



# Successful Integration of Assessment, Remediation, Wetland Creation, and Reclamation of an In-Situ Oil Sands Pilot Plant on the Cold Lake Air Weapons Range using GIS and Good Planning

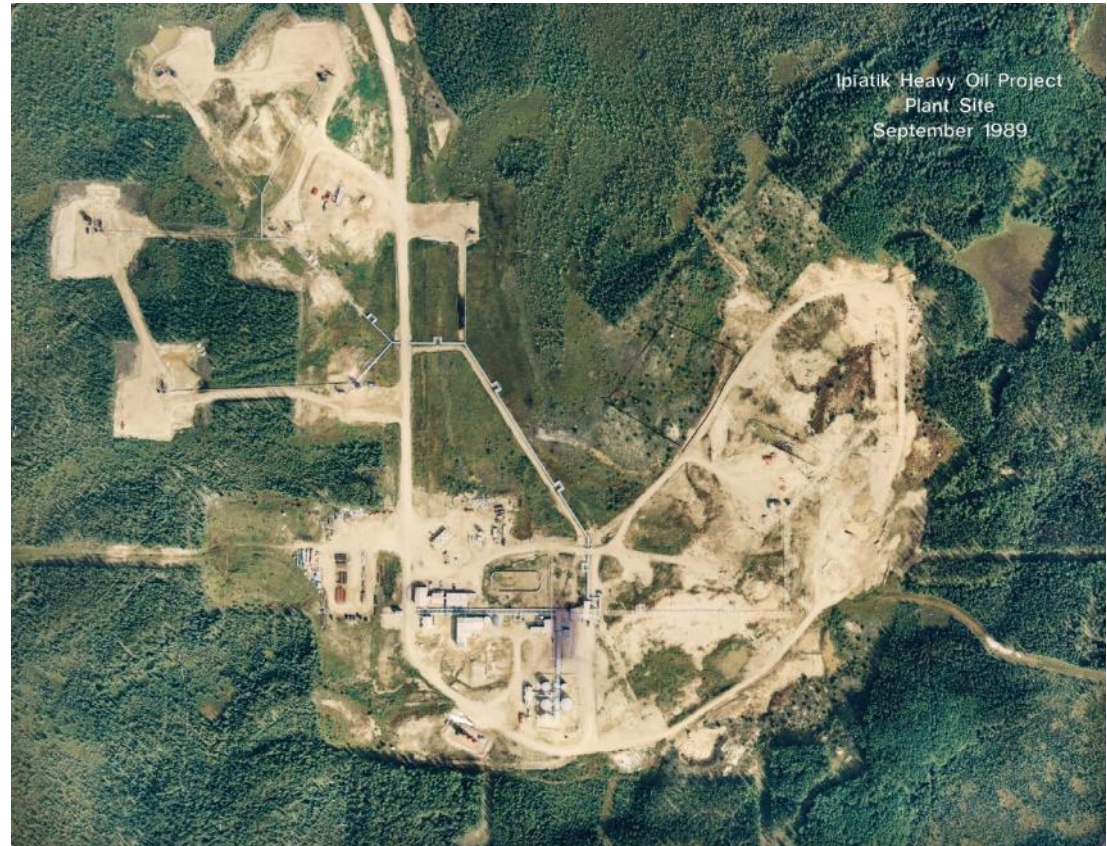
October 16, 2013

Environmental Services Association of Alberta  
2013 Remediation Technologies Symposium

**Smart. Responsive. Efficient.**

# Outline

- Site Background
- Project Purpose/Objective
- Environmental Assessment
- Project Approach/Planning
- Remediation
- GIS Integration
- Safety Mitigation
- Reclamation
- Wetland Development
- Tree Planting
- Challenges
- Learnings





# Site Location



**Smart. Responsive. Efficient.**

# Site Background

- In-situ oil sands pilot plant (21 ha) and 16 wellsites
- Suspended in 1990
- Facilities removed between 1990 and 2005



**Smart. Responsive. Efficient.**



# Purpose

- To reduce liability
- Obtain regulatory closure



# Objective

- Remediate to Alberta Tier 1
- Reclaim to Alberta Reclamation Criteria



# Previous Environmental Assessment

- Assessments from 1994 to 2009



# 2011

- Trace became involved in 2011
- Cenovus wanted accelerated site closure
- Reviewed previous work and developed plan
- Goal: use previously collected data but understand the limitations

# “The Plan”

- Integrate assessment, remediation, and reclamation into one project
- Integrate technology (GIS)
- Use consistent personnel, small team, one PM
- Invest time in planning
- Reclaim site by end of December 2012



# 2012

- 17 Phase 1's and 9 Phase 2's
- Remediation planning
- Remediation from October to December



**Smart. Responsive. Efficient.**

# Remediation Planning

- Detailed plan (including site specific safety plan and ERP)
- Intensive budget tracking
- Budget split between 9 AFEs

# Remediation Planning

- Collaboration with stakeholders to ensure project flow
- Cenovus (environment/operations/safety)
- Military
- Contractor (Frontline)

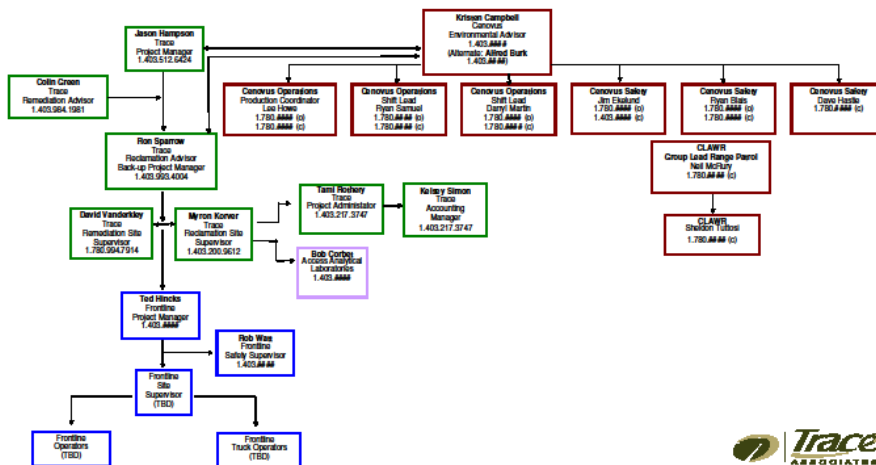




# Project Specific Safety and ERP Planning

- Detailed plan
- Involved all stake holders
- All personnel involved had copies of ERP Contact List

Appendix C - Project Organizational Chart  
Remediation Action Plan - Cenovus Energy Inc.  
Ipiatik Heavy Oil Pilot Project, Former Plant Site and Associated Abandoned Wellsites, near Conklin, Alberta  
Trace Project No. 200-242-02

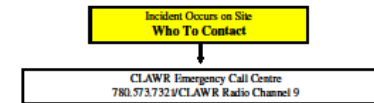


## APPENDIX D - EMERGENCY RESPONSE PLAN CONTACT LIST

Remediation Action Plan - Cenovus Energy Inc.

Ipiatik Heavy Oil Pilot Project, Former Plant Site and Associated Abandoned Wellsites, near Conklin, Alberta

Trace Project No. 200-242-02



### Emergency Response If Required

- Air Ambulance - STAR Helicopters Ltd.  
(RANGE CONTROL COORDINATES ALL AIR MEDICAL SERVICE)  
780.639.2770 (office)  
780.614.0551 (cell)  
780.573.3009 (cell)
- Helipad - Primrose Compressor Station (LSD 12-01-073-06 W4M)
- Nearest Hospital - Lac La Biche - William J. Cadzow Healthcare Centre  
780.623.4404 (24 hours)
- Lac La Biche Regional EMS (24 hours)  
780.573.7321

First Call - Trace Associates (go down chain of command until contact)		c	w	h
Project Manager	Jason Hampson	403.512.6424	403.984.1984	403.###
Alternate Project Manager	Ron Sparrow	403.993.4004	403.984.1992	N/A
President	Darrell Haight	780.914.0352	780.458.7787	780.###

Second Call - Cenovus Energy Inc. (go down chain of command until contact)		c	w
Remediation & Reclamation Advisor - Cenovus Operations Shared Services	Kristen Campbell	587.###	403.###
Production Coordinator - Cenovus Primrose Operations	Lee Howe	780.###	780.###
Shift Lead - Cenovus Primrose Operations	Ryan Samuel	780.###	780.###
Shift Lead - Cenovus Primrose Operations	Darryl Martin	780.###	780.###
Cenovus - Athabasca Gas Safety	Jim Ekolund	403.###	780.###
Cenovus - Athabasca Gas Safety	Ryan Blais	780.###	780.###
Cenovus - Athabasca Gas Safety	Dave Hastie	780.###	---

# Remediation

- 14,000 tonnes of impacted soil
- Comingled impacts consisting of PHCs/salinity/metals
- Method: excavate and landfill disposal



**Smart. Responsive. Efficient.**

# GIS Technology

- Incorporated GIS from initial planning onward
- Used in reclamation phase for vegetation/forest mapping as well as site status tracking
- Equipment: Trimble Geo XT with zephyr external antenna
- Accuracy: sub-metre



# GIS Technology

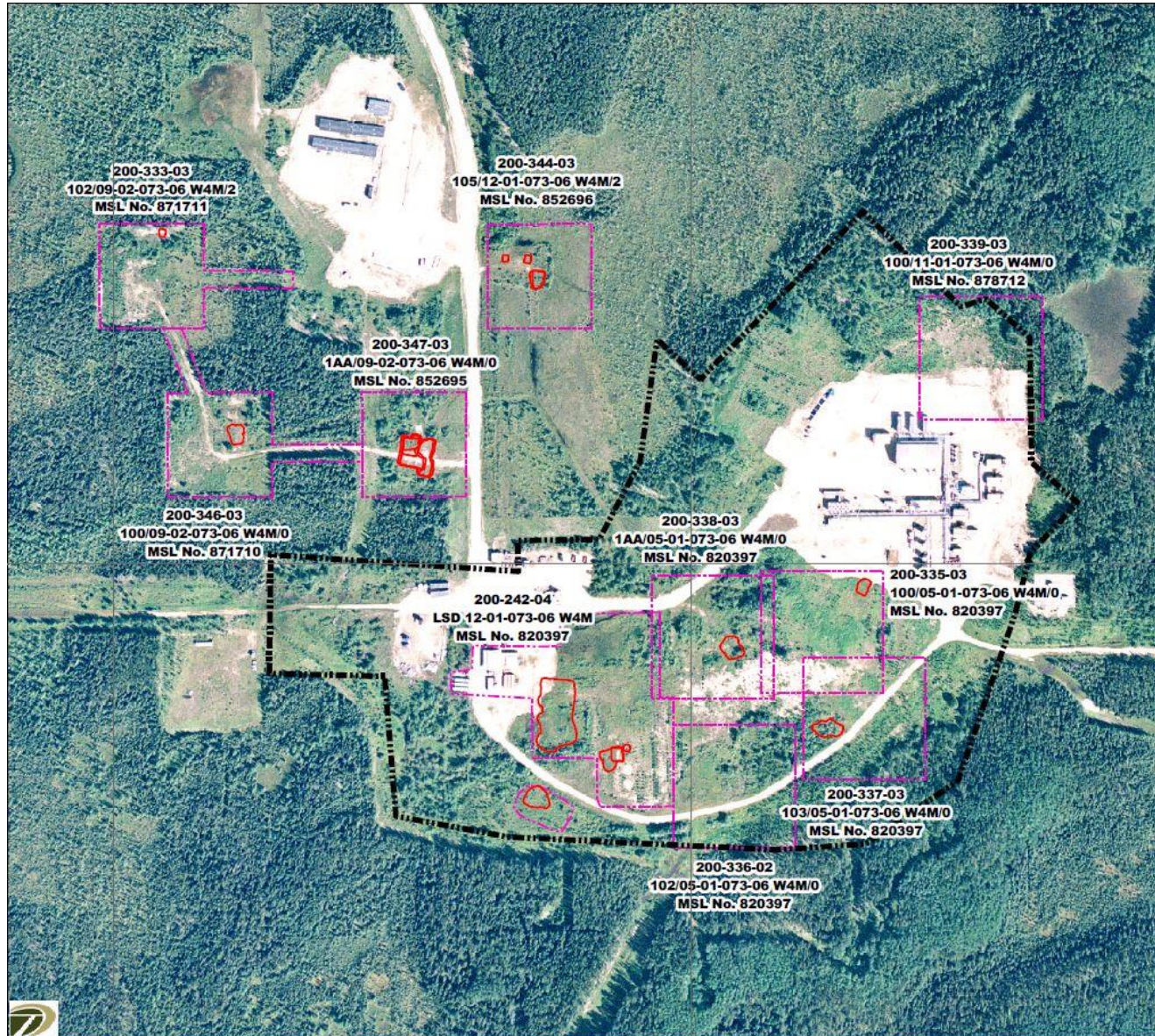
- All mapping and sampling locations were uploaded daily
- Allows for real time tracking of project status



**Smart. Responsive. Efficient.**



# Site Plan





# Efficiencies

## Impact Delineation



## Remedial Excavation



**Smart. Responsive. Efficient.**



# Safety Mitigation

Top three high risk hazards identified:

- Ground Disturbance
- Trucking
- Fatigue



**Smart. Responsive. Efficient.**

# Ground Disturbance

## Managed activities:

- Experienced staff on site at all times
- Dedicated team
- Stopped work when issue was identified, to “make it right”



**Smart. Responsive. Efficient.**

# Trucking

Use of Rock Trucks (Off Road)



Central Loading Area (On Road)



**Smart. Responsive. Efficient.**



# Fatigue

## Developed schedule:

- Reviewed OH&S
- Developed schedule and required breaks

## Minimized travel:

- Operations camp (15 minutes from site)
- At minimum, traveled in pairs

# Reclamation

- All backfill salvaged from on-site sources
- No additional disturbance associated with borrow pit
- Teams conducted remediation/reclamation concurrently
- End land use: forested land

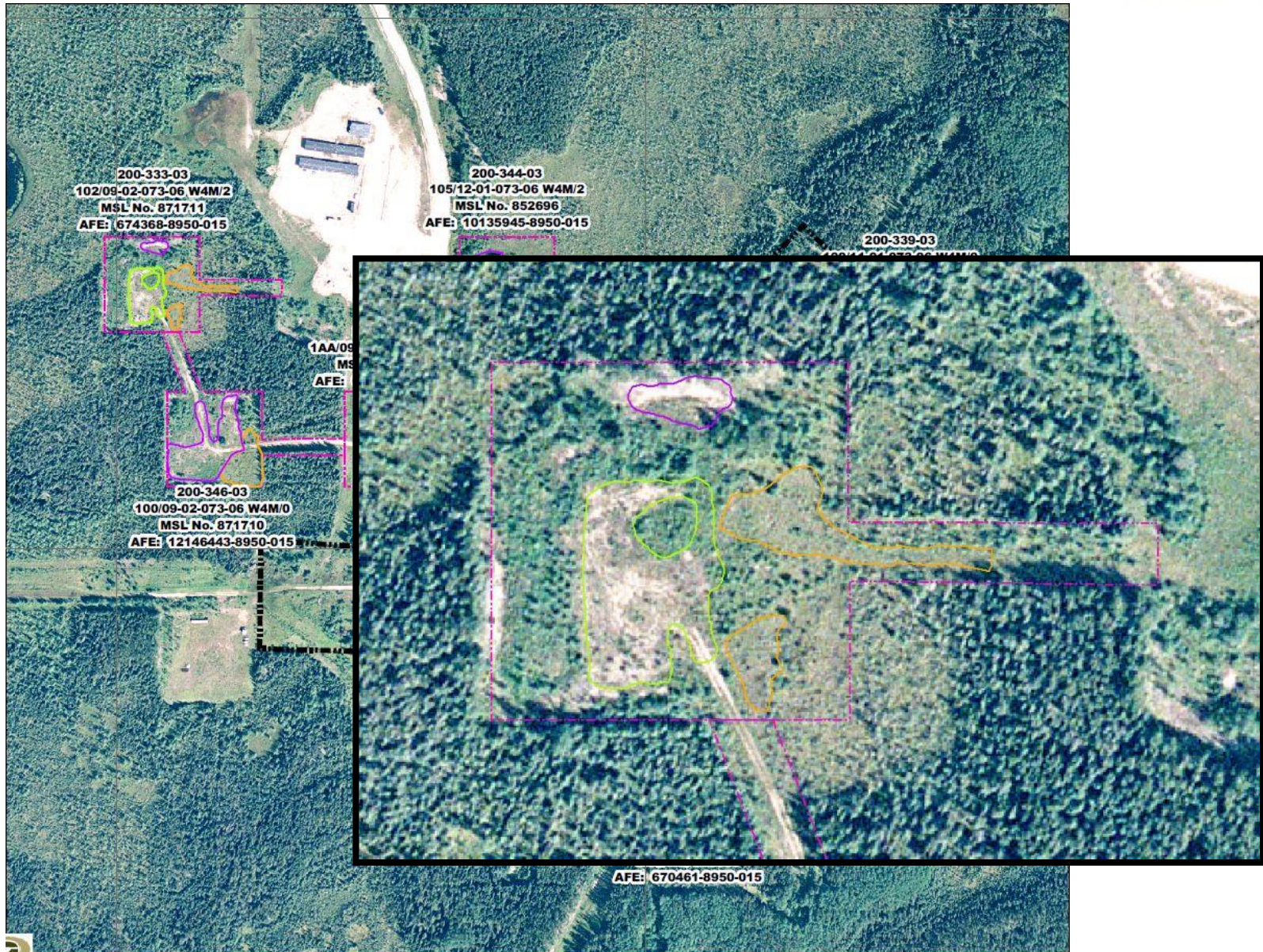


# Reclamation Activities

- Completed within one week of remediation
- Remedial excavation developed into wetland area
- Planted 10,170 trees
- Subsidence repair completed in 2013
- Monitoring 2014
- Site Closure 2015



# Reclamation

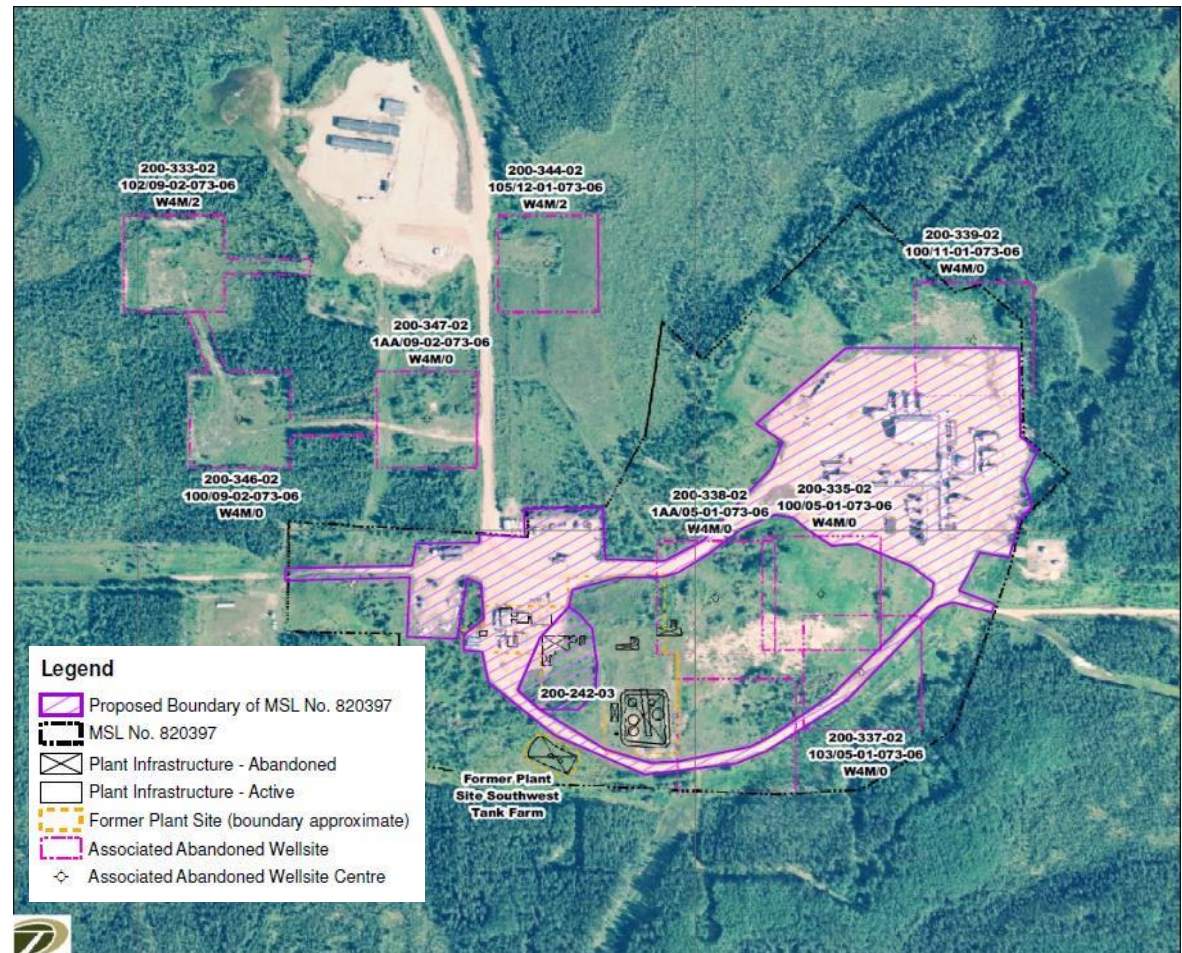




# Reduction of Footprint

Original MSL Area: 21.31 ha  
Reduced MSL Area: 7.34 ha

- Original MSL included an active neighboring compressor facility
- Closure of former facility required reduction of overall MSL
- Reduced footprint from 21.31 ha to 7.34 ha



**Smart. Responsive. Efficient.**

# Reclamation

Backfill/Recontouring



Mounding Activities



**Smart. Responsive. Efficient.**

# Wetland Development

- Area of impact expanded
- Sought regulatory authority approval to develop a wetland
- Wetland development reduced further land disturbance (i.e., borrow pit)



# Wetland Development

Post Remediation – Fall 2012



June 2013



Designed Shoreline Habitat

**Smart. Responsive. Efficient.**



# Wetland Development

July 2013



Shoreline Habitat

# Tree Planting



>10,000 seedlings  
obtained from Boreal  
Horticulture Services Ltd.



**Smart. Responsive. Efficient.**

# Challenges

- Extensive background reporting, with no closure goal set in the past
- Remote location
- Active military base
- Logistics (equipment, staff, etc.)
- Budget tracking (9 separate AFEs)
- Unknown buried facilities
- Early frost



# Learnings

- Grouping sites together at all phases under one plan streamlines program (Phase 1 through Remediation/Reclamation)
- Over communicate
- Detailed up front planning allows for flexibility
- Concurrent remediation and reclamation on multiple sites maximizes production

# Learnings

- Integrated assessment, remediation, reclamation team saved at least a year
- Wetland creation has significant safety, cost, and environmental benefits
- Integrated approach cost saving: easily \$400,000 vs. traditional method
- Bigger picture learning: get more done on fewer sites vs. getting a little done on many sites
- Ensure technical team (especially PM and Seniors) has knowledge on how to deal with unforeseen circumstances (e.g., wetland creation)

# The little things that create efficiencies...



**Smart. Responsive. Efficient.**



# Acknowledgements



Kristen Campbell, M.A., P.Ag.  
Lee Howe, Operations  
Cenovus Safety Team



Russ Domville, P.Geol.  
Ted Hincks, P.Eng., MBA  
Greg Dyck, Project Supervisor



Ron Sparrow, B.Sc., RPF, CPESC  
David Vanderkley, Dip. (M.E.T.)  
Myron Korver, A.T.T.  
Luisa Muenter, B.Sc.  
Brittany Richardson, B.Sc., B.I.T.

**Smart. Responsive. Efficient.**

# Questions?



Contact:

[jhampson@traceassociates.ca](mailto:jhampson@traceassociates.ca)

**Smart. Responsive. Efficient.**