



Design, Operations and Closure Plan Glenmore Landfill

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Agenda

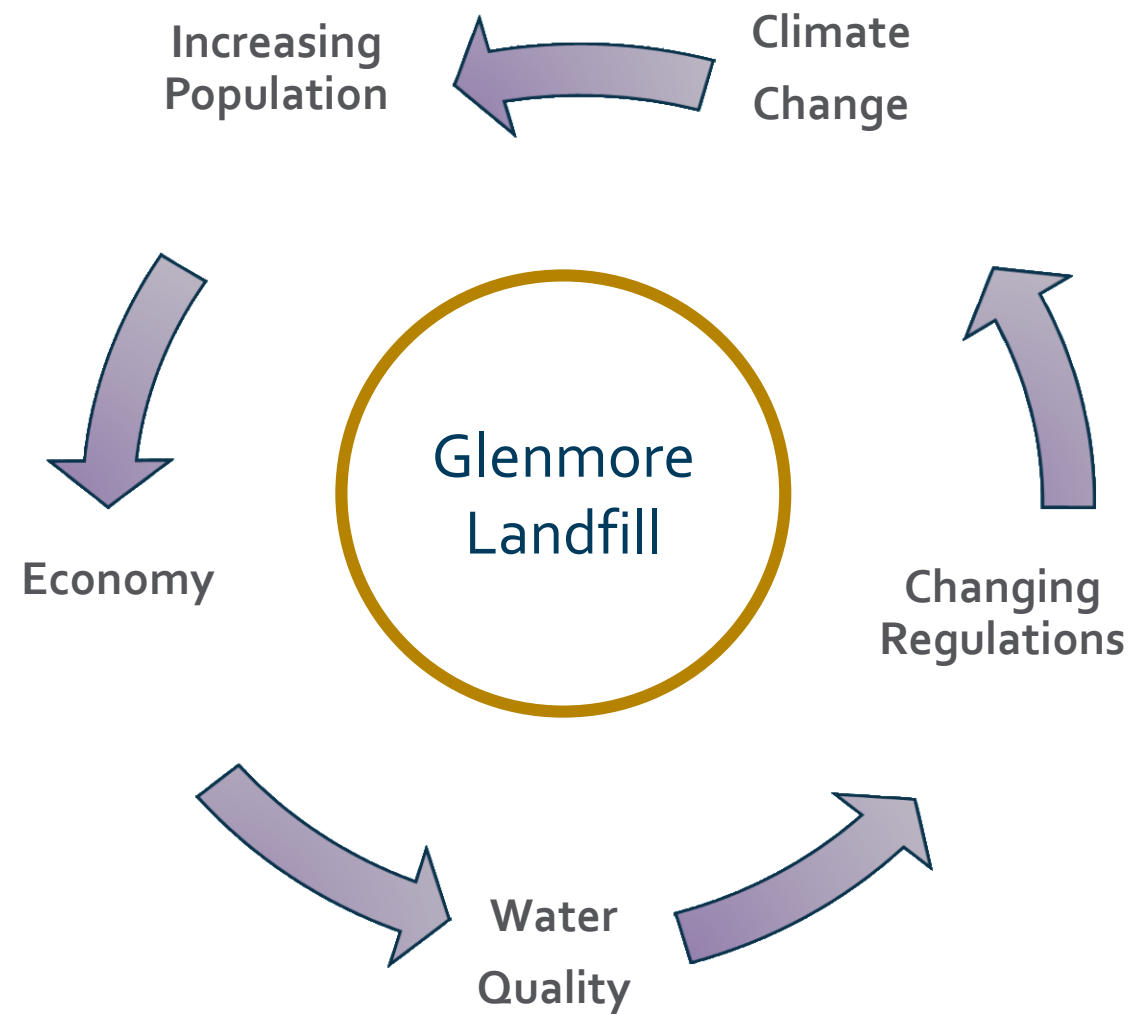
- ▶ Introduction
- ▶ Design, Operation and Closure Plan
 - ▶ Principles
 - ▶ Requirements
 - ▶ Report
- ▶ DOCP Highlights
- ▶ Wrap-up

Glenmore Landfill

- Landfill and waste management facility for RDCO and Big White
- Operates under RDCO SWMP and OC
- Services population of ~ 200,000
- 170,000 tonnes of waste per year permitted
- Landfill capacity ~39,800,000 m³
- 90 years site life



sustainability



Design, Operations and Closure Plan

- Updates/modernizes the 2008 Comprehensive Site Development Plan.
- Wording and content has now been standardized by the Province to be called DOCP,
- Landfill will be planned, designed, constructed, operated, monitored and closed in accordance with the Landfill Criteria (BC ENV, 2016)
- Now to be updated every 5 years



2018 Design, Operations, and Closure Plan

Glenmore Landfill
Kelowna, British Columbia

City of Kelowna



GHD | 10271 Shellbridge Way Suite 100 Richmond British Columbia V6X 2B9 Canada | (604) 271-1000 | Report No 04 | November 30 2018

DOCP Report

- ▶ Description of the facility and the physical setting
- ▶ 10-year conceptual design of the Landfill
 - ▶ Base liner system,
 - ▶ Leachate collection system,
 - ▶ Final cover
- ▶ Surface Water Management Plan
 - ▶ Minimizing Leachate



DOCP Report (Cont'd)

- ▶ Leachate Management Plan
- ▶ Site Development Plan
 - ▶ Filling plan,
 - ▶ Major capital components
- ▶ Operational procedures - waste acceptance and landfilling

DOCP Report (Cont'd)

- ▶ Environmental Monitoring Plan
 - ▶ Groundwater Impact Assessment
- ▶ Closure and post-closure requirements
- ▶ Demonstrate Landfill Criteria design objectives, minimal requirements for the Landfill and environmental control systems are met
- ▶ Financial Security Plan

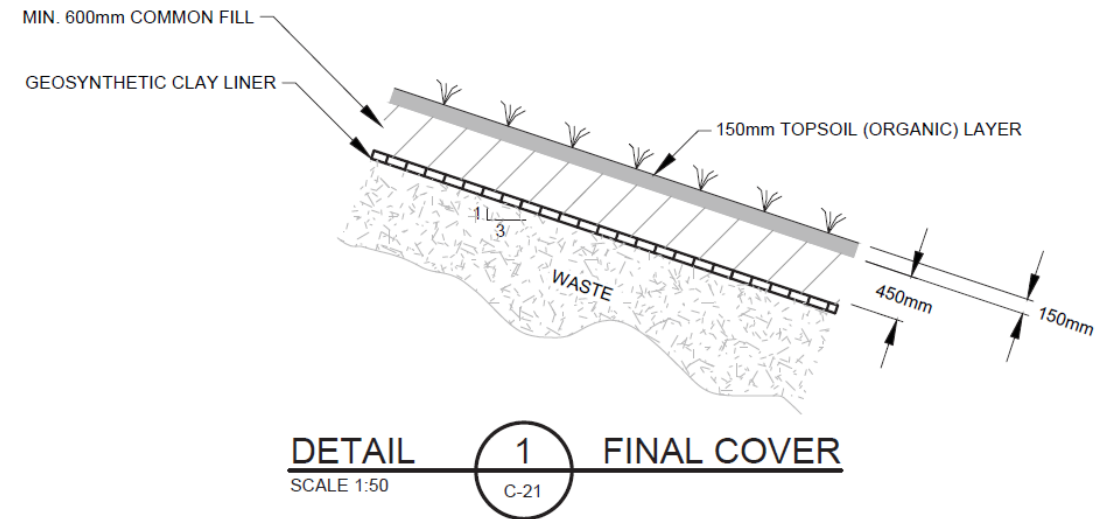
Highlights

- Progressive closure
- Nuisance monitoring and mitigation
- Surface water management plan
- Updated 10-year Capital Plan
- Financial Security



Closure

- ▶ Minimize potential for contamination, leachate or gas generation.
 - ▶ Inert 80 years after closure,
 - ▶ No more monitoring or care.
 - ▶ Areas to be naturalized.
- ▶ Final closure plans must be approved by the Province.
 - ▶ Must be consistent with current zoning at the time of closure.



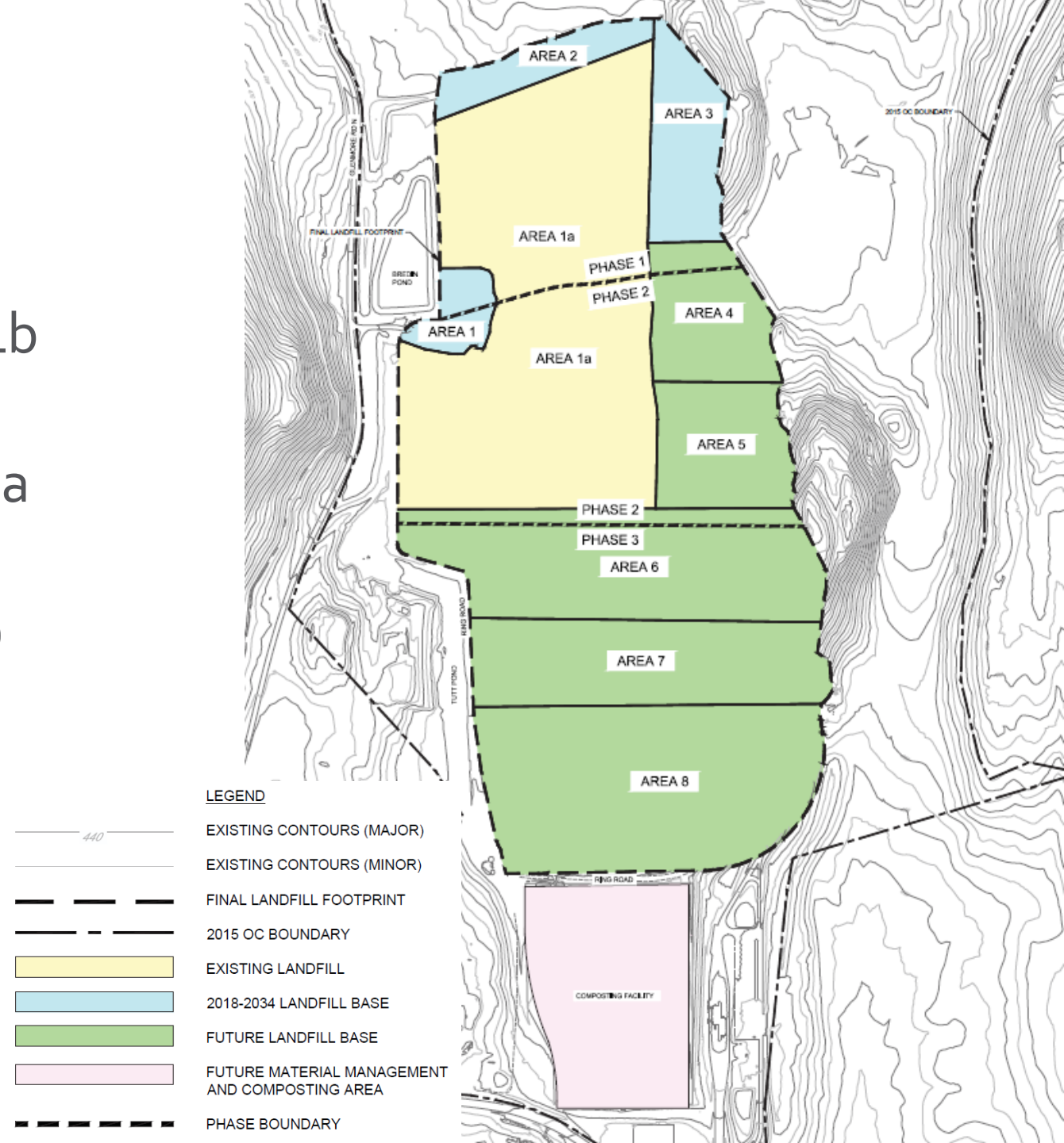
Revised Landfill Layout

► Next 10-years:

- Landfilling plateau - Areas 1a and 1b (existing unlined/lined)
- Area 1 – former public drop-off area (lined)
- Area 2 – northern extension (lined)
- Area 3 – Bredin Hill (lined)

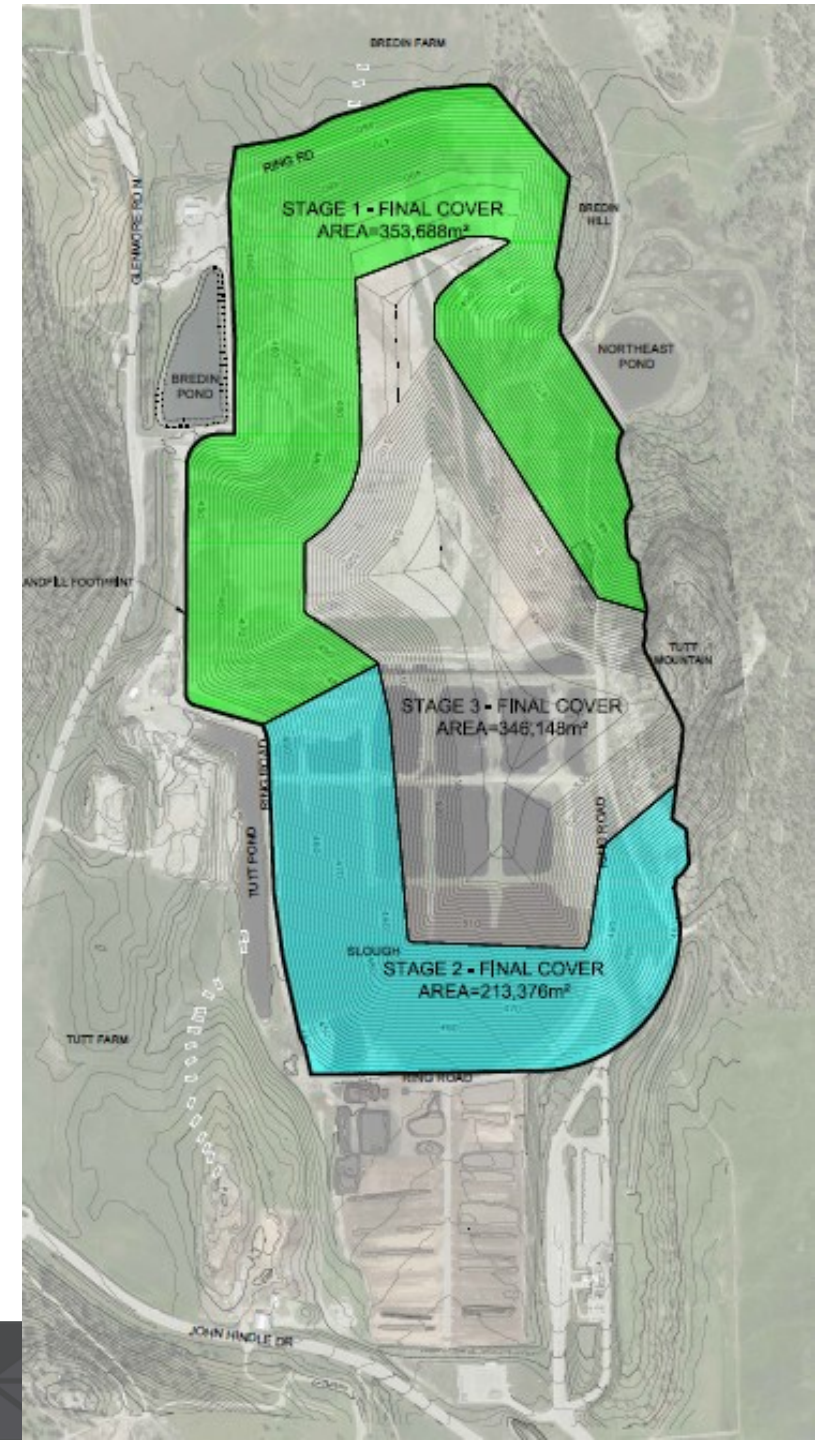
► Long-term (~90 years):

- Extend Phase 2 to Tutt Mountain
- Develop Phase 3 (Slough)



Progressive Closure

- ▶ Legally required (MOE).
- ▶ Allows cost recovery of closure while generating revenue.
- ▶ Areas that reach final waste contours will be closed once the area is sufficient to warrant construction of final cover.
- ▶ Over 913,000 m² to be closed in three stages
 - ▶ 2053 - Phase 1 and 2 side slopes
 - ▶ 2099 - Phase 3 side slopes
 - ▶ 2108 - Final closure (plateau)

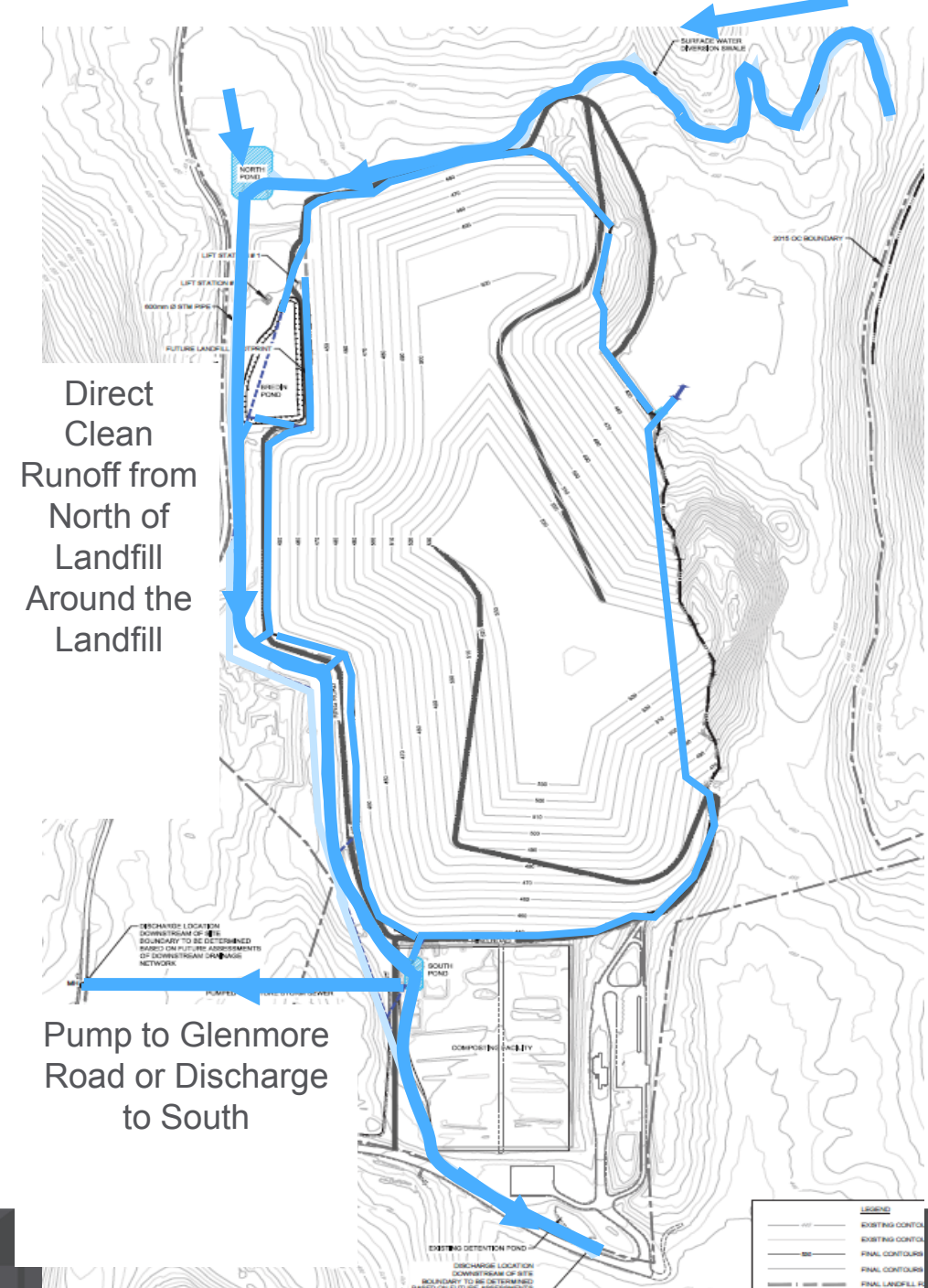


Detailed Nuisance Study

- ▶ Detailed Modeling Process
- ▶ Dust and Odour Measurement
- ▶ Recommend long term BMP's

Surface Water Master Plan

- ▶ Phase 3 cell development requires new surface water storage
- ▶ Manage future runoff from final cover:
 - ▶ Increased runoff.
 - ▶ Perimeter ditch/pipe and pond system.
 - ▶ Divert clean water from north of the landfill to Brandts Creek



Capital Plan Update

- ▶ Proposed 10 Year Capital Plan Update
 - ▶ \$42.15M over 10 years (2019-2028)
 - ▶ Areas 1, 2 and 3 - Membranes and Construction
 - ▶ Northeast Dam Decommissioning
 - ▶ Surface Water Management System.
- ▶ Long Term Costs (2029-2108)
 - ▶ \$114.81M over remaining 80 years.
 - ▶ Areas 4 – 8 – Membranes and Construction
 - ▶ Progressive Closure Stages 1, 2 and 3.

Post-Closure Contaminating Life Span & Financial Security

- ▶ Modelled contaminating life span (CLS) of 80 years
- ▶ Financial security
 - ▶ Fund an emergency closure of the landfill in that year and fund post-closure operations, monitoring, and maintenance for 79 years.
 - ▶ Currently - \$81M:
 - ▶ Capital & Emergency Closure costs – \$50M
 - ▶ Post closure O&M costs (79 years) – \$31M
- ▶ Progressive closure allows the Emergency Closure costs to decrease over time.

Next Steps

- ▶ Submit the final DOCP report to the Province.
- ▶ Staff will review and update operational, capital and financial plans.
- ▶ Complete the detailed design and construction projects.
- ▶ Apply for two minor Operational Certificate Amendments.
 - ▶ Minor variations in annual volumes,
 - ▶ A clarification in contaminated soil acceptance levels and definitions to better align operations with the BC Contaminated Sites Regulations.



Discussion & Questions