

Van Stone Mine

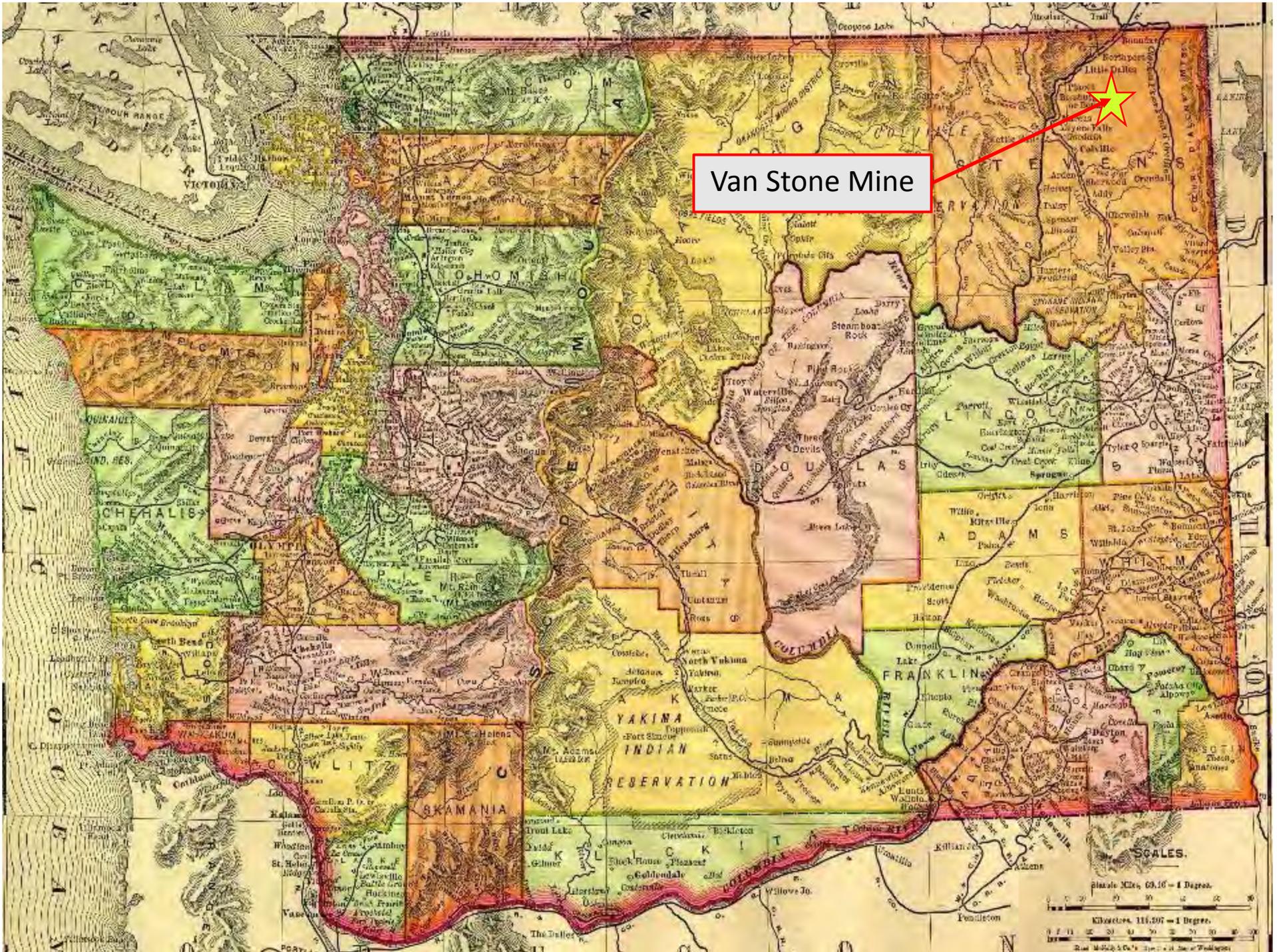
Assessment and Overview
of Reclamation
Alternatives



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Wasley, PE
May 3, 2016

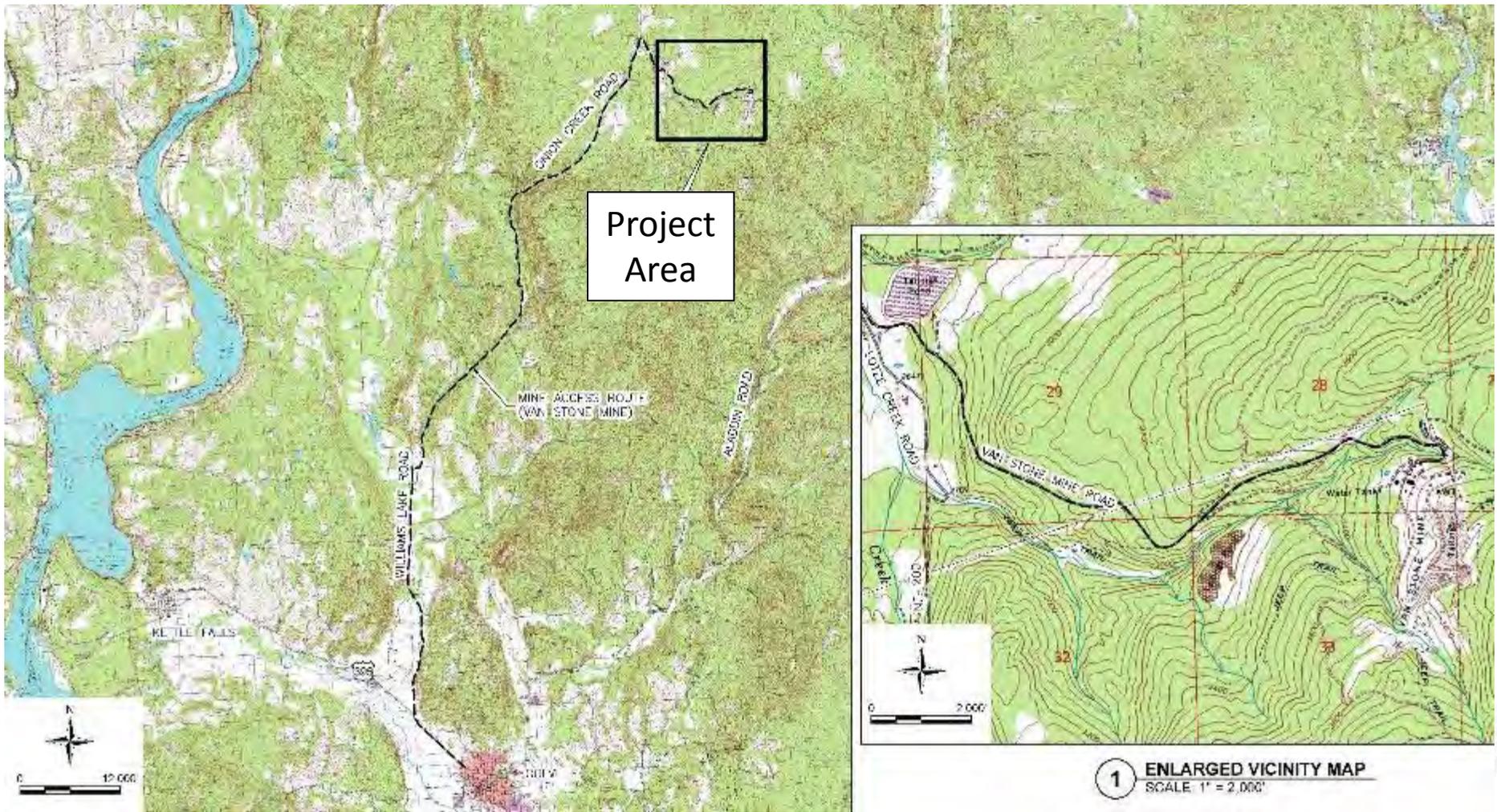
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Van Stone Mine





Site History

- Discovered by George Van Stone in 1920 while hunting
- 3,638 feet in the Kootenay Arc Structural Belt
- Part of the Northport (Aladdin) Mining District
- Zinc/lead ore produced between 1920 and 1993
- Carbonate host rock (Dolomite)

Mine Ownership

- George Van Stone – 1920 to 1926
- Hecla – 1926 to 1930
- Willow Creek Mines – 1939 to 1950
- ASARCO – 1950 to 1971
- Callahan Mining Corp./US Borax and Chemical Corporation/Newfoundland Exploration Ltd. – 1971 to 1990
- Equinox Resources – 1990 to 2009
- African Aura Mining – 2009 to?

Production

- Underground working until ASARCO
- ASARCO constructed a 1,000-ton/day Floatation Mill
- Zinc cons shipped to Anaconda Copper Company's smelter
- Lead cons shipped to ASARCO's East Helena smelter



Production

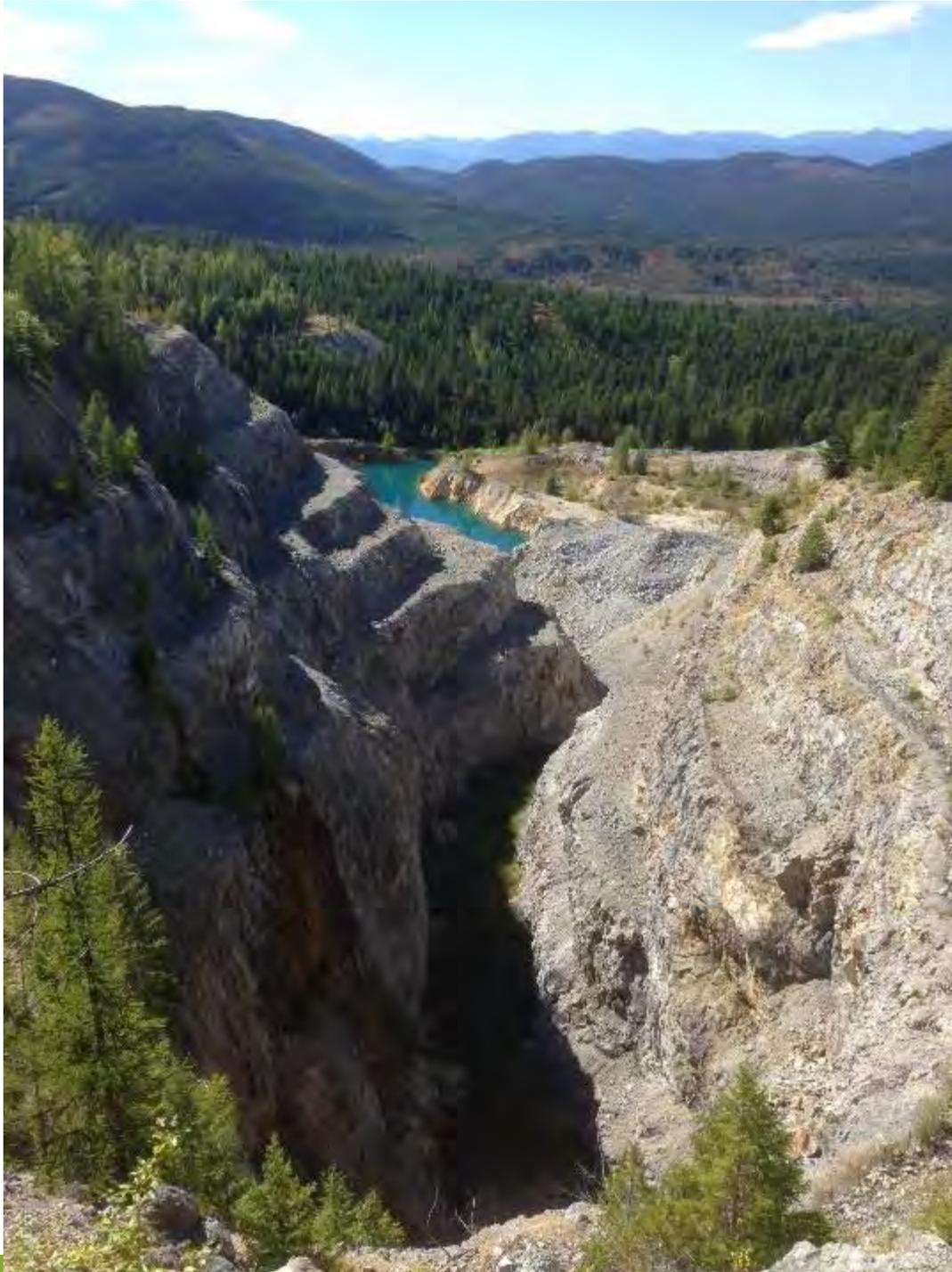
- 1961 – Upper Tailings Pond failed into Onion Creek
- 1965 to 1966 (top years) avg. 820 tons zinc/month
- By 1976 total output for the mine was 25M lbs. lead and 188M lbs. zinc
- ASARCO mined 7.5M tons (2.7M tons of ore) from the North and South Pits
- Mill was dismantled in 2006 and shipped to Canada



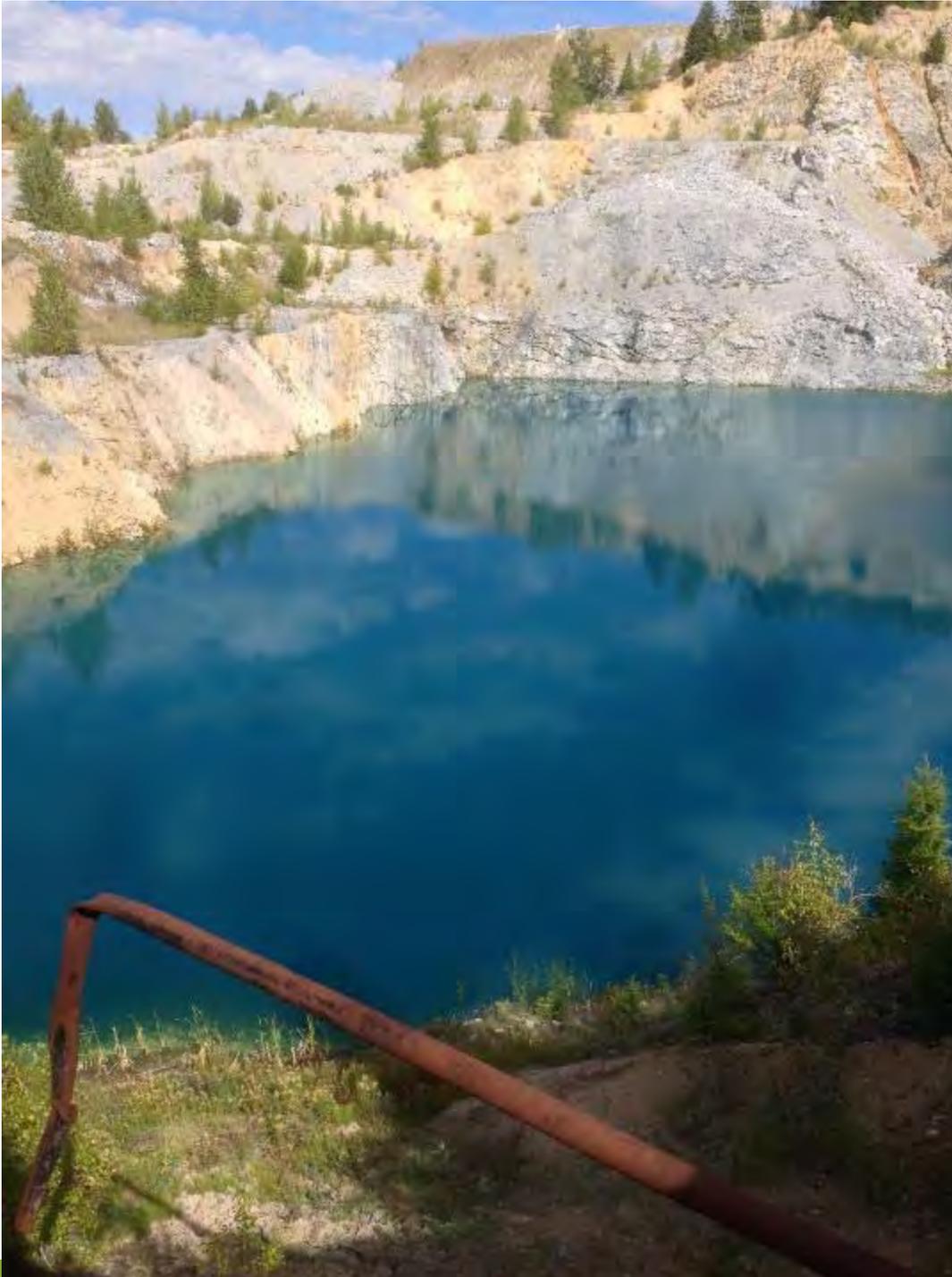








North Pit



North Pit



South Pit

Overburden/Waste Rock Near South Pit





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Washington Department of Ecology Involvement

- Site Hazard Assessment conducted 2007
- Site ranked 1 out of 5 (1 = highest risk)
- Equinox entered Ecology's Voluntary Cleanup Program
- Due to lack of adequate progress, Ecology moved the Site into formal cleanup under authority of the Model Toxics Control Act (MTCA)
- In 2010 Ecology received a settlement from a lawsuit against ASARCO (\$3.5M)

June 26, 2012



June 26, 2012



June 26, 2012



June 26, 2012



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October 10, 2012



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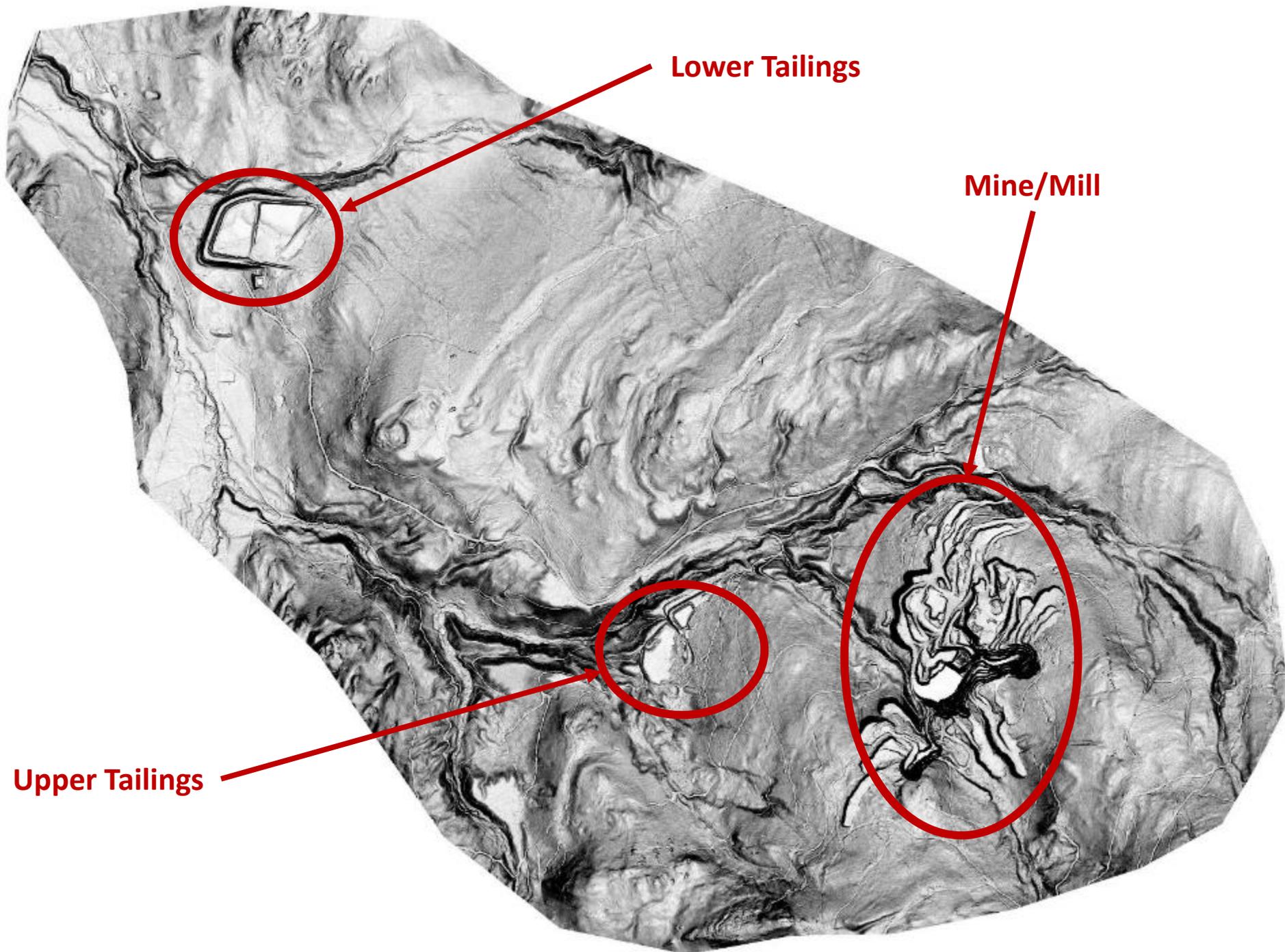
October 10, 2012



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Lower Tailings

Mine/Mill

Upper Tailings



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Lower Tailings Pile

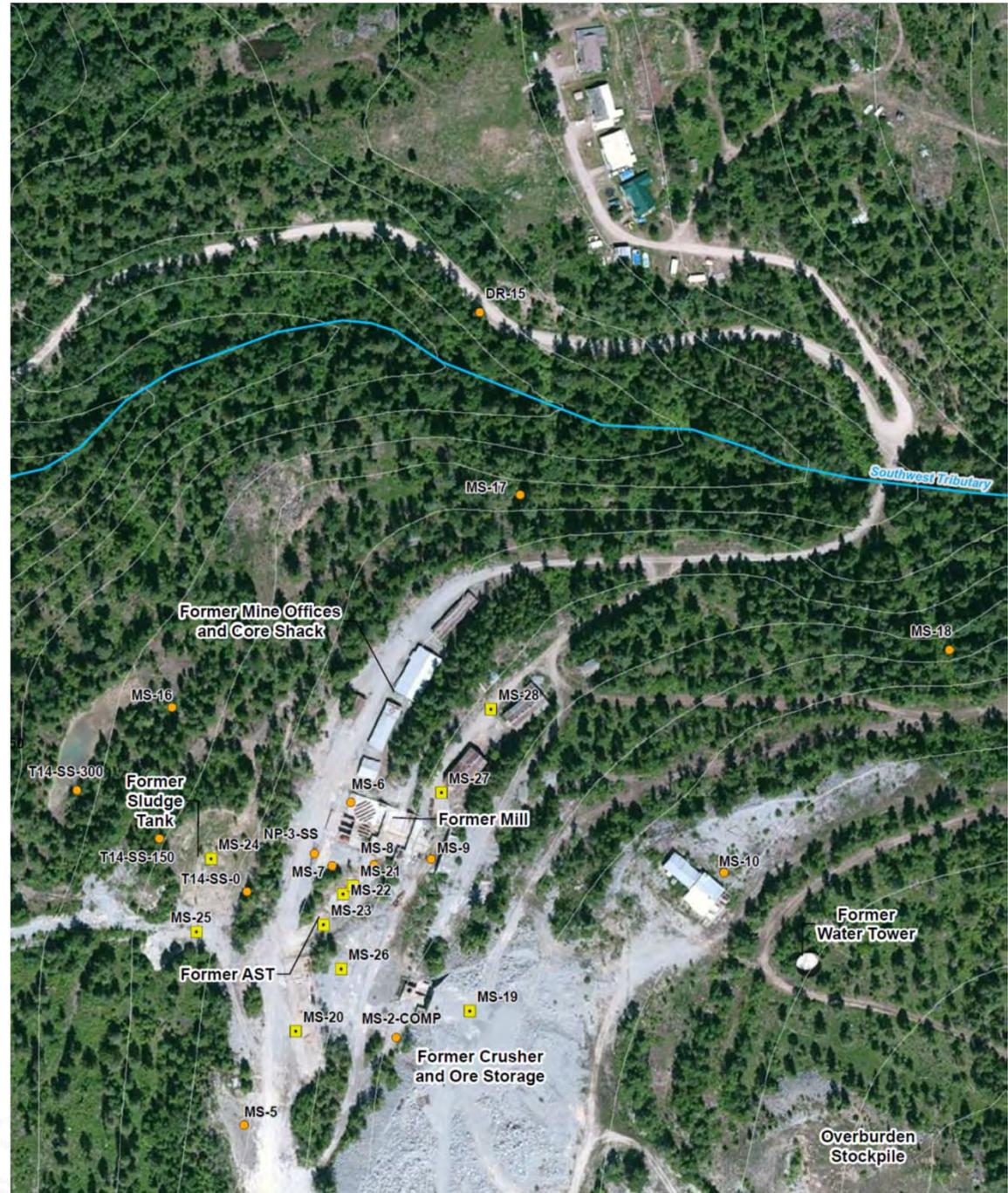


Upper Tailings Pile





Mill Area



Human & Ecological Risk Drivers

- Chemical

- Antimony (2.6 ppm)
- Arsenic (30.8 ppm)
- Cadmium (105 ppm)
- Lead (14,700 ppm)
- Zinc (57,200 ppm)

- Physical

- High wall hazard
- Landslide potential into pit lake
- Slope failure of tailings

Reclamation Alternatives

- No Action
- Institutional Controls
- Cap in-place
- Consolidation
 - Consolidate Upper with Lower and cap in-place
 - Consolidate Upper and Lower in centralized repository
 - Consolidate in the open pit
- Offsite Disposal