CASE STUDY

# 2020-21 REMEDIATION PROGRAM FOR COMMUNITY DEVELOPMENT

## Project Description

This project was completed in Edmonton for a major community developer to allow commercial development of lands impacted by historical industrial operations. The project focused on the remediation of historical hydrocarbon and salinity contamination that was completed to the site-specific risk-based remedial targets developed by 360 to procure a formal environmental closure from the Alberta government. A total of 39,000 tonnes of salinity and hydrocarbon impacted soil was excavated and disposed of at Claystone Waste Class II Landfill. Following a comprehensive confirmatory sampling program, the remedial excavations were backfilled with soil proven to be suitable via analytical and geotechnical testing.

## 360's Role

360 was a Prime Consultant in charge and directly responsible for project planning, execution, and deliverables that included environmental closure from the province.

## Applied Disciplines

**Project Management:**

- Management of all project phases from initiation to closure
- Contract administration

**Environmental Science:**

- Agrology (topsoil conservation, soil segregation, and soil management)
- Hydrogeology (pre-remediation groundwater assessment, excavation dewatering design, and post-remediation/closure groundwater monitoring)
- Impact Risk Assessment (development and justification of site-specific risk-based remediation values)
- Technical reporting

**Environmental Law and Regulations:**

- Environmental Protection and Enhancement Act (EPEA) and Water Act
- Environmental site assessment guidelines, directives, and standards

**Alberta OH&S and Legislation:**

- OH&S Act, Code, and Regulations
- Workers' Compensation Act

## Applied Specialties

- Site-specific Safety Plan development and implementation
- Active supervision of jobsite operations for efficiencies, quality, and elimination of re-work
- Contractor and service provider management

- Project efficiencies through detailed planning, communication, and collaboration with project parties and stakeholders
- Expert knowledge of Alberta's environmental and regulatory framework
- Drone aerial surveys
- Professional technical reporting
- Procurement of environmental closure

## Services Provided

- Preview of historical environmental reports and data gap analysis
- Completion of supplemental pre-remediation soil and groundwater assessments
- Processing supplemental data
- Development of site-specific risk-based remediation guidelines
- Preparation of Remediation Action Plan
- Communication with the Alberta Energy Regulator (AER) personnel assigned to project file
- Preparation of Class C and B cost estimates
- Preparation of tender documentation such as construction drawings, specifications, and project requirements for heavy equipment and trucking contractors, Class II landfills, and other service providers
- Tender management, including preparation of addenda and clarifications and communication with the candidate contractors and service providers
- Review of received bids and providing recommendations to client on contract award
- Detailed waste soil characterization and procurement of Class II landfill approval
- Sourcing and suitability confirmation of fill soil through analytical and geotechnical testing
- Supervision of remedial excavation and waste soil landfill disposal
- Identification, segregation, and salvaging of unimpacted overburden soil
- Completion of soil field screening, characterization, and confirmatory sampling
- Supervision of backfill operations
- Preparation of weekly Project Progress update reports for client
- Preparation and submission of final Remediation Program report and Record of Site Condition to AER
- Completion of post-remediation groundwater monitoring and assessment
- Preparation and submission to AER of Post-Remediation Groundwater Monitoring report

## Project Challenges and Solutions

**1. Last minute significant scope change due to re-design/re-routing a major utility corridor through remedial excavation area**

This significant scope change was presented to 360 by the client less than one and a half months before the initiation of jobsite operations. It resulted in a substantial re-design of excavation specifications, excavation dimensions, management of residual contamination, and closure parameters. Working in collaboration with the project manager, the 360 subject-matter team redeveloped the site-specific remedial target guidelines, revised excavation plans, re-worked the project scope and schedule, and recalculated cost estimates.

Despite extremely compressed timelines around the Christmas holidays, the 360 team dedicated the required technical resources and proposed a well suited solution that completely resolved the subject land development redesign. This was possible due to our vast experience with regulatory environmental closure protocols and government expectations, great relationships, and close collaboration with the project owner.

**2. Risk of groundwater inflow and excavation flooding**

At 6.5 metres below ground surface (mbgs), the final excavation floor was close to a significant coarse-grained water-bearing zone identified by 360 at 7-7.5 mbgs as part of pre-remediation hydrogeological assessments. To avoid excavation flooding, the 360 hydrogeologist and risk assessment group designed the excavation specifications to balance the excavation depth with the required removal of contaminated soil.

The 360 team also made arrangements with a dewatering contractor for personnel, equipment, and disposal facilities as a contingency plan.

The 360 jobsite team and heavy equipment contractor precisely executed the excavation plan, resulting in negligible groundwater accumulation.

**3. Project location in close proximity to established residential areas**

360 identified and managed significant project stakeholders through transparency, planning, and clear communication. 360 also established and implemented necessary jobsite work schedules, site security, and visitor protocols.

**4. Project operations amid COVID-19 restrictions**

360 developed a comprehensive yet practical COVID-19 Exposure Plan. The Plan identified risks and provided clear mitigation measures that were embraced by the jobsite personnel.

## Project Successes and Benefits Provided by 360

The development of the site-specific risk-based remedial targets instead of adopting the generic Tier 1 Guidelines and excavation design to avoid the inflow of groundwater resulted in approximately $1.8 MM in cost savings. This approach significantly reduced the volume of soil to be landfilled and water to be disposed of.

As secondary benefits, 360 design and project execution also resulted in the reduction in trucking, associated emissions, and potential road safety incidents.

## Project Budget*

$3 MM

*Approximate value provided for project confidentiality.