



Region of Waterloo

Landfill Development Optimization: Benefits of Air Space Tracking and Effective Long Term Planning

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Waterloo Landfill



Key Points to Landfill Development



- ✓ Alternate covers
- ✓ Less Soil Usage
- ✓ GPS Equipment
- ✓ Higher density
- ✓ Green bin organics

- ✓ Excess Soil
- ✓ West gas header
- ✓ 2012 NE4 cell learnings
- ✓ Revised base design
- ✓ Delayed gas header
- ✓ Air space tracking
- ✓ Updated closure 2029

- ✓ Continuously improve environmental controls
- ✓ minimize odours
- ✓ New SEA sequence
- ✓ Updated gas action plan
- ✓ Long term soil plan
- ✓ Refined air space model
- ✓ Updated closure 2047

- ✓ Additional diversion
- ✓ Extension to landfill life?

Landfill Development Optimization and Landfill Gas Action Plan Update



PROJECT OBJECTIVES:

- Optimize the build-out of the South Expansion Area



PROJECT DRIVERS:

- Optimize the landfill gas collection
- Optimize Site odour control
- Minimize leachate generation
- Improve temporary and long-term access
- Refine Site Life Calculations
- Improve soil management

Short Term Development Plan (2020-2025)



Long Term Development Plan (2025-onwards)



Refined Site Life Calculations



Current projected site life remaining is 25 years



Estimate Based On:

- Waste density of 850 kg/m³ (1994 design density of 593 kg/m³)
- Remaining air space of ~5.2Mm³ as of December 2022
- Current Region incoming waste forecast

Factors Affecting Waste Density

COMPACTION AND GPS

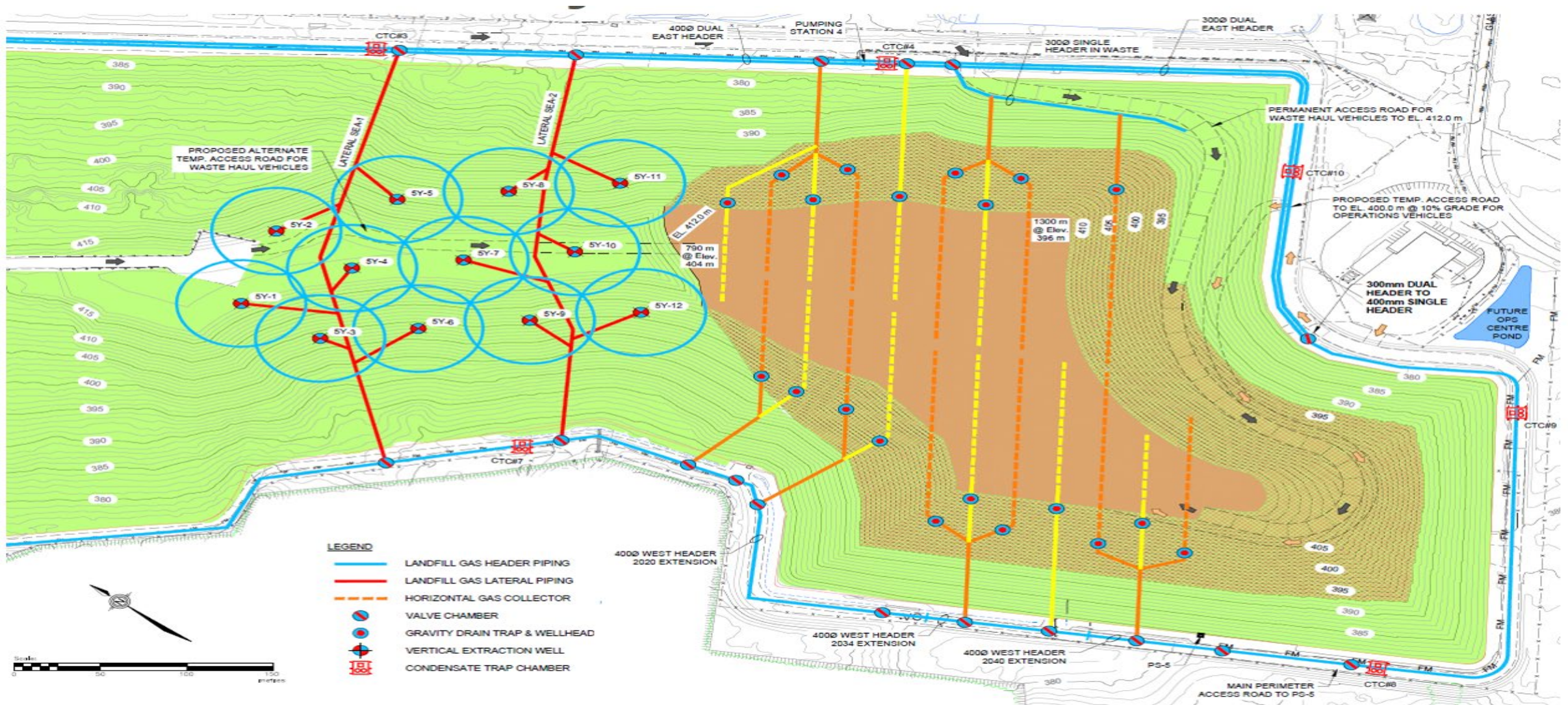


TARPS



SPRAY-ON COVERS

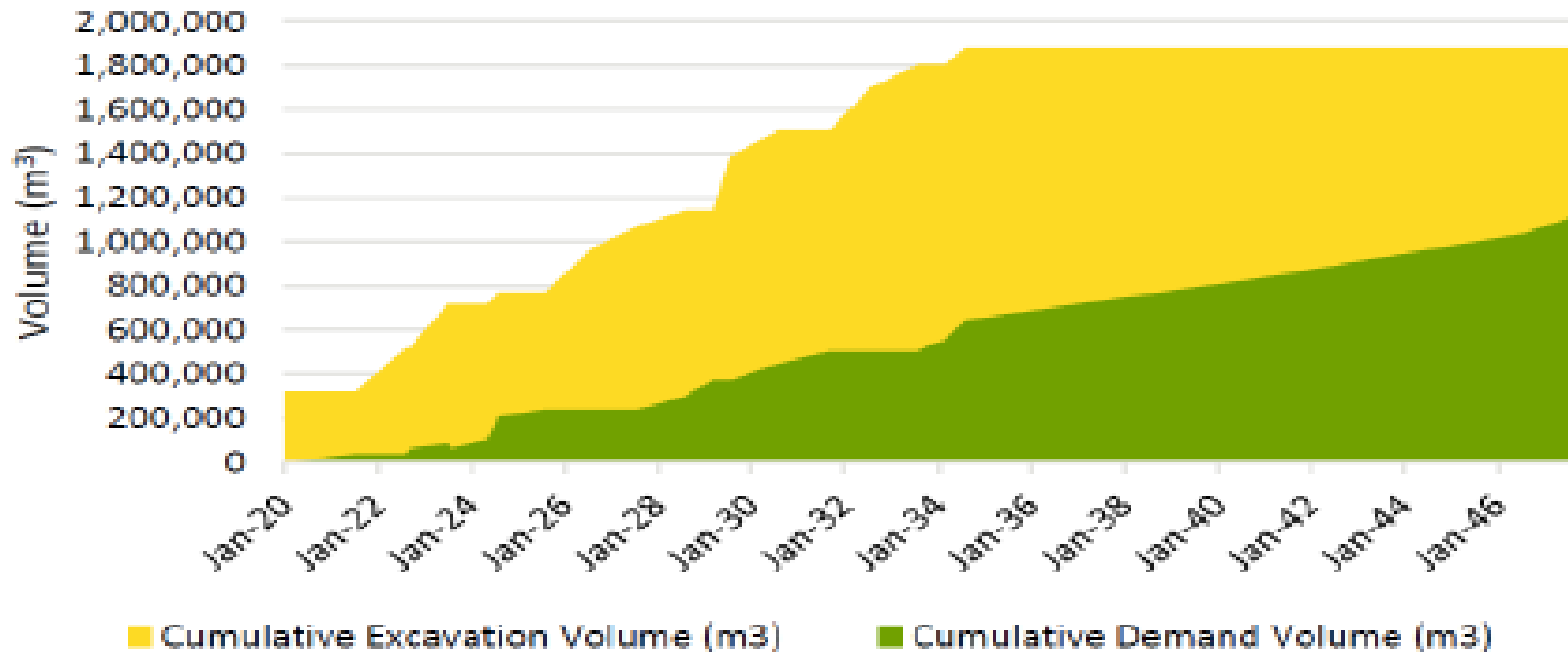
Landfill Gas Collection Buildout





Updated Soil Inventory

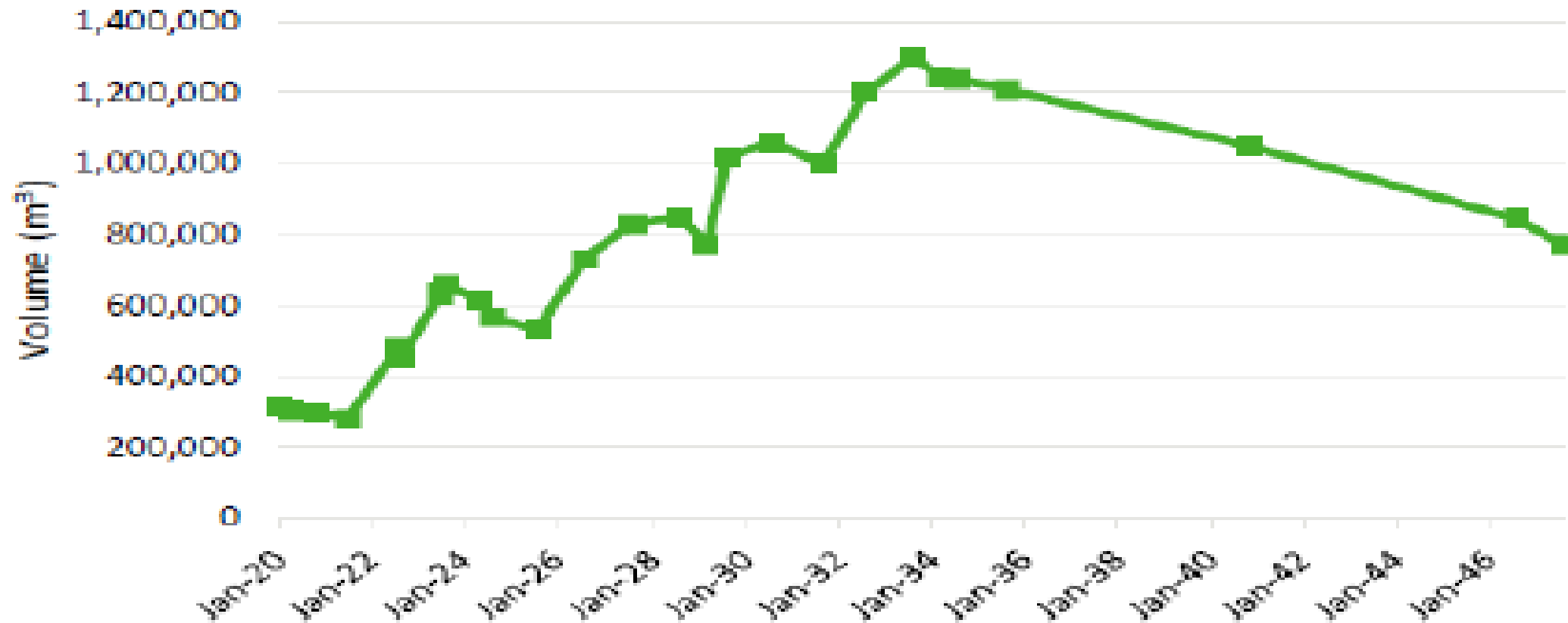
(a) Soil Generation vs. Demand



Updated Soil Inventory



(b) Excess Soil Volume



Comprehensive Soil Evaluation



CONCLUSIONS & RECOMMENDATIONS:

- No one single on Site or off Site option would address all the soil
- Short term undertake off Site soil hauling ~ 380,000 m³ sent to a local Reuse Site in 2021-2023
- Purchase adjacent piece of landlocked land for long term soil management

BENEFITS:

- Region retains ownership of clay
- Provides greatest operational flexibility
- Greatly reduces risk to development schedule and greenhouse gas emissions
- Will save Region ~\$40M over life of landfill

Benefits of Air Space Tracking & Long Term Planning



SUMMARY:

- ✓ Region has 25 years capacity and uses technology to optimize air space
- ✓ Extend landfill life through increased diversion and operational improvements
- ✓ Site development is a continuous process of improvement incorporating lessons learned and applied to future planning
- ✓ Integrated short and long term site development, landfill gas and soil management plans
- ✓ Strike balance between access for filling, progressive cover placement and management of environmental controls
- ✓ Better planning and design cycles = flexibility, lower risk, sufficient budget

Next Steps

- 2024/2025 long term strategic review and update
- Draft Objectives:
 - maximize reduction and reuse of waste;
 - maximize the recovery of waste and energy and optimal management of remaining residuals;
 - optimize operational advancements and improvements; and
 - develop a zero waste culture across the Region.



Thank you

For further any questions, please reach me by email at:

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