



# 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

# 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



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# Site Background

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



# 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



# Remediation Planning

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

# Remediation Planning

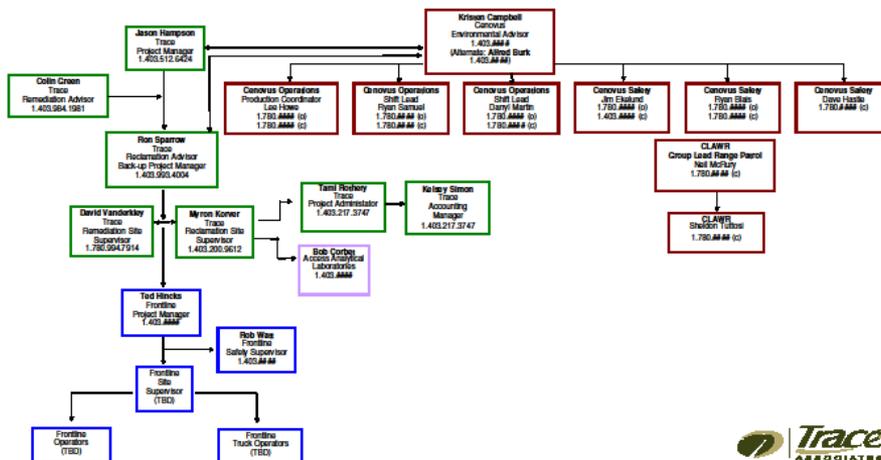
- Collaboration with stakeholders to ensure project flow
- Cenovus (environment/operations/safety)
- Military
- Contractor (Frontline)



# Project Specific Safety and ERP Planning

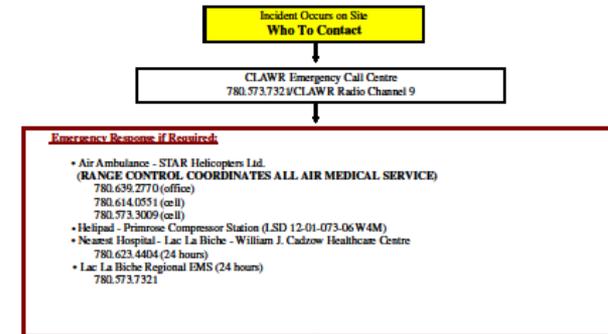
- Detailed plan
- Involved all stake holders
- All personnel involved had copies of ERP Contact List

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



# 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

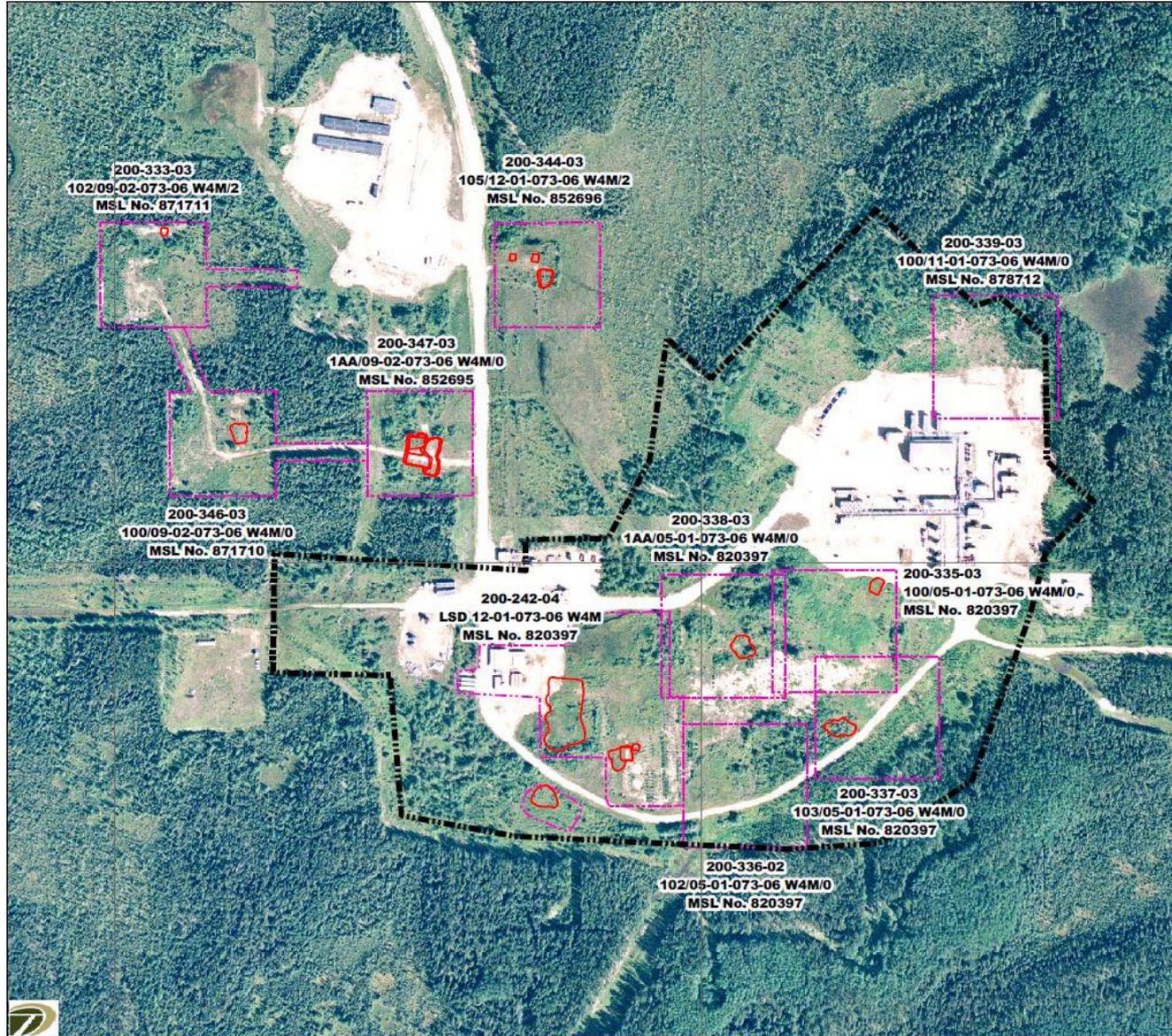


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# Site Plan



**Trace**  
ASSOCIATES



# Efficiencies

Impact Delineation



Remedial Excavation



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# Safety Mitigation

Top three high risk hazards identified:

- Ground Disturbance
- Trucking
- Fatigue



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# Ground Disturbance

## Managed activities:

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



# Trucking

Use of Rock Trucks (Off Road)



Central Loading Area (On Road)



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# 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

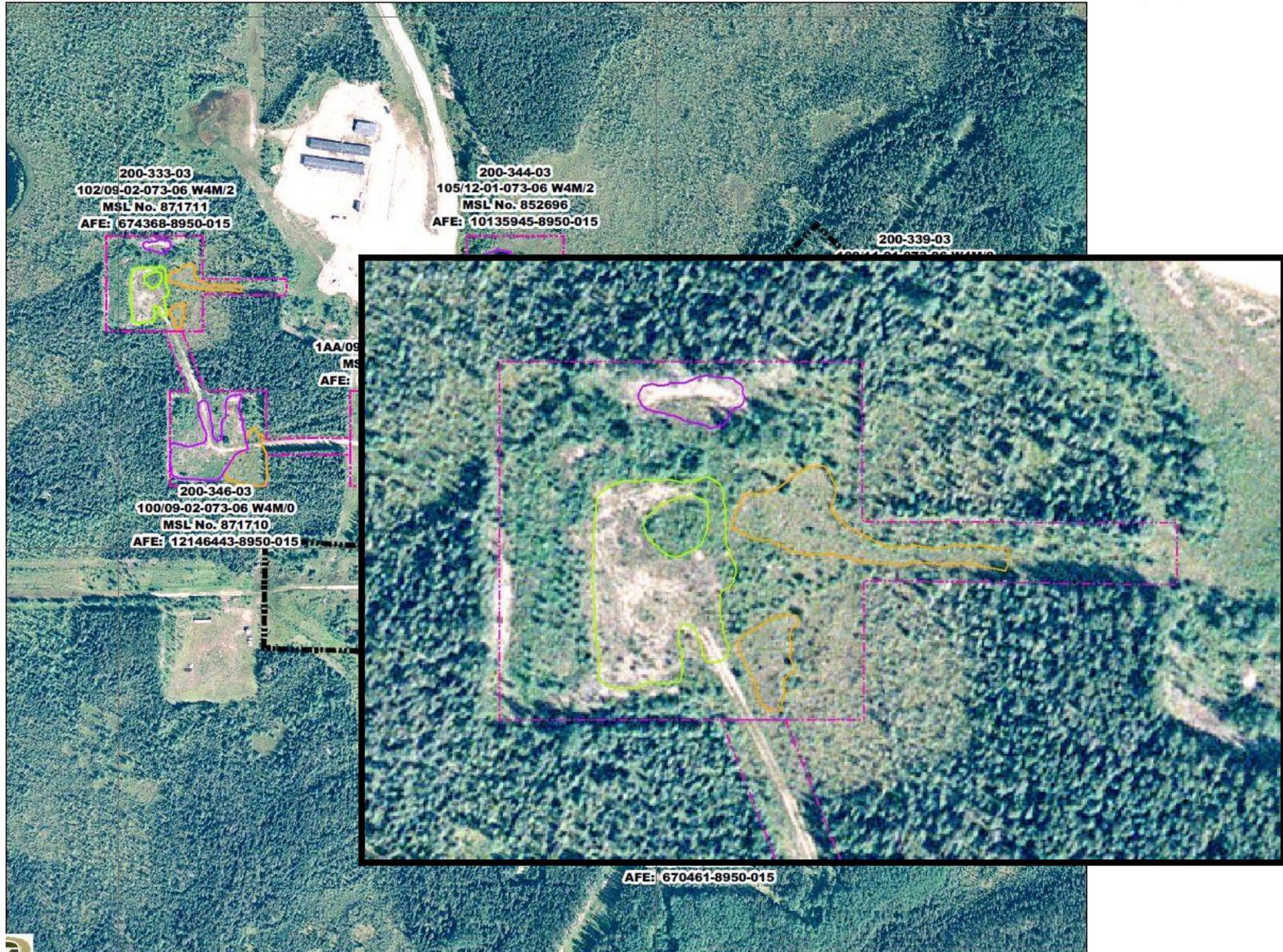
- All backfill salvaged from on-site sources
- No additional disturbance associated with borrow pit
- Teams conducted remediation/reclamation concurrently
- End land use: forested land



# 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

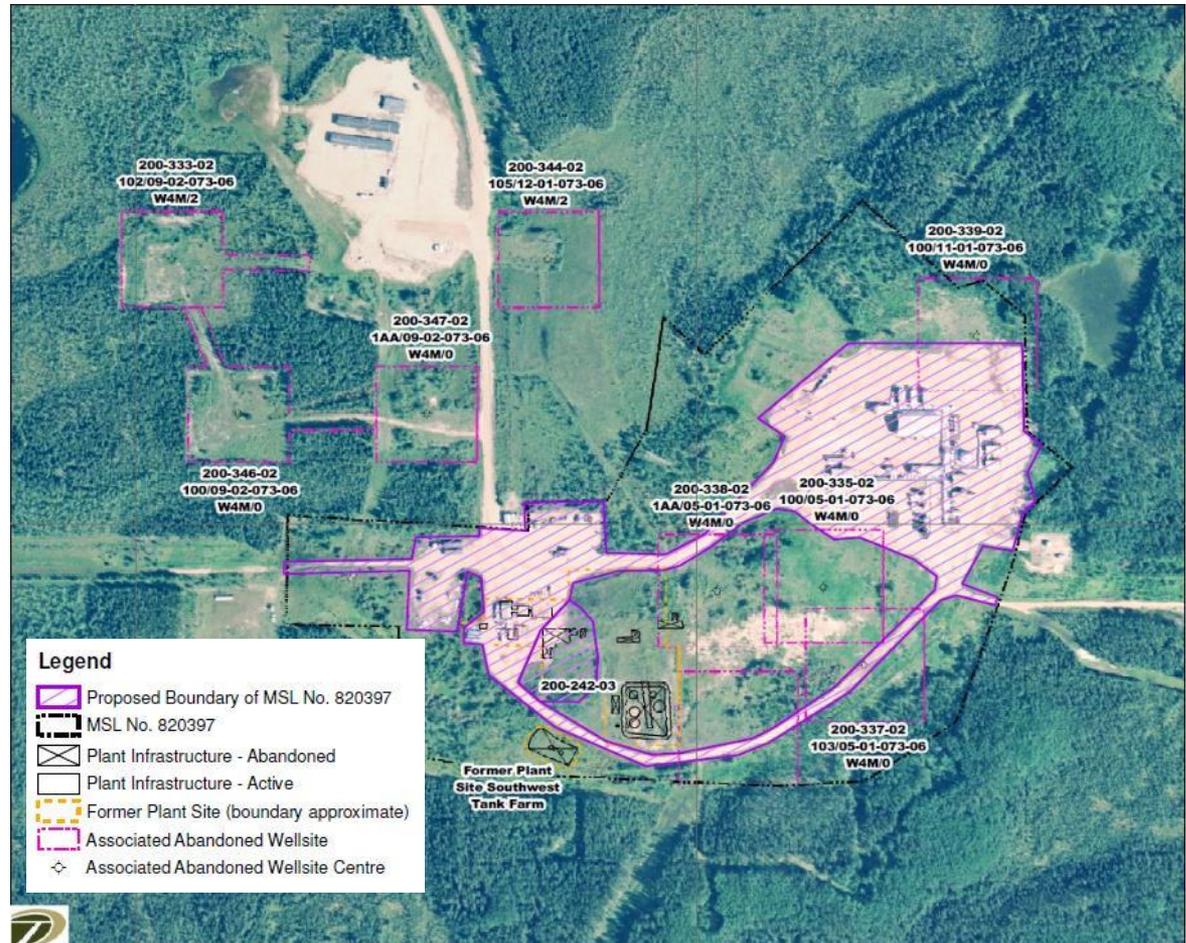
# Reclamation



# 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



# Reclamation

Backfill/Recontouring



Mounding Activities



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# 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

# Wetland Development

July 2013



Shoreline Habitat

# Tree Planting



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

# 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...



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# Acknowledgements



Kristen Campbell, M.A., P.Ag.  
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Cenovus Safety Team



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

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# Questions?



Contact:

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