



MONTE CRISTO MINING AREA CERCLA REMOVAL ACTION

Presented by:

Dustin G. Wasley, PE, Principal – CES

MT Mine Design, Operation & Closure Conference

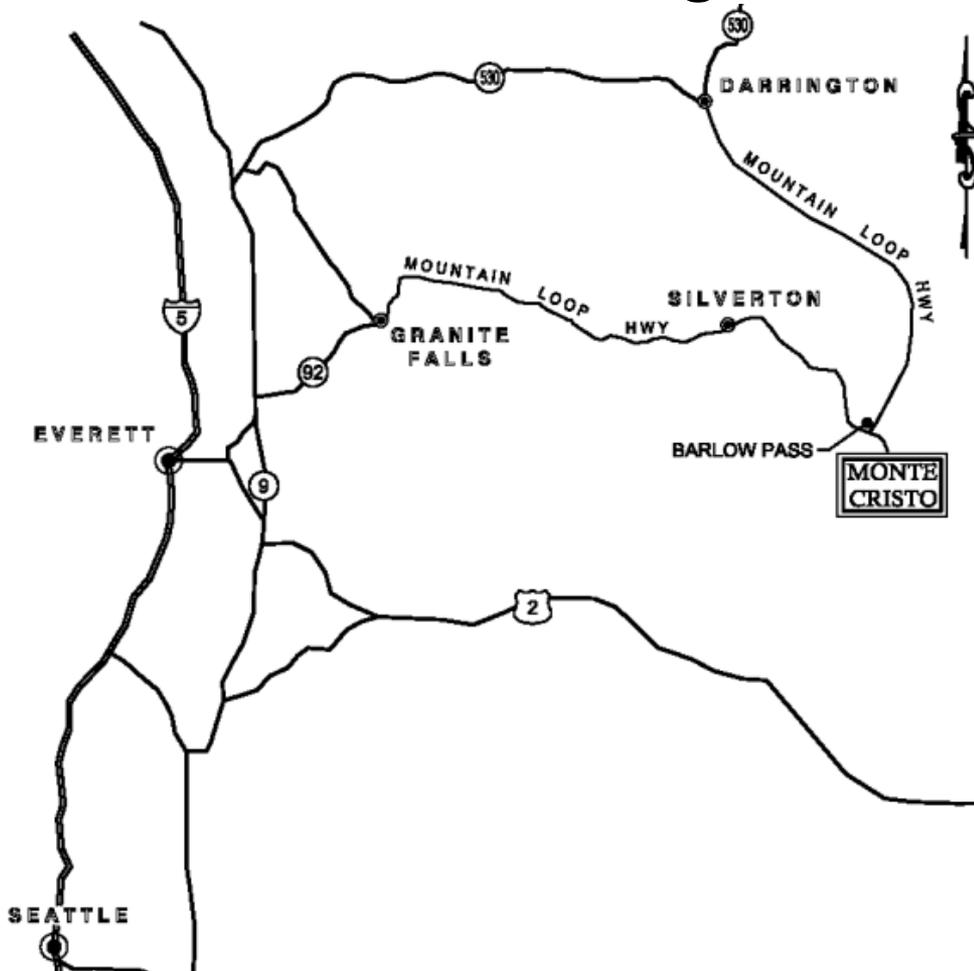
May 9, 2013

Outline of Topics

- History of the Monte Cristo Mining District
- Overview of Mines/Facilities
- Nature and Extent of Contamination
- Removal Action Summary
- Removal Action Update/Timeline
- Environmental Group Involvement/Interest

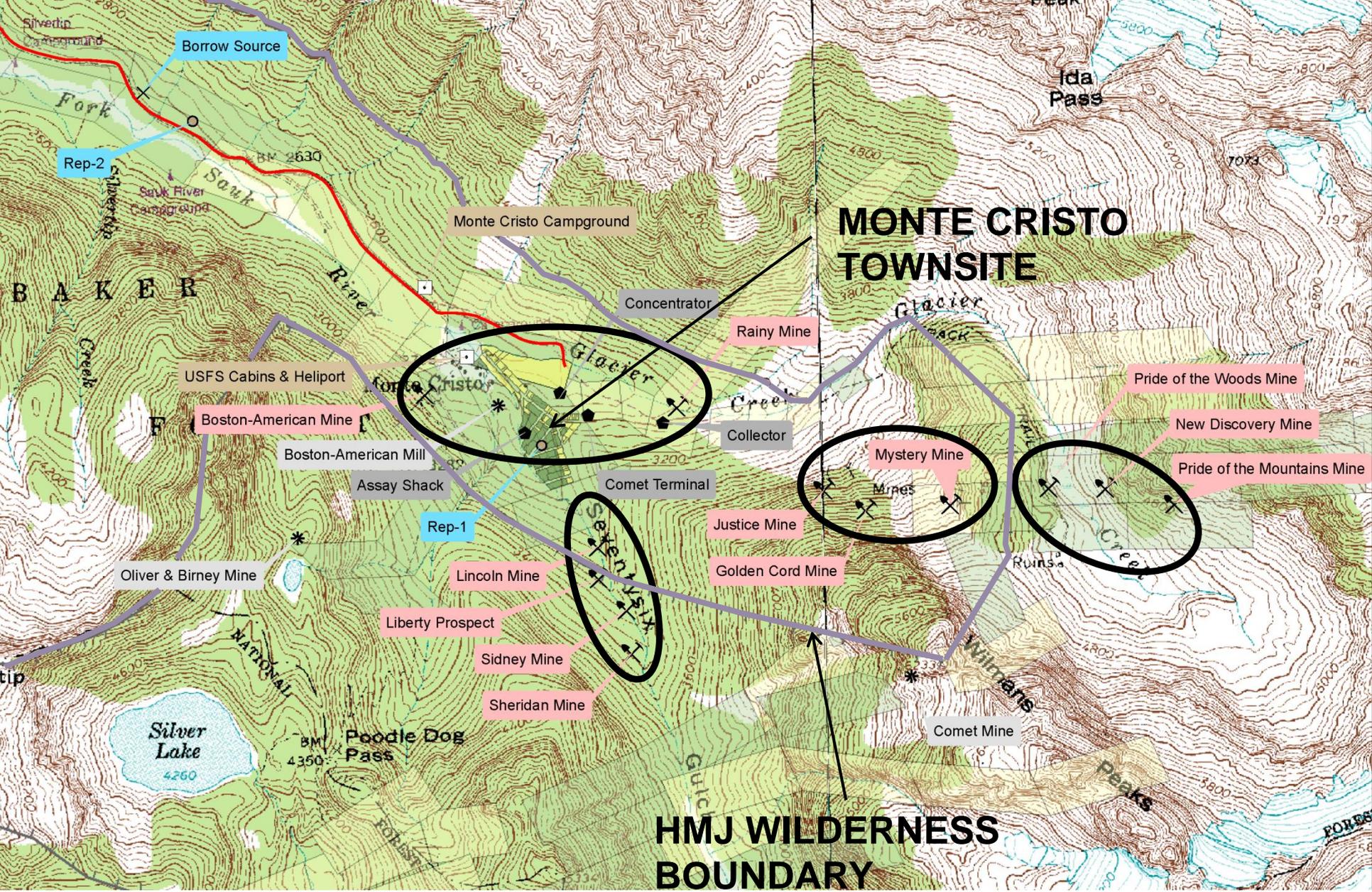
Overview of the MCMA

- Located in NW Washington, near/in HMJ Wilderness



Overview of the MCMA

- Located in NW Washington, near/in HMJ Wilderness
- ~60 Mines/Prospects, plus several mills - mainly waste rock, tailings, concentrates, and impacted soil
- Complex Land Ownership, USFS/private, platted Townsite
- 2,000 – 6,000 feet amsl (Monte Cristo Lake to Headwaters)
- Heavy Recreational Use (3,500+ annual visitors)
- ASARCO Settlement - \$5.5M each to Forest Service and Ecology



MONTE CRISTO TOWNSITE

HMJ WILDERNESS BOUNDARY

Stakeholders

- Region 6 – Forest Service
- Washington Department of Ecology
- Monte Cristo Preservation Association
- U.S. Fish and Wildlife
- Washington Department of Fish and Game
- Private Landowners/Seasonal Residents
- Recreational Users - Hikers, Campers, etc.
- Sauk-Suiattle Tribe

Early History of Mining District

- 1889 – First discovery and early claims.
- 1891 – Rockefeller buys majority interest.
- 1892/1893 – Wagon Road/Railway completed to Monte Cristo.
- 1894 – United Concentration Company completes Mill.
- 1894 to 1906 – Period of Most Significant Mining, Ore Production ~300,000 tons.
- 1903 – ASARCO purchases Everett Smelter/Monte Cristo interests.
- 1907 – Main Production ends at Monte Cristo.











CERCLA Investigations

- 2002 – Preliminary Assessment - Concentrator/Mystery (FS)
- 2004 – Site Inspection – Phase I/II Initiated (FS/CES)
- 2006 – Preliminary Assessments – 4 Additional Sites (FS)
- 2007 – Site Inspection – Phase III/IV Initiated (FS/CES)
- 2008 – Site Inspection Finalized (FS/CES)
- 2008 – EE/CA Initiated (FS/CES)
- 2009 – EE/CA Public Presentation (FS/CES)
- 2010 – EE/CA Published, Public Comment (FS/CES)
- 2012 – Signed Removal Action Memorandum (FS)

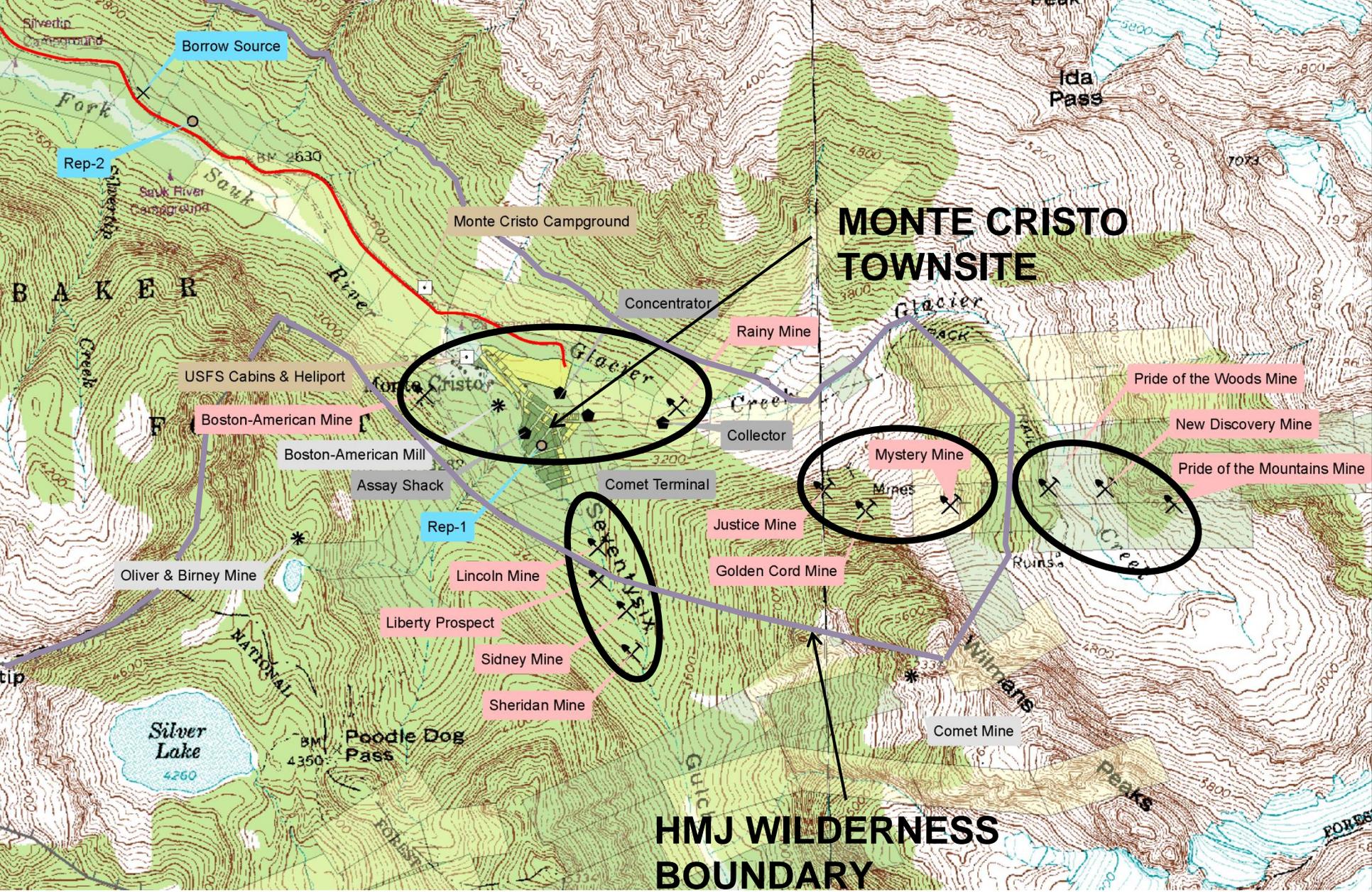
Project Challenges

- Wilderness Area
- Limited Access – No Viable Road
- Archeological / Cultural Issues (Road and Townsite)
- Inventoried Roadless Area
- Limited Communications
- High Gradient Streams
- Multiple Stakeholders
- And.....



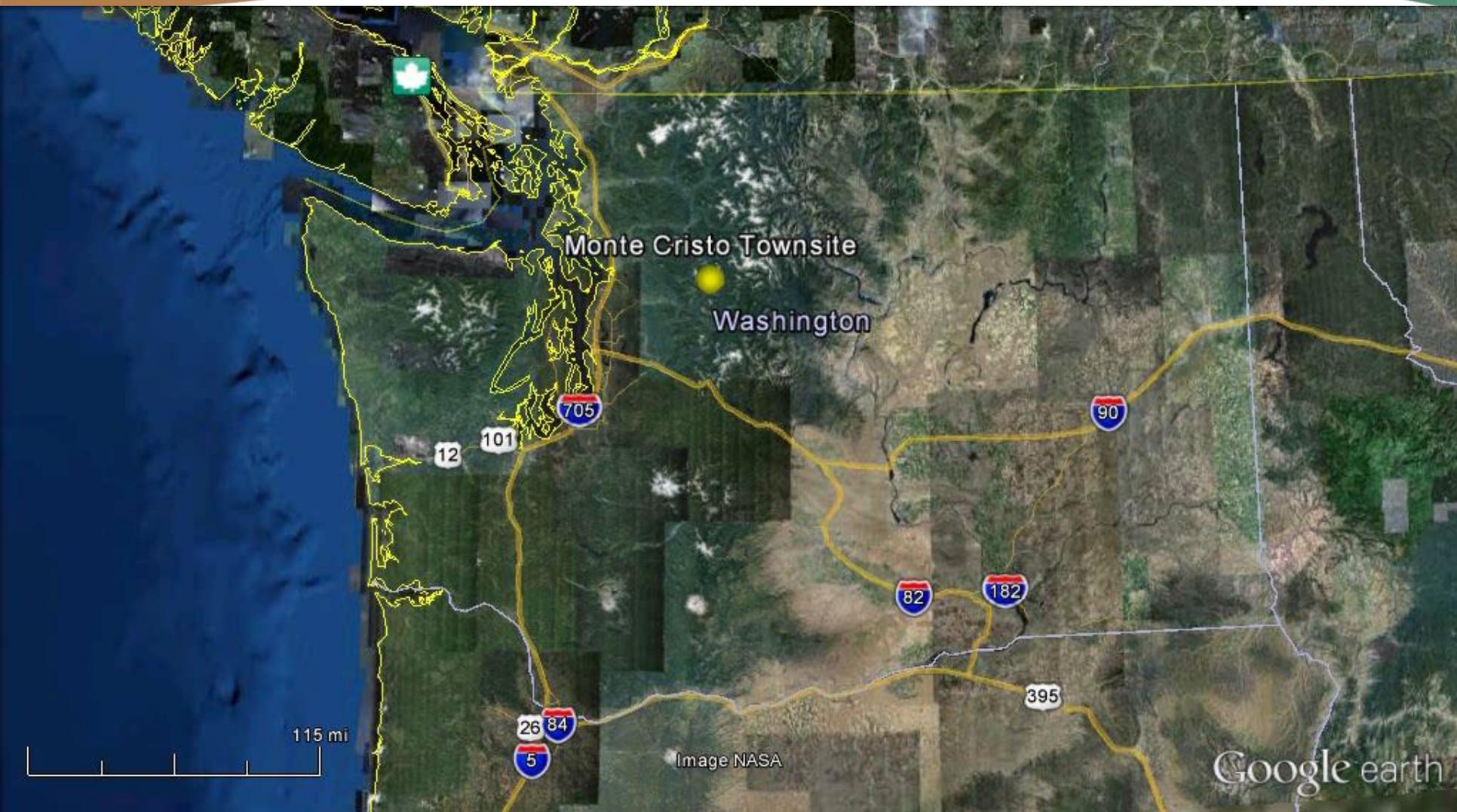
Mines/Facilities Investigated

- Pride of the Mountains Mine
- Pride of the Woods Mine
- New Discovery Mine
- Mystery Mine
- Golden Cord Mine
- Justice Mine
- Rainy Mine
- Lincoln Mine
- Liberty Prospect
- Sheridan Mine
- Sidney Mine
- Boston-American Mine
- Ore Collector
- Comet Terminal
- Concentrator/Mill
- Assay Shack
- Haulage Ways



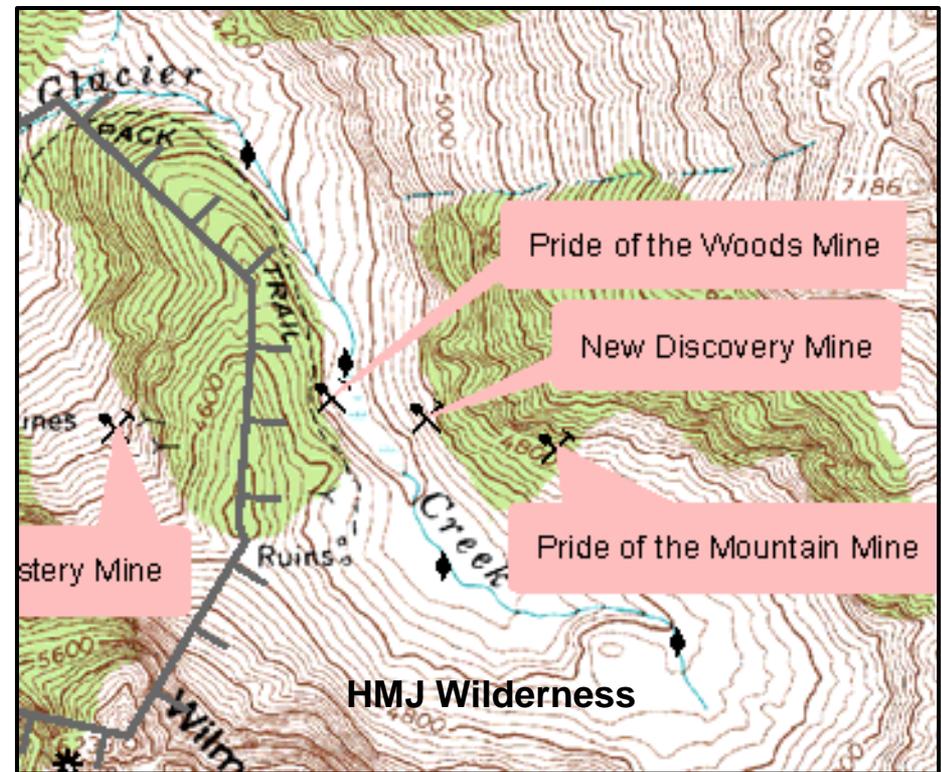
MONTE CRISTO TOWNSITE

HMJ WILDERNESS BOUNDARY

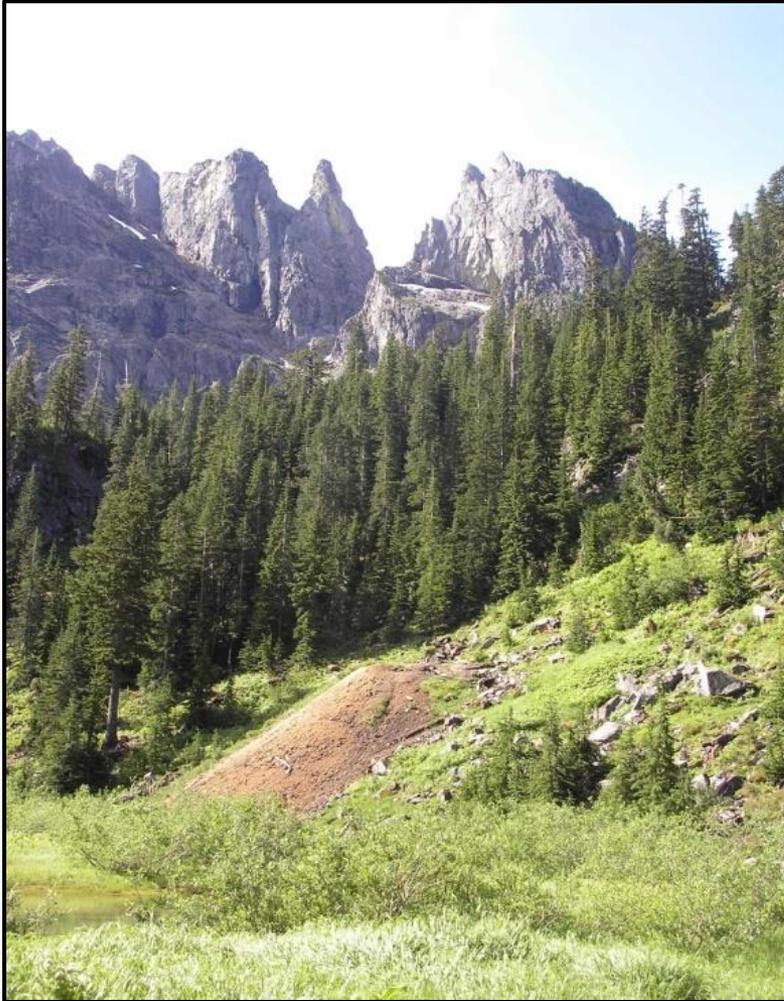


Upper Glacier Basin/Creek Area

- Pride of the Mountains Mine
- New Discovery Mine
- Pride of the Woods Mine



Pride of the Woods Mine



- 1 Adit
- Located on Glacier Basin Trail
- ~1000 cy of Waste Rock
 - As = 16,640 ppm (Avg)
 - Toe of Waste Rock in Glacier Creek
- Seep at Toe of Waste Rock
 - Up to 1,100 ppb (As)

Pride of the Woods Mine



Portal Area



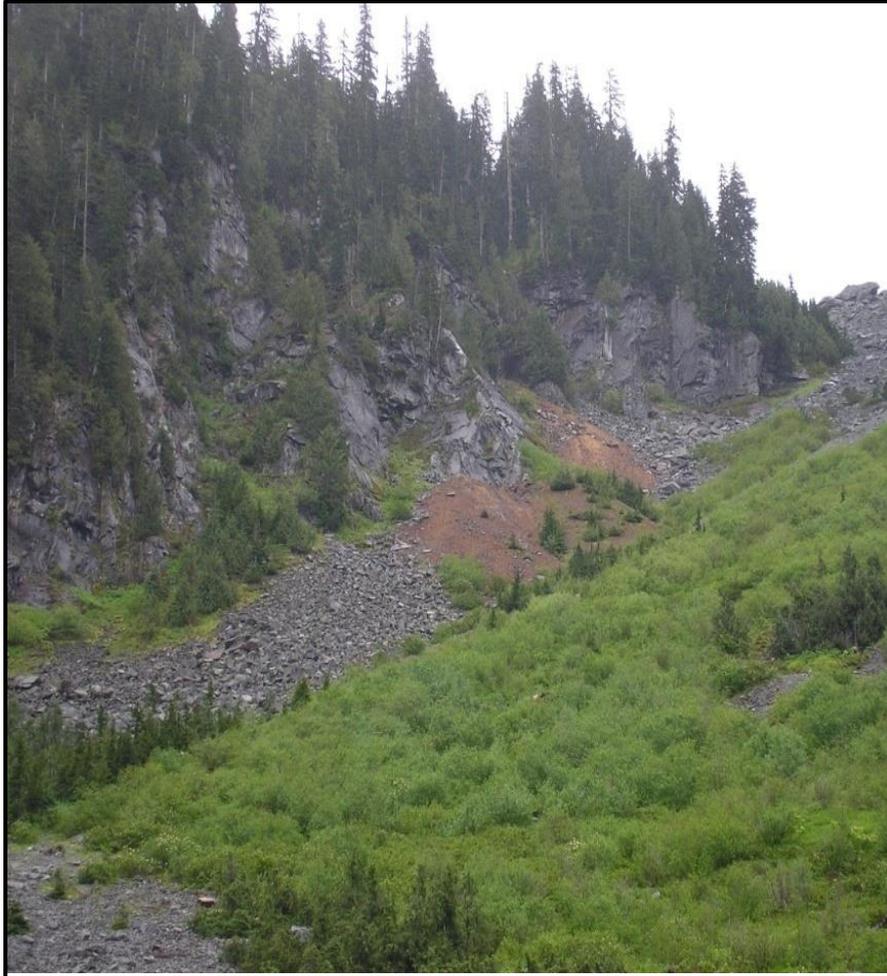
WR Toe in Glacier Creek

Mystery Ridge/Basin Area

- Mystery Mine
- Golden Cord Mine
- Justice Mine



Mystery Mine



- 3 Adits and Glory Hole
- ~32,000 cy of Waste Rock
 - As = 12,657 ppm (Avg)
- Adit Seep
 - <40 gpm / 3,300 ppb (As)
- Seep Below Waste Rock
 - <4.5 gpm / 1,100 ppb (As)

Mystery Mine



Adit Seep



Main Portal Area

Justice Mine



- 2 Adits
- ~14,000 cy of Waste Rock
 - As = 11,719 ppm (Avg)
- Adit Seep
 - 90 gpm & 235 ppb (As)
- Seep Below Waste Rock
 - 1.35 gpm & 264 ppb (As)

Justice Mine



Main Portal



Seep and WR Dump

Lower Glacier Creek/Townsite Area

- Rainy Mine
- Ore Collector
- Concentrator
- Assay Shack
- Haulage Ways
- Comet Terminal
- Boston-American Mine



Rainy Mine



- 1 Adit and 2 Shafts
- ~5,000 cy of Waste Rock
 - As = 40,455 ppm (Avg)
- Glacier Creek Eroding Waste Rock Dump
- Adit Seep
 - 0.05 gpm & 14 ppb (As)

Rainy Mine



Dump and Glacier Creek

Ore Collector



- Ruins Present (stone, brick, and wood)
- ~2,500 cy of Ore
 - Fine and Coarse
 - As = 29,551 ppm (Avg)



Comet Terminal



- Ruins/spillage piles
- Located on Glacier Basin Trail
- 11 ore stockpiles/spillage piles (As up to 10%)
- ~ 1,000 cy of piles and soil (scattered)

Concentrator/ Mill



- Mill Ruins Present
- ~10,000 cy of Tailings
 - As = 21,400 ppm (Avg)
 - 100 cy of Dangerous Waste
 - Near Glacier Creek





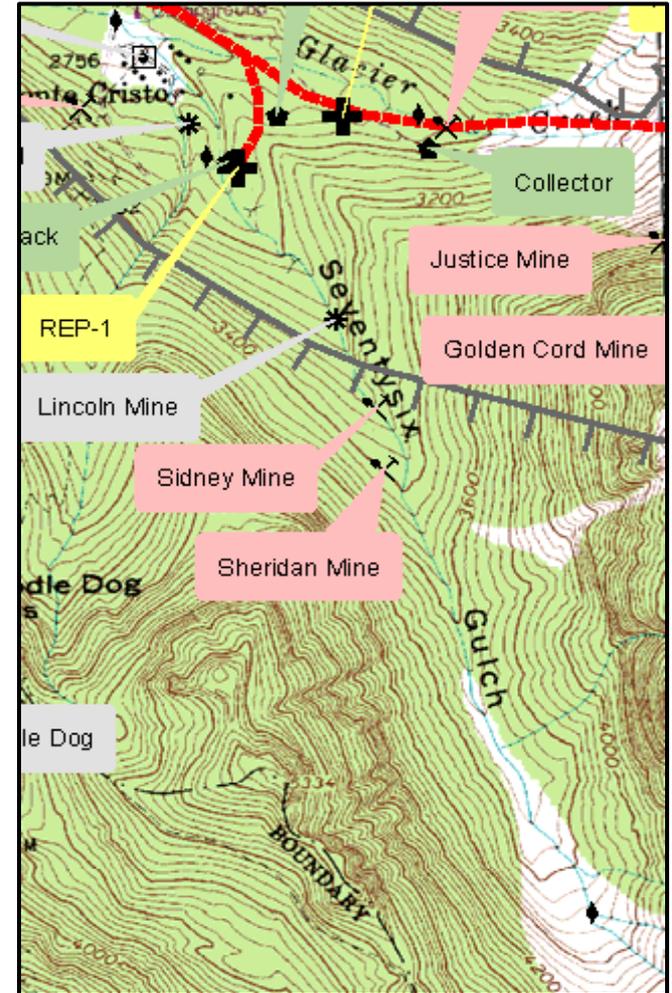
Assay Shack / Haulage Ways



- Ruins Present at Assay Shack
- ~200 cy of Soil @ Assay
 - As = 36,400 ppm (Avg)
- ~200 cy of Soil @ Haulage
 - As = 7,150 ppm (Avg)

Seventy-Six Gulch/Creek Area

- Sidney Mine
- Sheridan Mine
- Liberty Prospect



Sampling Overview

- 10 Background Soil Samples
- 115+ Waste Rock/Tailings/Soil Samples (plus many hundreds of XRF readings)
- 79 Adit Discharge Water Samples
- 164 Surface Water Samples – Aquatic Stations
- 169 Sediment Samples – Aquatic Stations
- 16 Pore Water Samples – Aquatic Stations

Nature and Extent of Contamination

- Soil (Complete Pathway) - Arsenic is the primary COC.
~80,000 cy of waste rock, tailings, cons, and impacted soil present.
- Air (Complete Pathway) – Contaminants are concentrated at the surface where receptors could be exposed (Accounted for in Soil Pathway)
- Groundwater (Incomplete Pathway) – No known wells near MCMA. Adit discharges/seeps are included in the Surface Water Pathway.
- Surface Water (Complete Pathway) – General increase in contaminant concentrations in surface water/sediment downstream.
- Cleanup Levels - 236 mg/kg (Near) / 660 mg/kg (Remote)

Aquatic Stations

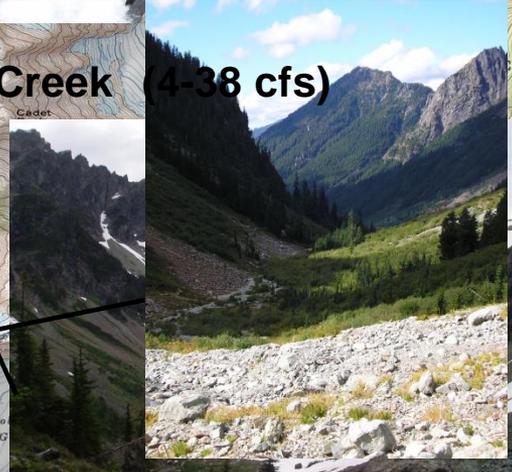
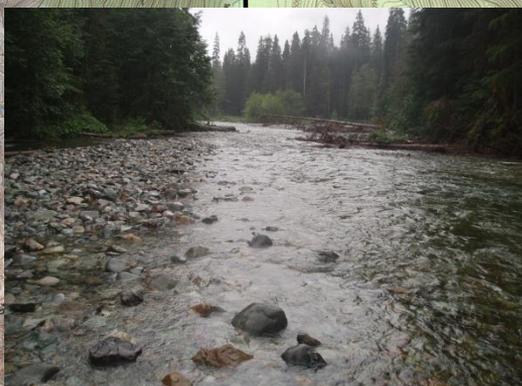
Monte Cristo Lake

South Fork Sauk River
(40-340 cfs)

Monte Cristo Townsite

Glacier Creek (4-38 cfs)

Seventy-Six Creek
(1-65 cfs)

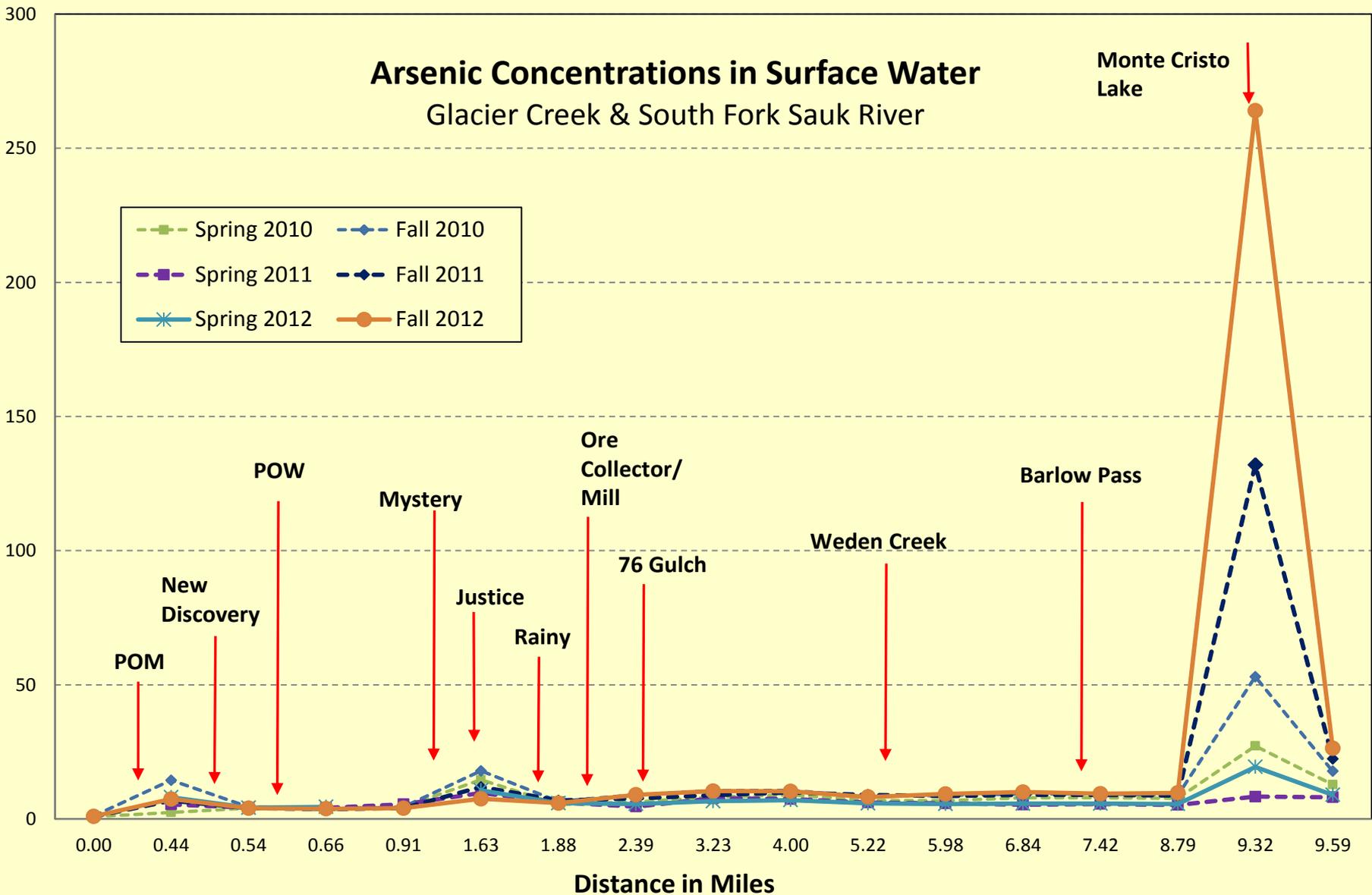


Arsenic Concentrations in Surface Water

Glacier Creek & South Fork Sauk River

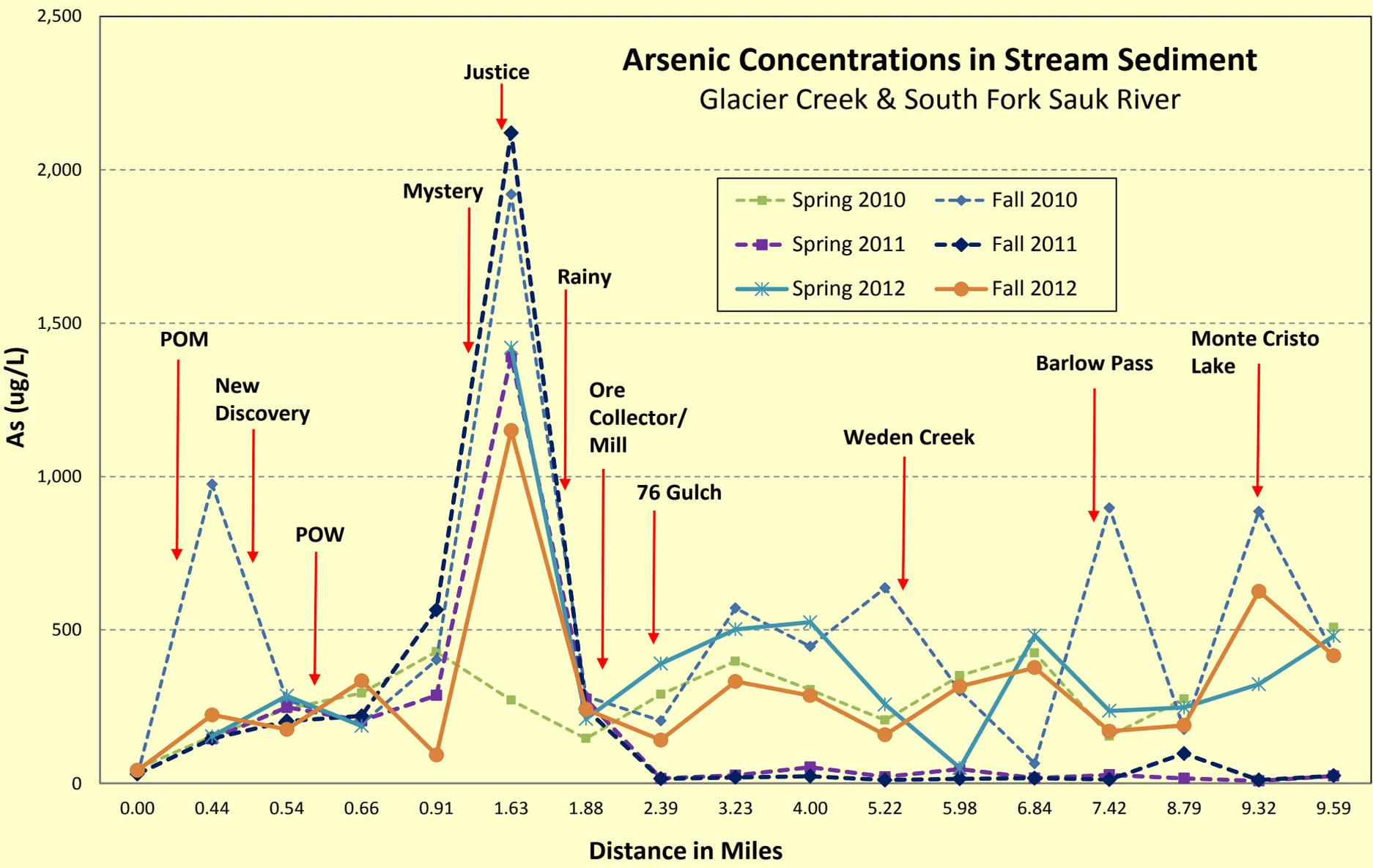


As (µg/L)



Arsenic Concentrations in Stream Sediment

Glacier Creek & South Fork Sauk River



RA Recommendations

- Common Items

- Adit / Shaft Closures (Easily Accessible only)
- Preservation of Historically Significant Areas (Process Facilities)
- Construct New CERCLA Access Route on North Side of SFSR
- Wilderness Area Signage
- Adit Discharge Water Treatment (Future Task)

- Onsite Fully Lined Repository

- Pride of the Woods Mine
- Rainy Mine
- Sidney Mine
- Collector/Concentrator
- Assay Shack/ Haulage Ways
- Comet Terminal

- Institutional Controls – Remaining Sites

- Due to Remoteness, Access, Wilderness Proximity, Distance from SW

- Total Cost ~ \$4-5M

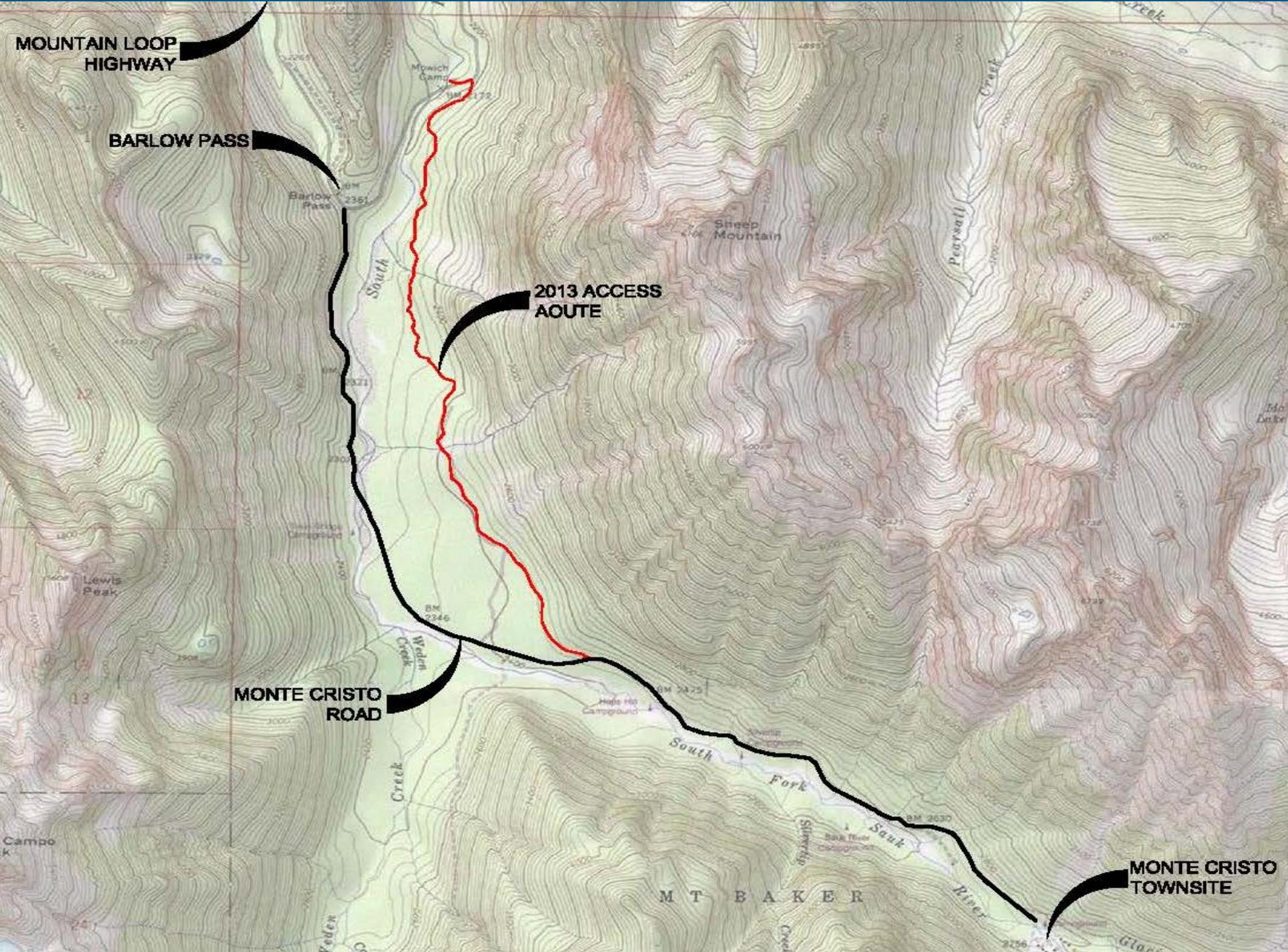
**MOUNTAIN LOOP
HIGHWAY**

BARLOW PASS

**2013 ACCESS
ROUTE**

**MONTE CRISTO
ROAD**

**MONTE CRISTO
TOWNSITE**



CERCLA Removal Action Timeline

- 2013
 - Winter – Finalize Access Route / Bridge Designs / Work Plan
 - Spring – Aquatic Sampling Event
 - Summer – Access Route / Bridge Construction
 - Summer – Data Gap Investigations
 - Fall – Aquatic Sampling Event
- 2014
 - Winter – Repository Design Plans/Specs/Work Plan
 - Spring – Aquatic Sampling Event
 - Spring/Summer – Removal Action Implementation
 - Fall – Aquatic Sampling Event

Environmental Group Involvement

- Washington Environmental Council (WEC) Lawsuit
 - Claimed CWA violations into waters of US
 - No NPDES permit on 7 discharges
 - Lawsuit eventually dismissed because of ongoing CERCLA project
- Sierra Club
 - Basically wants Forest Service to do nothing
 - Major concerns with Endangered Species
 - Requested onsite observer during construction
 - Requested USF&W to re-initiate BO process..

QUESTIONS?

