Diversion

Source	Measured/ Tracked	Weight (Metric Tonnes)
Municipal-Wide Curbside	Measured (Scale)	260
Waste Transfer Site	Tracked Acceptance/ Assumed Weights	48
Waste Transfer Station (Steel/ Electronics)	Tracked Acceptance/ Assumed Weights	86
		

In total, the Municipality diverted 394 metric tonnes of recyclable material from the landfill in 2021 (plus organic material that is not weighed).

Topic 2 Summary and Recommendations


- Estimated Landfill Life = 36 years
- Estimated Remaining Site Capacity = 21,216m³
- A UAV survey should be completed in 2022 (the recommended frequency is every 5 years, and the last survey was done in 2016).



Topic 3:

2022 Activities

APR 11 2017

 Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en
matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A051101
Notice No. 1
Issue Date: April 4, 2017

The Corporation of the Municipality of West Elgin
22413 Hoskins Line
Post Office Box, No. 490
Rodney, Ontario
N0L 2C0

Site Location: Rodney Landfill - West Elgin Landfill
911 address - 20385 on Downie Line
Lot B, Concession 7
West Elgin Municipality, County of Elgin

You are hereby notified that I have amended Approval No. A051101 issued on September 11, 2015 for the use and operation of 3.2 hectare waste disposal/transfer site within a total site area of 6.6 hectares, as follows:

The following definition is added :

"waste electrical and electronic equipment " has the same meaning as in Ontario Regulation 393/04 (Waste Electrical and Electronic Equipment) made under the Waste Diversion Act.

2022 RPA Survey

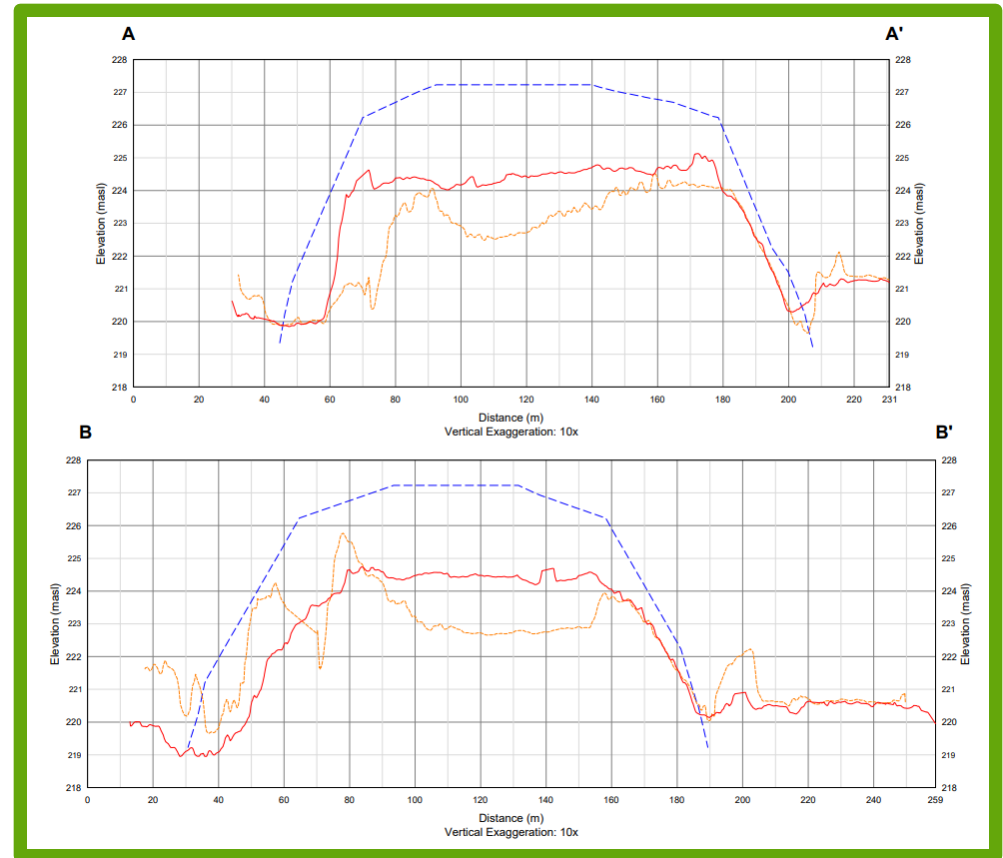
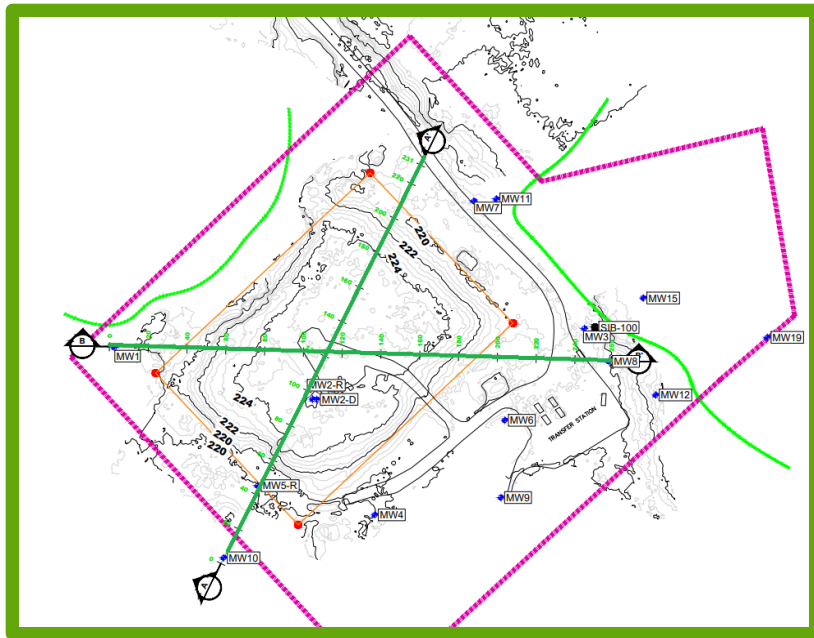
Produces a geodetically controlled 3D model of the landfill ground surface using temporary ground targets by GPS Real-Time Kinematic (RTK-GPS).



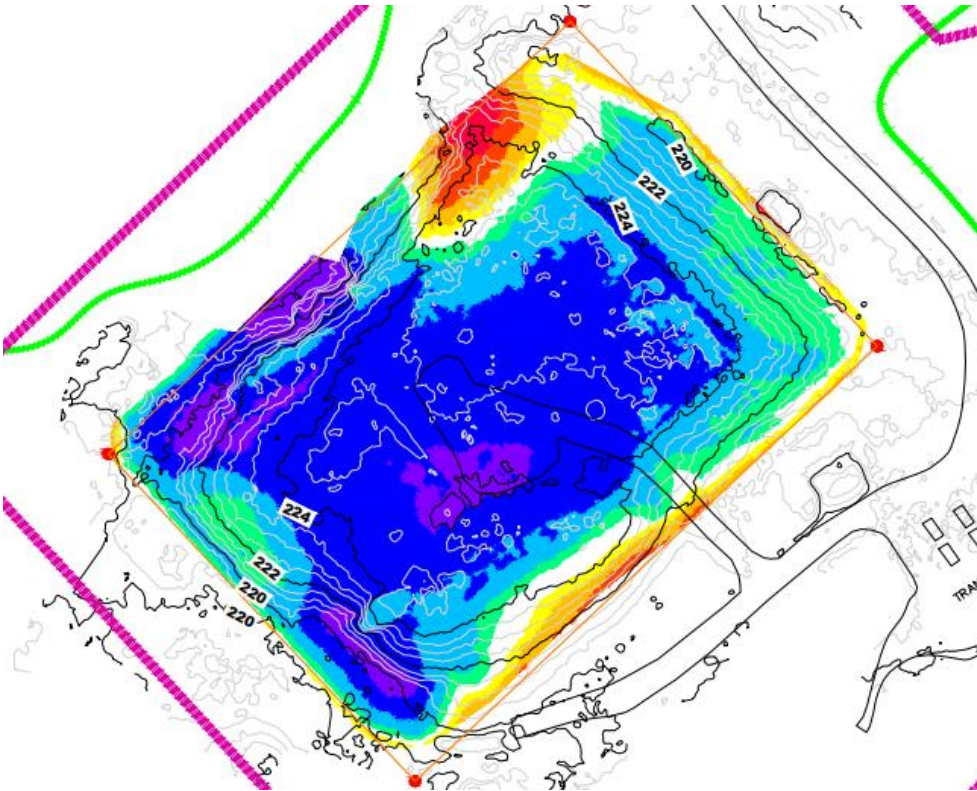
2022 Survey – Air Photo



2022 Survey- Cross Sections



2022 Survey – Volumetrics



- estimated remaining capacity is 24,939 m³
- this is more than we estimated using fill rates.
- estimated life of the landfill is 42 years.

2022 Spring Monitoring

- Spring monitoring completed May 12th
- Groundwater flow to the East (no mounding)
- No concerns with methane
- Tier 1 Alert and Tier 2 Assessments for:
 - MW1 – Alkalinity, DOC
 - MW2 – DOC
 - MW12 – DOC
 - MW19-R – Iron, DOC

2022 Spring Monitoring

- DOC present in the background well
- DOC is not solely representative of leachate – result of decaying plant matter and fluctuating temperature and precipitation.
- Alkalinity and iron also not solely representative of leachate
- Proposed recommended changes to Trigger Mechanisms and Contingency Plan

Proposed Changes to Trigger Mechanism and Contingency Plan

1. Identify LIPs as either primary (more conservative) and secondary (less conservative).
 - Primary LIPs to include; chloride, arsenic.
 - Secondary LIPS to include; alkalinity, DOC, iron, sodium
2. Tier 1 Alert will not be triggered unless two or more LIPs (including at least one primary LIP) meet the required criteria (i.e. the trigger level is exceeded for 3 consecutive sampling events at a trigger well).

Topic 4:

Future Considerations & Recommendations



Landfill Capacity Reminder

- Estimated Life = 42 years
- Waste Transfer Station can continue indefinitely



Landfill Closure

- ECA dictates that 3 years prior to closure of landfill you must provide the MECP with a 'Closure Plan'
 - *End use of landfill and appearance*
 - *Roll out to the community*
 - *Plan for post-closure care*
- Design and Operations Report (2006) specifies:
 - End use of landfill is green space area
 - Final cover will consist of 600 mm of compacted clay and 150 mm of seeded topsoil



Recommended Trigger Plan Update

Consult the local Ministry District Office to confirm best steps to update the Plan:

- Defined within 2021 report;
- Stand alone letter; or
- full ECA Amendment Application.



Questions?

