

>A Glance Back<
Blue Ledge Mine
Presented at
2013 MT Mine Conf.



Holden Mine Remedial Action

5-6-15

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Remedial Project Manager

US Forest Service, Pacific Northwest Region

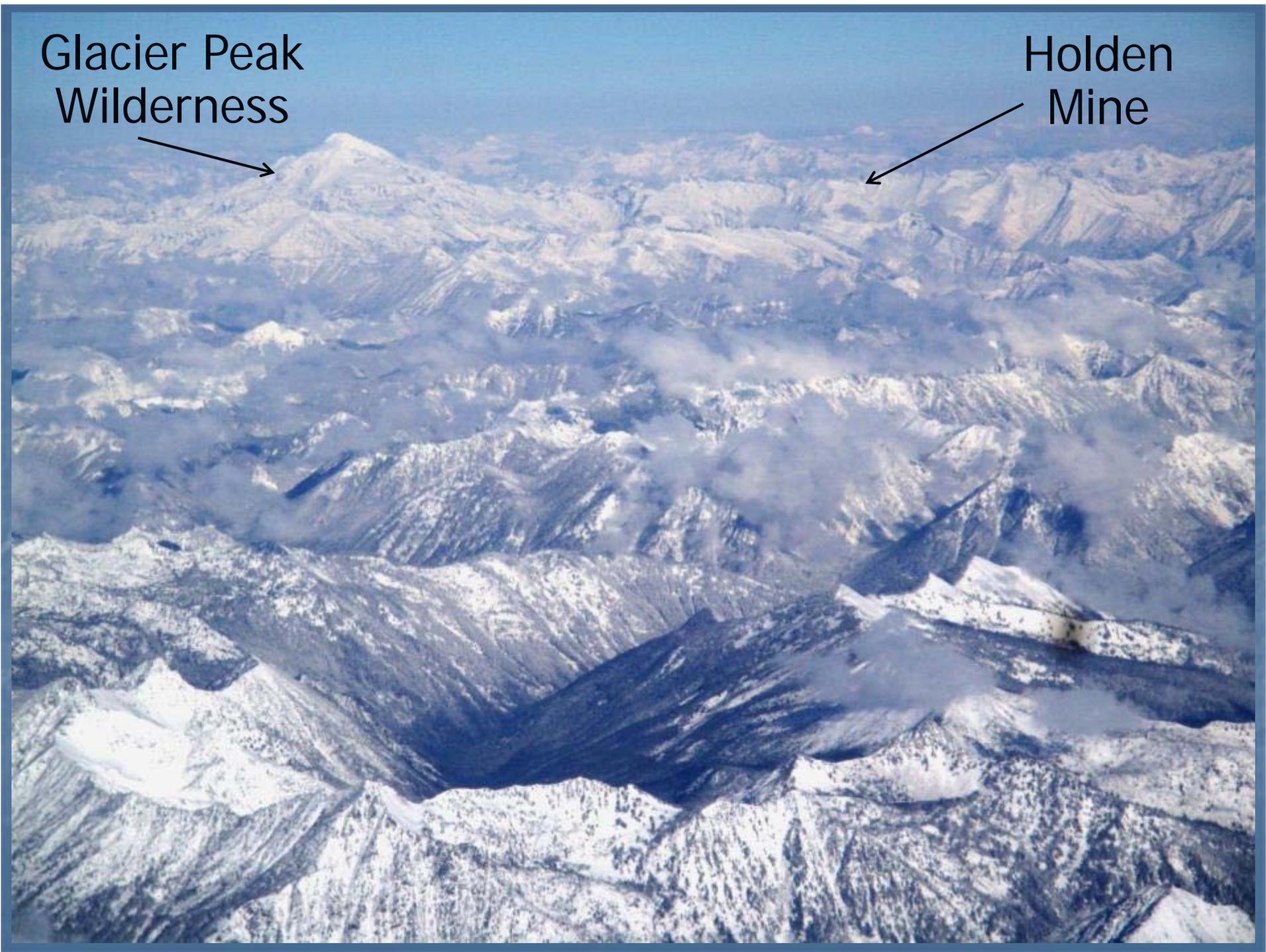




Glacier Peak
Wilderness



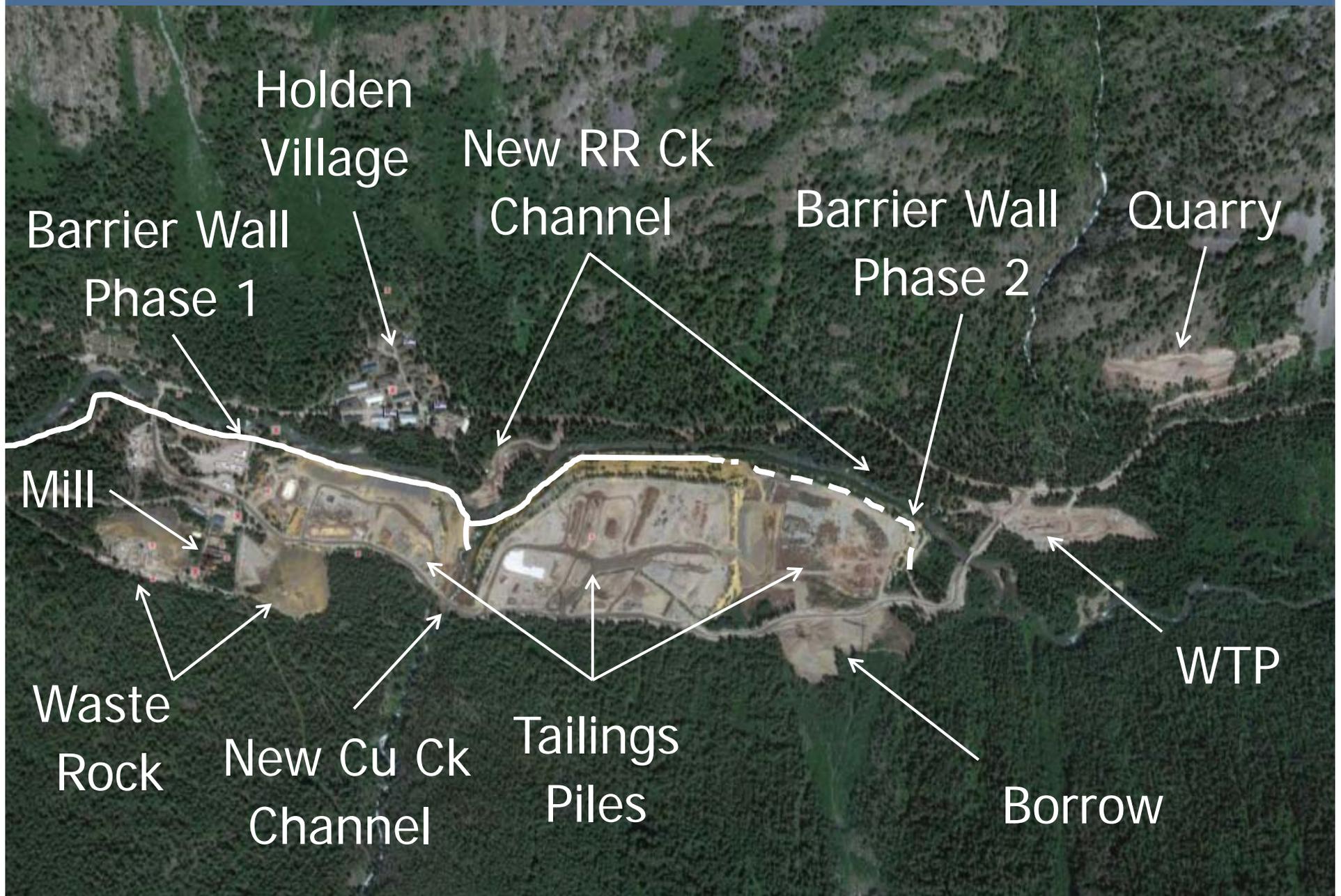
Holden
Mine



Holden Mine Site 2013



Holden Mine Remediation Site Features 2013



Holden Mine Site
Spring '15



Project – PRP/Agencies



- 1993 – The Potentially Responsible Party (PRP) was identified.
- AOC (1998) between **USFS, EPA, WA-DOE** with **PRP**, which directed the PRP to perform Remedial Investigation/ Feasibility Study (RI/FS)
- 2012 ROD / Unilateral Admin. Order
- **PRP: Howe Sound – Alumet – Intalco**



- Rio Tinto acquired Alcan in late 2007 and is now conducting UAO remedial work as PRP

Project Administration

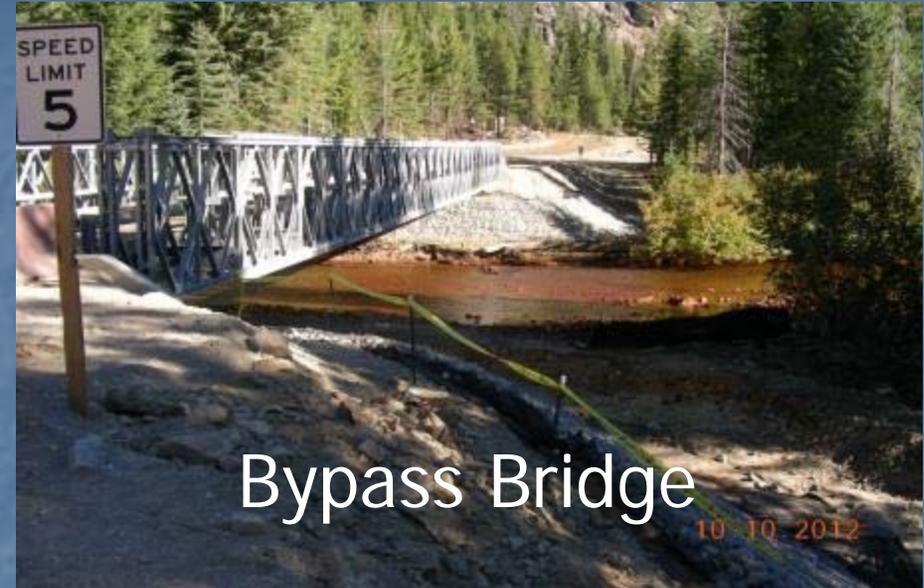
- Joint CERCLA & MTCA (State of Washington) Authority
- Forest Service is lead agency directing the remedial action, with focus on aquatic resource impacts
- **One of Largest CERCLA projects** in the National Forest System
- Site *not listed* on National Priorities List (NPL)
- Mixed ownership site (private & federal lands)
- Concurrent Natural Resource Damage Assessment activities (NRDA)



50 Mile Boat/Barge Transport On Lake Chelan For All Manpower/Machinery/Materials



2011-12 Early Works Activities



2013 Activities – Barge Ramp



2013 Activities – Portal Bulkheads



2013 Activities – Quarry-Borrow



2013 – Mill Demolition



2013-Railroad Ck Re-alignment



2013 – Barrier Wall Platform



2013 – Copper Ck Channel



2014 MAJOR WORKS

- Tailings Re-grading >750k cy
- Soil Cover over tailings slopes- 100k cy
- Complete RR Ck relocate / Cu Ck liner system
- Tailings Stabilization-Buttress, Test Jet Grout Column
- Barrier Wall- 3,700' (80% of 4,730' designed)
- Interim Groundwater Collection System



2014 - Tailings Piles Grading



2014 - Tailings Piles Cover



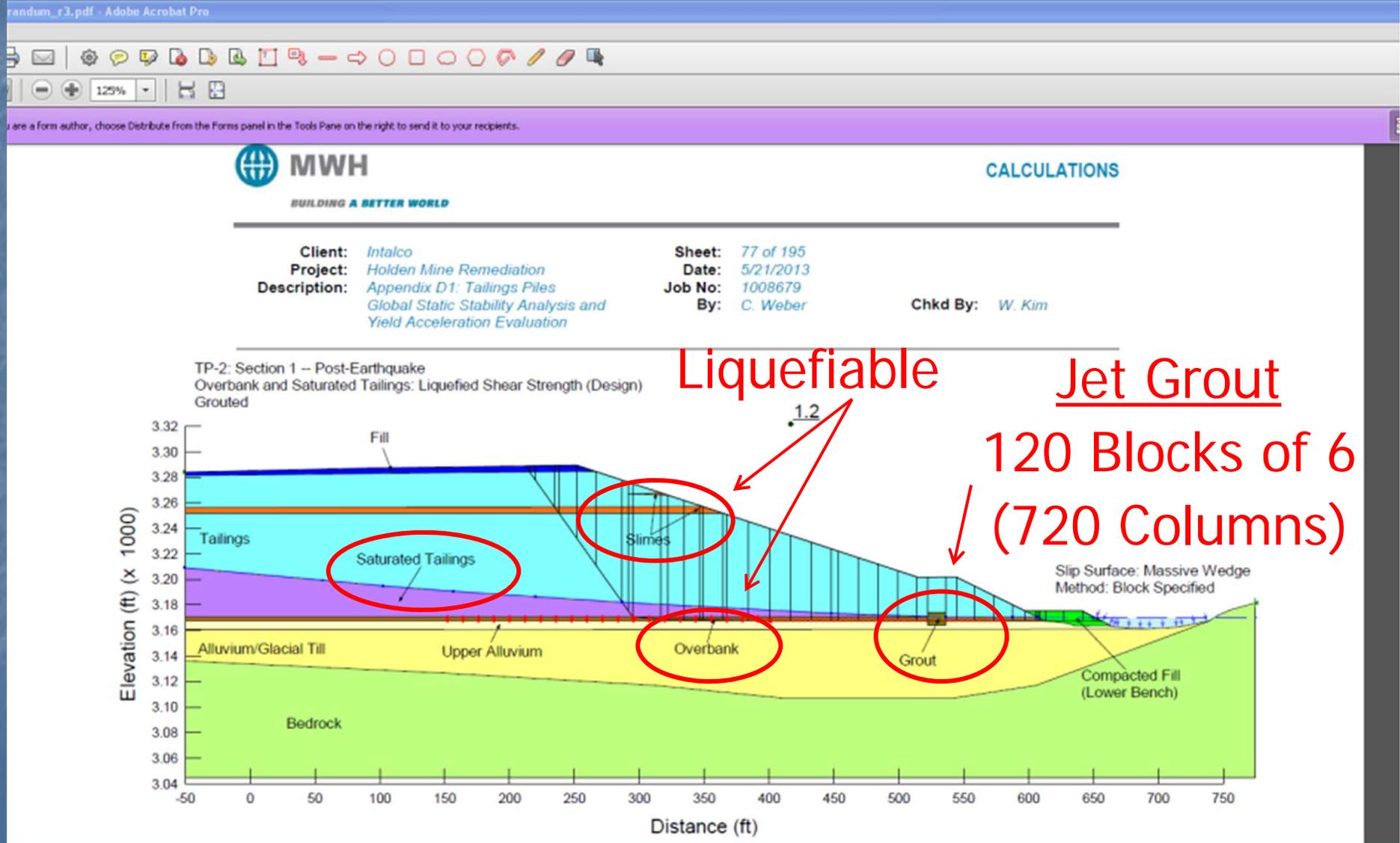
Future - Tailings Piles Cover



2014 – Creek Management



2014 – TP Buttress/Jet Grout





Saturated
Liquefiable
Overbank
Below Tailings

Saturated
Liquefiable
Slimes Beds
Within Tailings



Visual Examination of Columns



JetGroutStrengthAgencyPresentationNotes 1-29-14.pdf - Adobe Acrobat Pro

Trial Test Jet Grout Program

Verify that jet grout injection parameters will achieve requirements

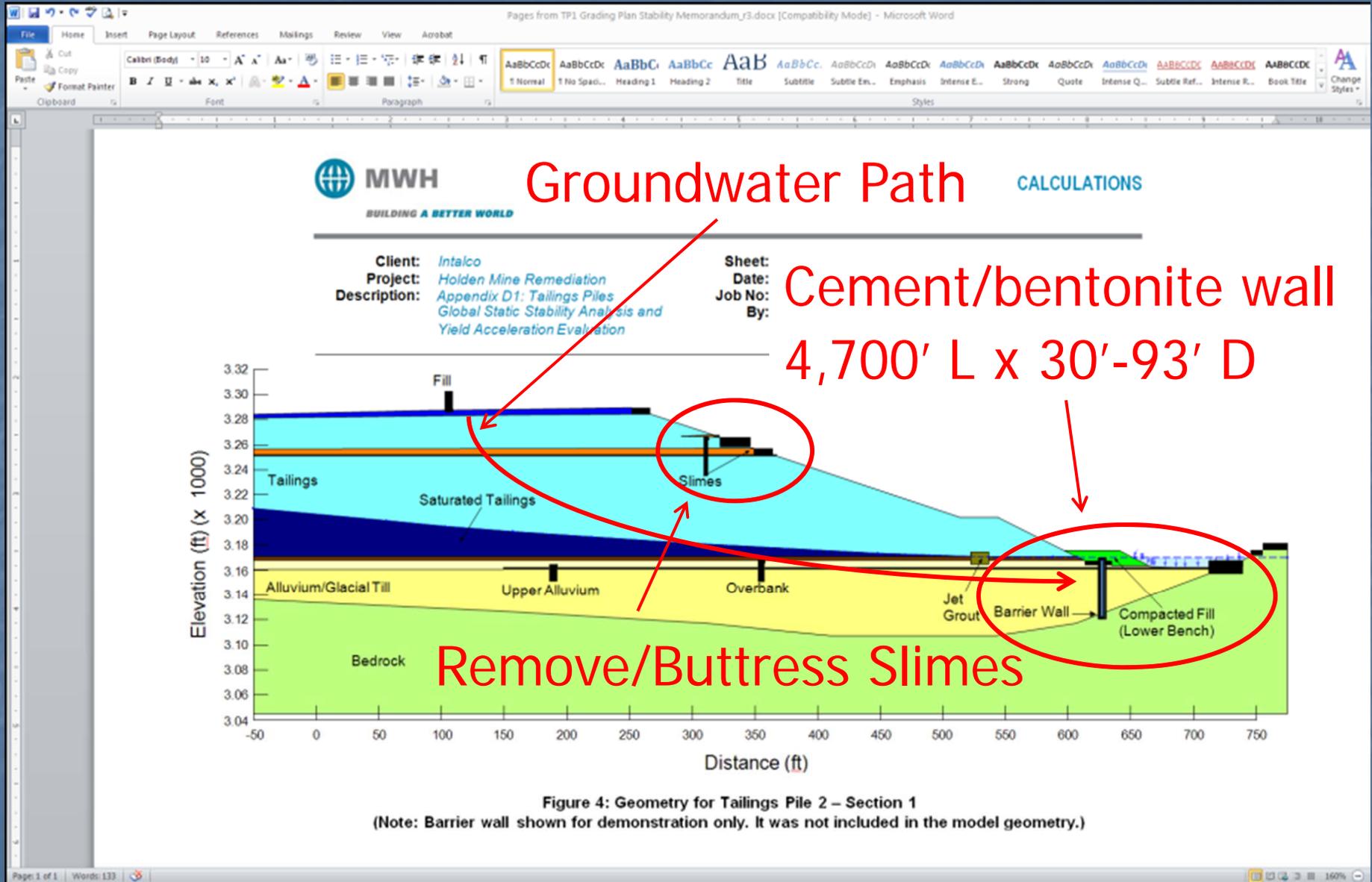
Jet Grouting guidelines recommended by the ASCE Jet Grouting Task Force

Performed near the NW corner of TP-1

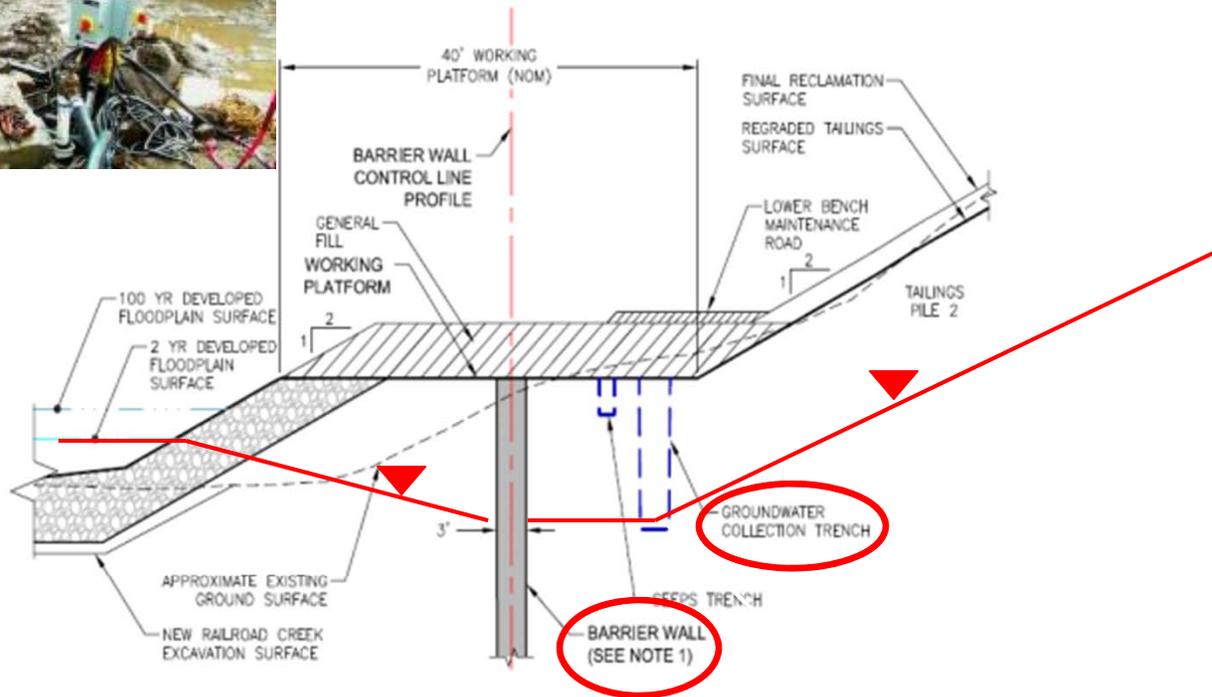
At least 3 sets of injection parameters evaluated

Set s
will b
inspe

2014 – Barrier Wall



Barrier Wall / GW Collection Trench



B TYPICAL BARRIER WALL SECTION AT TAILINGS PILE 2
(LOOKING DOWNSTREAM)
SCALE
10 0 10 20 FEET

Barrier Wall



Barrier Wall Challenges



2015 - Water Treatment Plant

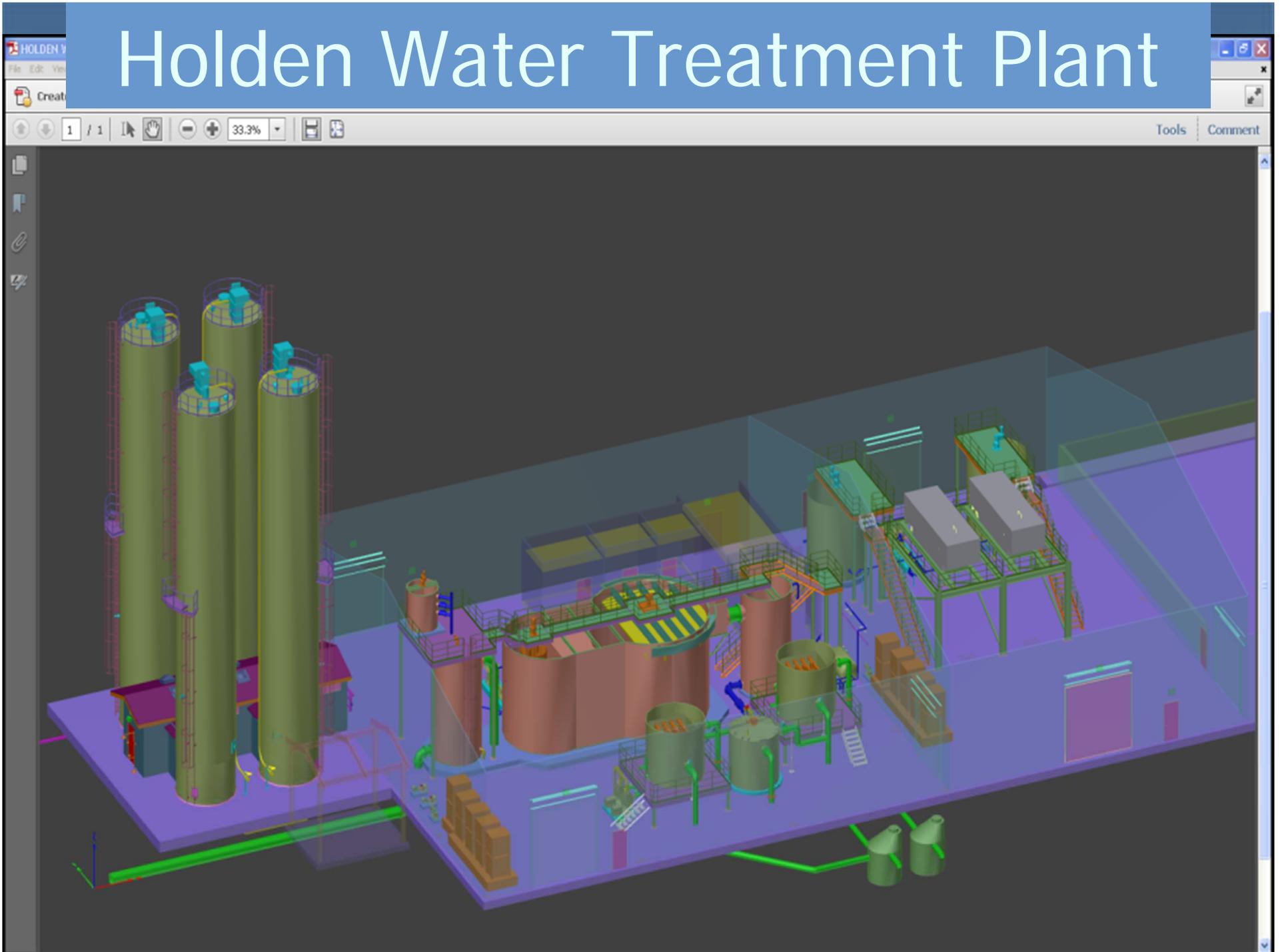
- Conventional low energy process involving acid neutralization (lime addition) and precipitation treatment
- System based on results of treatability studies (2009, 2010, 2013)
- In-mine bulkheads (equalization of flow for treatment)



Holden WTP Features

- 2,200 gpm capacity
- Metals effluent standards for: Al, Cd, Cu, Fe, Pb, Zn
- High density sludge - on-Site storage
- Disc filters and plate/frame press to dewater
- 2 million gallon return water pond
- 350 kW power demand -(possible future hydroelectric)
- Six months supply of chemicals/fuel =
 - 400 tons of lime
 - 1,500 gallons sodium hydrosulfide
 - 100,000 gallons of diesel

Holden Water Treatment Plant



Questions - Discussion

www.fs.fed.us/r6/wenatchee/holden-mine/index



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