



Cleanup of Former Asarco Smelter East Helena, MT November 2015



The Montana Environmental Custodial Trust was established in 2009 as part of the global ASARCO bankruptcy settlement. The Custodial Trust's responsibilities include: owning and managing approximately 2,000 acres of property in East Helena once owned by Asarco; holding and investing the funds set aside for cleanup of the former Asarco smelter; cleaning up contamination in soils, sediments and groundwater from more than a century of smelting activities using finite cleanup funds; and facilitating site redevelopment and ultimately selling or transferring the East Helena property. As Lead Agency, the US Environmental Protection Agency (EPA) oversees and approves the Custodial Trust's cleanup activities, which are performed EPA's Resource Conservation and Recovery Act (RCRA) corrective action program. EPA's federal partners include the US Fish & Wildlife Service and the US Forest Service. EPA consults with the State of Montana (through the Montana Department of Environmental Quality (MDEQ) and the Montana Department of Justice (MDOJ)) on site cleanup activities. EPA and the State are the beneficiaries of the Custodial Trust and must approve any sale or transfer of Custodial Trust property in East Helena.



Former Asarco Smelter—2008



Former Asarco Smelter—2014



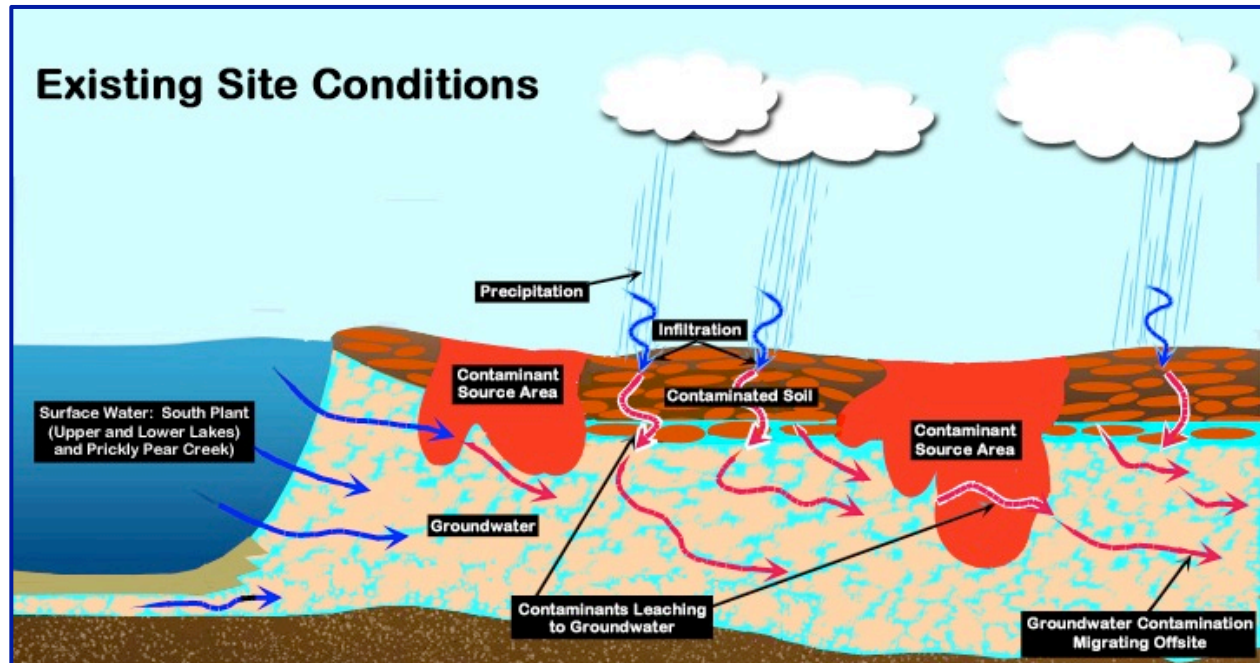
Former Asarco Smelter—2015

Custodial Trust Cleanup Goals

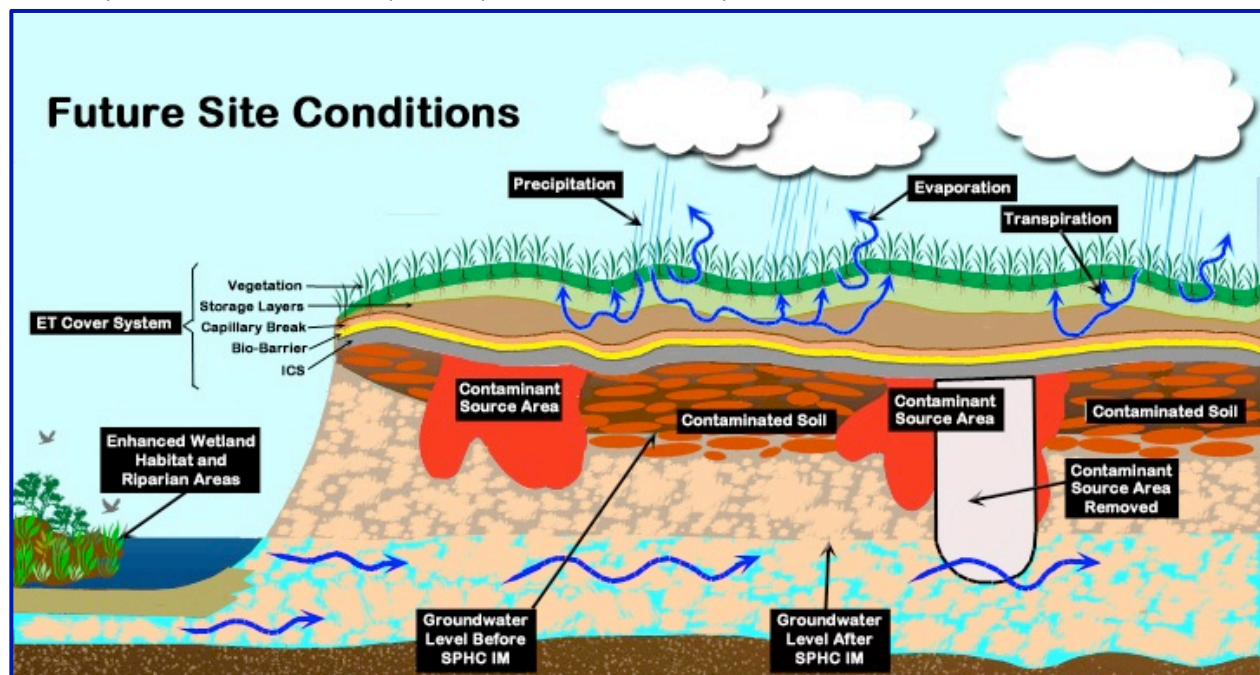
- ✓ Protect human health and the environment
- ✓ Fulfill EPA's RCRA Corrective Action requirements
- ✓ Maximize environmental benefit from finite funds

Custodial Trust Cleanup Priorities

- ✓ Prevent unacceptable exposure to contaminants
 - ✓ Address groundwater contamination
- ✓ Facilitate community-supported reuse of property



In 2012, EPA approved three RCRA Corrective Action cleanup activities, known as Interim Measures (IMs). These three IMs, which are interrelated and interdependent, are designed to reduce the off-site migration of contaminants (arsenic and selenium) in groundwater and to prevent exposure to contaminated soils. Groundwater gets contaminated by flowing through contaminated soils under the former smelter site or by precipitation that infiltrates down through contaminated soils that leach into the groundwater. (See Existing Conditions.) Besides contributing to groundwater contamination, contaminated soils on site pose a threat to human and ecological receptors (such as migratory birds) that may come into contact with these contaminated soils. Because it is not practically or financially possible to remove the millions of tons of contaminated soils on the former smelter property, the three IMs focus on minimizing the amount of contaminated soil in contact with groundwater and installing a cover system to prevent people, animals and precipitation from having direct contact with contaminated soils. Since 2012, the Custodial Trust has been designing, permitting and constructing the three EPA-approved IMs—South Plant Hydraulic Control IM, Evapotranspirative (ET) Cover System IM and and Source Control IM.





Three Interrelated, Interdependent Interim Measures (IMs)

- ✓ Reduce infiltration (from precipitation) leaching contaminants from soil to groundwater
- ✓ Eliminate exposure to contaminated soils
- ✓ Prevent stormwater contact with contaminated soil (that then requires treatment)

Evapotranspirative (ET) Cover System IM

- ✓ Excavate/consolidate contaminated soils under ET Cover
- ✓ Support wetland habitat and increase flood storage capacity
- ✓ If feasible, reduce volume of soils that are a source of contaminant loading to groundwater

Source Removal/ Control IM

South Plant Hydraulic Control (SPHC) IM

- ✓ Lower elevation of groundwater in south area of smelter to reduce the volume of groundwater flowing through heavily contaminated
- ✓ Provide additional flood storage capacity and establish beneficial wetland habitat



South Plant Hydraulic Control (SPHC) Interim Measure

Purpose of SPHC IM:

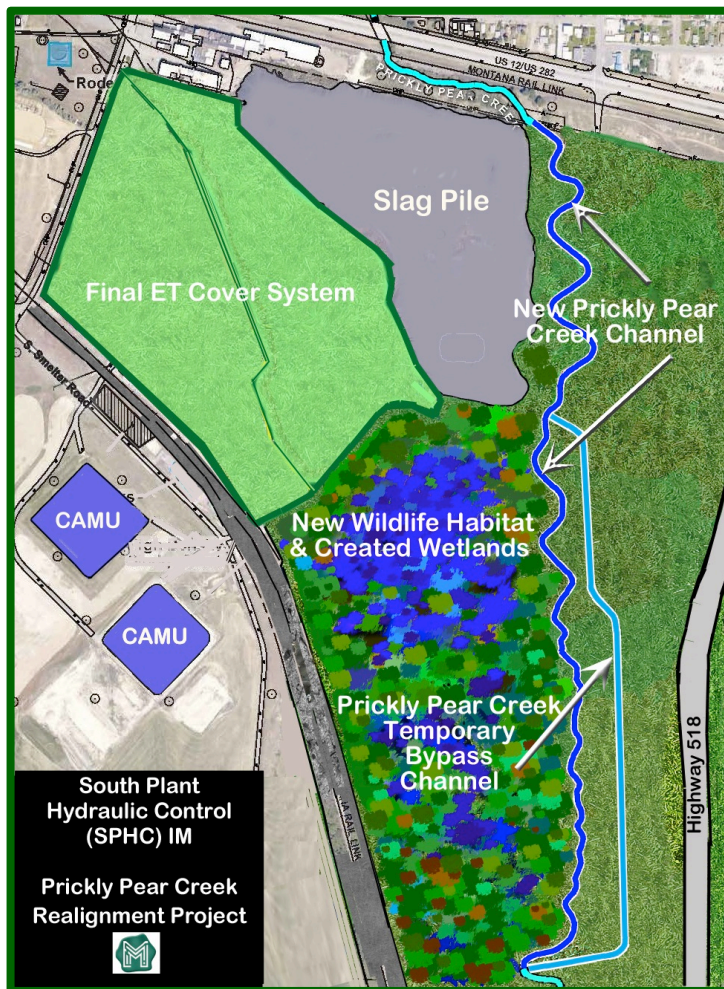
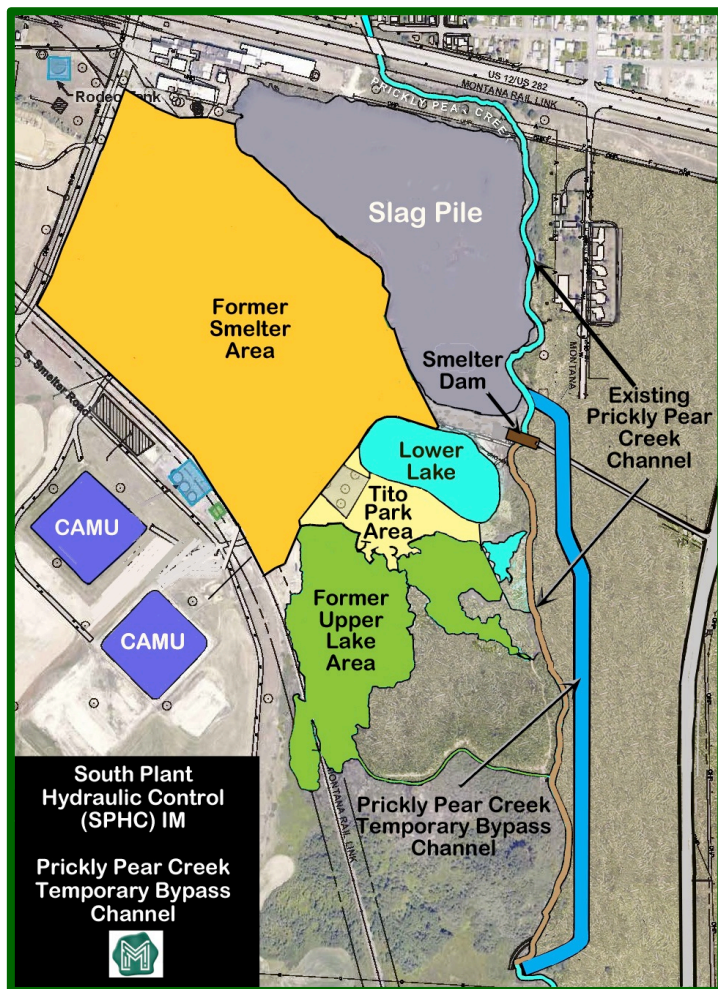
Surface waters from Prickly Pear Creek (PPC) and the Asarco made Upper and Lower Lakes artificially raised groundwater levels in the south plant area, driving groundwater flows through heavily contaminated smelter soils, increasing the loading of contaminants to groundwater and pushing plumes of contamination offsite. (See Existing Conditions.) SPHC IM is designed to reduce surface water recharge from the south plant area in order to lower groundwater levels and thereby reduce the volume of groundwater in contact with contaminated soils. (See Future Conditions.)

Components of SPHC IM

- ✓ Draining water from Upper Lake;
- ✓ Diverting PPC into temporary bypass channel to direct PPC flows away from south plant area and dewater Lower Lake;
- ✓ Constructing a new, more natural, functioning PPC channel and floodplain along the entire east bench area of the site with additional flood storage capacity;
- ✓ Constructing more than forty acres of wetlands and riparian habitat;
- ✓ Re-grading portions of the Slag Pile to prevent sloughing into PPC; and
- ✓ Removing Smelter Dam.

SPHC IM Benefits:

SPHC IM will reduce the loading of contaminants to groundwater. It will also create numerous other benefits, including: reduced erosion of slag into PPC (which will also stabilize the east side of the slag pile); increased flood storage; enhanced creek habitat; and elimination of the major impediment to fish passage on PPC by removal of Smelter Dam.





Evapotranspirative (ET) Cover System Interim Measure

Purpose of the ET Cover System IM:

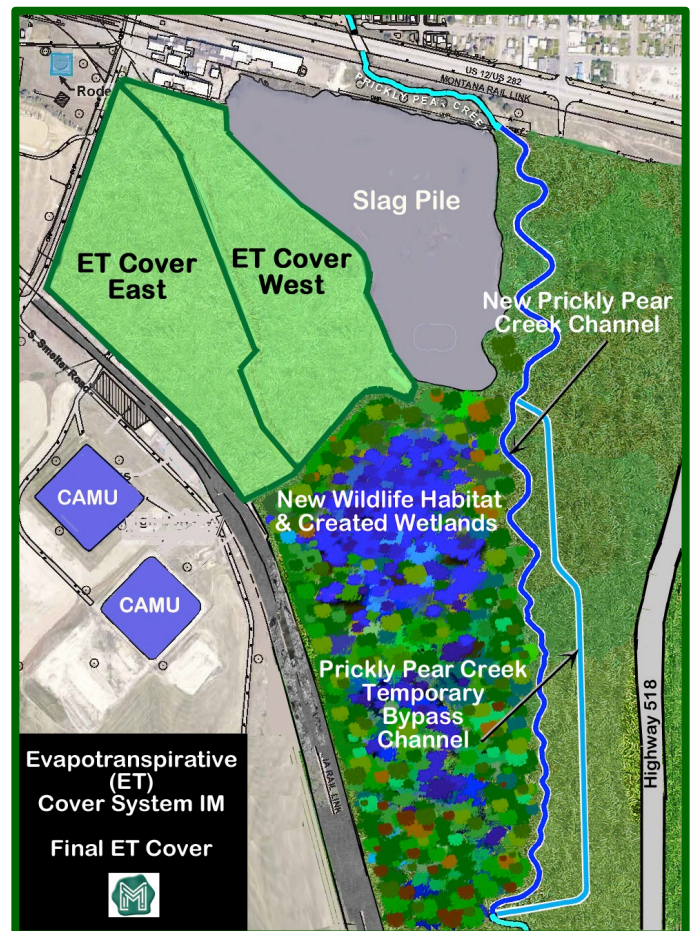
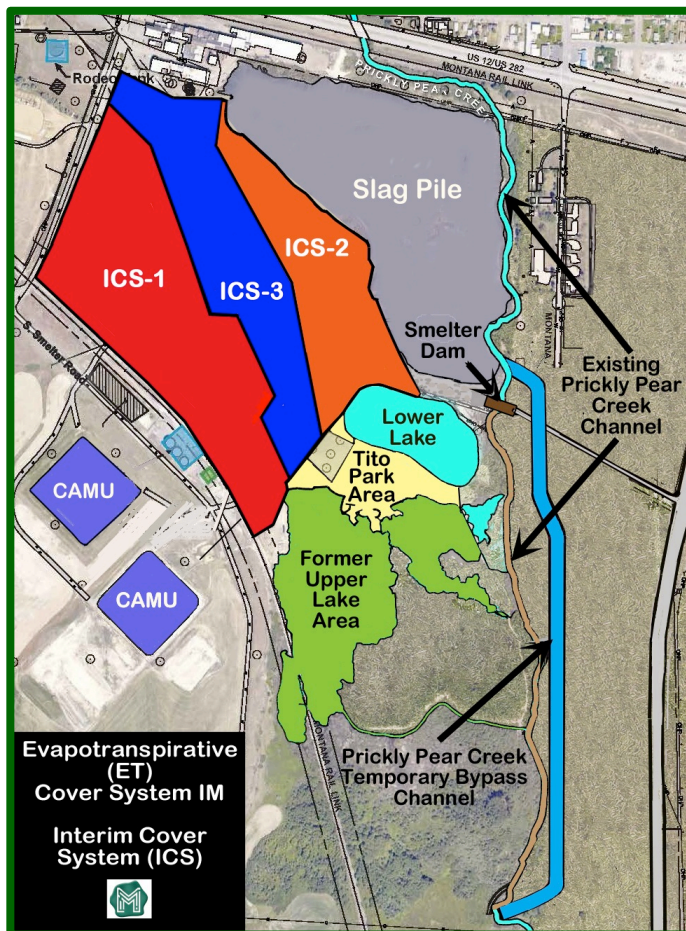
- ✓ Substantially reduce precipitation infiltrating through contaminated smelter soils to reduce leaching of contaminants to groundwater by storing water until it evaporates or is transpired (See Future Conditions.);
- ✓ Eliminate the ability of human and ecological receptors to come into contact with contaminated smelter soils; and
- ✓ Prevent stormwater from being contaminated by contact with smelter soils and thus eliminating the need to collect and treat storm water.

Components of the ET Cover System IM:

- ✓ Demolition of all structures on the smelter site;
- ✓ Construction of the ET Cover subgrade in three phases, referred to as three the interim cover systems (ICS-1, ICS-2 and ICS-3) to allow materials from demolition, SPHC IM excavation and Source Control IM removal to be consolidated and managed protectively as part of final ET Cover System; and
- ✓ Construction of the final ET Cover on top of the ICS areas, which consists of a bio-barrier layer (to deter burrowing animals), a capillary break layer (to increase the storage capacity of the storage layers), storage layers (for storing precipitation pending transpiration) and vegetation (native grasses).

Benefits of ET Cover System IM

The ET Cover System is a natural, self-sustaining protective cover that prevents contact with contaminated soils and leaching of contaminants into groundwater through infiltration. It is also sheds stormwater clean, eliminating the need to collect and treat contaminated stormwater. The ET Cover System also provides a protective repository for storing excavated materials (from the PPC temporary bypass and realigned channels and the Source Control IM) as well as demolition materials and debris.





Source Removal/Control Interim Measure (IM)

Purpose of Source Removal/Control IM

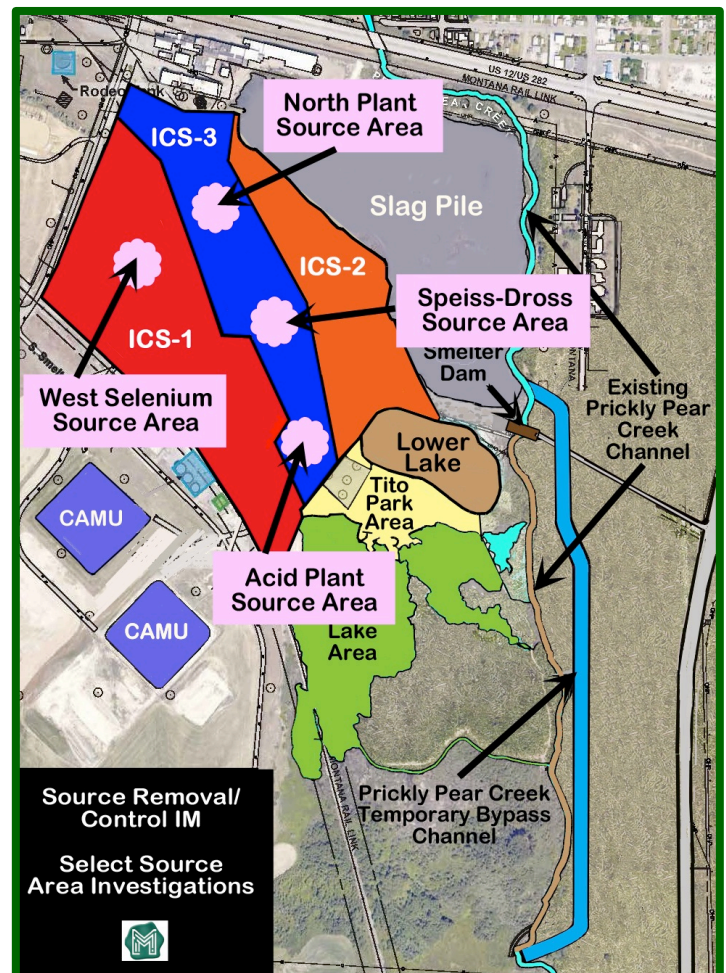
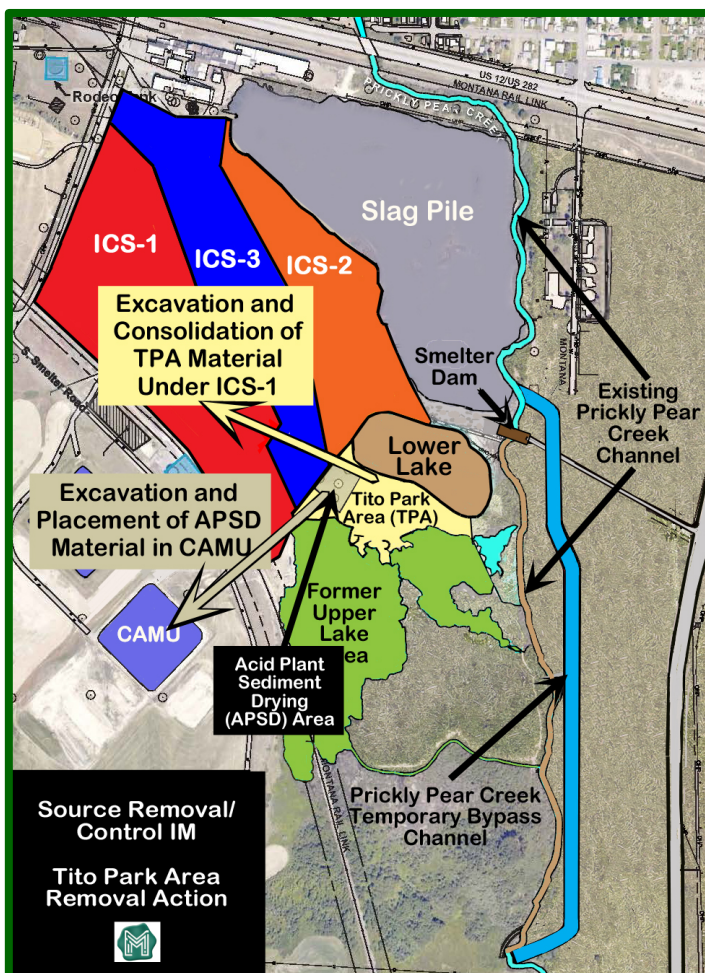
The Source Control IM is designed to reduce the mass loading of contaminants to groundwater by removing, isolating or treating select areas on the former smelter site where the concentrations of contaminants in soils are a significant source of contamination to groundwater (by infiltration or leaching).

Components of Source Removal/Control IM

- ✓ Removal of approximately 250,000 tons of contaminated soils, debris and hazardous and other wastes from the Tito Park Area (TPA)—an embankment constructed by Asarco that separated Upper and Lower Lake—and placement of excavated material under the ICS-1 area to eliminate a source of contamination to groundwater and surface water as well as the potential for inundation and erosion from PPC flooding; and
- ✓ If cost effective and supported by Site evaluations, potential removal, isolation and/or treatment of up to four select areas on the smelter property that significantly contribute to contaminant loading to groundwater—the West Selenium Area Source Area, the Speiss-Dross Source Area, the North Plant Source Area and the Acid Plant Source Area.

Benefits of Source Removal/Control IM

Removal of contaminated materials from the TPA not only eliminates an ongoing source of contamination, it also creates additional flood storage capacity, supports development of wetland habitat for the PPC realignment project and provides material for use in constructing the ICS. Removal, containment or treatment of one or more of the four select source areas, if warranted based on Site evaluations, will help reduce the mass loading of contamination to groundwater and provide additional material for construction of the ET Cover System.





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Construction Progress To Date:

South Plant Hydraulic Control (SPHC) IM

- ✓ De-watered Upper Lake
- ✓ Relocated utilities in PPC Realignment corridor (electricity, communications and water line)
- ✓ Constructed PPC Temporary Bypass Channel (TBC)
- ✓ Sorted and stockpiled TBC excavated material for use in construction of ICS and ET Cover
- ✓ Diverted PPC into TBC
- ✓ De-watered Lower Lake after TPA removal completed (see Source Control/Removal IM)

Evapotranspirative (ET) Cover System IM

- ✓ Demolished Phase 1 and 2 buildings and structures
- ✓ Constructed Interim Cover System (ICS) – 1

Source Control/Removal IM

- ✓ Excavated Tito Park Area (TPA) and consolidated material under ICS-1
- ✓ Excavated Acid Plant Sediment Drying (APSD) Area and placed material in CAMU
- ✓ Excavated speiss near TPA and consolidated material under ICS-1

Other Construction Activities

- ✓ Closed Corrective Action Management Unit (CAMU)-2
- ✓ Implemented measures required to protect migratory birds



Ore Storage and Handling Building Demolition



Interim Cover System (ICS) - 1



CAMU – 2 Closure



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Prickly Pear Creek Temporary Bypass Channel Construction





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2015 Construction Activities:

South Plant Hydraulic Control (SPHC) IM

- ✓ Salvage vegetation from PPC Realignment corridor to use as future plantings for realigned creek
- ✓ Begin excavation northern and southern PPC Realignment channel and floodplain

Evapotranspirative (ET) Cover System IM

- ✓ Demolish all remaining structures except water treatment plant
- ✓ Begin construction of ET Cover perimeter road
- ✓ Construct ICS-2 using excavated materials from TBC and PPC Realignment construction
- ✓ Relocate high voltage transmission line and remove substation
- ✓ Construct ET Cover West (over ICS-1)

Source Control/Removal IM

- ✓ Complete source area investigations

Other Construction Activities

- ✓ Implement measures required to protect migratory birds





2016/2017 Construction Plans

South Plant Hydraulic Control (SPHC) IM

- ✓ Complete construction of PPC Realignment channel and floodplain
- ✓ Re-grade toe slag pile
- ✓ Divert PPC into new channel
- ✓ Remove smelter dam
- ✓ Complete planting and vegetation of PPC floodplain and wetlands areas

Evapotranspirative (ET) Cover System IM

- ✓ Demolish water treatment plant
- ✓ Complete construction of ET Cover perimeter road
- ✓ Construct ICS-3 using excavated materials from PPC Realignment construction
- ✓ Construct ET Cover East (over ICS-1 and ICS-2) (2017)

Source Control/Removal IM

- ✓ Remove source material from former Acid Plant area
- ✓ Pump test speiss-dross source area
- ✓ Monitor west selenium hot spot area

Other Construction Activities

- ✓ Implement measures required to protect migratory birds





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Interim Measures Environmental Results To Date

- ✓ Groundwater levels in south plant area have dropped an average of 7 feet
- ✓ Groundwater levels in highly contaminated former Acid Plant area have dropped an average of 5 feet
- ✓ Dissolved arsenic and selenium concentrations in groundwater have decreased in localized areas (Acid Plant)
- ✓ SPHC IM and Source Control/Removal IM have significantly reduced contaminant loading to groundwater
- ✓ Improved quality of stormwater
- ✓ Volume of stormwater coming into contact with contaminated media has dropped by 500,000 since ICS-1 completed

Interim Measures Value Creation and Cost Savings Measures To Date

ET Cover System IM

- ✓ Saved ~\$3 million in fill material by using excavated materials from SPHC and Source Removal/Control IMs
- ✓ Avoided \$4 million to construct a third CAMU by protectively consolidating contaminated materials on-site
- ✓ Minimized time, cost and carbon footprint by not stockpiling or double-handling excavated materials
- ✓ Saved \$3 million in long-term stewardship costs by using sustainable ET Cover (in lieu of traditional cover)
- ✓ Reduced stormwater volumes requiring storage and treatment, allowing for elimination of water treatment plant O&M

SPHC IM

- ✓ Saved millions in long-term O&M costs compared to groundwater pump and treat system
- ✓ Avoided costs to bring smelter dam into compliance with Dam Safety Act

Source Removal/Control IM

- ✓ Saved cost to construct ET Cover over TPA (if left in place)

Other Cost Savings

- ✓ Saved \$3 million in hazardous waste fees by EPA-approved AOC policy
- ✓ Saved offsite transportation and disposal costs by consolidating material on site

For More Information

Contacts for East Helena Project:

- ✓ US Environmental Protection Agency (EPA) Project Manager: Betsy Burns at 406-457-5013
- ✓ Montana Environmental Custodial Trust Director: Cindy Brooks at 617-448-9762

Visit: www.mtenvironmentaltrust.org



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Former Asarco Smelter Slag Pile

A defining feature of the East Helena landscape, almost one half of the Asarco smelter property is occupied by the estimated 16 million ton pile of slag—the stony, black by-product of more than a century of smelting. Although there will never be sufficient funds to remove the slag pile, the Custodial Trust is committed to pursuing options for recycling the slag, eliminating the erosion of slag into Prickly Pear Creek and evaluating how slag may be contributing to contamination in groundwater.

Recycling Slag. The Custodial Trust has been pursuing several strategies for reusing the slag, including:

- ✓ Mining and selling slag as an additive for manufacturing cement;
- ✓ Crushing and transporting slag by rail to Canada where zinc and other residual metals are extracted; and
- ✓ Crushing and placing slag on site as filler material for the ET Cover System.

Interim Measures. Plans for the Prickly Pear Creek Realignment project include re-aligning the creek away from the Slag Pile and re-grading the pile to prevent erosion and sloughing of slag into the creek.

Groundwater Studies. The Custodial Trust is evaluating whether metals in the Slag Pile may be leaching into groundwater and options for mitigating potential contaminant issues, if appropriate.





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Collaborating With East Helena Stakeholders

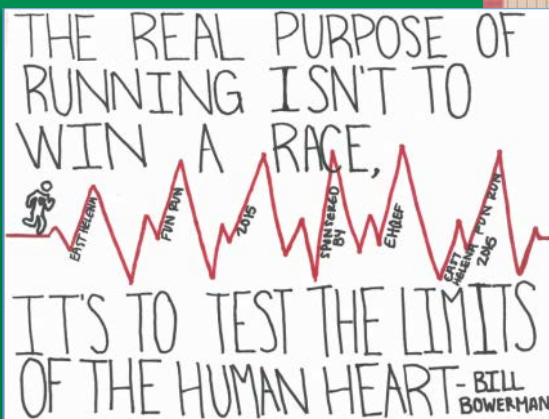
Over the last five years, the Custodial Trust has had the pleasure and privilege of collaborating with stakeholders from the East Helena community on a host of initiatives and projects. Examples include: supporting community traditions and hosting events such as the annual Independence Day fireworks display, the East Helena Rodeo and East Helena Public Schools Fund Run; allowing the East Helena Volunteer Fire Department to use former Asarco housing structures for live fire fighter training programs; donating land to the City of East Helena and Lewis & Clark County for expanding public roads, utilities and siting a new Search & Rescue facility; and holding town meetings and work shops to review cleanup plans and provide opportunities for community input on future development opportunities; and supporting the preservation of East Helena's rich history.



Annual East Helena Rodeo



Annual Independence Day Fire Works
East Helena Slag Pile



East Helena Public Schools
Annual Fun-Run



Lewis & Clark County
Search & Rescue Facility



Live Training Exercises
East Helena Volunteer Fire Department