

Former ASARCO Smelter East Helena Facility Annual RCRA Corrective Action Update



December 8, 2020



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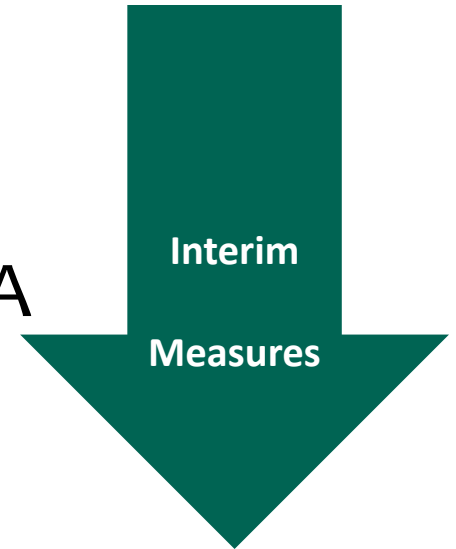
Agenda

- Welcome and Opening Remarks (EPA)
- RCRA Corrective Action Status
 - Work Completed to Date
 - Final Remedy Selection
 - Corrective Measures Implementation
- Groundwater Quality Update
- Slag Removal Project
- Property Redevelopment
- Public Participation
- Questions

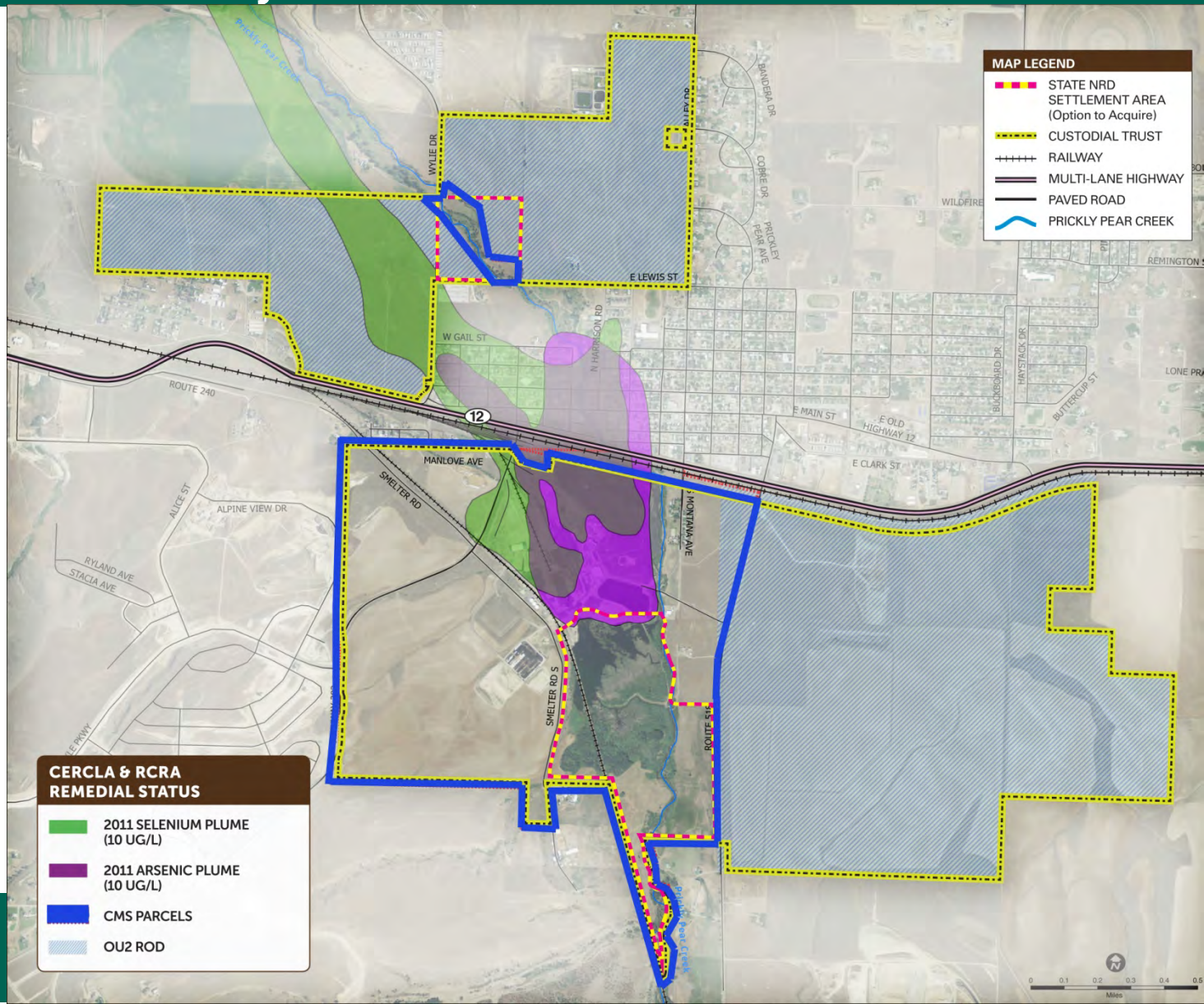


Corrective Actions Required by First Modification to Consent Decree

- ✓ RCRA Facility Investigation (RFI)
- ✓ Preliminary Human Health and Ecological Risk Assessments (HHRA and BERA)
- ✓ Corrective Measures Study (CMS)
- ✓ EPA Selection of Final Remedy
- **Corrective Measures Implementation (CMI)**

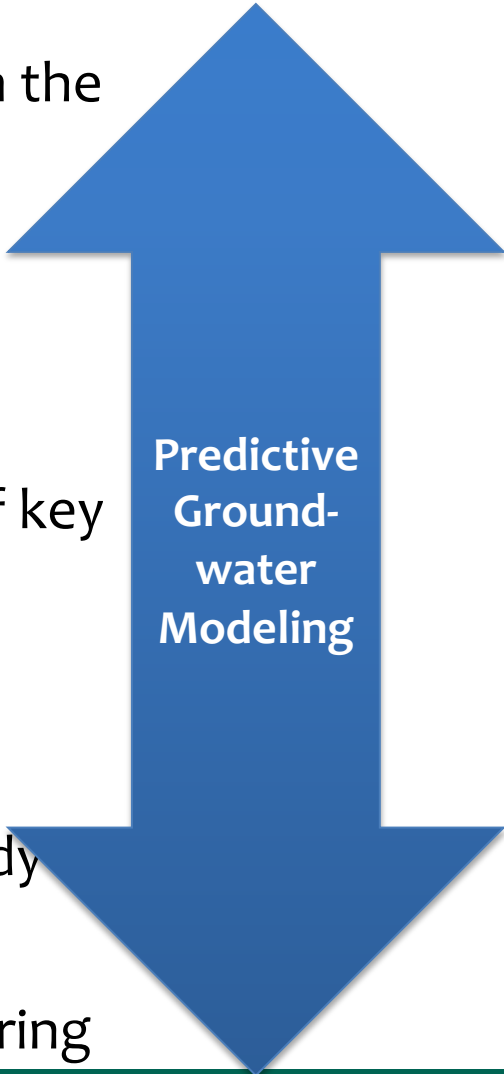


All Former ASARCO Properties Addressed By RCRA Corrective Action



Final Remedy Proposal Based on Comprehensive Technical Evaluations

- 2011-2014: Studies conducted to evaluate and design the IMs
 - Upper Lake Drawdown Test
 - MVS modeling
 - Stream flow assessments
 - Delineation of groundwater plumes
- 2014-2015: Identification and further investigation of key source areas
- 2015: Identification and screening of remedial alternatives
- 2016: Detailed alternative evaluation and final remedy proposal
- 2013-to date: IM performance groundwater monitoring



Predictive
Ground-
water
Modeling

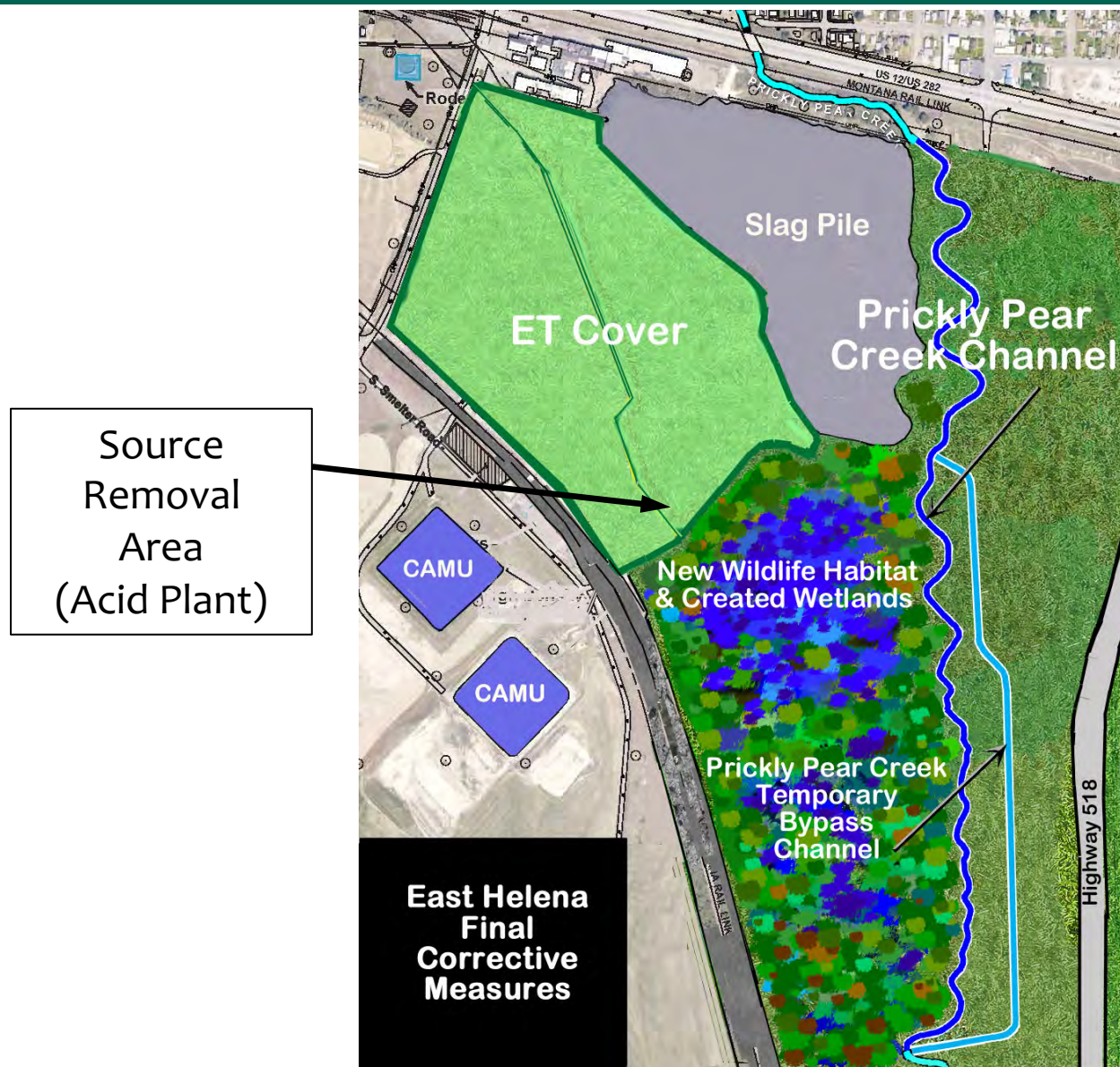


EPA's Final Remedy Selection Statement of Basis - July 2020

- ✓ Evapotranspiration (ET) Cover System
- ✓ South Plant Hydraulic Control
- ✓ Source Removal & Corrective Action Management Units (CAMUs)
- ✓ Speiss-Dross Slurry Wall
- **Slag Pile Cover**
- ✓ Institutional Controls
 - **Custodial Trust deed restrictions**
 - ✓ City and County Ordinances



East Helena Completed Corrective Measures



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Final Corrective Measures Meet Site-Specific Remedial Action Objectives

- ✓ Minimizes long-term stewardship.
 - No active operations (i.e., pump and treat system).
 - Natural cover and PPC realignment require less maintenance than man-made materials/technologies.
- ✓ Eliminate the need to manage and treat stormwater.
- ✓ Maximize use of sustainable remediation approaches.
 - Natural systems.
 - No energy requirements.
 - No emissions.
- ✓ Develop and evaluate alternatives that allow continued asset recovery from slag pile.
 - Design will accommodate future recovery.
 - Cover can be modified in future if market conditions change.



Corrective Measures Implementation (CMI)

- CMI Work Plan submitted to EPA on October 8, 2020
- Corrective Measures Implementation (CMI)
 - Long-term performance monitoring
 - Design & construction of slag pile cover system
 - Institutional controls (i.e., land-use restrictions)
 - Operation and maintenance
 - CAMUs
 - ET Cover



Engineering Controls	Corrective Measures Performance Evaluation	
	Purpose	Data to Be Collected and Evaluated
ET Cover and Slag Pile Cover	<ul style="list-style-type: none"> Prevent direct contact with contaminated soils/slag Reduce contaminant leaching to groundwater by reducing infiltration of precipitation 	<ul style="list-style-type: none"> Inspection of cover condition (vegetation, visual evidence of holes, erosion, etc.) Groundwater elevations (changes with precipitation) Groundwater quality
South Plant Hydraulic Control	<ul style="list-style-type: none"> Lower groundwater elevations in South Plant to reduce contact with contaminated soils 	<ul style="list-style-type: none"> Groundwater elevations in South Plant Groundwater quality
Focused Source Removal	<ul style="list-style-type: none"> Remove accessible, localized areas of contaminated soil 	<ul style="list-style-type: none"> Groundwater quality
Maintain CAMUs	<ul style="list-style-type: none"> Protectively manage hazardous waste 	<ul style="list-style-type: none"> Inspection of covers Groundwater quality Leachate volumes
Speiss-Dross Slurry Wall	<ul style="list-style-type: none"> Prevent groundwater contact with highly contaminated source material Prevent migration of contaminated groundwater within wall 	<ul style="list-style-type: none"> Groundwater elevations across wall Groundwater quality



Institutional Controls	Corrective Measures Performance Evaluation	
	Purpose	Data to Be Collected and Evaluated
Private Well Abandonment Program	Eliminate potential exposure	Presence of functioning private well
Deed Restrictions on Custodial Trust Property	Ensure use is protective	Confirmation that land use is consistent with restriction
Institutional Controls Implemented By Others		
Controlled Groundwater Area	Control exposure to potentially contaminated groundwater	Review of permit status
City Well Restrictions (COEH Municipal Code, Zoning Ordinance Title 8, Chapter 3, Section 8.3.7)	Control exposure to potentially contaminated groundwater	Review of private water well status
Soils Ordinance Required by OU-2 Record of Decision (Adopted by county June 2013)	Prevent direct contact with contaminated soil	Review of soil arsenic and lead concentrations within the established administrative boundary



2019/2020 Groundwater Monitoring Results

- Corrective Action Monitoring Plan (CAMP)
- Groundwater Level Trends
- Groundwater Quality Trends
- Plume Stability Update



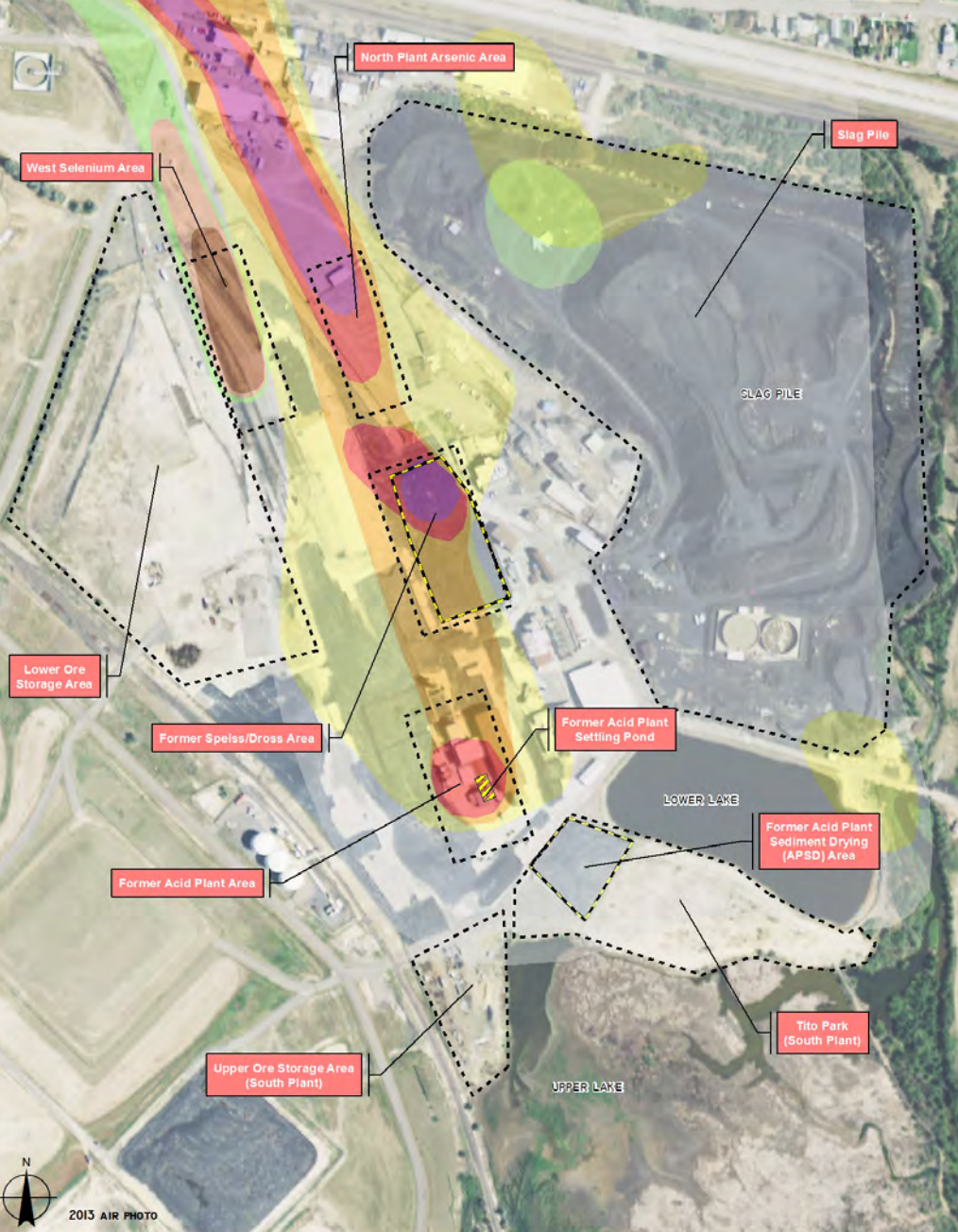
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Groundwater Related Investigations and Studies Since 2010

- Phase II RCRA Facility Investigation (2010-2012)
- Upper Lake Dewatering Evaluation (2011-2012)
- Downgradient Selenium Plume Delineation (2012-2016)
- 2014 Source Area Investigation and Report
- 2015 Source Area Investigation and Report
- Annual Groundwater/Surface Water Corrective Action Monitoring Program
 - Monitoring plans prepared and implemented annually 2010 through 2020
 - Monitoring reports prepared annually 2015 through 2019 (2020 report in preparation)



Groundwater Contaminant Source Areas Addressed by Corrective Measures



Primary Source Areas

- West Selenium Area
- North Plant Arsenic Area
- Former Speiss-Dross Area
- Former Acid Plant Area
- South Plant
- Slag Pile

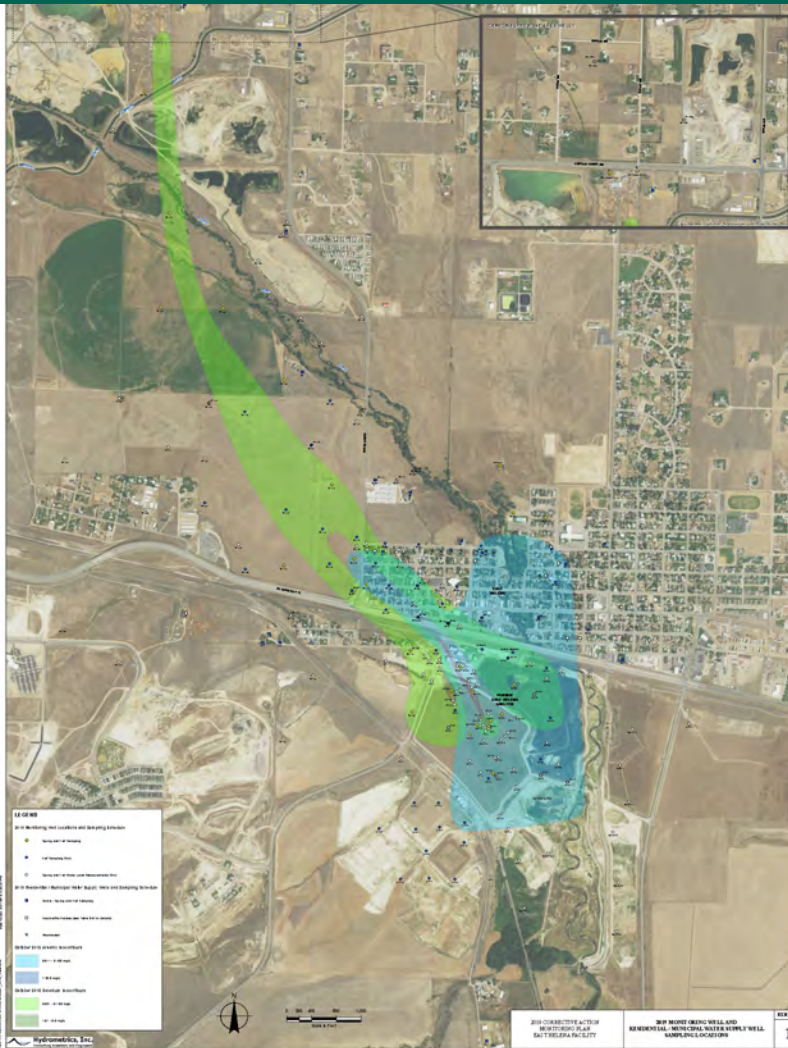
Corrective Measures

- ✓ South Plant Hydraulic Control
- ✓ Source Removals
- ✓ Evapotranspiration (ET) Cover
- ✓ Speiss-Dross Slurry Wall
- Slag Pile Cover



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Corrective Action Monitoring Program (CAMP)



Primary Objective

- Collect groundwater and surface water data to evaluate water resources response to Corrective Measures

Performance Monitoring Components

- **Groundwater Level Trend Analyses:** Evaluate effectiveness of SPHC and ET Cover at lowering groundwater levels and reducing groundwater interaction with contaminated soils.
- **Groundwater Quality Trend Analyses:** Collect groundwater quality data to document water quality trends at individual source area and downgradient monitoring wells.
- **Plume Stability Evaluation:** Collect groundwater quality data from established subset of plant site and downgradient wells to determine plume areas, average concentrations and plume centroid locations for annual comparison.



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2020 Annual Monitoring

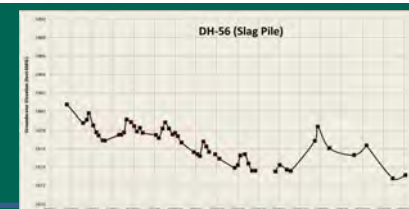
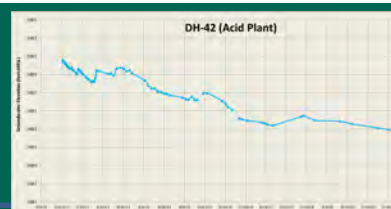
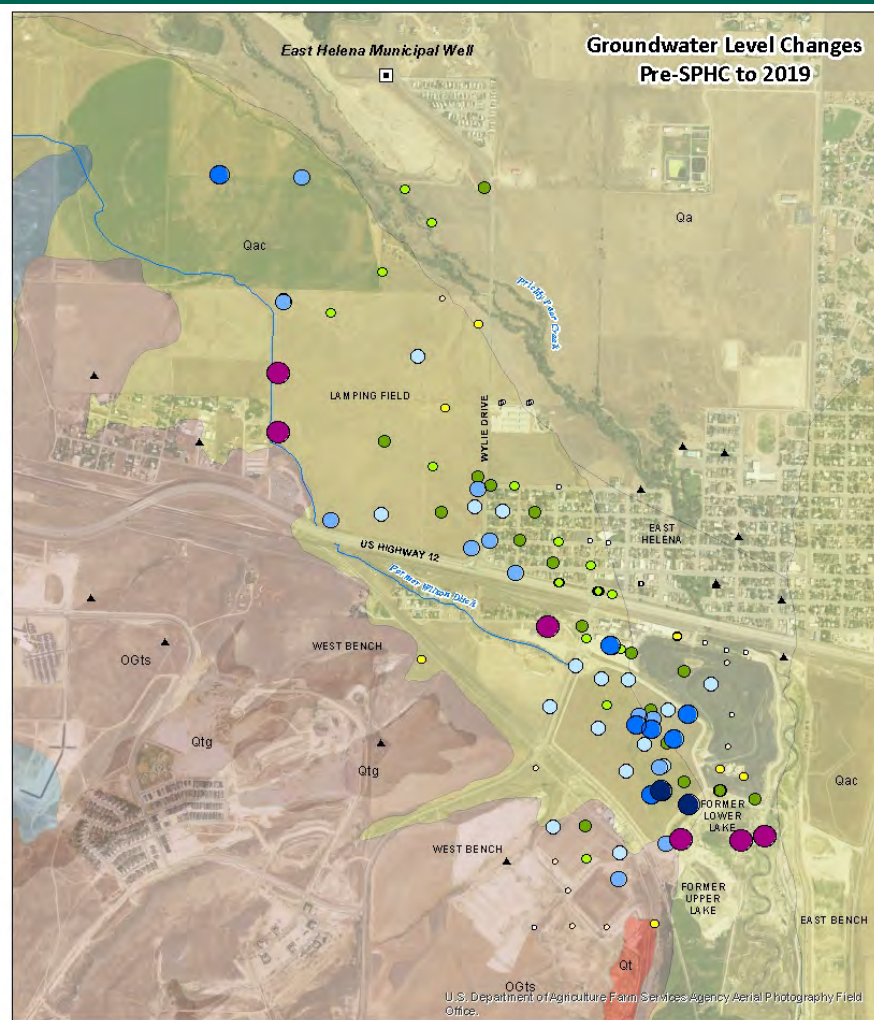
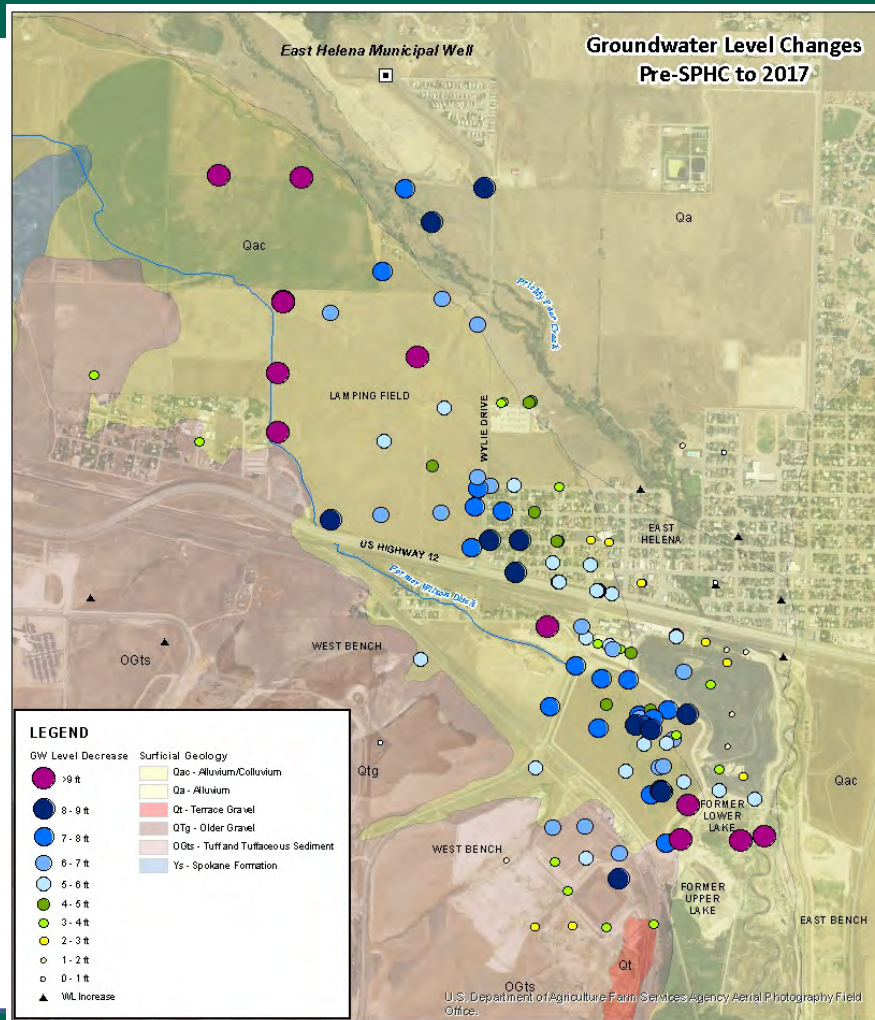
- Semi-annual Groundwater Monitoring
 - 23 wells in spring
 - 78 wells in fall
- Semi-annual Residential/Water Supply Well Monitoring in 20 wells
- Semi-annual Surface Water Monitoring at 7 locations
- Water Levels at 187 Wells and 9 Surface Water Elevations (Spring/Fall)



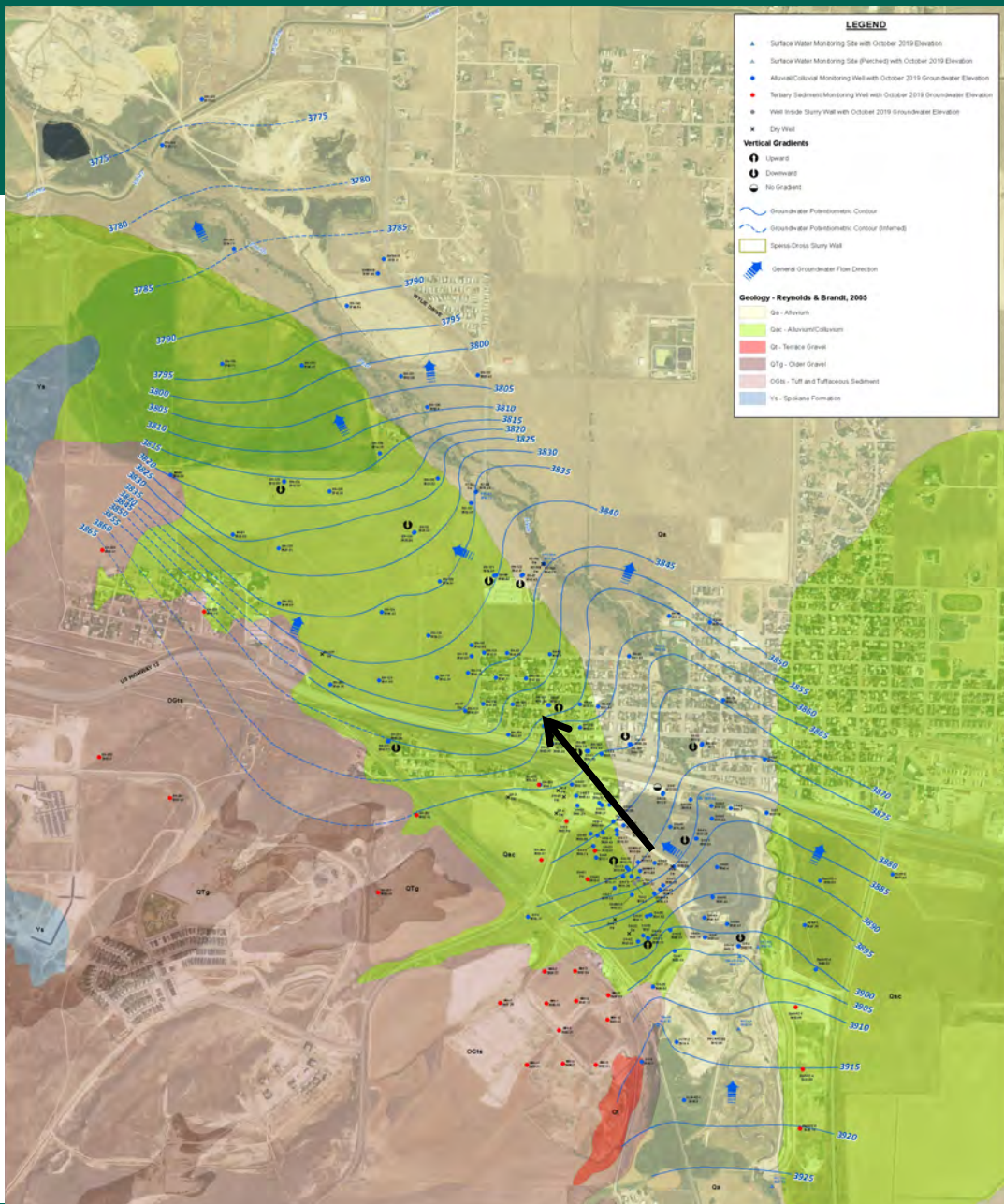
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Groundwater Elevation Trends

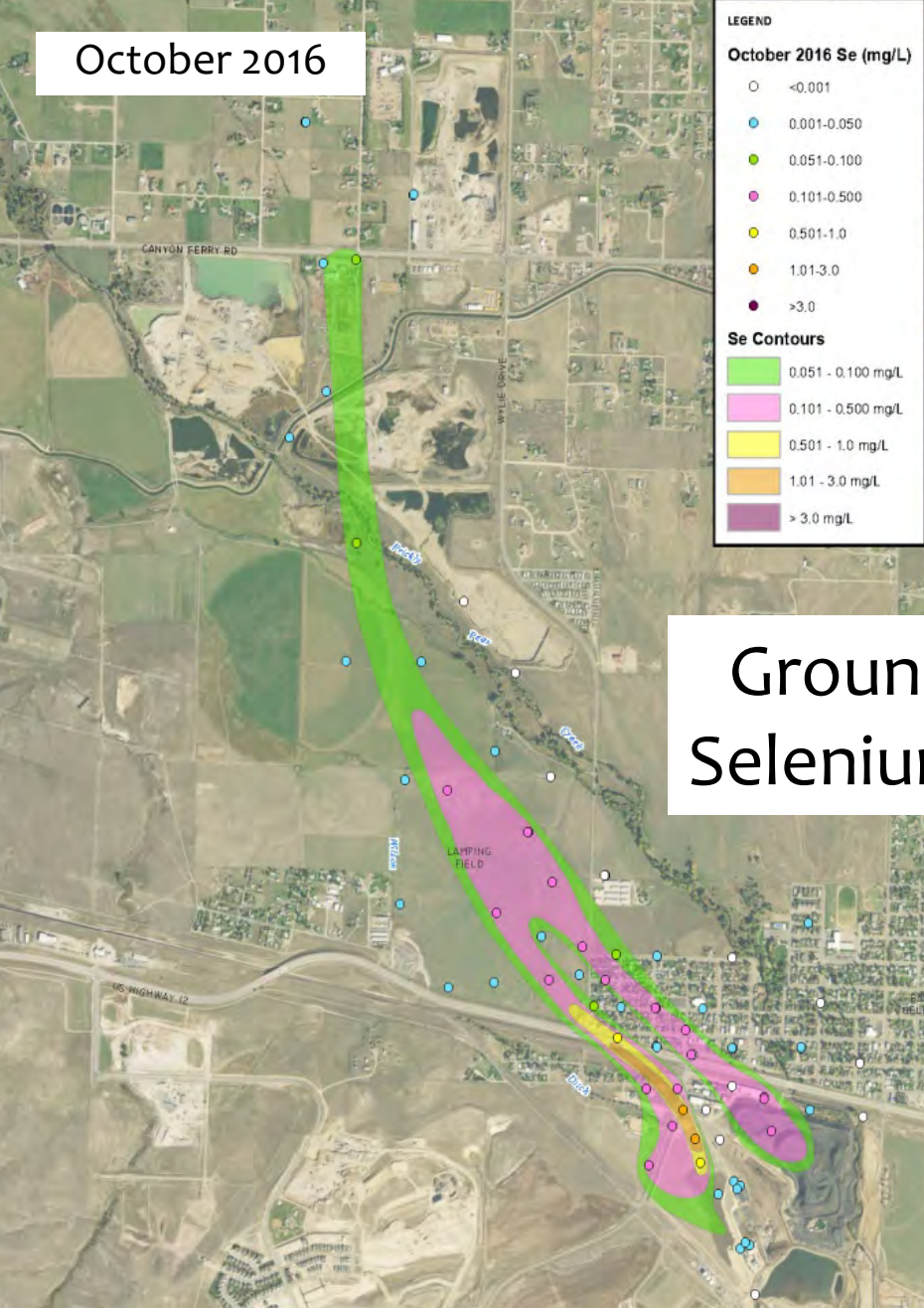


Potentiometric Map (October 2019)

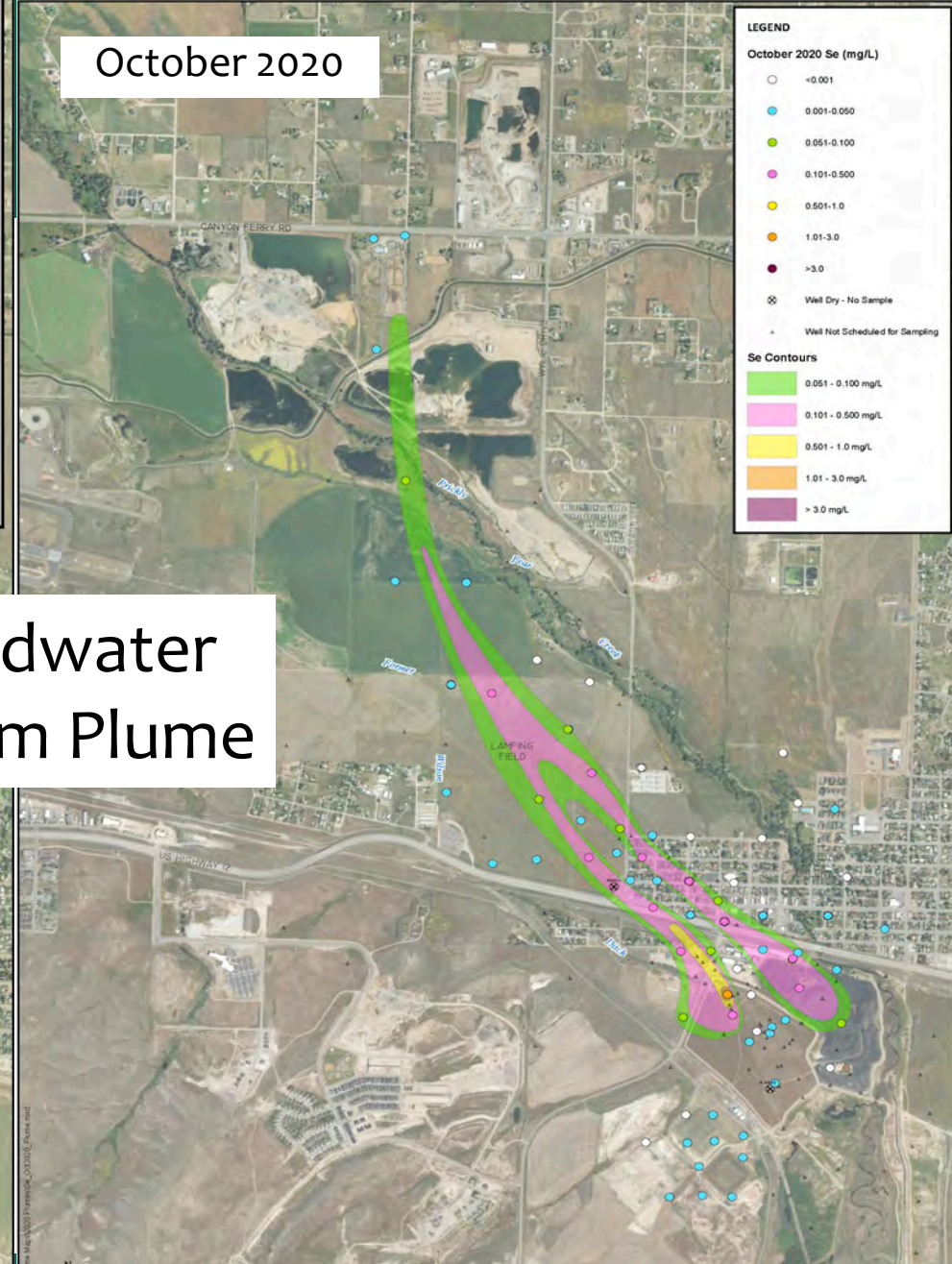


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October 2016



October 2020



Groundwater Selenium Plume

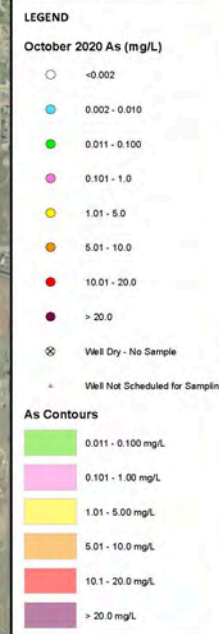
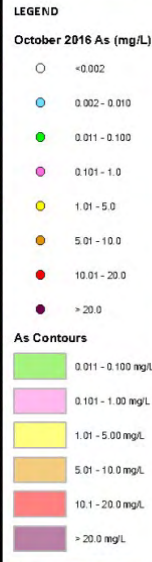


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October 2016

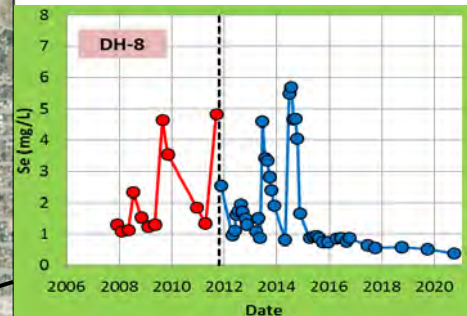
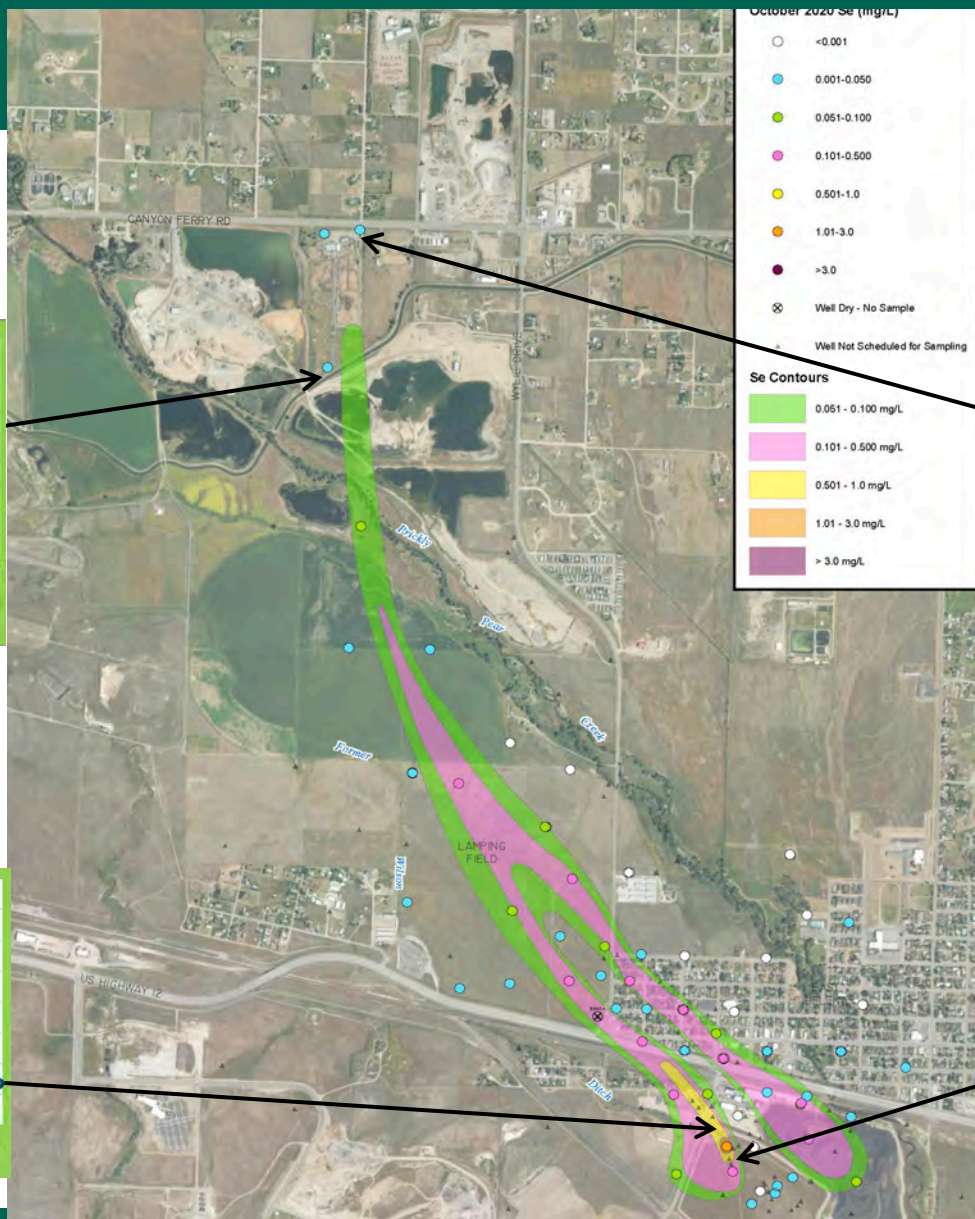
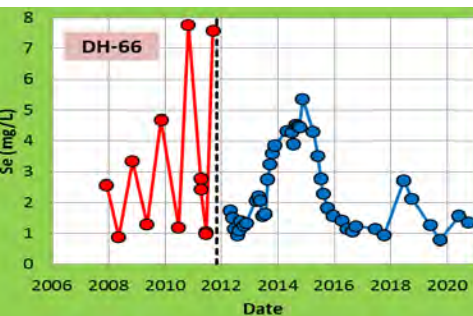
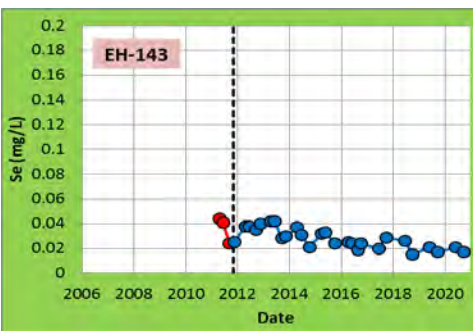
October 2020

Groundwater Arsenic Plume



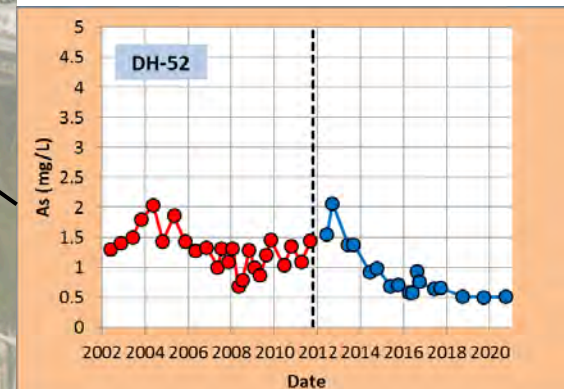
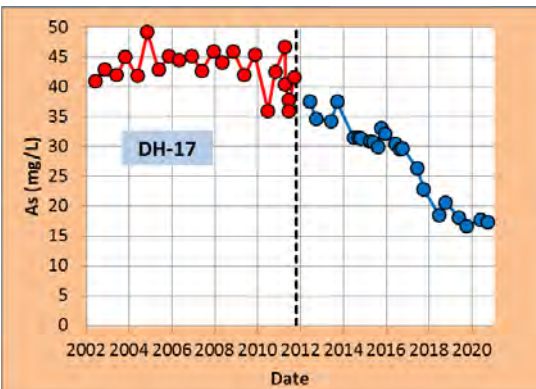
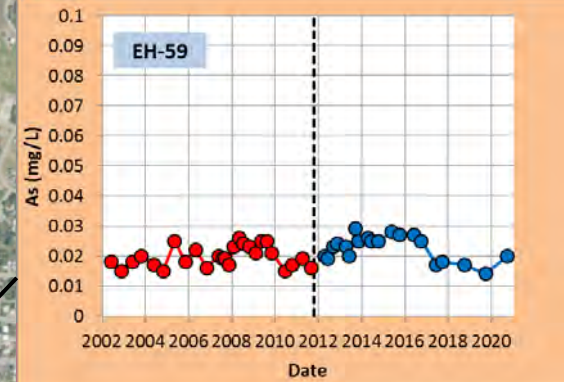
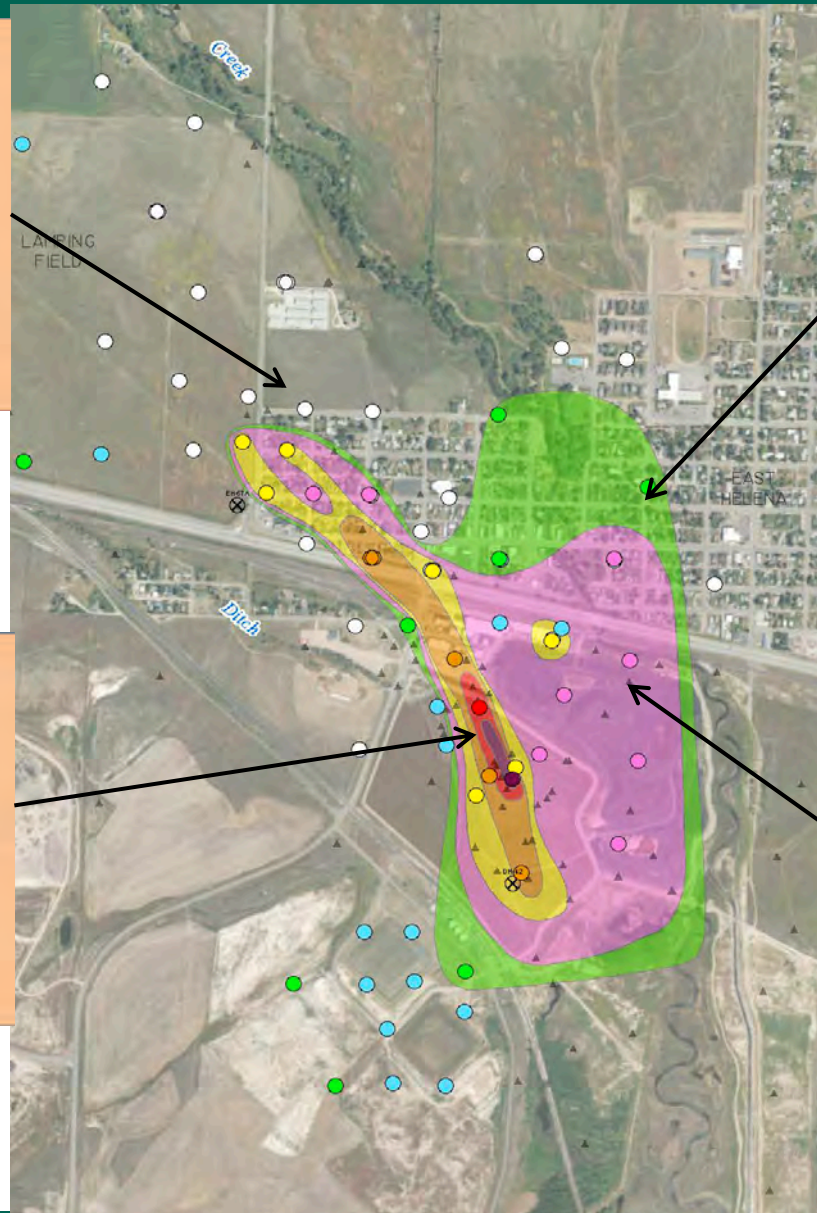
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Selenium Plume Trends



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Arsenic Plume Trends

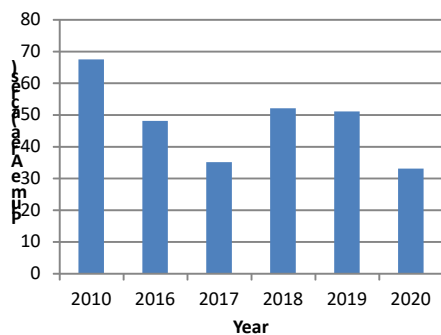


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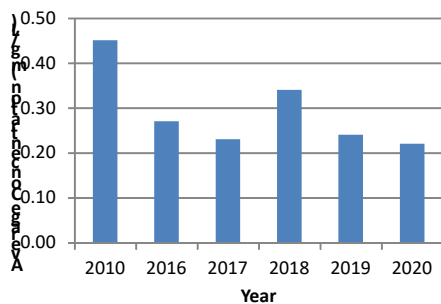
Plant Site

Year	Planar Area (acres)	Average Concentration (mg/L)
2010	67	0.451
2016	48	0.270
2017	35	0.230
2018	52	0.340
2019	51	0.240
2020	33	0.220

Plant Site Selenium Plume Area Trend



Plant Site Selenium Plume Average Concentration Trend

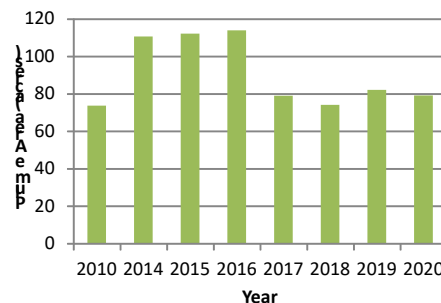


Plume Stability Analysis – Selenium

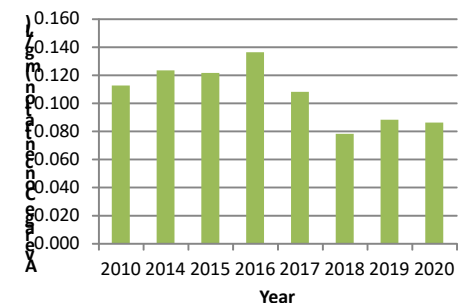
Downgradient

Year	Planar Area (acres)	Average Concentration (mg/L)
2010	74	0.112
2014	111	0.123
2015	112	0.121
2016	114	0.136
2017	79	0.108
2018	74	0.078
2019	82	0.088
2020	79	0.086

Downgradient Selenium Plume Area Trend



Downgradient Selenium Plume Average Concentration Trend

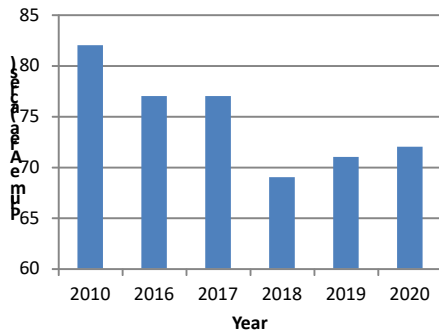


Plume Stability Analysis – Arsenic

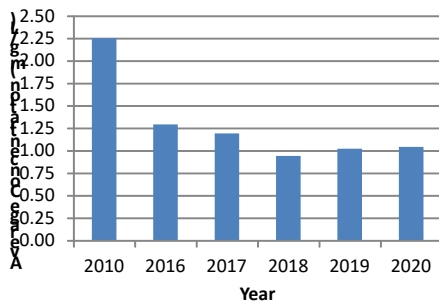
Plant Site

Year	Planar Area (acres)	Average Concentration (mg/L)
2010	82	2.25
2016	77	1.29
2017	77	1.19
2018	69	0.94
2019	71	1.02
2020	72	1.04

Plant Site Arsenic Plume Area Trend



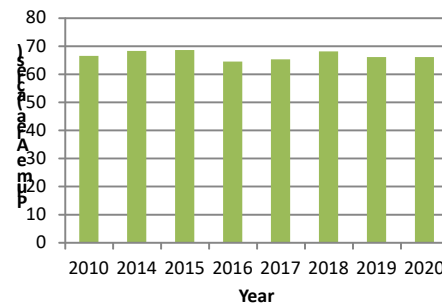
Plant Site Arsenic Plume Average Concentration Trend



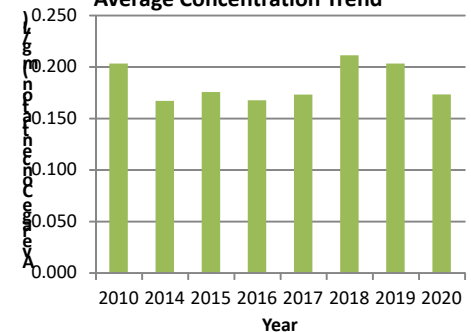
Downgradient

Year	Planar Area (acres)	Average Arsenic Concentration (mg/L)
2010	66	0.203
2014	68	0.167
2015	68	0.175
2016	64	0.167
2017	65	0.173
2018	68	0.211
2019	66	0.203
2020	66	0.173

Downgradient Arsenic Plume Area Trend



Downgradient Arsenic Plume Average Concentration Trend



Additional Corrective Measures May Be Implemented Based on Monitoring Results

- Long-term monitoring required to demonstrate effectiveness of corrective measures
- Need for additional corrective measures will be evaluated if monitoring indicates performance criteria are not met
- Corrective action approach to date:
 - Already showing improvements in groundwater quality; and
 - Has preserved sufficient funds to implement additional future remedies, *if needed*.



East Helena Slag Removal Project

- ✓ Remove 2,000,000 tons of unfumed slag
- ✓ Transport to South Korea for re-processing
 - Rail to Port of Longview, Washington
 - Ship from Washington to South Korea
- ✓ Project Schedule
 - Construction 12/2020 to 4/2021
 - 4/2021 begin shipping slag
 - 20,000 tons/month (2021)/30,000 tons (2022)
 - Project complete in 5 years
- ✓ Corrective Measure: Slag Re-grade and Cover
 - CMS allowed for slag recovery
 - Proceed with Slag Pile corrective measure after removal complete
 - Source removal (75% selenium)
- ✓ Cost savings for cover and puts money into EHCUC Account



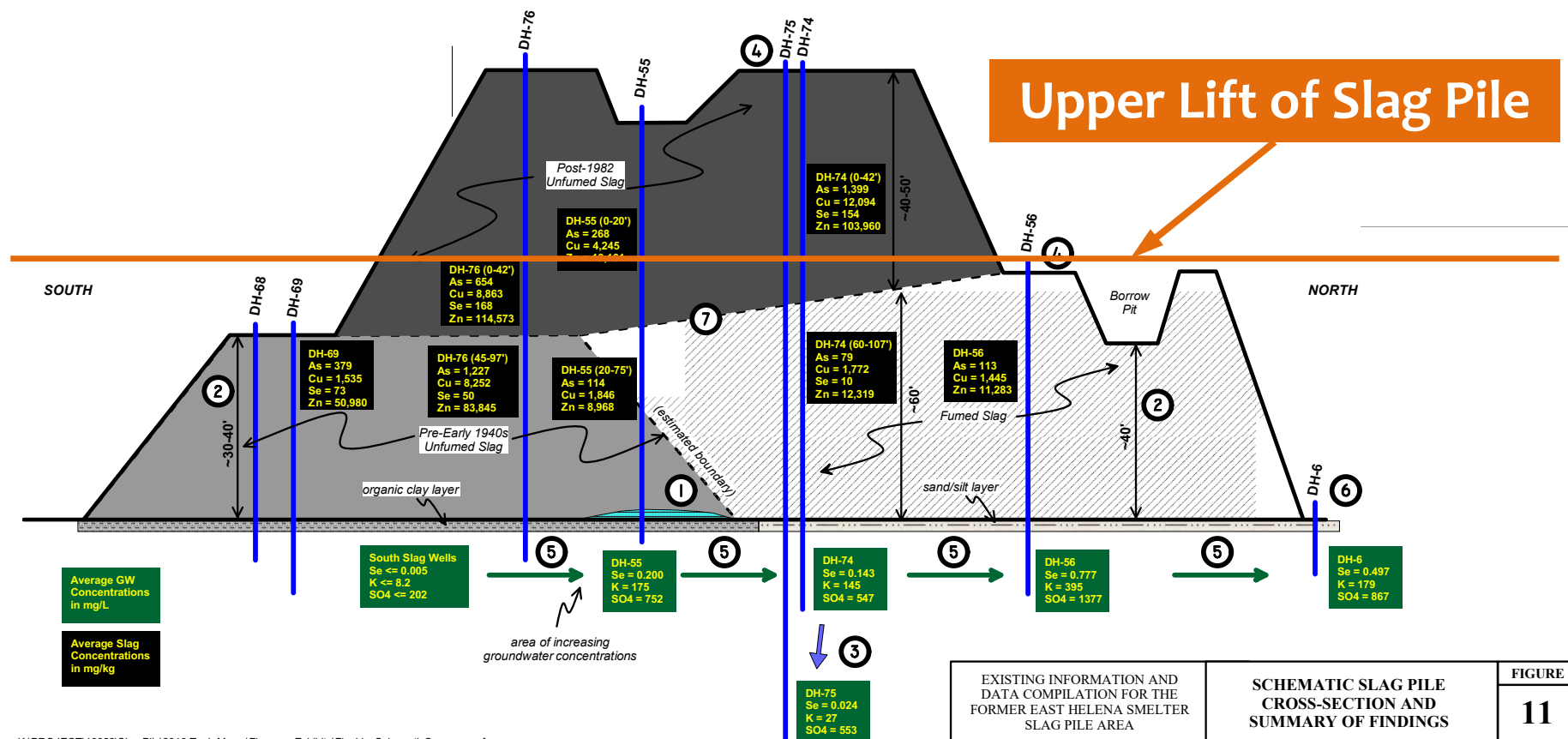
East Helena Slag Removal Project



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East Helena Slag Removal Project

- 75% of Selenium Plume from Upper Lift
- Reduce height of Slag Pile by more than 50%



K:\PROJECT\10022\Slag Pile\2016 Tech Memo\Figures - Exhibits\Fig 11 - SchematicSummary.srf

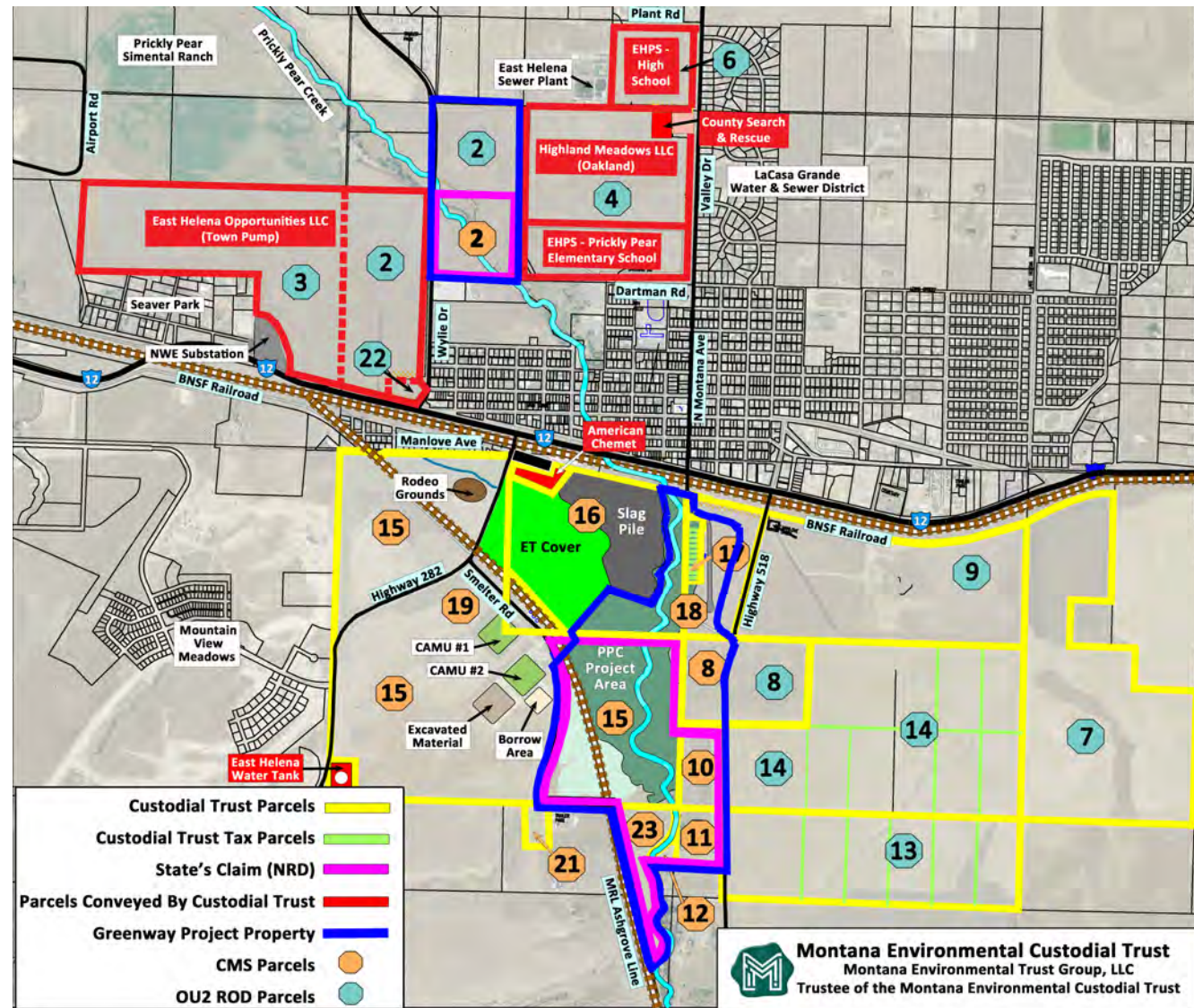


East Helena Redevelopment Project

Property Sold or
Transferred

Greenway
Project
Property

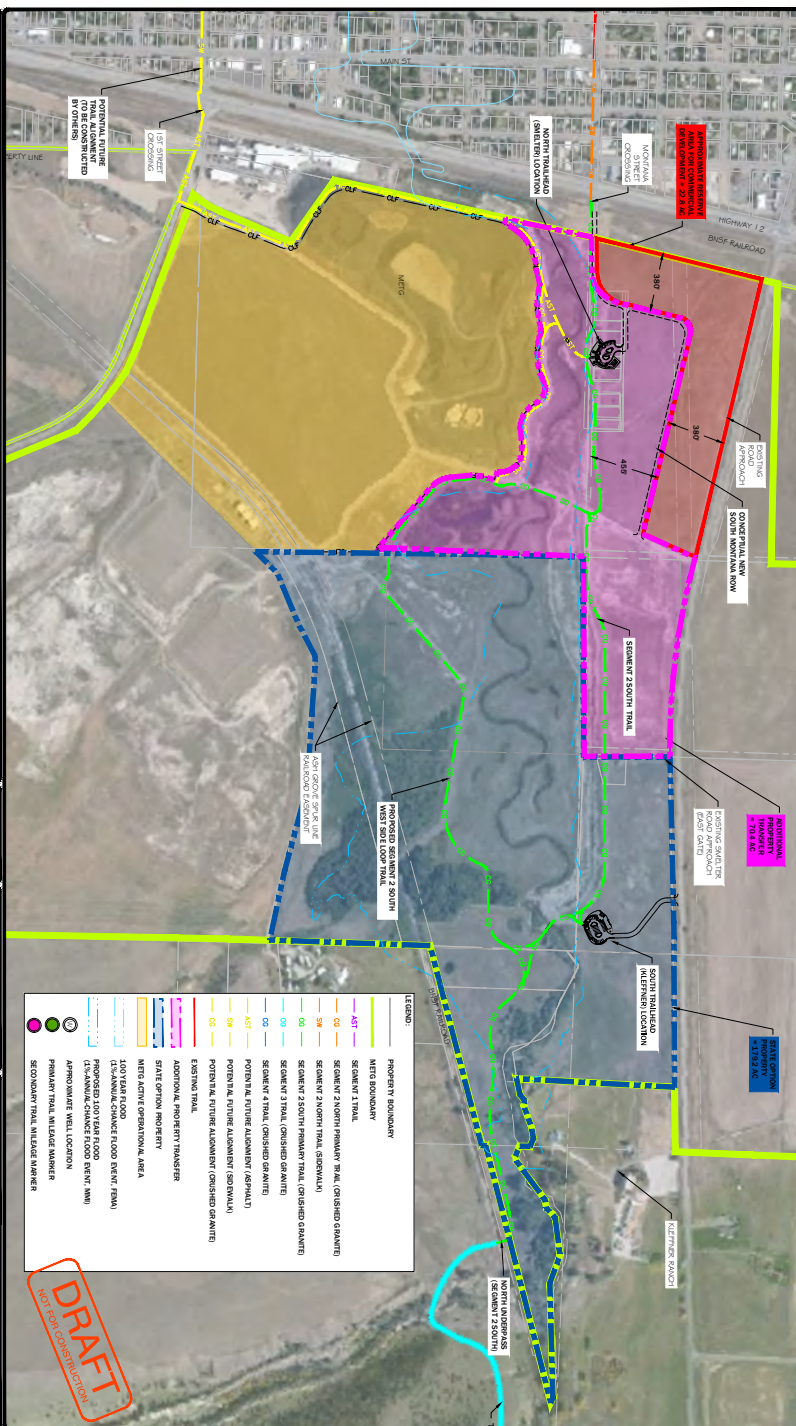
Natural Resource
Damage Option
Property



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Greenway Project

- Prickly Pear Land Trust
- Public Access to Prickly Pear Creek
- Approximately 5.4 miles of trail in East Helena



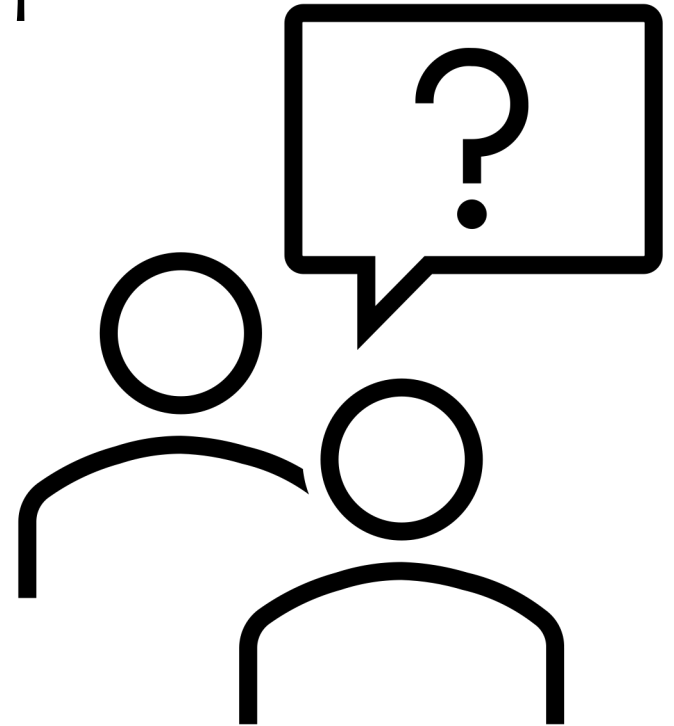
Recent Public Participation and Outreach

- World Montana Site Tour
- City Council Site Tour
- City Council Presentations
- Groundwater Technical Working Group Update
- Carroll Students Tours
- Prickly Pear Land Trust Tours
- Support of Prickly Pear Junction
- Custodial Trust Website:
<https://www.mtenvironmentaltrust.org/east-helena/>
 - Link to 2020 CMS Addendum:
<https://www.mtenvironmentaltrust.org/2020-corrective-measures-study-cms-report-addendum/>



Questions?

- If you have called in, you can unmute by pressing: *6
- If you have participated by Zoom, please use the Chat feature at the bottom of the screen



More Information

- Visit the Custodial Trust Website:
<https://www.mtenvironmentaltrust.org/east-helena/>
- Contact:
 - Betsy Burns, U.S. Environmental Protection Agency, (406)457-5013, burns.betsy@epa.gov
 - Cindy Brooks, Montana Environmental Trust Group, (617)448-9762, cb@g-etg.com

