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Overview and Lessons Learned – RCMP Detachment Remediation Project

Carcross, Yukon Territory

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Banff, AB

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Outline

- Snapshot of RCMP, PWGSC and Hemmera
- Overview of the Site
- Review of pre-remediation Site conditions
- Remediation Planning and Technical Tender Specs
- Remediation Program
- Lessons Learned throughout course of project

RCMP

- Responsible for maintaining peace, order and security in Canada and for all Canadians
- ~8,000 buildings
- ~3,000 land parcels
- Sustainable Development Strategy based in environmental compliance and aligned with RCMP mandate

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PWGSC

- Delivers services and programs for other federal organizations and ensures sound stewardship on behalf of Canadians
- Government's manager and steward of common office space, and provider of real estate services
- Annual expenditures of $4.5 billion
- Employs approximately 12,000 people

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Consulting Team

- Hemmera – Senior Environmental Engineer, Project Manager, Environmental Engineer in Training (field), Senior Hydrogeologist, Senior Risk Assessor
- Geopacific – Senior Geotechnical Engineer, Senior Structural Engineer and Geotechnical Engineer in Training (field)
- Quantum Murray – Contractor

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Carcross, YT

- 74 km south of Whitehorse
- Population of 430
- Home to Carcross/Tagish First Nation
- Major transportation centre after construction of White Pass & Yukon railway station in 1901
- Stopover and supply centre during Klondike Gold Rush

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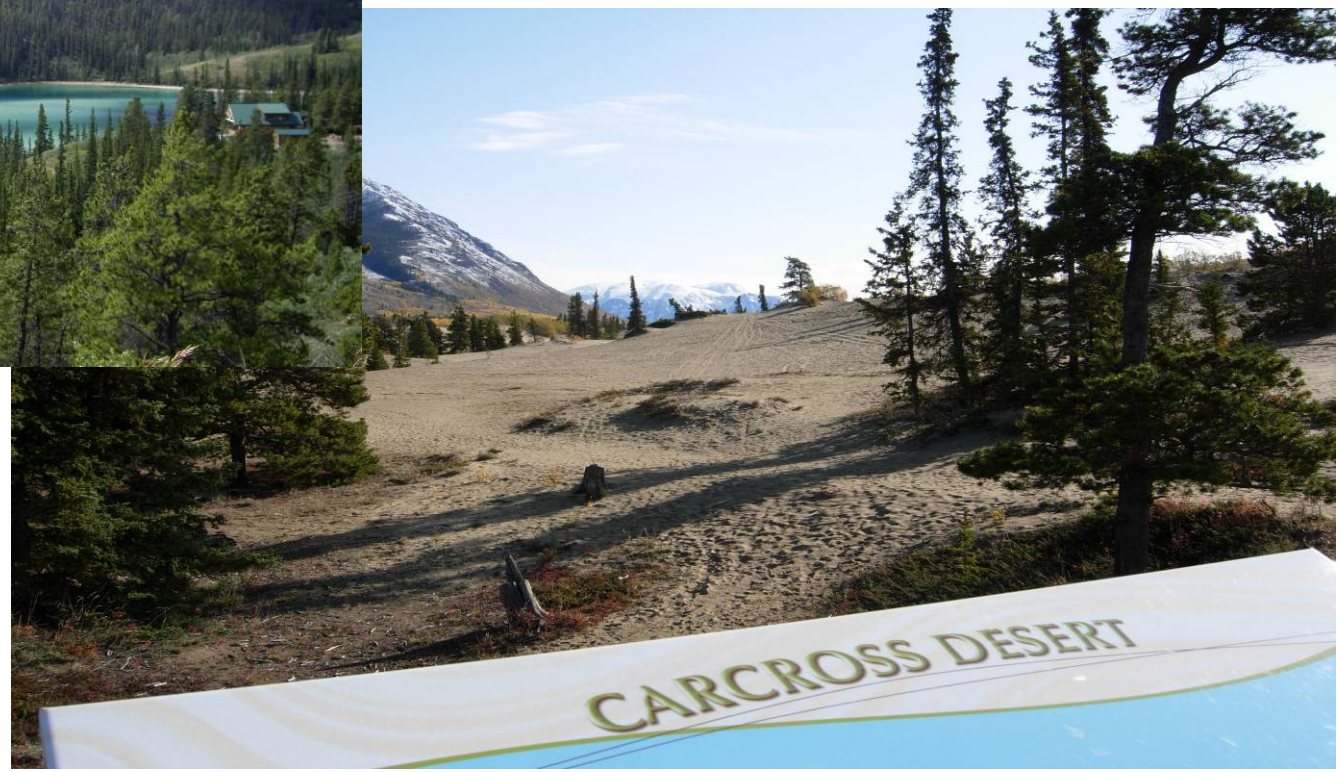
Carcross, YT



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The Site

- 1 Corporal, 2 Constables, 1 PSE
- ~4,000 L of heating oil released in 2002 (earlier leaks suspected) from ASTs and associated piping
- Soil & groundwater contamination on RCMP & neighbouring YTG property
- 1600m^3 impacted soil
- 900m^2 impacted groundwater plume (estimated)
- 200m^2 LNAPL (estimated)
- Highest concentrations of soil impact beneath DET building

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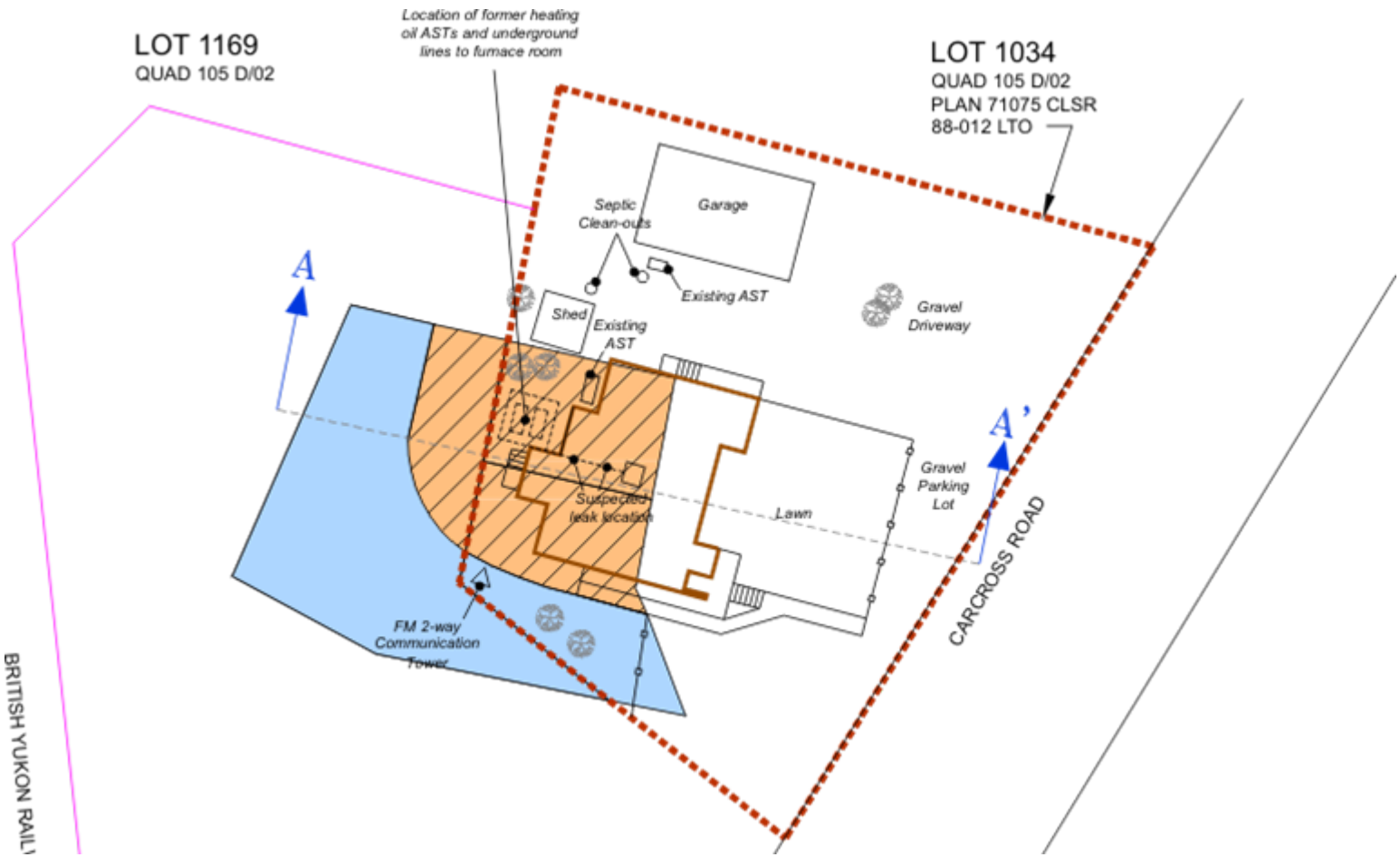
Directional Drilling

Soil Impact



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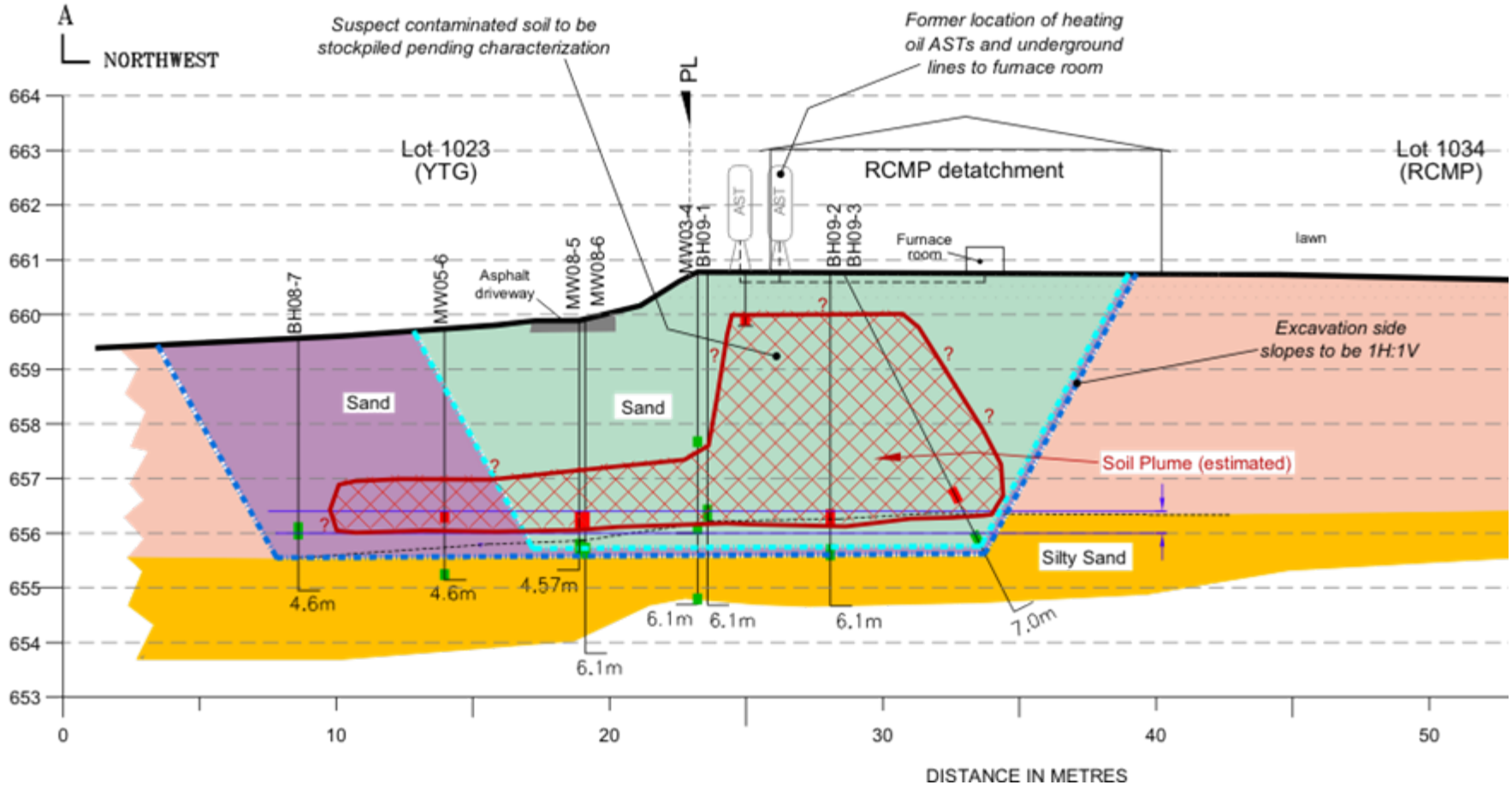
Cross Section



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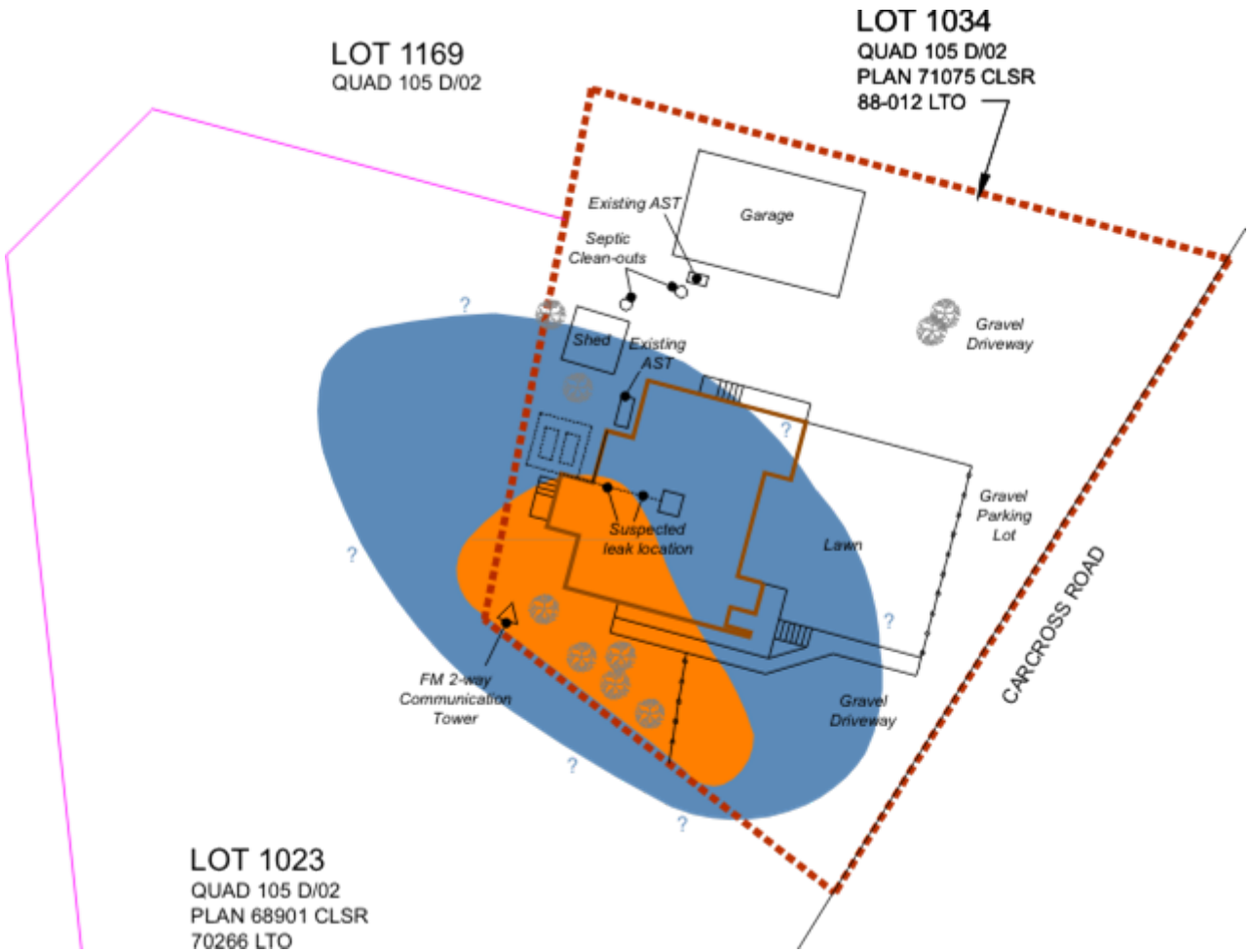
Groundwater Impact



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Remedial Plan

- Analysis recommended PHC source removal followed by risk assessment to address any remaining impacts
- Building Management options analysis included temporary support, permanent support, and building relocation
- Selected temporary support of building while contaminated soil excavated from beneath
- Detachment to remain operational through remedial activities

Objectives

- Remediate petroleum hydrocarbon concentrations in soil to <DL
- Determine post-remediation groundwater quality
- Update site RAP & RMP based on results (Remedial Action and Risk Management Plan)

Tender Development – Lessons Learned

- Include all engineering disciplines (even minor)
- Consideration of local conditions and limitations
- Cost reviews after detailed design and specs
- Mandatory site visit for bidders
- Clearly state assumptions for infrastructure to be managed during project
- Flexibility in tender to allow for alternative approaches

The Contract

- Hemmera prepared the tender specification
- Submitted for bid as a mini-tender by PWGSC
- Contract awarded to Quantum Murray LP (QMLP)

Lessons Learned:

- Include assumptions for lump sum items
- Require cost of services form for financial tracking
- Specify invoice submission requirements (e.g. timing)
- Consider impact of local conditions on schedule

Building Support

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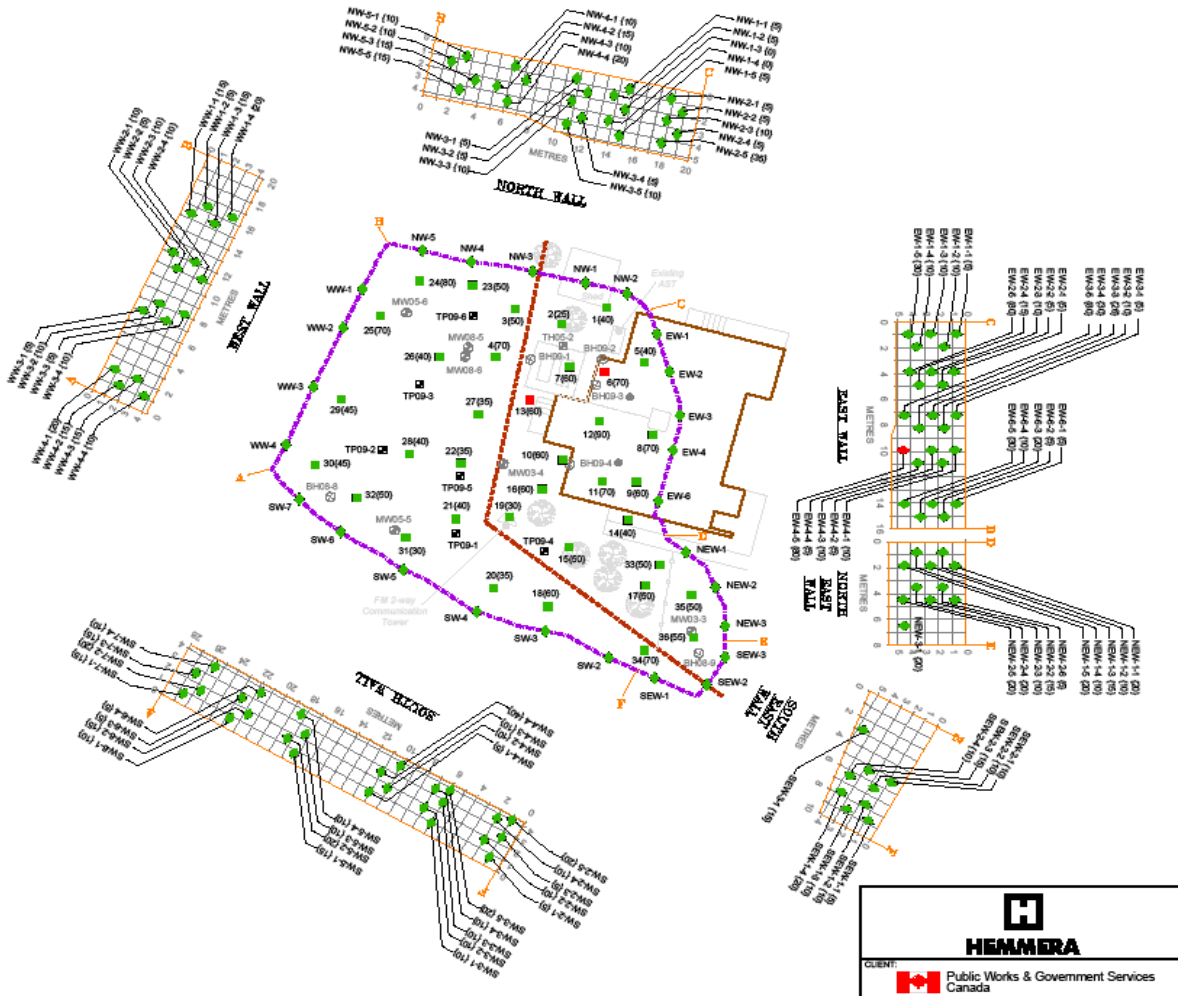
The Excavation

The Excavation

Results - Soil



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Challenges

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Lessons Learned – Technical

- Engage all engineering disciplines especially with field changes
- Utilize dedicated geotechnical investigation
- Understand limitations of mobile lab results (e.g. detection limits vs. applicable guidelines/standards)
- Consider potential impact of seasonal conditions and impact on project schedule
- Thorough review and documentation of pre- and post-project conditions for all onsite structures and ground conditions

Challenges

Challenges

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Lessons Learned – Health & Safety

- Change in design/approach can have significant H&S concerns
- Thorough review and documentation of pre- and post-project conditions for all on-site structures
- Regular communication with on-site personnel to identify and address issues
- Paint/mark pilings as excavation proceeds
- Understand role everyone has with respect to H&S during and after the project

Summary

- Lessons to be learned even from successful projects
- Be proactive during all project phases (planning, tendering, contracting, field)
- Strong team communications critical to effectively dealing with project challenges
- Document all work (pre and post-remedial program), photos in a digital world are cheap

Questions?

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