

# U.S. Environmental Protection Agency

## Third Five-Year Review Report for Silver Bow Creek/Butte Area Superfund Site

### *Volume 1: Site-Wide Review Summary*

June 2011



*Final*



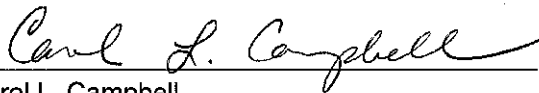
**Five-Year Review Report**  
**Third Five-Year Review Report**  
**for**  
**Silver Bow Creek/Butte Area Superfund Site**  
**Silver Bow and Deer Lodge Counties, Montana**

**June 28, 2011**

**PREPARED BY:**

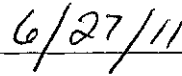
**U.S. Environmental Protection Agency, Region 8**  
**Helena, Montana**

Approved by:



Carol L. Campbell  
Assistant Regional Administrator  
Office of Ecosystems Protection and Remediation  
U.S. Environmental Protection Agency, Region 8

Date:





REMEDIAL ACTION CONTRACT  
FOR REMEDIAL, ENFORCEMENT OVERSIGHT, AND NON-TIME-  
CRITICAL REMOVAL ACTIVITIES AT SITES OF RELEASE OR  
THREATENED RELEASE OF HAZARDOUS SUBSTANCES  
IN EPA REGION 8

U. S. EPA CONTRACT NO. EP-W-05-049

**FINAL**

Five-Year Review for the  
Silver Bow Creek/Butte Area NPL Site  
Butte, Montana

*Volume 1: Site-Wide Review Summary*

Work Assignment No.: 337-FRFE-0822

June 2011

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## Volume 1 Appendices

*Appendix A Community Interviews Summary Report*

*Appendix B ARARs Review Technical Memorandum*

## Acronyms

ARAR	Applicable or Relevant and Appropriate Requirements
BMFOU	Butte Mine Flooding Operable Unit
BMI	benthic macroinvertebrate
BMP	best management practices
BPSOU	Butte Priority Soils Operable Unit
BRES	Butte Reclamation Evaluation System
BSB	Butte-Silver Bow
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
CGWA	controlled groundwater area
COC	contaminants of concern
DEQ	Montana Department of Environmental Quality
DNRC	Montana Department of Natural Resources and Conservation
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
HSB	Horseshoe Bend
IC	Institutional Control
ICIP	Institutional Controls Implementation Plan
LAO	Lower Area One
MCL	maximum contaminant level
MR	Montana Resources
O&M	operations and maintenance
OU	Operable Unit
RAO	Remedial Action Objectives
RMAP	Residential Metals Abatement Program
Rocker	Rocker Timber Treating and Framing
ROD	Record of Decision
Site	Silver Bow Creek/Butte Area Superfund Site
SSTOU	Streamside Tailings Operable Unit
TI	technical impracticability
TSS	total suspended solids
µg/L	micrograms per liter
WET	whole effluent toxicity
WSPOUs	Warm Springs Ponds Operable Units
WTP	water treatment plant

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# Executive Summary

The U.S. Environmental Protection Agency (EPA) Region 8 has conducted a five-year review of the response actions implemented at the Silver Bow Creek/Butte Area Superfund Site (Site), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System (CERCLIS) ID: MTD980502777 in Silver Bow and Deer Lodge Counties, Montana. This review covers activities conducted from January 2005 through December 2009. This is the third five-year review for the Site. The first five-year review was conducted in 2000 following construction and shakedown operations at the Warm Springs Ponds Operable Unit (WSPOU).

The purpose of the five-year review is to determine whether the remedies or other response actions in place or under construction within the Site are protective of human health and the environment and otherwise in compliance with the decision documents. The methods, findings, and conclusions of such reviews are documented in five-year review reports. In addition, these reports identify deficiencies found during the review, if any, and identifies recommendations to address them.

The Site is located along the course of Silver Bow Creek between the active mining operations at its headwaters just north of Butte, Montana to approximately 30 miles downstream to its mouth near the town of Warm Springs, Montana, at the beginning of the Clark Fork River. In addition to the impacted floodplain along Silver Bow Creek, the Site also consists of mine-waste impacted areas in and around the city of Butte, Montana, the town of Rocker, Montana, and the WSPOUs. The CERCLIS database lists 13 individual Operable Units (OUs) for the Silver Bow Creek/Butte Area. Several of the original thirteen OUs were removal OUs and, therefore, are addressed under the record of decision (ROD) for one or more of the remedial OUs. The OUs listed in CERCLIS at the Site include:

- 00 Site-wide OU
- 01 Streamside Tailings Operable Unit (SSTOU)
- 02 Area One OU (now part of OU08)
- 03 Berkeley Pit/Mine Flooding Operable Unit (BMFOU)
- 04 Warm Springs Ponds Active Area OU
- 05 Butte Reduction Works Tailings OU (now part of OU08)
- 06 West Camp/Travona Mine OU (previously part of OU03, now part of OU08)
- 07 Rocker Timber Treating and Framing (Rocker) OU
- 08 Butte Priority Soils Operable Unit (BPSOU)

- 09 Clark Fork River/Downstream OU (this OU was transferred to the Milltown Reservoir/Clark Fork River Superfund Site and is no longer part of the Silver Bow Creek/Butte Area Site)
- 10 Butte Residential Soils OU (now part of OU08)
- 11 Lower Area One (LAO) OU (now part of OU08)
- 12 Warm Springs Ponds Inactive Area OU
- 13 West Side Soils OU

Currently, the Site consists of seven active operable units listed below<sup>1</sup>; the first six of these OUs have selected remedies and were included in this third five-year review:

1. Streamside Tailings OU01 – includes the 26-mile, mine-waste impacted Silver Bow Creek floodplain between Butte and the WSPs. This is the second five-year review for this OU.
2. Butte Mine Flooding OU03 – includes contaminated groundwater in the flooded underground mine workings below the city of Butte along with contaminated water in the Berkeley Pit. The West Camp/Travona Mine OU06 was previously part of this OU, but treatment of the West Camp groundwater was transferred to OU08 with the BPSOU ROD. This is the second five-year review for this OU.
3. Butte Priority Soils OU08 – includes impacted soils, mine wastes, and contaminated attic dust located within portions of the city of Butte, along with mining-impacted alluvial groundwater and surface water associated with the historic and current Silver Bow Creek floodplain within the city of Butte. OUs 02, 05, 06, 10, 11 were incorporated into BPSOU with the 2006 ROD. This is the first five-year review for this OU.
4. Rocker Timber Framing and Treating OU07 – includes soils and groundwater contaminated with arsenic from a former timber treating facility. This is the second five-year review for this OU.
5. Warm Springs Ponds Active Area OU04 – includes the portion of the 2,600-acre WSPs that actively treats the entire flow of Silver Bow Creek prior to its confluence with Warm Springs Creek forming the start of the Clark Fork River. It also includes the reconstructed Mill-Willow Bypass. This is the third five-year review for this OU.
6. Warm Springs Ponds Inactive Area OU12 – includes the portion of the 2,600-acre WSPs that is not part of the active treatment of Silver Bow Creek water. This is the third five-year review for this OU.

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<sup>1</sup> These OU descriptions are intended to provide a very brief overview of the scope of each OU and are not intended to be comprehensive descriptions.

7. West Side Soils OU13 – includes the mining-impacted areas in and around the city of Butte that are not included in the BPSOU or the permitted active mining area. This OU is in the forward planning stages with a remedial investigation scheduled for 2013. This OU was not included in the five-year review.

Broadly speaking, the remedies at the Site are to remediate areas impacted by over 100 years of mining and ore processing so that human health and the environment are protected. The remedy components implemented to date include capping and/or removal of mine waste; residential yard cleanups to protect human health; groundwater controls and groundwater treatment; surface water controls (such as ponds, treatment systems, and catch basins); and, the reconstruction of Silver Bow Creek. Each of the OUs being reviewed contains some type of these remedial elements.

The Site is a large, complex CERCLA site with several EPA and state project managers being responsible for certain portions of the Site. Due to the size and complexity of the site, each of these OUs was evaluated individually; these individual review reports are included as subsequent “volumes” in this five-year review report.

The purpose of Volume 1 of the report is to provide an overview of the effectiveness of the selected remedies, as well as provide an assessment summary of the performance of each OU’s selected remedy. Site-wide issues brought up through the community interviews, and the findings of the site-wide applicable and relevant or appropriate requirements (ARARs) review are included in this first volume in Appendices A and B, respectively. In addition, the final appendix in each volume includes a responsiveness summary specific to that OU, to address substantive comments received on the five-year review. The volumes are as follows:

- Volume 1: Executive Summary, including the review of ARARs and the results of the community interviews;
- Volume 2: Streamside Tailings OU – OU01;
- Volume 3: Butte Mine Flooding OU – OU03;
- Volume 4: Warm Springs Ponds Active and Inactive OUs – OU04 and OU12 (the review of these two OUs is combined);
- Volume 5: Rocker Timber Framing and Treating OU – OU07; and,
- Volume 6: Butte Priority Soils OU – OU08.

EPA Region 8 conducted the review with input from the Montana Department of Environmental Quality (DEQ). CDM Federal Programs Corporation (CDM) provided technical support to EPA in preparation of this five-year review under contract EP-W-

05-049 for all OUs except for the SSTOU. CH<sub>2</sub>M Hill supported EPA in preparation of the SSTOU portion of the five-year review.

Overall, removals and remedial actions directed towards achievement of the remedial action objectives, and implementation of the selected remedies at each OU have resulted in tremendous progress towards the protection of human health and the environment of the site. Many of the large source areas or “hotspots” that have posed the greatest threats to human health and environment have been mitigated. During the major cleanup processes, which have been ongoing since the 1990s, much has been learned, and remedy design and implementation has improved. The CERCLA related issues identified in this review are nuanced when compared to the overwhelming issues and risks that were encountered in the 1980s and 1990s when the site was first listed and reclamation activities began. This review has also determined that some of the remaining challenges to the ultimate recovery of Silver Bow Creek include issues that are outside of the jurisdiction of CERCLA.

Protectiveness statements for each OU above are issued in this report. A site-wide protectiveness statement will not be issued until construction of the remedy is complete at all OUs. This review finds that as the remedies are being implemented, short-term and long-term protectiveness will be achieved.

## Five-Year Review Summary Form

### SITE IDENTIFICATION

**Site name:** Silver Bow Creek/Butte NPL Site

**EPA ID: 0974 CERCLIS ID #: MTD980502777**

**Region:** 8      **State:** Montana      **City/County:** Silver Bow/Deer Lodge Counties

### SITE STATUS

**NPL status:**  Final  Deleted  Other (specify) \_\_\_\_\_

September 8, 1983

**Remediation status** (choose all that apply):  Under Construction  Operating  Complete

**Multiple OUs?**  YES  NO      **Construction completion date:** Ongoing

Remediation Ongoing

Has Site been put into reuse?  YES  NO

### REVIEW STATUS

**Reviewing agency:**  EPA  State  Tribe  Other Federal Agency \_\_\_\_\_

**Author name:** Roger Hoogerheide

**Author title:** Remedial Project Manager      **Author affiliation:** EPA Region 8

**Review period:** October 2009 – December 2010

**Date(s) of Site inspection:** October 1, 2, 6 and 7, 2009 and November 24, 2009.

**Type of review:**  Statutory

- Policy       Post-SARA  Pre-SARA  NPL-Removal only  
 Non-NPL Remedial Action Site  NPL State/Tribe-lead  
 Regional Discretion

**Review number:**  3 (third)

**Triggering action:**

Actual RA Operation of Groundwater  Previous Five-Year Review Report

**Remedial Systems**

Construction Completion

Other (specify) \_\_\_\_\_

**Triggering action date:** September 2005

**Due date (5 years after triggering action date):** September 2010

*(Because of the site complexity and the public comment period, the review was completed after this due date)*

<b>Five-Year Review Summary Form (continued)</b>		
<b>Issues:</b>		
	<b>Affects Protectiveness (Y/N)</b>	
	<b>Current</b>	<b>Future</b>
<b>OU 01 Stream Side Tailings</b>		
1-1. Bare surface soils with salt formation and evidence of recontamination from waste left in place was observed within remediated areas.	Yes	Yes
1-2. Potential exists for recontamination of SSTOU by sources on tributaries.	Yes	Yes
1-3. Institutional Controls (ICs) are not fully and formally implemented.	No	Yes
1-4. Potential exists for recontamination by stormwater from upstream BPSOU until BPSOU remediation is fully in place.	Yes	Yes
1-5. The remedial monitoring network for surface water, instream sediments, groundwater, vadose zone water, soils, and vegetation should be revised to allow a systematic assessment of the performance of the remedy throughout the SSTOU.	No	Yes
1-6. Disturbed areas along stream banks during and after construction are not adequately treated with best management practices (BMPs) to prevent erosion and transport of sediment (possibly with residual metals) into Silver Bow Creek.	Yes	Yes
<b>OU 03 Butte Mine Flooding</b>		
3-1. The Horseshoe Bend (HSB) water treatment plant (WTP) did not meet the final pH effluent standard. Effluent is currently recycled to the Montana Resources (MR) mining operations and does not discharge to Silver Bow Creek.	No	Yes
3-2. Supersaturation of gypsum in the treated effluent causes a high potential for gypsum scaling throughout the WTP and in the effluent pipeline to Silver Bow Creek. Delayed precipitation of gypsum may also cause exceedances of the total suspended solids (TSS) discharge standard. Effluent from the WTP is currently recycled to MR mining operations.	No	Yes
3-3. Stringent pH and effluent turbidity control will be required for the WTP to reliably meet the cadmium discharge standard. Effluent from the WTP is currently recycled to MR mining operations.	No	Yes
3-4. The performance test did not include treatment of Berkeley Pit water, which has significantly higher concentrations of metals and sulfate than HSB water.	No	Yes
3-5. Use of scale inhibitors to control gypsum scaling issues in the treatment system may affect metals removal in the treatment plant. Effluent from the WTP is currently recycled to MR mining operations.	No	Yes
3-6. Whole effluent toxicity (WET) testing has not yet been performed on the HSB WTP effluent. Effluent from the WTP is currently recycled to MR mining operations. Should the effluent fail the WET testing, additional treatment processes may be necessary.	No	Yes.
3-7. The beta-photon procedure used to evaluate the concentration of radio- nuclides in the treatment plant effluent is not practical, given the need to analyze 179 different radionuclides.	No	No

## Five-Year Review Summary Form (continued)

<b>Issues:</b>		
	<b>Affects Protectiveness (Y/N)</b>	
	<b>Current</b>	<b>Future</b>
<b>OU 04 and OU 12 Warm Springs Ponds Active and Inactive Areas</b>		
4-1. Arsenic standard seasonally exceeded in effluent.	Yes	Yes
4-2. New exposure pathways for wildlife/aquatic life may now be present. These have not yet been evaluated	Unknown	Yes
4-3. A final ROD has not been issued. Final construction of the upstream SSTOU will soon make it possible for a final decision for this OU.	No	No
<b>OU 07 Rocker Timber Treating and Framing</b>		
7-1. Rebounds of arsenic concentrations below the repository are greater than expected in groundwater.	No	Yes
7-2. Atlantic Richfield submitted a technical impracticability (TI) evaluation for a waiver of the arsenic standard in groundwater in 2007.	No	No
7-3. The Town Pump well exceeds the recently-promulgated 10 micrograms per liter (µg/L) drinking water standard for arsenic. While the facility has switched to the community alternative water supply, there is no requirement for the facility to stay on the alternative water supply.	Yes	Yes
7-4. Increasing arsenic concentrations in shallow well RH-44 adjacent to Silver Bow Creek may indicate groundwater impacts to surface water. This is a data gap.	Yes	Yes
7-5. The ¼-mile radius controlled groundwater area may be overly restrictive.	No	No
7-6. The monitoring plan is not ideal for the current phase of the remedy.	No	No
7-7. The new arsenic standard of 10 µg/L is not in a decision document	No	No

<b>Five-Year Review Summary Form (continued)</b>		
<b>Issues:</b>		
	<b>Affects Protectiveness (Y/N)</b>	
	<b>Current</b>	<b>Future</b>
<b>OU 08 Butte Priority Soils (includes OUs 02, 05, 06, 10, 11)</b>		
8-1. Changes have been made to the Selected Remedy for Solid Media (sampling depths and removal depth)	No	No
8-2. Some corrective actions identified during Butte Reclamation Evaluation System (BRES) monitoring are not taking place in a timely manner. Corrective action work plans are not being developed and sent to EPA for approval before implementation. Corrective actions need to be implemented on an annual basis to maintain cap integrity.	No	Yes
8-3. There are gross exceedances of acute aquatic life standards in Silver Bow Creek during storm events. Copper exceedances of acute aquatic life standards are tens and hundreds of times greater than the standard.	Yes	Yes
8-4. The Butte-Silver Bow (BSB) storm sewer system is aging and contributing to contamination in Silver Bow Creek. Monitoring of storm system point sources from Superfund and non-Superfund sources will be required as BMP's are implemented, to determine where the need exists for additional work on the storm water system.	Yes	Yes
8-5. Interim institutional controls are in place. Specific, key ICs include: (1) earth moving protocols (not in place); (2) storm water ordinance (in place); (3) zoning ordinances (in place); (4) restrictive covenants on caps and other engineered structures (in place); and, (5) controlled groundwater area (in place).	No	Yes
8-6. Ecological monitoring does not track the success of the remedy in attaining the goal of a self-sustaining fishery in Silver Bow Creek.	No	Yes



## Five-Year Review Summary Form (continued)

### Recommendations and Follow-Up Actions:

(Note: Numbering Corresponds with Issue Number)

#### Streamside Tailings Operable Unit (OU 01)

- 1-1. All spots within the remediated areas with little or no vegetation should be inventoried and remediated.
- 1-2. An inventory and evaluation of major tributary gulches with historic mining activity should be performed. Inventory should be field verified and noted for regulatory action, restoration work, or West Side Soils OU evaluation and remediation. Remedial progress by the U.S. Forest Service on the Beal Mountain Heap Leach Pad project should be monitored until complete.
- 1-3. A formal IC Plan needs to be prepared and approved.
- 1-4. Ongoing evaluation and implementation efforts to control upstream stormwater should continue, as is currently required.
- 1-5. Align existing, and design new monitoring station locations to comprehensively monitor remediated media within each subarea. The monitoring network should be designed to accurately assess the performance of the remedy in surface and ground water, as well as vegetation, macroinvertebrates, and fish, and help identify areas not responding as intended so they can be quickly addressed.
- 1-6. Stormwater BMPs should be applied to disturbed areas along reconstructed streambanks during and after final construction activities to prevent erosion and transport of sediment (possibly with residual metals) into Silver Bow Creek. Effective BMPs should be maintained and monitored until streambanks are stabilized by deep rooted vegetation, and robust vegetative cover can be established in the reconstructed floodplain.

#### Butte Mine Flooding Operable Unit (OU 03)

- 3-1. Conduct an additional performance test to investigate solutions to exceedance of the final pH standard prior to the next five-year review.
- 3-2. Conduct an additional performance test to investigate solutions to gypsum supersaturation issues prior to the next five-year review.
- 3-3. Conduct an additional performance test to investigate solutions to ensure reliable cadmium compliance prior to the next five-year review.
- 3-4. Conduct an additional performance test to treat Berkeley Pit water prior to the next five-year review.
- 3-5. Conduct an additional performance test to investigate the effect of scale inhibitors on metals removal prior to the next five-year review.
- 3-6. Perform WET testing on representative effluent prior to the next five-year review.
- 3-7. Determine a more practical approach to analyzing radionuclides to determine compliance with the beta-photon emitter discharge criteria.

## Five-Year Review Summary Form (continued)

### Recommendations and Follow-Up Actions:

(Note: Numbering Corresponds with Issue Number)

#### Warm Springs Ponds Operable Units (OU 04 and OU 12)

- 4-1. Complete arsenic treatment optimization studies, and then determine if meeting Remedial Action Objectives (RAOs) is feasible.
- 4-1. Evaluate contaminant pathways.
- 4-2. Begin forward planning for the final ROD (including data collection efforts, updated risk assessments, and feasibility studies).

#### Rocker Timber Treating and Framing Operable Unit (OU 07)

- 7-1. Evaluate whether additional treatment or a TI waiver is needed. Review the TI waiver petition submitted in 2007.
- 7-2. Evaluate whether additional treatment or a TI waiver is needed. Review the TI waiver petition submitted in 2007.
- 7-3. Follow up to ensure Town Pump continues to use the community water supply and not groundwater
- 7-4. Evaluate the current or potential contribution, if any, of arsenic contamination to Silver Bow Creek from shallow groundwater.
- 7-5. Evaluate the protectiveness and continuation of the ¼-mile radius well ban.
- 7-6. Update the monitoring plan to optimize groundwater sampling.
- 7-7. Write a decision document to update the arsenic standard

#### Butte Priority Soils Operable Unit (OU 08, with OUs 02, 05, 06, 10, and 11 incorporated)

- 8-1. Issue a decision document to acknowledge changes in sampling and removal depths for residential properties.
- 8-2. Develop a program to follow up on BRES-related recommended corrective actions and other operations and maintenance (O&M) for reclaimed areas. Include corrective action tracking, annual work plans, updates to the source area database and an annual audit of the schedule and accomplishments.
- 8-3. Construct new BMPs on the Butte Hill to control runoff. Continue water quality monitoring during storm events to measure progress and long-term trends in storm water quality. Include careful monitoring and coordination with BSB with the storm water conveyance system in this process.
- 8-4. Evaluate and optimize municipal storm water collection system in concert with upgrades to the Superfund collection and treatment system.
- 8-5. Implement an enforceable IC Plan.
- 8-6. Update the monitoring plan to include ecological monitoring.

## Five-Year Review Summary Form (continued)

### Protectiveness Statements:

#### OU 01 Streamside Tailings:

The remedy at OU 01 is not protective. Source areas within the OU that can recontaminate the remedy must be identified, evaluated, and mitigated if appropriate. These include salt patches appearing on remediated areas that impede vegetation, and inadequately vegetated stream banks, as well as tributary sources. An IC plan must be developed and approved. Enforceable elements should be added to the IC program to ensure interim protectiveness, and the formal IC program should be approved by DEQ and EPA in coordination with appropriate County and local agencies and organizations. The existing monitoring plan also needs to be revised into a comprehensive groundwater, surface water, sediment, vadose zone, revegetation, macroinvertebrates, and fish monitoring plan to adequately demonstrate protectiveness. The plan also does not provide for maintenance of the remedy.

In-stream cleanup standards have not been met, although substantial progress towards these standards has been made and will likely continue. Environmental exposures continue. To be protective, the remedy must be more completely implemented, data gaps must be filled, enforceable ICs put in place, and the monitoring and maintenance plan updated and implemented.

#### OU 03 Butte Mine Flooding:

The remedy at OU 03 is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could cause unacceptable risk are being controlled by water treatment, routing water for re-mining use, land use access controls, and an IC preventing groundwater use. In order to be protective in the long term, water quality issues in the treated effluent will have to be resolved before discharge to Silver Bow Creek becomes necessary.

#### OUs 04 and 12 Warm Springs Ponds:

The remedy at OUs 04 and 12 is not protective because aquatic life criteria are not met in the Pond discharge. In order to ensure protectiveness, remedy implementation must progress at other OUs upstream. Further, it is unknown if additional human or wildlife exposures are occurring within these OUs.

#### OU 07 Rocker Timber Treating and Framing:

The remedy at OU7 is not protective because the Town Pump well exceeds the arsenic MCL of 10 µg/L and was being used for drinking water. Additionally, prolonged use of this well could enlarge the existing plume and otherwise adversely affect remediation of the site. Action to prevent domestic/public use of this well and to prevent extensive pumping is needed to ensure protectiveness.

Further, it is unknown whether site contaminants are reaching Silver Bow Creek.

Other aspects of the remedy currently protect human health and the environment. Land use controls are in place to prevent residential development on the OU and a ban on well use within the Rocker OU is still in place. The Montana Department of Natural Resources and Conservation (DNRC) instituted a controlled groundwater area (CGWA) for the Rocker area and the Rocker residents were provided with an alternate community water system. Existing wells within the CGWA can still be utilized, however well owners have been notified of the potential risks. RAOs were prioritized according to actual or potential use of these groundwater zones. Progress is taking place in lowering the arsenic concentrations in the high quality lower aquifers which are currently used (Tertiary groundwater system) and that have the potential to be used (deep alluvium). A TI waiver is under consideration. Ongoing monitoring, continued implementation of institutional controls, controlling site access, and O&M activities are required to ensure long-term protectiveness.

## Five-Year Review Summary Form (continued)

### Protectiveness Statements:

#### OU 08 Butte Priority Soils:

The remedy at OU 08 is not protective because aquatic life standards are not met in the stream. Environmental exposures continue. Short-term protectiveness is provided for all other potential exposures by the recently enacted CGWA, information/educational ICs, and engineering and access controls of source areas. To ensure protectiveness, remedy implementation must be completed, and municipal storm water contributions to Silver Bow Creek must be abated.

Releases of arsenic and heavy metal contaminants in alluvial groundwater to Silver Bow Creek have been reduced through a comprehensive groundwater control, capture, and treatment system, such that water quality standards are being met much of the time during base flow conditions. The design of a more effective capture system is very important for completion of the surface water component of the remedy. Storm water continues to be a significant source of contaminant loading to Silver Bow Creek during runoff events, and additional remedial actions are necessary.

The Residential Metals Abatement Program (RMAP) program will continue to obtain access to residential properties within the BPSOU that have not previously been sampled to complete indoor and outdoor assessments (i.e., residential yard soil, indoor and outdoor dust, attic dust, lead-based paint, drinking water, and mercury vapor) and perform clean up actions where necessary. The program anticipates completing these goals by about 2020.

For non-residential areas, engineering and institutional controls effectively isolate identified waste materials, thus preventing human and environmental exposures. Protection of human health is expected to be strengthened as the BRES evaluation and cover maintenance programs are improved and mature, and as the ICIP is fully implemented, tested, and enforced. It is important that follow-up on BRES findings be tracked and implemented.

#### Site-wide:

A site-wide protectiveness statement will not be issued until construction of the remedy is complete at all OUs.