



# Labrador Iron Mines – Sustaining the Environment:



**Redmond Creek Fish  
Habitat Compensation  
Project**

# Fish Habitat Compensation Project

## Moving a Section of the Unnamed Tributary

James Mine

Unnamed  
Tributary

- **Re-design of James South pit**

- » To access additional ore
- » Address pit wall stability



# Fish Habitat Compensation Project

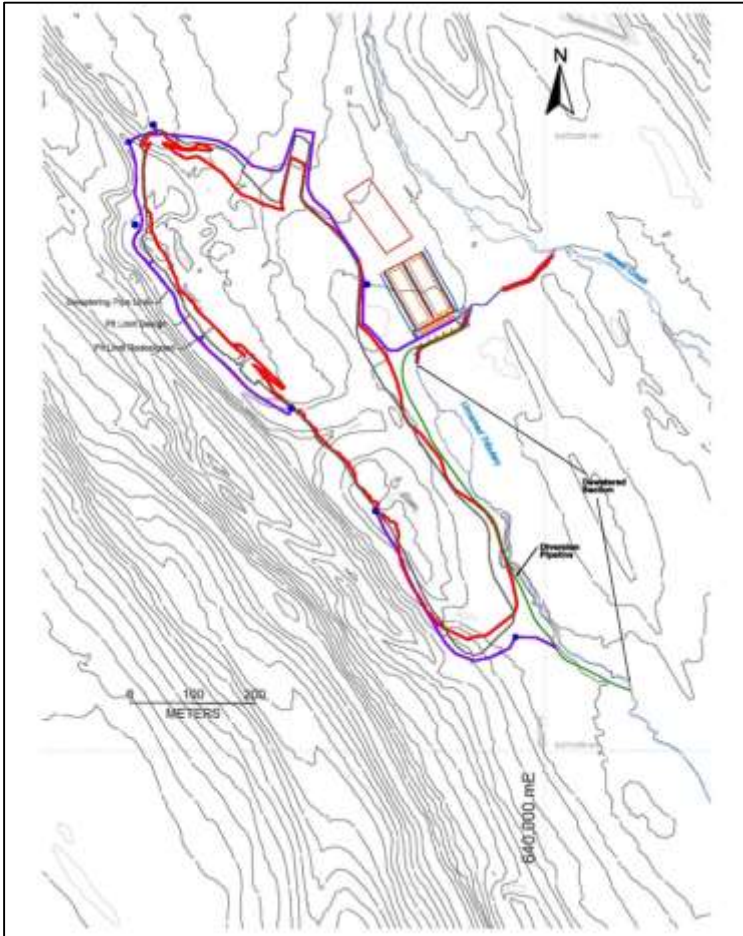


↑  
Unnamed  
Tributary

James Mine



# James Pit Re-Design





The re-design of the James South Pit was required due to two concerns:

1. Structural Integrity of the Pit Wall:

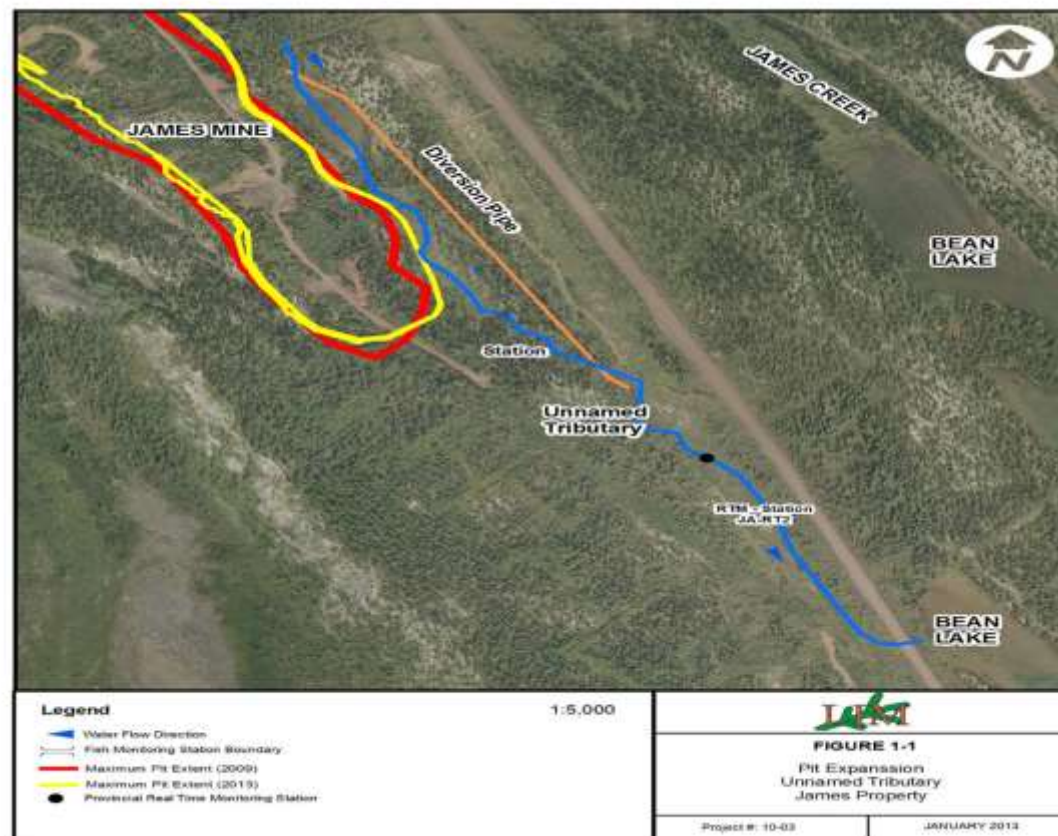
- The Pit perimeter was approximately 20 m from a section of the unnamed tributary
- The organic layer was much deeper than anticipated and the material lacked the required competency for the current pit design, therefore, the structural integrity of the pit wall had become a concern

2. Access to additional ore:

- To access ore in the eastern section of the pit the pit perimeter had to be pushed out to the east extending past the unnamed tributary
- Therefore the pit was re-designed to allow for a more gradual slope which allowed a larger pit floor and access to the identified ore body, i.e.  versus 
- This required the removal (de-watering) of approximately 500 m of the upstream section of the unnamed tributary
- A diversion pipe was installed to bypass the de-watered section and to deliver flows into downstream section



# James Pit Expansion



# Unnamed Tributary Prior to Dewatering





## Fish Habitat Compensation Project Impact

Unnamed Tributary Affected Habitat :

- 31 m<sup>2</sup> of spawning habitat
- 222 m<sup>2</sup> of rearing habitat; and
- 5,409 m<sup>2</sup> of adult habitat



# Fisheries Authorization - DFO



An Off Set Plan was approved by DFO to compensate for loss of 5,662 m<sup>2</sup> of fish habitat.

Predicted Productivity ratio 4 : 1, therefore 1,500 m<sup>2</sup> (15 units) of compensatory fish (brook trout) habitat were required to offset the loss



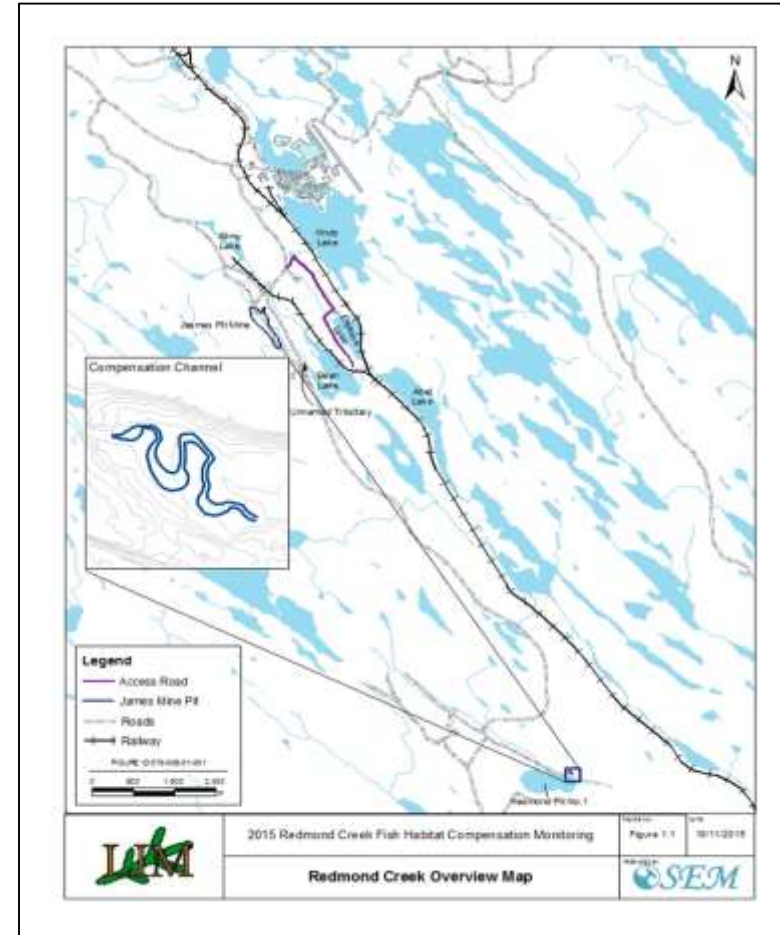
# Fish Habitat Compensation Site: Redmond Creek

## Site Selection Criteria:

- ✓ Within the same watershed
- ✓ Same fish species
- ✓ Accessibility
- ✓ Habitat Enhancement Potential
- ✓ Existing information on water quality and resident fish species

## Selected Site:

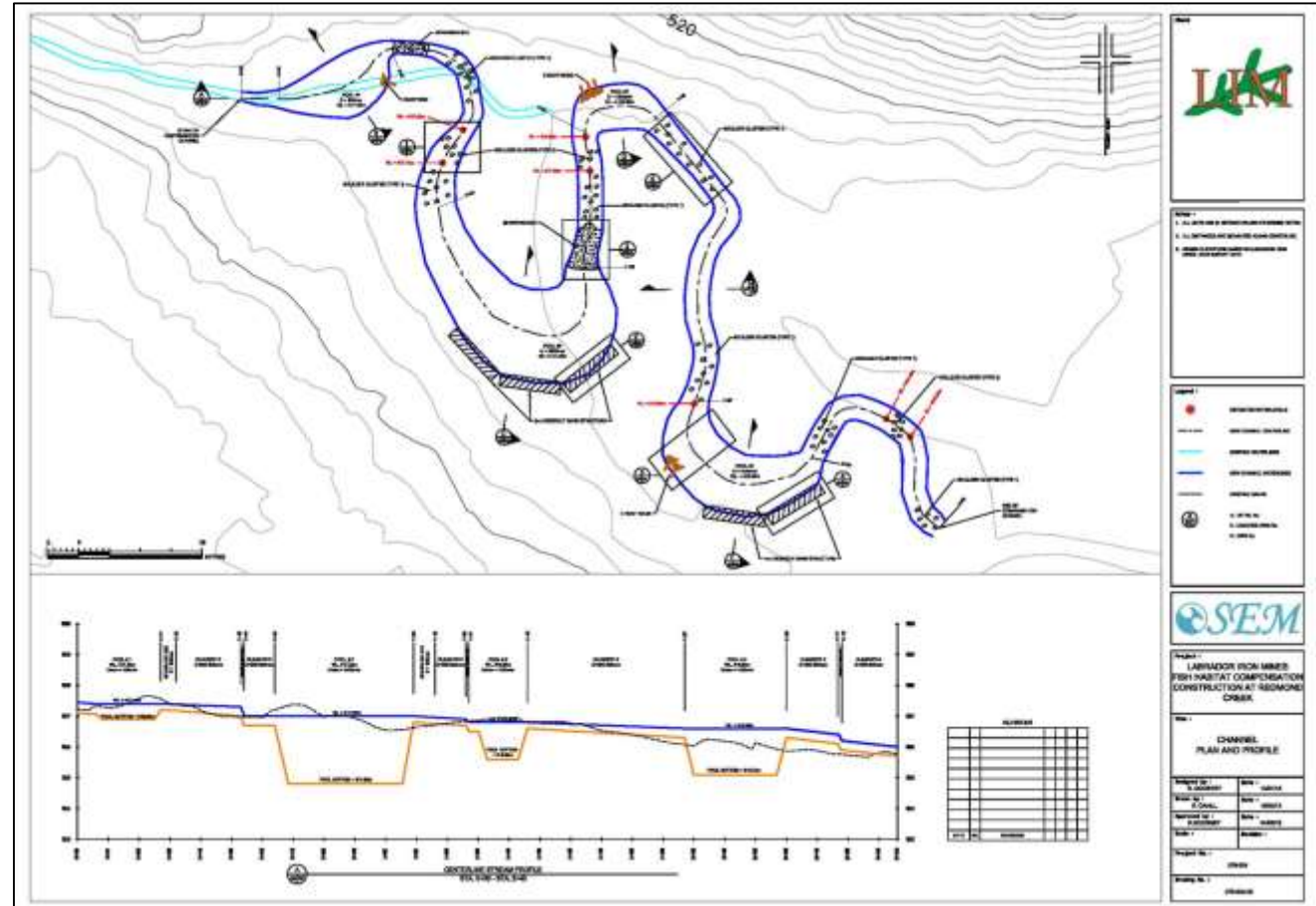
Redmond Creek met all criteria



# Fish Habitat Compensation Site: Redmond Creek



# Redmond Creek Fish Habitat Compensation Channel Plan and Profile



# Fish Habitat Compensation Project

Start of Construction August 8, 2013



August 16, 2013

Laydown Area

Pump 2

Access Road

Pump 1

Downstream Cofferdam

Upstream Cofferdam

Diversion Channel



August 23, 2013

Laydown Area

Downstream Coffer Dam

Pump 2

Access Road

Grubbed and Dewatered

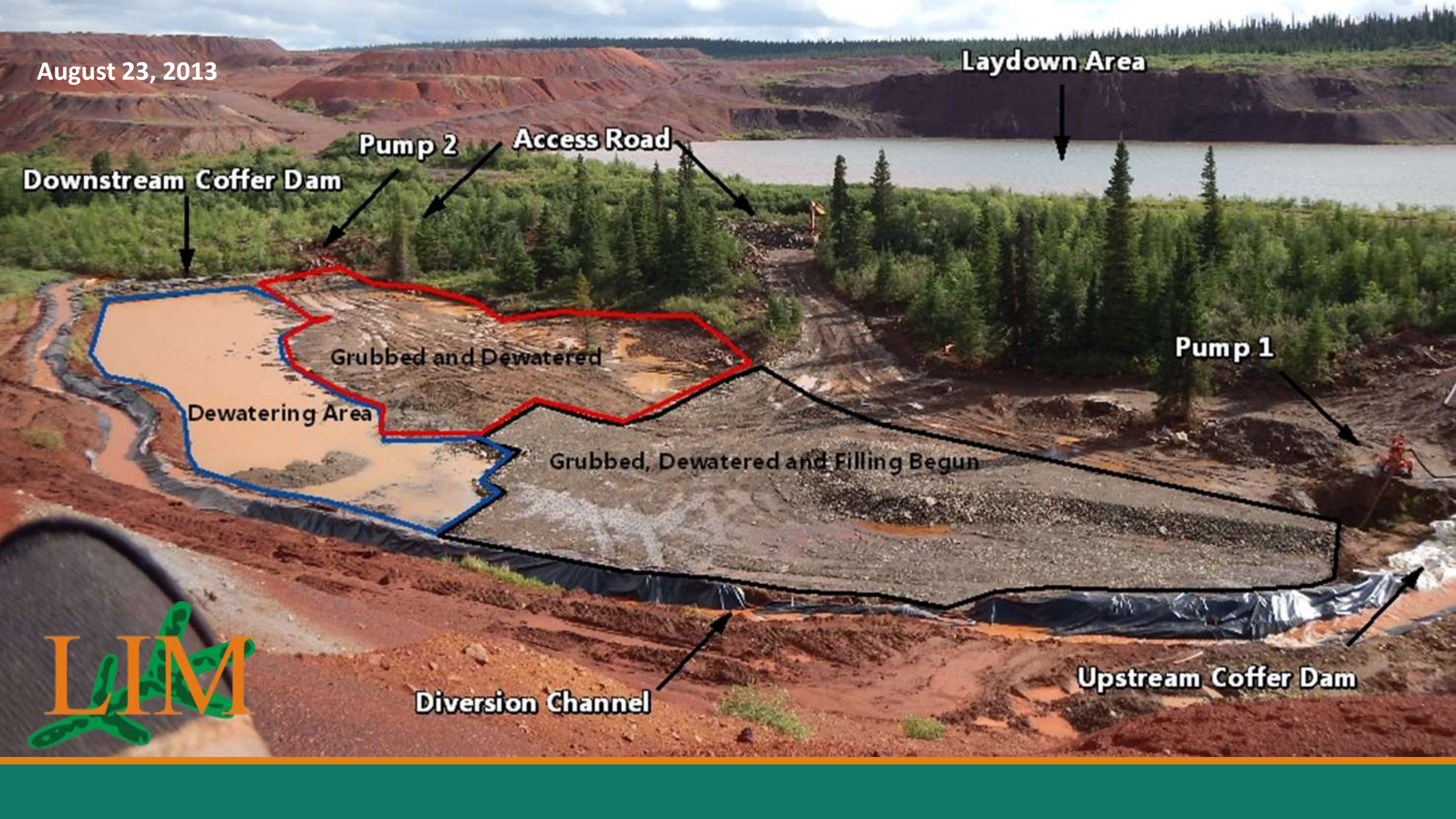
Dewatering Area

Grubbed, Dewatered and Filling Begun

Pump 1

Upstream Coffer Dam

Diversion Channel



September 6, 2013

Downstream Coffer Dam

Pump 2

1m Undercut Bank Structures

Laydown Area

500mm Boulder Stockpile

Pump 1

Riffle Run Channels and Pools

Upstream Coffer Dam

Diversion Channel



September 14, 2013



September 19, 2013



**Completion of Construction  
September 24, 2013**



Redmond Creek  
July, 2015



**Redmond Creek Revegetation**  
**August, 2015**



# Fish Habitat Compensation Project



## Results:

- ✓ 46 m<sup>2</sup> of spawning habitat;
- ✓ 313 m<sup>2</sup> of rearing habitat; and,
- ✓ 1141 m<sup>2</sup> of adult habitat.

## Other features include:

- ✓ Addition of substrates for spawning and rearing of target species in the riffle/runs;
- ✓ Provision of undercut bank structures and root wads for providing shade, cover and shelter
- ✓ A total of four pools, ranging in depth from 0.5 m to 2 m, and four sections of riffle/runs.



# Fish Habitat Compensation Project



## Follow up Monitoring:

2014, 2015, 2016, 2018 & 2020:

- Habitat stability and quality
  - Structural integrity and substrate distribution
  - Discharge
  - Riparian vegetation
- Biological response
  - Water quality
  - Benthic productivity
  - Fish productivity



# Fish Habitat Compensation Project



## Results to Date

The Report on the field studies completed in 2014 and 2015 concluded that:

- “the benthic invertebrate population is becoming established and that fish are utilizing the created habitat.
- The physical parameters of the stream indicated that the needs of all life stages of brook trout are being met.
- Successful reproduction and colonization of the pool habitats by large adult brook trout have been documented.
- It is anticipated that the resident population of brook trout will continue to increase as the physical environment becomes further established (i.e., riparian vegetative cover).”



## Environmental Policy and Guiding Principles

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*Labrador Iron Mines Limited (LIM) is committed to conducting operations in an environmentally responsible manner by maintaining a high standard of environmental responsibility and performance.*

*Our goal is to minimize the environmental footprint at all operations, while conducting operations in a safe and socially responsible manner. We have adopted this **Environmental Policy** to demonstrate our respect for the environment and the local communities in which we work.*

