

**BUTTE AREA ONE  
DRAFT RESTORATION PLAN**

**October 11, 2012**

**Prepared By:**

**THE BUTTE NATURAL RESOURCE DAMAGE RESTORATION  
COUNCIL (BNRC)  
AND THE STATE OF MONTANA  
NATURAL RESOURCE DAMAGE PROGRAM (NRDP)**

65 East Broadway

Butte, MT 59701

(406) 533-6882



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## List of Acronyms

ARCO	Atlantic Richfield Company
BAO	Butte Area One
BNRC	Butte Natural Resource Damage Restoration Council
BSB	Butte-Silver Bow City-County Government
CD	Consent Decree
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
DCRP	Draft Conceptual Restoration Plan
DEQ	Montana Department of Environmental Quality
DOI	U.S. Department of Interior
EPA	U.S. Environmental Protection Agency
FWP	Montana Fish, Wildlife and Parks
LAO	Lower Area One
MBMG	Montana Bureau of Mines and Geology
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSD	Metro Storm Drain <sup>1</sup>
NRDP	Natural Resource Damage Program
ROD	Record of Decision
RPPC	UCFRB Restoration Plan Procedures and Criteria
TRC	Trustee Restoration Council
CSKT	Confederated Salish and Kootenai Tribes
UCFRB	Upper Clark Fork River Basin

<sup>1</sup>Metro Storm Drain (MSD) is a term used to describe the realigned and reconstructed channel of Silver Bow Creek from Texas Avenue to its confluence with Blacktail Creek.

## **Executive Summary**

The 2008 Montana v. ARCO Consent Decree allocated \$28.1 million (M), plus interest, to restore, replace or acquire the equivalent of the injured groundwater and surface water of Butte Area One. The Governor created the Butte Natural Resource Damage Restoration Council (BNRC) to give the citizens of Butte a strong voice on how this fund should be spent. This nine member volunteer council, with assistance from the Montana Natural Resource Damage Program (NRDP), has developed this restoration plan to guide the expenditure of these funds. The BNRC recognizes that this important task must be accomplished with limited funds and resources.

Restoration typically follows remedy and goes beyond remedial actions in an effort to restore the injured natural resources. The BNRC started meeting in April 2010 with the expectation that their Butte Area One Restoration Plan would follow the anticipated Consent Decree for the Butte Priority Solis Operable Unit. It was also their desire to produce a restoration plan in time for Governor Schweitzer to consider it prior to the end of his term. At this time a Consent Decree finalizing the remedial actions for BPSOU has not been reached, however, in keeping with their goal, the BNRC has produced this restoration plan in time for the Governor's consideration. Since the final BPSOU remedy plan is unknown, this restoration plan is not as specific as the council had desired. Instead, it offers enough flexibility that it should complement the future remedy and not take its place.

In order to develop this restoration plan, the BNRC, with assistance from the NRDP, first produced the "Butte Area One Final Restoration Process Planning Document." This document contains the legal criteria and policy criteria by which projects/alternatives would be evaluated. That document was subject to public review and was approved by the Governor in March 2012. The provisions in the planning document were followed during the production of this "Butte Area One Restoration Plan." Throughout their course, the BNRC conducted a transparent decision-making process that allowed numerous opportunities for citizens to have direct input into the plan development, including multiple project scoping sessions. It became clear that the desire of the council and the community was to concentrate efforts primarily on direct

restoration of the injured natural resources in Area One. As a result, the focal point of this restoration plan is “the BNRC Restoration Recommendation” which concentrates on the “restoration of the Upper Silver Bow Creek Corridor” from Texas Ave. to Montana St.

The BNRC Restoration Recommendation devotes these funds, approximately \$32M as of December 31, 2011, into the following restoration categories: Restoration of the Upper Silver Bow Creek Corridor - \$10M; Water System Improvements - \$10M; Waste Cap Improvements/Revegetation - \$6M; Stream Restoration - \$4M; Storm Water Controls - \$ 0; Recreation - \$1M; and Small/Miscellaneous Projects - \$1M.

It is a requirement of Superfund Law, 43 CFR 11.82(a), that a reasonable number of possible alternatives for the restoration, rehabilitation or replacement of the injured natural resources be developed and considered. The alternatives produced in this restoration plan: “no action,” “Alternative 1,” and “Alternative 2” were originally developed by the NRDP for the 2007 Butte Area One Draft Conceptual Restoration Plan, but were updated and included as alternative restoration actions in this plan. The merits of each alternative were compared using both the legal and BNRC policy criteria. Out of the four restoration alternatives considered, the “BNRC Restoration Recommendation” more completely achieves the goals of these criteria, produces the greatest benefits to the injured resources and replaces more of the services lost because of the injury, and aligns with the priorities of the Butte community; therefore, the BNRC Restoration Recommendation is the preferred alternative.

# 1 Introduction and Background

## 1.1 Purpose and Scope of this Document

This *Draft Butte Area One Restoration Plan* describes the restoration plan the State of Montana will implement to restore the injured groundwater and surface water resources of Butte Area One. The Butte Natural Resource Damage Restoration Council (BNRC), with assistance from the State of Montana, Department of Justice, Natural Resource Damage Program (NRDP), developed this document for public consideration in fall 2012. Following consideration of public comment, the BNRC will recommend a final version of this plan in November 2012 for consideration of the Trustee Restoration Council (TRC) and approval of the Governor in December 2012. The NRDP and TRC will also consider public comment and make recommendations to the Governor regarding a final Butte Area One Restoration Plan.

This Draft Restoration Plan is organized as follows:

- This introductory Section 1 describes the purpose and scope of this draft document and provides background on the Butte Area One site and the restoration planning steps that led to the development of this draft plan, including public involvement.
- Section 2 describes the restoration project categories the BNRC developed as a result of a public scoping process and used to generate restoration project alternatives.
- Section 3 describes the proposed restoration project alternatives.
- Section 4 provides a comparative analysis of the proposed restoration project alternatives.
- Section 5 identifies the BNRC's preferred and recommended restoration alternative (referred to herein as the "BNRC Restoration Recommendation") based on this analysis.
- Section 6 is a summary of the restoration plan implementation process.

## 1.2 Background

### 1.2.1 Butte Area One (BAO) Site Background and Injury Overview<sup>1</sup>

The deposition of wastes in the City of Butte from mining and mineral-processing operations has resulted in injury to groundwater resources and the surface water of Silver Bow Creek. Figure 1 depicts the Silver Bow Creek watershed in the headwaters area of the Upper Clark Fork River Basin. The injured alluvial groundwater and surface water in Butte is located in the south central portion of the Butte Priority Soils Operable Unit (BPSOU) referred to as “Area One.” Area One is depicted in the red-outlined area on Figure 2. Many of the wastes in Area One are associated with five facilities – the Parrot Smelter, the Metro Storm Drain (MSD),<sup>2</sup> the Butte Reduction Works, the Colorado Smelter, and the Berkeley Pit.

Injury to groundwater in Butte Area One has been demonstrated by the occurrence of concentrations of heavy metals (including cadmium, zinc, iron, lead, and copper), arsenic, and sulfate that exceed drinking water standards in the alluvial aquifer. The areal extent of the known contamination above drinking water standards of the alluvial aquifer is about a square mile and extends from the Parrot Tailings area down gradient along the historic Silver Bow Creek channel. The highest known concentrations of dissolved constituents in groundwater coincide with wastes from the Parrot mill and smelter. These leachable wastes have a volume of approximately 590,000 cubic yards.<sup>3</sup> Other areas known as the Diggings East and Northside Tailings also contain contaminants that are most likely leaching metals into the groundwater and potentially to surface waters. In Lower Area One, west of Montana Street, most of the tailings were previously removed by ARCO; however, some slag and tailings from the Butte Reduction Works and Colorado Smelter remain in place and have the potential to leach metals to ground and/or surface water.

The discharge of contaminated groundwater and contaminated surface runoff to Silver Bow Creek in Butte Area One results in surface water and streambed contamination. The contaminated alluvial aquifer potentially discharges to Silver Bow Creek and Blacktail Creek. Surface runoff from storms and snowmelt can carry hazardous substances from hundreds of dispersed waste sources to Silver Bow Creek through surface drainages and the Butte storm water collection system.

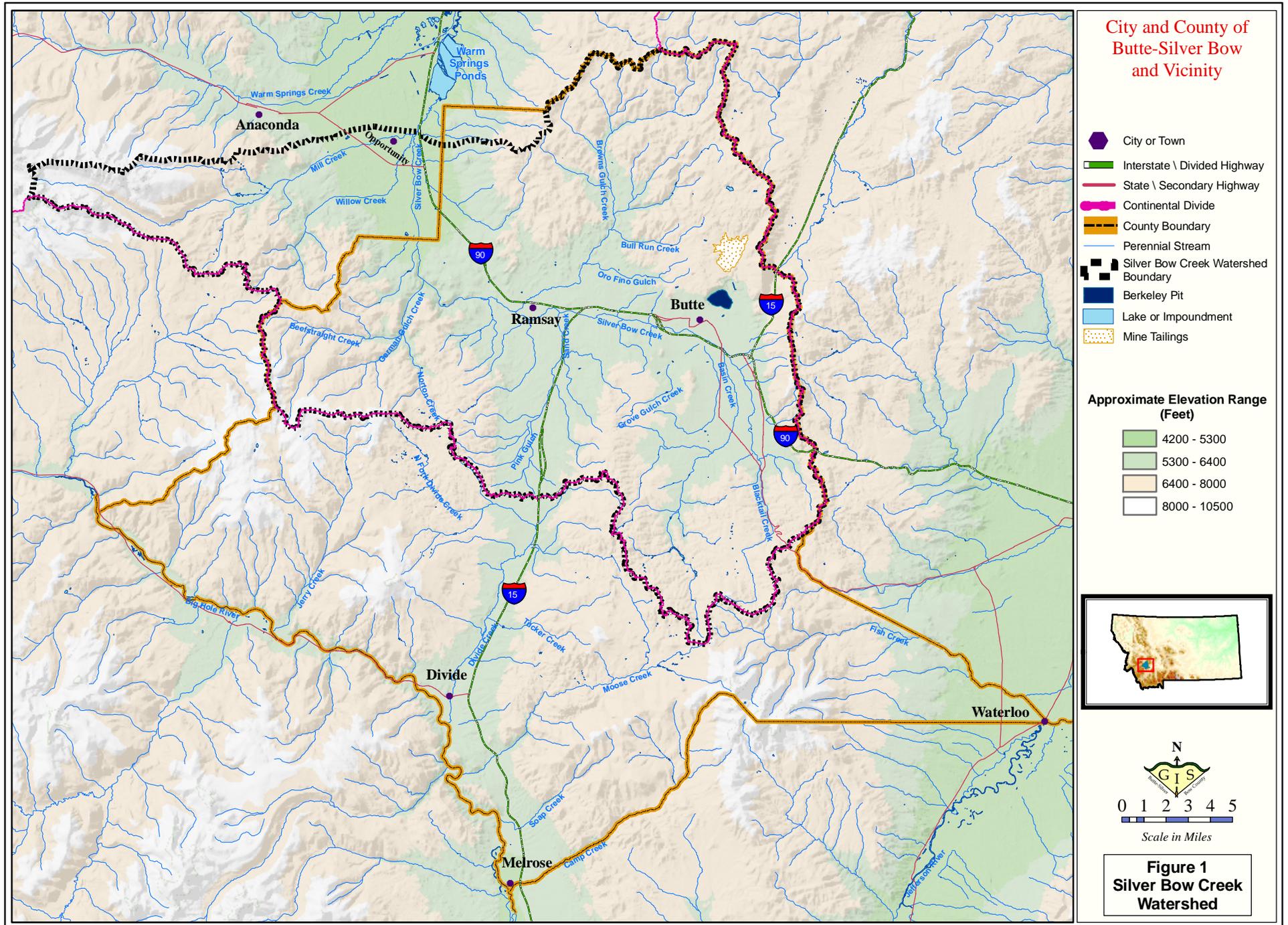
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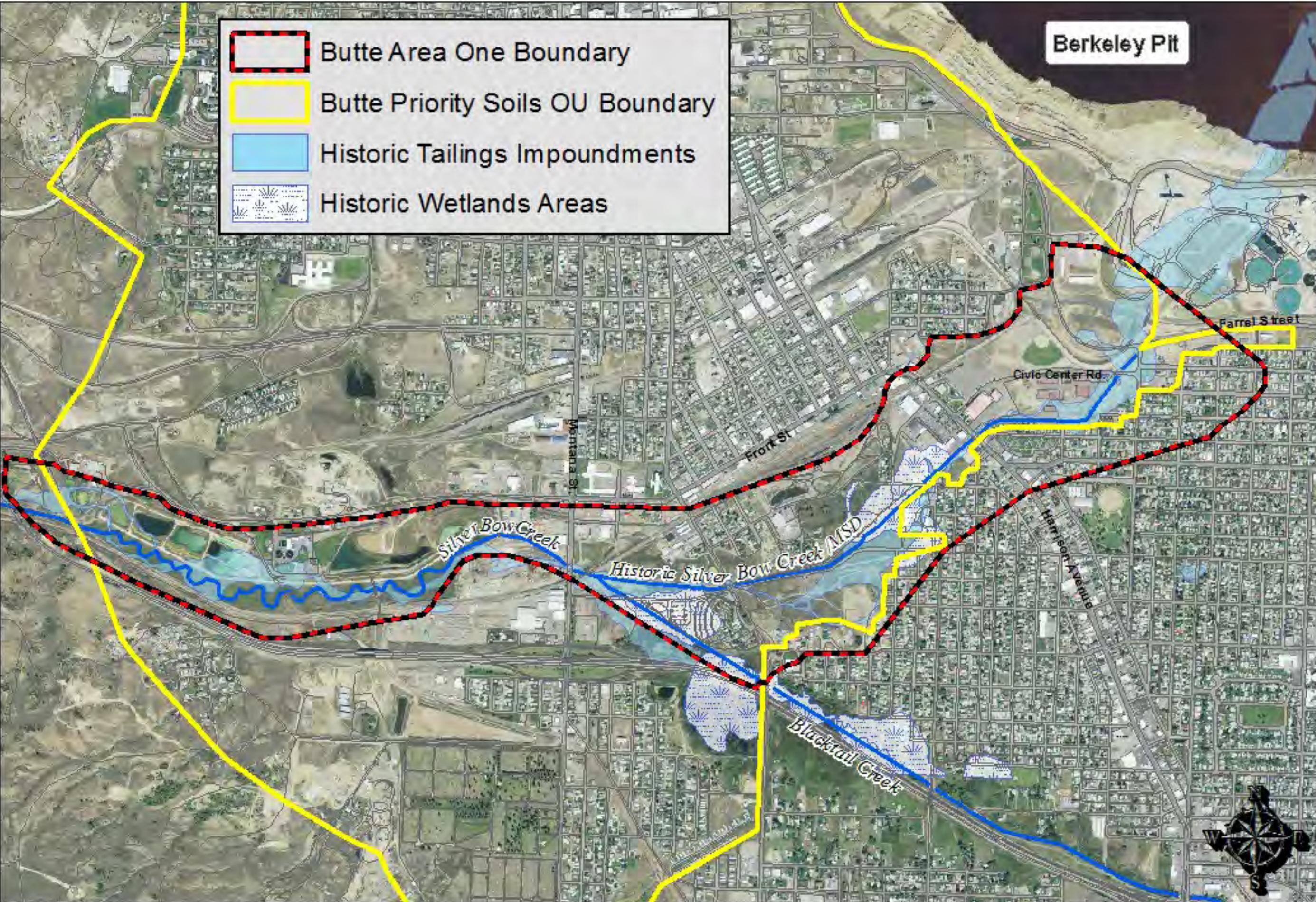
<sup>1</sup> This description of the BAO site is provided in the NRDP’s February 2008 “Summary of 2008 Settlement of Clark Fork River Remediation and Natural Resource Damage Claims and Related Restoration Plans,” available from the NRDP website at : <http://doj.mt.gov/lands/naturalresource/resources/claims/settlementfactsheet2008.pdf>.

<sup>2</sup> Metro Storm Drain (MSD) is a term used to describe the realigned and reconstructed channel of Silver Bow Creek from Texas Avenue to its confluence with Blacktail Creek.

<sup>3</sup> Parrot Tailings Volume Study, Montana Bureau of Mines and Geology, Open File Report #590, February 2010.

Figure 1. Map of Silver Bow Creek Watershed





**Figure 2. Butte Area One**

### 1.2.2 Overview of 2008 Settlement Agreement on Butte Area One Injured Resources

In 1983, the State of Montana filed a lawsuit in Federal District Court against the Atlantic Richfield Co. (ARCO) for injuries to the natural resources in the Upper Clark Fork River Basin (UCFRB), which extends from Butte to Milltown. The Montana v. ARCO lawsuit, brought under federal and state Superfund laws, sought damages from ARCO, contending that decades of mining and smelting in the Butte and Anaconda areas had greatly harmed natural resources in the basin and deprived Montanans of their use. In 1989, the Environmental Protection Agency (EPA) filed another lawsuit to establish ARCO's liability for remedial cleanup in the UCFRB.

In 1995, the State produced the *1995 Restoration Determination Plan*, which analyzed restoration alternatives and selected specific restoration and/or replacement alternatives for each of the nine injured resource areas covered under Montana v. ARCO, including Butte Area One, using U.S. Department of Interior (DOI) legal criteria.<sup>4</sup>

In 2005, the State produced the final Silver Bow Creek Watershed Restoration Plan, which identified and prioritized restoration needs in the Silver Bow Creek watershed, to serve as a guide to restoring natural resources in the watershed.<sup>5</sup> Development of the plan involved extensive public input, and data collection and analysis, and identified 61 significant restoration needs within eight planning areas in the watershed.

In 2007, the State produced restoration plans for the Butte Area One, Smelter Hill Uplands, and Clark Fork River sites that were incorporated into the 2008 Consent Decree, which finally settled Montana v. ARCO.<sup>6</sup> These plans included an analysis of restoration alternatives

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<sup>4</sup> *Restoration Determination Plan for the UCFRB*, prepared by the NRDP, with assistance from Rocky Mountain Consultants, Inc., dated October 1995.

<sup>5</sup> *Final Silver Bow Creek Watershed Restoration Plan* prepared by the NDRP, dated December 2005. This plan is available from the NRDP website at:

<https://files.doj.mt.gov/wp-content/uploads/2011/06/silverbowcreekrestorationplanfinal.pdf>.

<sup>6</sup> *Butte Ground and Surface Water Restoration Planning Process and Draft Conceptual Restoration Plan*, prepared by the NDRP, dated November 2007; *Revised Restoration Plan for the Clark Fork River Aquatic and Riparian Resources*, prepared by the NRDP, dated November 2007; *Draft Conceptual Smelter Hill Uplands Resource Restoration Plan*, prepared by the NRDP, dated December 2007. These plans are available from the NRDP website at: <https://doj.mt.gov/lands/lawsuit-history-and-settlements-2/>.

and selection of a preferred alternative that essentially revised the 1995 *RDP's* restoration alternatives analysis for these three sites.

The State settled Montana v. ARCO through a series of settlement agreements, or consent decrees, completed and approved by the court in 1999, 2005 and 2008.<sup>7</sup> One of the three injured areas in the UCFRB covered under the 2008 settlement agreement was the Butte Area One injured groundwater and surface water site, which is the focus of this restoration plan.

The 2008 Montana v. ARCO Consent Decree specifically allocated \$28.1 million in natural resource damages, plus interest, to restore, replace, or acquire the equivalent of injured natural resources at the BAO site, as provided for in the 2007 "*Butte Ground and Surface Water Restoration Planning Process and Draft Conceptual Restoration Plan*."<sup>8</sup> The requirements of the Consent Decree are consistent with the natural resource damage provisions of the federal Superfund law and associated regulations which specify that any damages recovered from natural resource damage lawsuits may only be used to restore, replace, or acquire the equivalent of the injured natural resources that were the subject of the lawsuit (42 U.S.C. 9607). Attachment A provides the general definitions and examples of these terms.

The 2007 *Butte Area One Draft Conceptual Restoration Plan*, which was "conceptual" in nature, generally set forth a restoration planning process to determine how the \$28.1 million settlement, plus interest, will be expended to restore or replace the injured resources. Under the process set forth in the *conceptual restoration plan*:

1. A final restoration plan will be developed based, in large part, on local input, subject to requirements of the law. This plan would allocate the entire \$28.1 million, plus interest, for Butte restoration projects;

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<sup>7</sup> These settlements are summarized on the NRDP's website at:

<http://www.doj.mt.gov/lands/naturalresource/lawsuithistory.asp>

<sup>8</sup> The *BAO DCRP*, along with the Consent Decree, is available on the NRDP's website at:

*DCRP*: <http://www.doj.mt.gov/lands/naturalresource/resources/claims/butteareaonerestorationplan2008.pdf>;

Link to 2008 Consent Decree: <http://doj.mt.gov/lands/naturalresource/resources/claims/consentdecree2008.pdf>

2. A Butte Natural Resource Damage Restoration Council (BNRC) would be created for purposes of developing and recommending for approval the final restoration plan, in accordance with a specific planning process developed by the BNRC, subject to public comment, and approved by the Governor.

The Governor as trustee of the settlement money would approve a final BAO restoration plan, after considering public input and the recommendations of the BNRC, NRDP, and Trustee Restoration Council.

### **1.2.3 Overview of the BNRC Butte Area One Restoration Planning Process**

The BNRC was created in early 2010, with six members appointed by Butte-Silver Bow Chief Executive Paul Babb and three members appointed by Governor Brian Schweitzer. Attachment B provides a list of BNRC members. The BNRC held its first meeting in April 2010.

The BNRC focused its efforts in its first year on becoming knowledgeable about the BAO site and the related remediation and restoration processes. The BNRC then developed a draft restoration planning process document in spring 2011 for consideration by the public. The BNRC revised the process document in January 2012 based on public comment. In March 2012, the revised process document was recommended for approval by the Trustee Restoration Council and approved by the Governor. This document, the *Butte Area One Final Restoration Process Planning Document*,<sup>9</sup> hereafter referred to as the *BAO Process Plan*, describes the procedures to be followed and the criteria to be used in developing and obtaining approval of a final BAO restoration plan and the role of the major entities involved in that process.

From April 2010 through August 2012, the BNRC held 39 meetings and went on several field trips to further develop its knowledge of the remediation and restoration processes specific to the Butte Area One site and to develop this draft restoration plan. Attachment C provides a summary of the BNRC meetings to date and lists the major topics covered at each meeting.

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<sup>9</sup> The *BAO Final Restoration Process Planning Document* is available on the NRDP's website at: [https://dojmt-zippykid.netdna-ssl.com/wp-content/uploads/Jan2012proposedfinal\\_BAO-Process-Document.pdf](https://dojmt-zippykid.netdna-ssl.com/wp-content/uploads/Jan2012proposedfinal_BAO-Process-Document.pdf)

In the spring of 2012, the BNRC solicited the public for restoration project ideas and alternatives to be considered for the expenditure of BAO settlement funds. The BNRC also conducted extensive public outreach about this solicitation process and held two workshops in March of 2012. In response to these outreach efforts, the public submitted approximately 100 BAO restoration project ideas. Appendix A provides a summary table of the ideas submitted by the public.

In May 2012, the NRDP, at the request of the BNRC, screened the possible restoration ideas to determine whether they met the legal threshold of restoring or replacing the injured natural resources of the Butte Area One site, namely groundwater and the aquatic resources of Silver Bow Creek, that were the subject of the \$28.1 million claim recovered from ARCO. The BNRC then met several times to consider and categorize the ideas that met the legal threshold. In June 2012, the BNRC conducted a “straw poll” to allocate restoration funding for seven different restoration categories. The BNRC allocated the \$32 million, which was the approximate BAO Settlement Fund balance as of December 31, 2011.

Following the June 2012 meeting, the BNRC held five additional meetings in July and August of 2012 to evaluate its initial funding allocations. At these “working sessions,” public participation and comment was solicited and considered at various points during these meetings. The BNRC’s final category fund allocations decided upon at its August 30, 2012 meeting were as follows:

- Restoration of the Upper Silver Bow Creek Corridor - \$10 million;
- Water system improvements - \$10 million;
- Waste cap improvements/revegetation - \$6 million;
- Stream restoration - \$4 million;
- Storm water controls - \$ 0;
- Recreation - \$1 million;
- Small/Miscellaneous projects - \$1 million.

The BNRC Restoration Recommendation described and analyzed in Section 3 of this Draft Restoration Plan is based on the above allocations.

### **1.3 Public Participation**

The BNRC designed the restoration planning and decision making methods outlined in the *BAO Process Plan* with numerous opportunities for public comment in order to ensure that all viewpoints were considered to the fullest possible extent. The public comment on this draft restoration plan is just one of the many opportunities that have been provided to the public for participating in this restoration planning effort.

The State of Montana and the BNRC recognize the importance of public input and participation in the restoration planning process. Involving the public in restoration planning promotes better decision making.

The BNRC serves as an important voice of the citizens of Butte and Montana on matters related to the restoration of the injured natural resources of Butte Area One. The Council facilitates public dialogue on and promotes public understanding of restoration and remediation issues of Butte Area One. In accomplishing its mission, the BNRC's decisions can be viewed as part of the meaningful public participation in the Butte Area One restoration planning process.

### **1.4 Criteria for Decision Making**

The 2012 *BAO Process Plan* outlined the criteria that will be used to analyze restoration alternatives and to decide on the preferred alternative(s). The criteria are grouped into two sets reflecting their derivation from two different sources: legal and policy. The "Stage 1 Legal Criteria" are derived primarily from the criteria set forth in the U.S. DOI natural resource damage assessment regulations, which trustees are to use when selecting restoration projects. The Stage 1 Criteria also include a criterion reflecting the additional factors the State is to consider under the Memorandum Of Agreement with the Confederated Salish and Kootenai Tribes and the U.S. DOI. The "Stage 2 Policy Criteria" have been developed by the BNRC to promote the goals important to them. The *BAO Process Plan's* description of both Stage 1 and

2 criteria is listed below. An evaluation of alternatives based on these criteria is found in chapter 4.

In applying these criteria to evaluate proposed restoration projects, the criteria will be evaluated qualitatively rather than quantitatively. The importance of each criterion as applied to individual alternatives will vary depending upon the nature of the alternatives.

#### 1.4.1 **Stage 1 Legal Criteria**

The Stage 1 Legal Criteria that the BNRC, with assistance from the NRDP, used to evaluate restoration alternatives are as follows:

Technical Feasibility: This criterion evaluates the degree to which a project employs well-known and accepted technologies and the likelihood that a project will achieve its objectives. Obviously, projects that are technologically infeasible will be rejected. However, projects that are innovative or that have some element of uncertainty as to their results may be approved. Different projects will use different methodologies with varying degrees of feasibility. Accordingly, application of this criterion will focus on an evaluation of a project's relative technological feasibility.

Relationship of Expected Costs to Expected Benefits: This criterion examines whether a project's costs are commensurate with the benefits provided. In doing so, the costs associated with a project, including costs other than those needed simply to implement the project, and the benefits that would result from a project, will be determined. Application of this criterion is not a straight cost-benefit analysis, nor does it establish a cost-benefit ratio that is by definition unacceptable. While it is possible to quantify costs, quantifying benefits is more difficult. Requiring projects to meet some established cost-benefit ratio would likely result in the rejection of many worthwhile projects because of the difficulty in quantifying the benefits to resources and services resulting from the implementation of the projects.

Cost-effectiveness: This criterion evaluates whether a particular project accomplishes its goal in the least costly way possible. To apply this criterion in a meaningful fashion, all of the benefits a project would produce must be considered, not just cost; otherwise the focus would

be too narrow. Take the example of a project that would fully restore a given resource in a short period of time compared to another project that would restore the same resource at less cost but over a longer period of time. Considering only that the second project is less expensive than the first project ignores the benefits resulting from a relatively shorter recovery period. In this example, since an accelerated recovery time is a benefit, it would need to be factored into a determination of cost-effectiveness.

Results of Response Actions: This criterion considers the results or anticipated results of response actions underway, or anticipated, in the Upper Clark Fork River Basin. Numerous response actions are ongoing and additional response actions are scheduled to begin in the next several years, continuing for many years into the future. Application of this criterion will require assessment of response actions at an adequate level of detail, given the inherent uncertainties associated with this task, in order to make projections as to their effects on resources and services. Consideration of response actions will occur in two principal contexts:

- Evaluating what is necessary in the way of restoration of resources and services in light of the ongoing and planned response actions.
- Evaluating the degree of consistency between a project and a response action looking at whether a project builds on a response action or, at the other end of the spectrum, seeks to undo a response action. Those projects that do the former as opposed to the latter will generally be favored.

Adverse Environmental Impacts: This criterion weighs whether, and to what degree, a project will result in adverse environmental impacts. Specifically, there will be an evaluation of significant adverse impacts, which could arise from a project, short term or long term, direct or indirect, including those that involve resources that are not the focus of the project. To do so, the dynamics of a project and how that project will interact with the environment must be understood.

Recovery Period and Potential for Natural Recovery: This criterion evaluates the merits of a project in light of whether the resource is able to recover naturally and, if a resource can

recover naturally (i.e., without human intervention), how long that will take. This will place a project's benefits in perspective by comparing the length of time it will take for the resource to recover if the project were implemented, with the length of time for natural recovery. (The term "recovery" refers to the time it will take an injured natural resource to recover to its "baseline," i.e., pre-injury condition.) If a resource will not recover without some action or if natural recovery will take a long time, a restoration action may very well be justified. Conversely, if a resource is expected to recover on its own in a short period of time, a restoration action may not be justified.

Human Health and Safety: This criterion evaluates the potential for a project to have adverse effects on human health and safety. Such a review will be undertaken not only to judge a particular project but also to determine if protective measures should be added to the project to ensure safety.

Federal, State, and Tribal Policies, Rules and Laws: This criterion considers the degree to which a project is consistent with applicable policies of the State of Montana and applicable policies of the federal government and Tribes (to the extent the State is aware of those policies and believes them to be applicable and meritorious). In addition, projects must be implemented in compliance with applicable laws and rules, including the consent decrees and this restoration planning process.

Resources of Special Interest to the Tribes and DOI: This criterion considers whether an alternative is consistent with the provisions of the State's Memorandum of Agreement (MOA) with the Department of Interior and Confederated Salish and Kootenai Tribes.<sup>10</sup> Pursuant to the MOA, the State is to pay particular attention to natural resources of special interest to the Tribes and/or DOI, including attention to natural resources of special environmental, recreational, commercial, cultural, historic, or religious significance to either the Tribes or the

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<sup>10</sup> Memorandum of Agreement among the State of Montana, Confederated Salish and Kootenai Tribes and United States Department of Interior Regarding Restoration, Replacement, or Acquisition of Natural Resources in the Clark Fork River Basin, dated November 1998. This agreement is available from the NRDP website at <http://doj.mt.gov/lands/naturalresource/grantapplications.asp#guidance>.

United States. The MOA also provides for the State to pay particular attention to “Tribal Cultural Resources” or “Tribal Religious Sites,” as those terms are defined in the MOA.

#### 1.4.2 Stage 2 Policy Criteria

In addition to the legal criteria, the BNRC has selected the following policy criteria that will be applied when considering prospective restoration projects for Butte Area One. Prospective projects need not meet all of these criteria to be recommended for implementation; however, generally (all else being equal), projects that address these criteria will be ranked higher than those that do not. These policy criteria are reflective of the BNRC’s goals (see Attachment B) and listed in order of importance to the BNRC.

Restoration of Injured Resources: This criterion will examine whether and to what extent a project directly restores injured resources. Preference will be given to restoration over replacement of injured resources and to restoration activities that integrate with remediation activities.

Public Support: This criterion will assess the level of public support for a project. Preference will be given to those projects with demonstrated public support over those without such demonstrated support.

Benefits to Butte Area One: This criterion will examine the benefits that will occur specifically to the injured groundwater and surface water resources of Butte Area One. Preference will be given to projects that offer benefits to these injured natural resources and the services they provide over projects that benefit resources and associated services outside of Butte Area One.

Silver Bow Creek Ecosystem Health: This criterion examines the relationship between a particular project and overall resource conditions in the Silver Bow Creek Watershed. Preference will be given to projects that fit within a broad ecosystem concept in that they improve a resource problem(s) when viewed on a watershed scale (including how it helps protect the downstream areas of Silver Bow Creek from further releases of hazardous substances), are sequenced properly from a watershed management approach, and are likely

to address multiple resource problems in the Silver Bow Creek watershed. As part of the evaluation of this criterion, priorities and projects that meet the legal threshold identified through other relevant documents, including but not limited to those listed in Attachment D, will be considered.

Long-Term Effectiveness: The long-term effectiveness of a project will be evaluated. Preference will be given to projects that offer benefits in the long-term over those that offer short-term benefits.

Matching Funds and Cost Sharing: This criterion examines whether and to what degree a project, or the selected portion of a project proposed for restoration funding, has funding from another source. Leveraging the recovered natural resource damages produces obvious efficiencies.

Coordination and Integration: The degree to which a restoration project is coordinated or integrated with other ongoing or planned actions in Butte and the surrounding area of the Silver Bow Creek watershed will be examined. This is in addition to the coordination with EPA response actions, which is separately addressed under the “Results of Response Actions” criterion. Projects that can be efficiently coordinated with other actions may achieve additional cost savings.

Normal Government Functions: This criterion evaluates whether a project involves activities for which a governmental agency would normally be responsible or that would receive funding in the normal course of events and would be implemented if recovered natural resource damages were not available. BAO settlement funds may be used to augment funds available to government agencies, if such cost sharing would result in the implementation of a restoration project that would not otherwise occur through normal government function. Based strictly on this criterion, a project involving activities that would fall within normal government responsibilities may be ranked lower than a project that does not fall within this category.

## **2 Restoration Project Categories**

Project ideas received by the BNRC from the public, Butte-Silver Bow agencies, and the NRDP staff were each assigned into broad restoration categories: Upper Silver Bow Creek corridor restoration; mining waste area improvements and revegetation; stream restoration; Butte-Silver Bow municipal water system improvements; storm water controls; recreation; and small/miscellaneous projects. Appendix A summarizes these project ideas by category. The following sections describe the project ideas evaluated for each restoration category and provide a preliminary screening.

Generally, projects not considered further in this analysis did not meet one or more legal or policy criteria described in the 2012 *BAO Restoration Process Planning Document*. In instances where a project idea would interfere with ongoing or future remedial actions, the idea was also screened from further consideration in this Plan. Section 3 presents the restoration project alternatives which include projects proposed by the public, Butte-Silver Bow, and the NRDP.

### **2.1 Restoration of the Upper Silver Bow Creek Corridor**

A total of 30 ideas related to mine waste removal and restoring the Upper Silver Bow Creek corridor were received from the public in the spring of 2012. Thirteen of these ideas were related to removing remaining tailings from Silver Bow Creek and the remainder of the ideas generally involved the removal of the Parrot Tailings, Diggings East, or Northside Tailings. Below is a summary description of the 30 proposed ideas that focused on removing mining wastes within or near Butte Area One.

Public ideas #1 and 87 through 99 would remediate and restore Silver Bow Creek from Texas Avenue to Montana Street by removing mining wastes left in place in or near the creek and on adjacent lands. The ideas viewed removal of mining wastes as a fundamental first step towards restoring Silver Bow Creek to a fully functioning fishery. These ideas could be coordinated with the stream restoration components of Public Idea #1, which calls for restoration in Butte Area One with the goal of being a restored fishery.

Public idea #11 also supported the concept of removing tailings and other mine wastes from Silver Bow Creek within Butte Area One. The letter of support referenced the Parrot Tailings, Diggings East and Northside Tailings, and the need for removal of those wastes and restoration of the areas. This idea shares a common theme with public idea #18 which also proposes removal of tailings remaining in the Silver Bow Creek corridor.

Public idea #12 supported the removal of the Parrot Tailings, Northside Tailings and the Diggings East, the restoration of Silver Bow and Blacktail Creeks, and construction of a park/trail/interpretation center in Lower Area One west of Montana Street. The proponent advocated negotiating additional response action monies from ARCO for the tailings removal.

Public ideas #16, 17, 22, 25, and 41 all advocated removal of the Parrot Tailings. Several of the proponents stated that the tailings removal should be completed with a funding source outside of the Butte Area One NRD funding. The NRD funds would then be used to revegetate and otherwise restore the area.

Public ideas #29, 49, 53, and 54 advocated removing mine waste contaminated material throughout the BAO (including all of Diggings East and Northside Tailings) to protect water quality, improve local fisheries, and to protect human health.

Public idea #50 was to stop organic contaminants from entering Silver Bow Creek near Montana and Front Streets by excavating and removing petroleum contaminated subsurface soils south of the old Holland Rink. The organic contamination noted in this idea may be the subject of further investigation by the Montana Department of Environmental Quality Waste and Underground Tank Management Bureau. Because there are regulatory tools available for addressing petroleum contamination, this idea will not be considered further in this restoration plan.

Public idea #63 would remove mine wastes in the wetland areas near the Butte Chamber of Commerce building and on both sides of Interstate 90. This idea could be coordinated with the stream restoration alternative idea of developing the shallow pond near the Butte Chamber of Commerce and Blacktail Creek into a fishing pond, and with public idea

#37 to develop the wetland south of Interstate 90 and west of Elizabeth Avenue into publicly accessible recreation area.

Public idea #71 was to remove slag and mine waste dumps along Moulton Road just north of the Moulton Water Treatment Plant. This site is located outside of the Butte Priority Soils Operable Unit in an area known as the Westside Soils Operable Unit. The EPA has not completed their remedial investigation of this operable unit, and has not issued its record of decision for the site. Since future Superfund response actions could possibly address these sites, it is premature to commit restoration funds to address these wastes; therefore, this idea will not be considered further in this restoration plan.

## **2.2 Waste Cover Improvements/Revegetation**

A total of 11 waste area improvements/revegetation project ideas were received from the public in April of 2012. These are areas where waste was left in place and covered under the Superfund remedy. Also, the NRDP proposed conducting a sizable restoration effort for the waste covers in its 2007 BAO Draft Conceptual Restoration Plan; and likewise, the local government submitted a “Butte Tree Planting Project” to the BNRC in February of 2012. Below is a description of the 13 proposed ideas to revegetate and/or improve waste areas that have various depths of soil covers.

In the NRDP Draft Conceptual Restoration Plan, the NRDP proposed placement of up to 12 inches of growth medium (topsoil, fertilizer, compost, mulch and/or other soil amendments) on previously un-reclaimed or poorly reclaimed waste sites that are protected from future development (areas designated by Butte-Silver Bow County as “open space”). This project involves placement of growth medium and a diverse seed mix on approximately 100 acres. This plan identifies several discrete areas within the Butte Priority Soils Operable Unit that comprise the 100 acres and provides detailed cost estimates for performing the work.

Butte-Silver Bow’s proposal calls for testing soil properties and potentially adding soil to increase the depth up to 24 inches to make it more suitable for planting forbs and shrubs. Up to 48 inches of soil would be placed in areas for planting trees. Compost and other soil

amendments would be used where needed to enhance soil properties to promote plant growth. Mature trees would be planted and a diverse seed mix would be applied to complete revegetation in open space areas on Butte Hill and in Butte Area One.

Public idea #4 involves revegetating a community park at Britannia Boulevard. The park grounds are situated on the reclaimed workings of the Britannia Mine and currently do not support healthy vegetation. This project calls for covering the disturbed areas with growth medium; applying seed, fertilizer, and mulch; and, possibly planting sapling trees. This proposal could be coordinated with the revegetation and soil cover improvements components of the 2007 NRDP Conceptual Restoration Plan and proposed Butte-Silver Bow tree planting project.

Public ideas #14, 15, 23, and 59 all propose a combination of planting trees, shrubs, native grasses, and forbs in reclaimed areas, fields and parks, and in other un-reclaimed areas. Some areas could also require soil amendments to promote plant growth. The Missoula Gulch area was noted as one particular area in need of restoration efforts. Most of these projects have significant overlap with the revegetation and soil cover improvements components of the NRDP Conceptual Restoration Plan and with the tree planting project proposed by Butte-Silver Bow. Both the NRDP restoration plan and the Butte-Silver Bow tree planting project are more fully developed as conceptual restoration projects; therefore, the more general project ideas will not be considered as stand-alone ideas, but rather they could be incorporated into one of the two major revegetation plans.

Public idea #39 was to plant trees and shrubs in McGruff Park. The proponent noted that the park is 2.3 acres, but only 15 trees are present. The proponent proposed planting 30 to 50 additional trees and perimeter shrubs and hedges. It was also observed that this proposal could be coordinated with the tree planting project proposed by Butte-Silver Bow, with a focus on restoration rather than beautification. This project was sponsored by Northwestern Energy and implemented by the Urban Forestry Board and volunteers in September 2012.

Restoration project idea #50 proposes planting native aspen, Swedish Aspen, and flowering shrubs on a 6.26 acre tract of land owned by Butte-Silver Bow, Montana Resources, and ARCO. The tract of land is the approximate south slope of the reclaimed Parrot Mine

dump. Nearly 5,000 native aspen, 376 Swedish aspen, and an unspecified quantity of shrubs as seed would be planted over a three year period. Montana Resources and ARCO would be asked to fund the plantings on their respective properties. There is a nearby water supply, and the project sponsor proposed the installation of a water delivery system for tree watering. This restoration effort could possibly be coordinated with the tree planting project proposed by Butte-Silver Bow. The proponent, however, does suggest a discreet area for the work and a specific mix of trees designed to produce a visual context for historical Finntown, which would need to be limited to restoration only.

Public idea #56 was submitted by personnel at Montana Tech and proposes ten years of funding for an active demonstration project titled “Restoring Native Plant Diversity in the Upper Clark Fork Basin.” The initial demonstration project was funded by the NRDP using Upper Clark Fork River Basin settlement funds in 2008. This proposal asks for a continuation of that effort for 10 more years. Key components of the proposal included continued maintenance of a forb orchard, production of forb sods, collection of seeds, and expansion and maintenance of greenhouses for plant overwintering. The forbs and forb products (seed and sod) would be planted on reclaimed waste areas on the Butte Hill and within Butte Area One to stabilize soils and reduce potential sediment transport. The greenhouse and forb orchard are located on the Montana Tech campus. This proposal was also submitted to the NRDP for consideration as an UCFRB terrestrial project.

Public idea #64 proposes to plant native grasses, plants, and trees in an open space area behind Hillcrest Elementary School. This proposal could also be coordinated with the revegetation and soil cover improvements components of the NRDP Conceptual Restoration Plan and with a tree planting project proposed by Butte-Silver Bow.

Public idea #72 is a University of Montana proposal promoting native plant diversity in the BPSOU through planting diverse and weed resistant mixes of native species and by applying biochar and solarization weed control methods. Similar to public idea #56, this project proposed establishing a forb orchard and utilizing greenhouses to start plants for replanting at locations within Butte Area One and on the Butte Hill. Missoula, Montana is the proposed

location for the forb orchard and greenhouse trials. The forbs and seed produced by these facilities would be used to maintain existing demonstration plots. University of Montana requests funding over a ten year period beginning in 2013. This idea has significant technical similarities to public idea #56, but its out-of-town location makes it less cost effective than idea #56.

Public idea #81 is a demonstration project for developing soil-free grass, forb, and shrub mats. The mats would compare three different seed sources, including seed produced by Montana Tech. The project goal is to commercialize plant mats for establishing metals/acid tolerant native plant communities. This idea overlaps with Public idea #56 for restoring native plant diversity. Because it overlaps with Public idea #56 for restoring native plant diversity, and because it does not have the established performance record of idea #56, public ideas #72 (University of Montana native plant diversity proposal) and #81 (development of vegetation mats) will not be considered further in this restoration plan as stand-alone project ideas.

### **2.3 Stream Restoration**

A total of 11 ideas related to stream/water features restoration were received during the public solicitation process. Five additional ideas were generated by Butte-Silver Bow and by the BNRC. Below is a summary of those 16 proposed stream restoration ideas.

Public idea #13 would use water from the Basin Creek Reservoir to provide increased flows in Silver Bow Creek for the purpose of improving the fishery. The Butte-Silver Bow Water Utility Division has gone on record that they plan to build a water treatment plant for the Basin Creek system, so it is unlikely that this source of water could be used to augment in-stream flows for Silver Bow Creek; therefore, this idea will not be considered further in this restoration plan.

Public idea #30 is to construct a storm water retention pond in the Silver Bow Creek stream channel just before its confluence with Blacktail Creek. The retention pond would be maintained as a small recreational fishing pond. The BNRC and the NRDP believes there will be

additional remedial actions in the area proposed for this idea. In light of that potential conflict, this idea will not be considered further in this restoration plan.

Public idea #36 involves replacing culverts with a bridge where the Pony Express Trail crosses over Browns Gulch Creek just north of Ramsay. The streambed in this area would also be restored. The project location is over five miles downstream from Butte Area One. Given that the restoration needs in Butte Area One far exceed the funds available, the BNRC developed a policy criterion that gives preference to projects that directly impact the injured resources of Butte Area One; therefore this project, as well as others with no direct ties to this injured area, will not be considered for implementation using BAO restoration funds.

Public idea #42 would implement recommendations from the *"2005 Silver Bow Creek Watershed Restoration Plan"* (NRDP, 2005) and the *"2009 Current Status of Blacktail Creek, Recommendations for Habitat Improvement, and Suggested Implementation Plan"* funded by the Mile High Conservation District & City-County of Butte-Silver Bow. This project would implement recommendations from the 2009 study which analyzed a 6.3 mile section of Blacktail Creek from the Nine Mile to the northern end of the Butte Country Club golf course and the Interstate 15/90 crossing. The study examined opportunities for improving substrate quality, improving stream flow conditions, addressing fish barriers, improving land use practices, increasing woody plant densities within the riparian corridor, and physically manipulating the channel. The goals of future projects were to reestablish Westslope Cutthroat Trout fishery, enhance in-stream flows, and contribute to a functioning stream channel and habitat system. The study produced two primary recommendations: to improve historical diversions of the creek, and to coordinate the varied land management practices of the 70-plus landowners along this stretch of the creek. The project would also provide public access to portions of Blacktail Creek owned by Butte-Silver Bow by constructing a trail and an interpretation system beginning at the north end of the Butte Country Club and continuing south to connect with the Continental Drive Trail near the High Altitude Speed Skating Center.

Public idea #47 would restore the Blacktail Creek (a.k.a. Bell Creek) through Father Sheehan Park to a pre-disturbance condition. This idea is considered an extension of the

Blacktail Creek restoration ideas #42, so it will not be considered as a stand-alone restoration idea.

Public idea #52 would restore a portion of Horse Canyon Creek adjacent to Farrel Street. This creek section is on the northern side of Farrel Street, beginning at Texas Street and continuing along Continental Drive to Grand Ave. This reach is approximately 1.5 miles and historically it was a tributary to Silver Bow Creek. The upper reaches of Horse Canyon Creek are currently cut off by the Continental Pit. Re-routing of surface water through this area will be addressed under the Mine Flooding Consent Decree. Contaminated soil and sediment in Horse Canyon Creek streambed from Texas Avenue to the Montana Resource's guard shack is being addressed by remedy under the 2011 Unilateral Administrative Order issued by the EPA. Because of the pending remedy and response action, this idea will not be considered further in this restoration plan.

Public idea #58 would help restore Silver Bow Creek to a natural fishery which supports salmonids, benthic organisms, and aquatic insects. Water quality would be improved by diverting water from the top reach of Silver Bow Creek above Moulton Reservoir to the lower reach at Texas Avenue or by discharging Silver Lake water to Silver Bow Creek at Texas Ave. The concept of increasing flows in Silver Bow Creek using Moulton Reservoir drainage or Silver Lake water conflicts with municipal water supplies and other water. Also, the Mine Flooding Consent Decree will address diversion of surface water around the Yankee Doodle Tailings Pond once current mining operations cease. Therefore, this idea will not be considered further in this restoration plan.

Public idea #61 would restore Basin Creek along its reach through the airport authority property at Bert Mooney Airport. The project would eliminate areas where Basin Creek floods on airport property. Based on BNRC's policy criterion that gives preference to work in BAO and limited funding, this project will not be considered further in this restoration plan as a stand-alone project idea. Improvements in this reach of Basin Creek that may directly benefit Blacktail Creek and Silver Bow Creek in Butte Area One such as increased in-stream flow and

reduced sedimentation are considered a sub-component of other Blacktail Creek restoration ideas.

Idea #73 submitted by Butte-Silver Bow is a proposal to study the maximum feasible beneficial public use for surface and near-surface water bodies in and around Butte Area One. The study would involve evaluation of water bodies through a study of soil toxicity, ground and surface water toxicity, property ownership, zoning and growth policy status, and potential site improvements. Maximum beneficial uses for each water body may include stream restoration, revegetation, mine waste removal, recreation, water systems improvements, and storm water controls. Water bodies and riparian areas would be evaluated through soil and water sampling and analysis of potential engineered improvements. Specific improvement recommendations for each water body would be proposed at the end of the study.

Public idea #100 would involve restoration of approximately 1,300 feet of Basin Creek through the Butte Country Club. The Butte Country Club proposed to install a drainage system on hole #8 and to extend another drain system recently installed. Because of the new drains, the Butte Country Club believes that significantly increased flows would be expected in Basin Creek and that the creek channel and its banks will need to be altered or protected to reduce erosion. Based on BNRC's policy criterion that gives preference to work in BAO and limited funding, this project will not be considered further in this plan as a stand-alone project idea. Improvements in this reach of Basin Creek that may directly benefit Blacktail Creek and Silver Bow Creek would be evaluated by public idea #42.

Idea #2 from the *Silver Bow Creek Watershed Restoration Plan* was to protect Yankee Doodle Creek from potential pollution sources and activities that may threaten water quality. This idea received a "very high" ranking in the Watershed Restoration Plan. However, because the Mine Flooding Consent Decree and future response actions will address surface water upstream from the Yankee Doodle Tailings Pond once current mining operations cease, this idea will not be considered further in this plan.

Idea #4 from the 2005 *Silver Bow Creek Watershed Restoration Plan* also received a "very high" importance ranking and would support activities to protect Westslope Cutthroat

Trout in the upper reaches of Basin Creek. The proposal would evaluate Westslope Cutthroat Trout habitat above Basin Creek Reservoir and in other parts of Basin Creek. The cutthroat trout fishery in upper Basin Creek is isolated from the lower watershed by fish passage barriers, and it is unlikely that this project would benefit the injured resources of Butte Area One. Because the BNRC policy criteria for restoration decision making gives preference to projects which directly benefit BAO injured groundwater and surface water resources, this idea will not be considered further in this restoration plan.

Idea #16 from the 2005 *Silver Bow Creek Watershed Restoration Plan* received a “high” importance ranking and would support activities to protect Westslope Cutthroat Trout in the upper reaches of Blacktail Creek. The proposal would evaluate Westslope Cutthroat Trout habitat and habitat improvement projects in Blacktail Creek. This idea is considered a sub-component of other Blacktail Creek restoration ideas; therefore, it will not be considered further in this restoration plan as a stand-alone idea.

Several of the public ideas for stream restoration involve revegetation and enhancing woody vegetation within the Blacktail Creek riparian corridor. The BNRC proposed incorporating a program to establish woody vegetation on portions of the Blacktail Creek, its smaller tributaries, and the Silver Bow Creek riparian corridors. This idea would complement other ideas for stream restoration involving pollution control and fisheries improvement.

## **2.4 Municipal Water System Improvements**

The public submitted a total of three ideas with a drinking water supply component in March and April of 2012. Butte-Silver Bow also submitted a proposal for at least \$10 million for a Basin Creek water treatment plant. The Butte-Silver Bow proposal is consistent with the Basin Creek Reservoir water treatment upgrade alternative detailed in the 2007 NRDP Draft Conceptual Restoration Plan and in the 2012 Butte-Silver Bow water system master plan update. Below is a summary description of the five proposed ideas to incorporate a waste water or drinking water project into Butte Area One restoration alternatives. One project request was submitted for infrastructure improvements at the World Museum of Mining which did not meet the NRDP legal criteria and cannot be considered for restoration funding. The

legal threshold criterion that a project must restore or replace the injured resources of alluvial groundwater and surface water in Butte Area One, or replace a lost service that the injured resource provided, was not evident in this proposal.

Public idea #8 would use Silver Lake water for Butte's domestic water system. The use of Silver Lake water for municipal use was considered by Butte-Silver Bow in the 2012 Master Plan as an alternative, however, Butte-Silver Bow has chosen treatment of the Basin Creek water supply to supplement municipal water needs with that of the Big Hole River water supply. A request for at least \$10 million for a water treatment plant for Basin Creek Reservoir water was made to the BNRC in a presentation by the Butte-Silver Bow Chief Executive at the June 26, 2012 BNRC meeting. Because of the ongoing efforts for Basin Creek Reservoir water to be utilized as a municipal supply, the idea for use of Silver Lake water will not be considered further in this plan.

Public idea #31 is to build a treatment facility for the groundwater in Butte Area One. The treated groundwater would be used to increase flows in Silver Bow Creek and to irrigate parks or sports fields. Using groundwater to irrigate parks and sports fields would reduce demand on Butte's domestic water system. Using existing groundwater to irrigate parks in Butte is also discussed in public idea #34. Capturing and treating alluvial groundwater in Butte Area One is the selected remedy in the EPA's 2006 Record of Decision for the BPSOU. Therefore ARCO and the other BPSOU responsible parties are obligated perform this duty. Captured groundwater is treated with lime at the Butte Treatment Lagoons located in Lower Area One, and the cleaned water is discharged to Silver Bow Creek. Since this is a remedy issue, this idea will not be considered further in this restoration plan.

Public idea #34 is similar to public idea #40 in the small/miscellaneous projects category because it involves drilling wells and using groundwater to irrigate park lands, sports complexes, and other open spaces to reduce demand on Butte's domestic water system. Like public idea #40, it will not be considered further.

Butte-Silver Bow is proposing to build a 7 million gallon per day treatment plant for Basin Creek Reservoir. Butte-Silver Bow's Water Utility Division manager stated that additional

water delivery capacity is currently needed for Butte to meet peak spring and summer demands and for possible future population growth. The project would consist of the design and construction of a new water treatment plant that employs a three step process. The raw water would be treated using enhanced coagulation for color, turbidity and Total Organic Carbon removal. The next step would be filtration for finished turbidity removal followed by disinfection using chlorine. The plant would be fitted with sludge removal and handling facilities. This proposal is documented as Alternative 1 in the *2012 Butte-Silver Bow Water Master Plan* and is consistent with the Basin Creek Reservoir water treatment plant upgrade alternative detailed in the 2007 NRDP Conceptual Restoration Plan. NRDP determined that the project replaces lost surface water and groundwater, and is technically feasible since it may be accomplished with proven and readily available technologies. Given the range of alternatives for Butte water supply, it is also cost effective. Butte-Silver Bow Chief Executive Paul Babb requested funding for this project at the June 26, 2012 meeting of the BNRC with a follow up request in a letter dated July 3, 2012.

## **2.5 Storm Water Controls**

A total of ten project ideas with a storm water component were received from the public as shown in Appendix A. Below is a summary description of the ten proposed ideas.

Public idea #20 involves using natural means of controlling storm water run-off from Butte Hill towards Silver Bow Creek, including topographical analysis and manipulation and planting vegetation that would slow runoff. Revegetation projects are proposed in the Waste Area Improvements/Revegetation section of this plan, and therefore this idea will not be considered further as a stand-alone idea in this plan.

Public idea #30 involves constructing a storm water basin just before the confluence of Blacktail Creek and Silver Bow Creek, and maintaining the pond as a fishing resource. Ongoing remedial activities known as storm water “best management practices” call for an iterative process to control storm water, and this area could be the site of future remedy improvements. It should also be noted that storm water from the Butte Hill often exceeds the copper and zinc

toxicity levels for aquatic life, so using a storm water basin as a fishing pond is not practical at this time. Therefore this project idea will not be considered further in this plan.

Public Idea #32 would construct a storm water system for the town of Rocker. The storm water system would consist of curb and gutter, drain pipes and retention ponds. It is typically a normal government function for municipalities to design, construct and manage storm water systems. Also the BNRC has the desire to focus the Butte Area One restoration efforts in the injured area. For these reasons, this proposal will not be evaluated further in this plan.

Public ideas #43 and 44 were a request to mitigate a storm water discharge issue located on a private lot south and west of the KXLF TV station and Summit Beverage. A culvert that drains storm water off Butte Hill discharges to the property and the discharge then drains freely across the property. Public idea #62 was also a request to mitigate storm water issues located on private property located on South Alabama Street. Issues of point source storm water discharge should be addressed under BPSOU remedial actions; therefore, these project ideas will not be considered further in this Plan.

Public idea #55 is to construct a storm water collection system, including curbs and gutters, in the Greely Area. For the same reasons cited for idea #32, this project idea will not be considered further in this plan.

Public idea #66 calls for planting native grasses, shrubs, and trees around the storm water ditch and pond at the south end of Utah Avenue near the Blacktail Creek walking trail. Also, plantings would be performed at other storm water outlets discharging water into Blacktail Creek. Both Butte-Silver Bow and the BNRC have proposed tree and riparian vegetation plantings as part of mine waste area and stream restoration projects in this plan. This idea is considered a sub-component of those proposed projects, so it will not be considered as a stand-alone idea in this plan.

Public Ideas #69 and 70 proposed modifying the storm water drainage areas at the baseball fields and children's play areas on Caledonia Street and Missoula Avenue through

culvert installations and vegetation plantings to prevent storm water and sediments from collecting on the fields. Butte-Silver Bow officials toured the site once this problem was brought to their attention and provisions were made to include these areas as planting sites for the 2012 tree planting project approved by the BNRC. Additional efforts will likely be required to fully correct this problem, and Butte-Silver Bow will address the issues under the curb and gutter program that are part of remedial activities. Therefore these projects will not be considered further in this restoration plan as stand-alone ideas.

## **2.6 Recreation**

A total of 21 ideas with a recreation component were received during the BNRC's public solicitation process. Of the 21 ideas, 13 (as shown in Appendix A) do not meet the NRDP legal criteria and cannot be considered for restoration funding. These projects generally involve constructing infrastructure (a new carousel, ball fields, etc.) which do not meet the legal threshold criterion of restoring or replacing the injured natural resources i.e., to alluvial groundwater and surface water of Silver Bow and Blacktail Creeks, nor do they replace a lost service that the injured natural resources provided. Several ideas were submitted involving trail systems, but only those ideas for which the trails would provide access to recreation involving surface water would meet the legal threshold criterion since the Butte Area One claim was specific to surface water and groundwater resources. Below is a summary description of the eight remaining proposed ideas to implement a restoration alternative with a recreation component relating to Butte Area One.

Public ideas #3 and 67 are similar and involve modifying a shallow pond and the channel of Blacktail Creek near the Butte Chamber of Commerce to create a fishing pond. The pond would be deepened to at least 20 feet and stocked with native trout. Material excavated from the pond and nearby creek banks are likely contaminated with metals and could require disposal in the mine waste repository. If implemented, this project would need to be coordinated with a project in the mine waste removal category to remove contaminated soils and sediments. The proposal also builds on other area public resources including the nearby trail system which provides access to Blacktail and Silver Bow Creeks.

Public idea #33 involves restoring approximately 230 acres owned by Butte-Silver Bow. This property is bordered by Little Basin Creek Road, Beef Trail Road, and Humbug Drive. This area would be enhanced to protect downstream fisheries, while providing fishing, archery deer hunting and waterfowl hunting opportunities for the public. Ideas for restoring this acreage include: construction of a storm water retention pond to reduce sedimentation to Grove Gulch Creek, fencing, weed control, and construction of a parking lot on the west portion of the property. This idea would involve coordination with Butte-Silver Bow.

Public idea #37 proposes restoring an approximate 52 acre wetland into an urban bird sanctuary, avian park, and water recreation area. The wetland is located just south of Interstate 90 and west of Lexington Avenue. This area is privately owned and public access is limited. The proposal seeks to transfer private land parcels to Butte Silver Bow County, and to clean up debris and wastes in the wetland area, to remove possible mine wastes and, then to convert the area into a public park that would provide bird watching and picnicking opportunities. The wetland area is a significant surface water resource within the BPSOU, which would be improved through restoration; however, the wetland currently appears to be naturally functioning quite well. The proposal includes a technically feasible work plan and a cost effective budget. This project could possibly be coordinated with the Butte-Silver Bow stream restoration idea #73. The boating/kayaking component of this project is likely not feasible because of public safety concerns associated with the soft bottom of the pond. Also, provisions for waterfowl protection during critical nesting periods would need to be incorporated into a project design.

Public idea #48 would construct a fish pond on Grove Gulch located west of the Copper Mountain Park. The fishing area would also incorporate bike trails connected to other area trail systems. The pond would be designated for children and would be stocked annually with trout. The surrounding area would be restored to a pre-disturbance condition. An existing pond in Grove Gulch could be improved by this proposal. Improvements in Grove Gulch could also improve flows in Silver-Bow Creek and could remove barriers to fish passage. Similar to idea

#33, this proposal would involve coordination with Silver-Bow County, Montana Fish, Wildlife and Parks, and possibly private land owners.

Public idea #57 calls for transforming the Alice Pit into a recreation and fishing area. The pit would be re-contoured, partially backfilled, lined, and filled with water from Moulton Reservoir. Native fish would be planted in the pit lake and the surrounding area would be revegetated. A walking trail would be installed on the outer rim of the pit which would connect the scenic trail already on the Alice Knob to the walking trail which now ends at the Granite Mountain Memorial site. The Alice Pit area has already been addressed by remedy, and this proposed restoration effort could undermine the remedy. Also, this project does not provide a direct connection to restoring the injured natural resources of Butte Area One. For these reasons, this project will not be considered.

Public idea #65 would develop a fishing pond and swimming area behind the Butte Plaza Mall. There is no associated cost, ownership, or technical information associated with this proposal and feasibility is unknown. Because this area is outside the Butte Area One boundary and since other recreation ideas involving fishing ponds are more fully developed, this idea will not be considered further in this restoration plan.

Public idea #76 would connect existing trails in the Butte Chamber of Commerce area to other trail systems leading to Ramsay along Silver Bow Creek. Currently the Greenway Service District is working with Butte-Silver Bow and ARCO to complete and improve the trail systems in this area. Because other entities may fund improvements associated with remedy in the Silver Bow Creek corridor between Butte and Ramsay, this idea will not be considered further in this restoration plan.

Public idea #70, which was an idea submitted as a terrestrial project proposal during solicitation for such type projects under the UCFRB terrestrial/aquatic solicitation in May of 2012, was considered by the BNRC as specifically requested by Butte-Silver Bow. In this proposal, which was submitted by Butte-Silver Bow, is the request to purchase and permanently protect as open space a 225 acre tract of land on Timber Butte. The Timber Butte tract of land is located in the head of the Little Basin Creek drainage and contains diverse

terrestrial habitat. The land borders nearby public land and public facilities including the Grove Gulch area and Copper Mountain Sports Complex. Acquisition of the land would permanently protect the natural features of the land and open space while providing connectivity to other public resources. A similar replacement project calls for purchasing approximately 252 acres of land on the East Ridge from the Continental Public Land Trust and designating the area as public open space.

## **2.7 Small/Miscellaneous Projects**

A total of 15 ideas which involve education, research, community gardens, and energy were received from the public in April of 2012. These ideas did not fit into any other idea category. Of the 15 ideas, seven (as shown in Appendix A) do not meet the legal criteria of restoring or replacing the injured resources (alluvial groundwater and surface water) of Butte Area One, or replacing a lost service that the injured resource provided, so they cannot be considered for restoration funding. Of these projects, five involved community gardens, two involved education, and one involved energy. Below is a summary description of the eight remaining proposed ideas, and Section 3 discusses the small projects proposed in a restoration alternative.

Public idea #5 proposes to educate all 8th grade students on watershed and revegetation issues in the Butte-Silver Bow area, possibly with cooperation from Montana Tech. This idea is duplicative of the currently NRDP funded Clark Fork Watershed Education Project mission, and therefore this project idea will not be considered further in this plan.

Public idea #9 would involve removal of landscaped grasses around the Maroon Activity Center and replacement of the grasses with “desert scaping” that does not require irrigating. Desert scaping would involve installation of weed barrier, decorative rock and gravel, and arid climate trees and shrubs. The desert scaping would reduce demand on Butte’s domestic water system. The BNRC expressed concerns about spending public funds to improve private property and were reluctant to consider this idea further in this plan because it offered limited public benefit.

Public idea #35 calls for the purchase of approximately 2,185 acres of ranch land north of Ramsay. The land would be acquired as a replacement of lost or injured resources in Butte Area One. The property contains large swales made up of grassy meadows like those that could have existed in Butte Area One before development. As cited earlier in this document, this area is distant from the injured area, and does not replace lost surface water and groundwater resources; therefore, this proposal will not be considered further.

Public idea #40 proposes using alternative irrigation water sources at several mine yards that have been redeveloped to provide public recreation and open space opportunities. The project would complete a study to determine if a clean water source would be available to drill a well to irrigate reclaimed mine yard areas. If clean water was able to be utilized on-site the project would drill and develop an irrigation system in the mine yards. Using on-site wells to irrigate the mine yards would reduce reliance on Big Hole River and other municipal water sources. The technical feasibility and cost effectiveness of the idea however is unknown. This project was not considered by the BNRC during discussions, and therefore is not carried forward.

Public idea #45 proposes a pilot project which would educate 500 to 1,000 Butte residents on how to implement water and soil conservation methods in their homes and businesses. The workshops and demonstrations would cover: rainwater catchment, water conservation kits, community composting, and demonstrations of native shelter belts and xeriscaping. This project was not discussed in depth by the BNRC, and therefore is not carried forward.

Public idea #74 is to establish a watershed stewardship program to educate and engage Butte area landowners in restoration of Silver Bow Creek through: providing information, training and incentives for installing native landscapes; rain gardens; reducing turf area; controlling run-off; marking storm drains; providing proper disposal of household hazardous wastes; and, other activities that mitigate urban and industrial impact on water quality. This project was not considered by the BNRC during discussions, and therefore is not carried forward.

Public idea #77 calls for installation of public education signage with specifications, data, and other information at trails, streets, and restored sites along Silver Bow Creek. Signage along the Butte Area One trail system is currently being managed by the Greenway Service District and funded with restoration dollars. Therefore this project idea will not be considered further in this plan.

Public idea #78 would perform a contaminant transport evaluation of the hydrodynamic devices being installed by the BPSOU responsible parties in the MSD system to remove sediment from storm water. Operation and maintenance of the hydrodynamic devices, as well as efficacy evaluations, are currently the responsibility of ARCO and the other BPSOU responsible parties, and are incorporated under the BPSOU remedial actions; therefore, this project idea will not be considered further in this restoration plan.

Public idea #84 would involve funding Montana Tech to conduct research on potentially backfilling the Berkeley Pit with slag and contaminated mine wastes. The emphasis of the study would be on geochemical reactions between pit lake water and potential backfill material. At the current time, any proposed scenario to backfill the Berkeley Pit would interfere with the Mine Flooding Operable Unit actions. ARCO and Montana Resources are responsible for managing the Berkeley Pit site, and the use of limited restoration dollars to conduct research on potential remedial solutions would not be prudent. Therefore, this project idea will not be considered further.

### **3 Restoration Project Alternatives**

Restoration alternatives discussed in this section are a combination of the projects discussed in Section 2. The “no action” alternative is also discussed to provide the baseline against which restoration alternatives are evaluated.

Each alternative represents a restoration plan based on technically feasible projects, which restore injured natural resources or services associated with those resources within and near Butte Area One. The preferred alternative, which is identified as the “BNRC Restoration Recommendation” is described in Section 3.2. Other restoration alternatives are identified and

described in Section 3.3 and 3.4. Section 4 provides a comparative analysis of alternatives according to the legal and policy criteria outlined in Section 1.4, with the conclusions of the analysis summarized in Section 5 of this Plan. The BNRC Restoration Recommendation is the alternative that the BNRC and NRDP believe delivers the most benefit to the injured alluvial groundwater and surface water of Butte Area One in a cost effective manner while incorporating the public participation process.

### **3.1 No Action Alternative**

Superfund requires that a “no action” alternative be considered. The no action alternative is the basis against which other restoration alternatives are compared. Under the no action alternative, no additional restoration would take place in Butte Area One and impacts to surface water and groundwater quality from contaminant transport would continue. Human and ecological health risks from contaminated environmental media would remain and the landscape would stay the same. Because no additional restoration would take place in Butte Area One, the cost of the no action alternative would be \$0. The No Action Alternative is not preferable because it does nothing to restore the injured resource and it does not comply with the BNRC legal and policy criteria for the use of restoration monies described in Section 1 of this Plan.

### **3.2 BNRC Restoration Recommendation**

The BNRC Restoration Recommendation is a product of two years of BNRC work and the public process. As a result of the public involvement process, proposed restoration projects which complied with superfund legal criteria were evaluated by the BNRC for technical feasibility and cost effectiveness. These included projects proposed by Butte-Silver Bow, and those proposed by the NRDP in the 2005 Silver Bow Creek Watershed Restoration Plan and the 2007 Butte Area One Draft Conceptual Restoration Plan. Projects determined to meet both the legal and BNRC derived policy criteria were recommended for funding in this alternative. In many cases, projects from the seven different restoration categories complement each other, potentially increasing their effectiveness and the resulting benefit to Butte Area One injured resources.

### **3.2.1 Restoration of the Upper Silver Bow Creek Corridor**

The BNRC Restoration Recommendation calls for the removal of mine wastes left in place along the historic floodplain of Silver Bow Creek through Butte Area One. Leaving these wastes in place was by far the greatest concern expressed by the majority of the citizens that responded during the public solicitation process. These wastes have been identified as the primary sources supplying contaminants of concern to the alluvial groundwater and surface water resources within the historic Silver Bow Creek corridor. These wastes include the Parrot Tailings, Diggings East, Northside Tailings and other isolated areas of mine wastes in the Blacktail and Upper Silver Bow Creek floodplains. The BNRC Restoration Recommendation would remove and permanently dispose of the mine wastes and contaminated materials in an environmentally protective manner. The removal areas would then be restored to naturally functioning open spaces or other beneficial end uses.

The objectives of removing mine wastes left in place in Butte Area One are to eliminate known sources of heavy metal contamination to alluvial groundwater and surface water; to restore the area to a beneficial end use; to enhance the area riparian corridors; and to improve the quality of the fishery in Blacktail and Upper Silver Bow Creeks. Response actions to date have not addressed removal of mine wastes in these areas, and because of the on-going injury to ground and surface water resources caused by the wastes, removal was identified as a priority in the 2007 NRDP Butte Area One Draft Conceptual Restoration Plan as well.

Mine waste removal is both a technically feasible and cost effective means of achieving the objectives stated in this proposal. The work could be performed using traditional construction methods with readily available labor and equipment. Mine waste removal also complements other projects proposed in the restoration alternative by providing the ground level work for further revegetation, stream restoration, and recreation area improvements.

Because this restoration could cost as much as \$30 million and because of the large number of other important projects to be accomplished using Butte Area One funds, the BNRC Restoration Recommendation would allocate \$10 million for restoration activities in the Upper Silver Bow Creek corridor and requests a match from other sources to complete the project.

Restoration activities could include land shaping and contouring; constructing sediment controls; waste removals, importing clean soils and soil amendments; revegetating disturbed areas; and replacing recreational or public facilities that would be eliminated incidental to waste removal activities. The BNRC prefers that the cost of waste removal be funded by other sources and not with Butte Area One restoration settlement monies.

The cost for removing the Parrot Tailings was estimated by the NRDP in the 2007 Butte Area One Draft Conceptual Restoration Plan (DCRP) and in the “*2011 Cost Estimate for the Removal of the Parrot Tailings*” prepared by Montana Tech and the Montana Bureau of Mines and Geology (MBMG). The DCRP alternative analyzed removal of 666,000 cubic yards of wastes to the Butte Mine Waste Repository at a total cost of \$20.2 million, with \$8.7 million estimated for demolition, reconstruction or relocation of the Butte-Silver Bow Shop Complex currently located on top of the waste area.

The 2011 report by Montana Tech evaluated the costs of both truck hauling and slurry transport of tailings to multiple disposal sites (Butte Mine Waste Repository, Berkeley Pit, and Yankee Doodle Tailings). It is important to note that neither Montana Tech nor the State of Montana consulted with ARCO and/or Montana Resources in the finalization of this report, and the waste disposal options have not been reviewed nor approved by either corporation. This report relied on new contaminated volume estimates for calculating project costs and included the past \$8.7 million estimate for removing/relocating the Butte-Silver Bow Shop Complex. Transportation and disposal of tailings and the native material under the tailings by slurry pipeline in the Berkeley Pit was the least expensive estimate for \$12.9 million and hauling waste by truck to the Butte Mine Waste Repository the most expensive estimate for \$15.3 million. In 2009, the NRDP commissioned the MBMG to conduct a thorough investigation on the extent of the Parrot Smelter wastes. As a result the volumes of Parrot Tailings and contaminated soils were revised to approximately 320,000 cubic yards with 750,000 cubic yards of slag and granitic fill identified as clean material.

The cost of disposal of the Diggings East wastes and the Northside Tailings was estimated in the 2007 *Butte Area One Conceptual Restoration Plan* at \$3.5 million. The

estimate was based on excavation and truck hauling of approximately 113,800 cubic yards of tailings and contaminated soils to the Butte Mine Waste Repository. Most of land associated with the Diggings East area is privately owned and arrangements would have to be made with these landowners before any removal action could take place.

The restoration of the Upper Silver Bow Creek corridor, as provided above, will become part of a more definitive restoration plan that will be developed by the NRDP before the ongoing BPSOU Consent Decree negotiations are concluded. That plan will be funded with up to a \$10 million allocation provided for in this section and, it is envisioned, from other funding sources. The more definitive plan, whether or not other sources are found to contribute to its funding, shall be treated as a “significant, substantial change” in this Butte Area One Restoration Plan for the purposes of Section 6, below, and will be subject to the same review and public comment steps before its final approval by the Governor as provided for in Section 6.

### **3.2.2 Waste Area Improvements/Revegetation**

Several of the waste area improvement/revegetation restoration ideas discussed in Section 2 would be implemented by this alternative. The restoration ideas for waste area improvements are technically feasible and cost effective. They also complement previous response actions in Butte Area One by covering waste areas with additional plant growth media and by revegetating open spaces. A result of successful revegetation of waste areas and areas surrounded by wastes would be the reduction of sediment discharge into surface water bodies. The project would also promote the broad ecosystem health concept of surface water protection identified in the 2012 *Butte Area One Restoration Process Planning Document*.

This project would include implementing the soil amendments, placement of additional soil, seeding, soil testing, and tree/shrub planting proposed by both the NRDP and Butte-Silver Bow projects. The technical feasibility of these project components is likely high because these proposed actions would utilize standard reclamation technologies and construction practices; materials and equipment required to implement the projects are readily available; and, the chance of success is high. They are also cost effective, because of the commercial availability of

topsoil, fertilizer, mulch, seed and live plants. The projects will be effective long-term when plant production in the treated areas becomes self-sustaining. A key component of this alternative is that clean imported soils will enhance the existing, in-place soil properties in areas of greatest need in and around Butte Area One and on the Butte Hill. Plant communities will thereby be more sustainable than if left in areas of thinner, poor structured soils. The exact locations for soil placement and amendments would be decided with BNRC input and implemented in conjunction with ongoing Butte-Silver Bow work over a 5 to 10 year period.

The BNRC Restoration Recommendation would also directly fund two public ideas, #50 and 56, and would indirectly fund six public ideas, #4, 14, 15, 23, 39, and 64, of the 11 public ideas involving waste area improvements summarized in this plan. Public ideas #14, 15, 23, and 64 involve additional soil placement and revegetation in areas which overlap with the NRDP and Butte-Silver Bow proposals. Integration of these ideas will provide enhanced cost effectiveness. The public ideas which improve soils and establish vegetation have the attributes of technical feasibility and cost effectiveness that are similar to the NRDP and Butte-Silver Bow proposals.

Public idea #56 involves a small scale orchard and greenhouse production of plants, test plots, and field demonstration of sod and vegetation mat technologies. The BNRC believes it is advantageous to provide funding for continued use of the Montana Tech plant nursery and believes technical assistance from Montana Tech is beneficial to ongoing revegetation efforts on the Butte Hill.

Under the BNRC Restoration Recommendation, \$6 million would be allocated to restoration projects that would improve previously capped mine waste areas as well as mine waste areas in the BPSOU that did not exceed action levels for lead and arsenic and therefore were not reclaimed. Also, mine waste areas that are conducive to contouring or consolidation to blend the capped area in with the natural topography and to reduce runoff will be considered where feasible. The cost of the alternative would be allocated between the project ideas as shown in Table 1. The funding levels shown in the table reflect the cost and technical effectiveness of the ideas and budgetary constraints. NRDP and Butte-Silver Bow proposal

funding is based on a detailed scope of work and estimates for materials, labor, and equipment. Funding for public idea #56 (orchard and greenhouse projects) is less than the proponents estimated cost because of budgetary constraints. Funding for public idea #50 (Parrot Mine area tree planting) would be dependent on land owner agreements.

**Table 1 BNRC Restoration Recommendation waste area improvement/revegetation funding summary**

<b>Idea</b>	<b>Proposed Funding (\$)</b>	<b>Proposed Years of Work</b>
Butte Area One DCRP: soil amendment, placement, and seeding (100 acres)	2,714,000	2013-2019
Butte-Silver Bow soil testing and placement, tree and shrub planting	2,080,000	2013-2019
Public idea #50, revegetate Parrot Mine area	206,000	2014
Public idea #56, Montana Tech forb and shrub project	1,000,000	2013-2020
<b>Total</b>	<b>6,000,000</b>	

### 3.2.3 Stream Restoration

The stream restoration component of the BNRC Restoration Recommendation calls for the implementation of a study, which is referred to as “Butte-Silver Bow beneficial use study” in Table 2, as proposed by Butte-Silver Bow to identify restoration needs and the “maximum beneficial use” for multiple water bodies within Area One. Up to \$300,000 would be allocated for this study that would involve the evaluation of soil toxicity, ground and surface water toxicity, property ownership and water rights, zoning and growth policy status, and potential site improvements. The maximum beneficial uses for each water body may include stream restoration, revegetation, mine waste removal, recreation, water systems improvements, and storm water controls. Specific improvement recommendations for each water body would be proposed at the end of the study. Public idea solicitation has identified a general need for restoration and riparian habitat improvements in the Upper Silver Bow Creek corridor, in sections of Blacktail Creek, and its smaller tributaries. The project would improve habitat in the reach of Silver Bow Creek within Butte Area One (and the tributaries which contribute to the

water quality and quantity in Silver Bow Creek) by establishing woody vegetation where insufficient riparian habitat currently exists. Riparian habitat improvements would be coordinated with waste removal and other restoration activities in the Silver Bow Creek corridor.

The BNRC Restoration Recommendation would allocate \$4 million to stream restoration projects. The cost of the projects would be allocated as shown in Table 2. The funding levels shown in the table reflect the cost and technical effectiveness of the ideas and budgetary constraints.

**Table 2 BNRC Restoration Recommendation Stream restoration projects funding summary**

<b>Idea</b>	<b>Proposed Funding (\$)</b>	<b>Proposed Years of Work</b>
Surface Water Beneficial use study	300,000	2013
Upper Silver Bow Creek and tributaries restoration and Riparian habitat improvements	3,700,000	2013-2016
<b>Total</b>	<b>4,000,000</b>	

### 3.2.4 Municipal Water System Improvements

The original Butte City Water Company was a privately owned enterprise. The City Water Works was located in Butte Area One on the south bank of the confluence of Blacktail and Silver Bow Creeks at Colorado and De Smet Streets. This facility employed a series of shallow wells, most under artesian pressure, to supply water to the mining operations and the Citizens of Butte. By 1893 this shallow groundwater was unfit for human consumption prompting the City to enter an agreement with the Butte City Water Company “to furnish the City of Butte and the inhabitants thereof with water from its reservoir in Basin Gulch and that no water from any seepage or water from any of the creeks on the flat shall be pumped into the said City for consumption or use.”

For over a century, the Basin Creek Reservoir provided potable water to Butte residents with chlorination the only treatment required. However, The Montana Department of

Environmental Quality recently revoked the “filtration waiver” for this water system. At the June 26, 2012 BNRC meeting, Butte-Silver Bow Chief Executive Paul Babb addressed the council and requested that they allocate “at least \$10 million” from the BAO restoration fund toward construction of a new water treatment plant for the Basin Creek water system. The request was documented in his letter to the council dated July 3, 2012.

The BNRC Restoration Recommendation would allocate \$10 million to Butte-Silver Bow for the construction of a new Basin Creek Reservoir water treatment plant as proposed by the Butte-Silver Bow Chief Executive. Water from this new facility should meet the current state and federal drinking water quality standards, thus allowing the county to continue using Basin Creek as a municipal water source. The treatment of Basin Creek water is technically feasible since it can be accomplished with proven and readily available technologies. Given the range of alternatives for Butte water supply, it is also cost effective.

### **3.2.5 Storm Water**

The public ideas submitted with a storm water component will be primarily addressed by other projects proposed in this plan. One idea did not meet the NRDP policy criterion excluding projects considered normal government function, and the remaining ideas should be accomplished through on-going remedy actions. Because other regulatory authority requires that storm water issues be addressed, the BNRC is proposing that no funds from the Butte Area One settlement be allocated directly to storm water projects under the BNRC Restoration Recommendation. Although no funds have been allocated to this category, because of its importance it remains in the plan as a place holder for potential future funding of projects dealing with critical storm water needs.

### **3.2.6 Recreation**

The members of the BNRC believe that restoration projects executed properly will consequently lead to opportunities for recreation. Several ideas received through the public solicitation process had worthy recreational components and would replace the opportunities lost due to the impacts of mining on the surface waters of Silver Bow Creek and Blacktail Creek

and the groundwater in Butte Area One. However, at this time the BNRC has deferred from endorsing any specific recreation project. Instead the council proposes reserving \$1 million for this restoration category, with the intention that these funds would be spent to enhance the recreational components after the significant restoration actions in the Upper Silver Bow Creek corridor have been specified and preliminarily designed. At that time, the council and staff will reevaluate potential projects like the fishing pond by the Chamber of Commerce, the bird sanctuary proposal as well as the proposals to acquire private lands to provide public open spaces on Timber Butte and the East Ridge. These efforts will be coordinated with the Butte-Silver Bow Parks and Recreation Department and Montana Fish, Wildlife and Parks. Long term operation and maintenance responsibilities and costs must be addressed prior to funding any recreational facility. The funds dedicated to this category should be spent or allocated to specific recreational projects no later than the end of 2016.

### **3.2.7 Small/Miscellaneous Projects**

The BNRC Restoration Recommendation would allocate \$1 million toward implementing future small/miscellaneous projects. The maximum amount of funding for any small project would be \$100,000. Beginning in the spring of 2013, the BNRC would make a call for project ideas from the public and ideas submitted would be evaluated by the BNRC and NRDP staff. Consideration of such projects may continue through 2016 by which time all of the money in this account should be spent or allocated to specific projects. A match of funds would be strongly encouraged under this alternative. At this point, none of the public restoration project ideas are specifically earmarked to receive funding through the small/miscellaneous project reserve.

### **3.2.8 BNRC Restoration Recommendation Cost Summary**

As of December 31, 2011, the approximate balance of the Butte Area One Restoration Fund was \$32,050,000. Table 4 provides a summary of how the available funding would be allocated to projects proposed under the BNRC Restoration Recommendation.

**Table 3 BNRC Restoration Recommendation Cost Summary**

<b>Project Category</b>	<b>Category Allocation Total (\$)</b>
Restoration of the Upper Silver Bow Creek Corridor	10,000,000
Mine Waste Area Restoration/Revegetation	6,000,000
Stream Restoration	4,000,000
Municipal Water System Improvements	10,000,000
Storm Water	0
Recreation	1,000,000
Small/Miscellaneous projects	1,000,000
<b>Grand Total</b>	<b>32,000,000</b>

### **3.3 Restoration Alternative 1**

Restoration Alternative 1 corresponds to Alternative 1 in the NRDP's 2007 Draft Conceptual Restoration Plan. However, this revised alternative takes into account more recent information on waste volumes in the Parrot Tailings area. This alternative would remove wastes left in place in Butte Area One. The general components, which total \$32 million are:

- \$20 million for removal of the Parrot Tailings and the Butte-Silver Bow Shop Complex;
- \$5 million for the removal of the Diggings East and Northside Tailings areas and revegetation/restoration of these areas;
- \$1 million for waste removal in the Butte Chamber of Commerce area; and
- \$6 million for waste cover improvements and revegetation on Butte Hill.

#### **3.3.1 Parrot Tailings Removal**

The volume of tailings to be removed in the Parrot Tailings area is estimated at 320,000 cubic yards with the thickest sections of waste underlying the Butte-Silver Bow Shop Complex. Removal of these sections of the Parrot Tailings will necessitate the demolition of the shop

complex. Backfill requirements of the approximate 37-acre area excavation area would be based on the final land use. In addition to the shop complex, there is open space and a ball field located at this site.

The cost for removal of the Parrot Tailings and placement of the tailings in the Butte Mine Waste Repository was estimated at approximately \$13 to \$20 million. This cost included site demolition of the six shop buildings and relocation and reconstruction of the shop complex.

### **3.3.2 Diggings East and Northside Tailings Removal**

The Diggings East, a 19-acre area, and a 10 acre area known as Northside Tailings, would be removed and disposed of by Restoration Alternative 1. The area would be revegetated and restored to a park like area. The combined volume of these tailings is estimated to be 113,800 cubic yards. Land purchase of private lands may be necessary. The wastes would be disposed of in the Butte Mine Waste Repository. The excavation site would then be brought back to grade and revegetated. Estimated total cost of this restoration action is approximately \$5 million.

### **3.3.3 Butte Chamber of Commerce Tailings**

Restoration Alternative 1 would also target the removal and disposal of areas of mining wastes near Blacktail Creek in the Butte Chamber of Commerce area that might not be removed by remedy. The volume of these wastes has not been accurately determined, however, for costing purposes this action is estimated at approximately \$1 million.

### **3.3.4 Waste Area Improvements**

Similar to the BNRC Restoration Recommendation, this Alternative 1 would implement the waste area improvements idea of importing clean soil and soil amendments to enhance reclamation on existing waste covers on the Butte Hill and other reclaimed waste areas. Soil amendments may include mulch and fertilizer. The additional growth medium would promote sustainable plant growth which is likely to reduce erosion and the load of sediments that reach surface waters of Butte Area One. Alternative 1 would allocate \$6 million for delivery and

placement of clean fill and soil amendments. Native grass, forb, tree and shrub species would be reestablished in the treated areas.

### **3.3.5 Restoration Alternative 1 Cost Summary**

The total estimated cost of Restoration Alternative 1 is \$32 million.

## **3.4 Restoration Alternative 2**

Restoration Alternative 2 is a “replacement alternative.” It does not directly restore the injured groundwater in BAO nor does it provide additional protection to the surface water of Silver Bow and Blacktail Creeks. Rather, this option aims at replacing the beneficial uses of the resources that were injured, mainly drinking water. The restoration Alternative 2 in this plan is similar to Alternative 2 from the NRDP 2007 Draft Conceptual Restoration Plan, but revises the alternative to account for components that have been funded since 2007. The general components of Alternative 2 are:

- \$17 million funding for a new Basin Creek water treatment plant;
- \$5 million for improvements to the upper and lower Basin Creek dams;
- \$5 million for replacement of 27,000 feet of the Basin Creek water transmission line; and
- \$5 million funding for waste cap improvement/revegetation.

### **3.4.1 Basin Creek Water Treatment Plant**

Butte-Silver Bow has historically consumed up to seven million gallons of water per day from the Basin Creek source which was under a filtration treatment waiver. New drinking water regulations have resulted in the revocation of the filtration waiver and Butte-Silver Bow must begin filtration if the Basin Creek source is to be used as a drinking water source in the future.

The project would consist of the design and construction of a new 7-million gallon per day water treatment plant that employs a three step process. The raw water would be treated using enhanced coagulation for color, turbidity and total organic carbon removal. The next step would be filtration for finished turbidity removal followed by disinfection using chlorine. The plant would be fitted with sludge removal and handling facilities. Total cost of this plant is estimated at \$17 million. Under Alternative 2, the entire \$17 million would be allocated to construction of the new water treatment plant.

### **3.4.2 Basin Creek Dam Improvements**

Restoration Alternative 2 would allocate \$5 million to Upper and Lower Basin Creek Dam improvements. The Upper Basin Creek Dam was constructed in 1898 as a rock-filled timber crib dam. In 1907 a concrete core wall was constructed upstream of the cribbing and earth fill was placed around the cribbing and core wall. The dam was partially breached in 1981 by removing a portion of the embankment and core wall to address dam safety concerns. The dam in its current state is not stable and does not provide any significant water storage. However, it does reduce the sediment loading into the lower dam. In order to stabilize the dam in its current breached condition, Butte-Silver Bow is proposing the following improvements:

- Buttressing the downstream side of the existing dam embankment with roller compacted concrete.
- Protect the existing breach channel with grouted rock.
- Minor improvements to the existing spillway, outlet channel and stilling basin.

These improvements are intended to preserve the integrity of the existing structure and will not return the upper dam to its full water storage capacity.

The Lower Basin Creek Dam is a rock masonry arch that was constructed in the 1890's. In 1913 further improvements were made which consisted of buttressing the lower face of the dam with concrete and raising the crest of the dam to its current elevation of 5873 feet. In the 1930's earth fill was installed on the downstream face to protect the concrete buttressing. The

last improvements were made in 2006 to meet current dam safety requirements. These improvements included the construction of a new spillway and rehabilitation of the outlet works and intake piping.

In June of 2010 heavy precipitation in the drainage caused the dam to overtop and considerable seepage was observed through the dam crest causing significant erosion. The eroded embankment material was replaced, but the dam is currently being operated at 10 feet below its full pool elevation to prevent the seepage and erosion from re-occurring in the dam crest. The proposed improvements for the lower dam to increase its useful life and allow it to store at its full pool capacity include:

- Removal of the existing dam crest and replacement with a new concrete crest.
- Replacement of the concrete lining on the upstream face of the dam.
- Raising the spillway.
- New concrete abutments and toe drains.
- A new stilling basin and outlet improvements.

### **3.4.3 Water Transmission Line Replacement**

Restoration Alternative 2 would allocate \$5 million for replacement of 27,000 feet of the Basin Creek water transmission line. The new transmission main will replace the existing aging 24-inch steel pipeline between the dam and the location of a new water treatment plant which is proposed to be located in the industrial park at the south edge of Butte. The project will consist of 27,000 feet of new 24-inch pipe which will convey water from the lower dam to the new water treatment plant. The project would also include new pipe joints; new blow-off piping and valves; construction of new air release/vacuum relief vaults; and, rehabilitation of infrastructure impacted by construction.

### **3.4.4 Waste Area Improvements**

Similar to the BNRC Restoration Recommendation and Alternative 1, Alternative 2 would implement the waste area improvements idea of importing clean soil and soil amendments to enhance reclamation on existing waste caps and other reclaimed waste areas. Soil amendments may include mulch and fertilizer. The additional growth medium would promote sustainable plant growth and reduce sedimentation to Butte Area One surface water. Alternative 2 would allocate \$5 million for delivery and placement of clean fill and soil amendments. Native grass, forb, and shrub species would be reestablished in the treated areas.

### **3.4.5 Restoration Alternative 2 Cost Summary**

The total estimated cost of Restoration Alternative 2 is \$32 million.

## **4 Comparative Analysis of Restoration Alternatives**

The purpose of this section is to compare the relative merits of each restoration alternative presented in this Plan. The alternatives are compared to both legal criteria and policy criteria as defined in Chapter 1. Table 4 presents the comparative analysis of each alternative against legal and policy criteria. The alternatives considered in this analysis are:

- The No Action Alternative.
- BNRC Restoration Recommendation: product of the public participation process and BNRC working sessions. Includes the restoration of the Upper Silver Bow Creek Corridor, improvements to the municipal water system, mine waste cover/revegetation improvements, stream restoration, small/miscellaneous restoration projects and recreational improvements.
- Restoration Alternative 1: remove wastes in Butte Area One which have not previously been addressed by Superfund remedy. The alternative would also allocate funds to improve waste areas by soil cover and revegetation.

- Restoration Alternative 2: primarily a replacement alternative for Butte-Silver Bow water supply, but it also includes the allocation of funds for waste cap improvements and revegetation.

#### **4.1 Technical Feasibility**

The No Action Alternative is technically feasible; however, it will not meet the goals of restoring the groundwater and improving/protecting the surface water resources of Butte Area One, nor would it replace any of the services that could be provided by the injured natural resources. Because of this, the No Action Alternative will not be discussed further.

The BNRC Restoration Recommendation and Alternatives 1, and 2 are approximately equivalent in terms of technical feasibility. Each alternative is based on proven technologies, construction methods, and scientific principles. The likelihood that any of the alternatives would achieve the objectives of resource protection and service replacement is relatively high.

The BNRC Restoration Recommendation is the alternative with the most diverse range of projects proposed (waste removal, waste area capping, soil amendments and revegetation, municipal water supply improvements, stream restoration, recreation, and small/miscellaneous projects), while Alternative 1 is primarily a waste removal alternative, and Alternative 2 is primarily a water supply replacement alternative. Although the range of projects proposed make its management more complex, the BNRC Restoration Recommendation proposes only projects which are technically feasible.

#### **4.2 Cost-Effectiveness and Cost-Benefit**

Each alternative considered in this analysis, other than no action, proposes to expend all of the Butte Area One restoration monies to fund projects which protect and enhance water resources and replace services associated with those resources. The projects proposed in each alternative are cost effective because they can be accomplished with standard engineering practices, traditional construction methods, and readily available equipment and materials. The action alternatives also share elements: all three propose implementing the waste area/cap enhancement and revegetation projects proposed in the NRDP 2007 Draft Conceptual

Restoration Plan; the BNRC Restoration Recommendation and Alternative 2 both propose funding a Basin Creek Water Treatment Plant; while the BNRC Restoration Recommendation and Alternative 1 both propose to remove remaining wastes left in place in Butte Area One. Because of these common elements and the intent of the BNRC to use available restoration funds, the benefits which each of the elements will provide should be considered.

For example, Butte-Silver Bow's proposal to construct a new water treatment plant for the Basin Creek Reservoir system is a common component of two action alternatives. This alternative for drinking water was analyzed in the NRDP 2007 Draft Conceptual Restoration Plan as Alternative 2, and given the range of options for Butte-Silver Bow's water supply it is considered cost effective. In addition to being cost effective, the Basin Creek treatment alternative would also provide benefits that other water supply alternatives do not. One benefit- would be, if implemented, the Basin Creek water treatment plant would provide an additional drinking water supply that could be relied on by Butte Silver Bow if there were an interruption in Big Hole water delivery. Currently, if the supply of treated water from the Big Hole system were interrupted, Butte would only be able to draw treated water from the Moulton Reservoir system which can treat a maximum of 2 million gallons per day, far short of Butte's average consumption of over 10 million gallons per day during the summer months. Alternatives to use funding for solely upgrading the Big Hole water treatment and delivery system are not only higher cost, but do not provide the benefit of a second source of water.

The benefits of expenditures on Alternatives 1 and 2 would be narrowly focused when compared to the BNRC Restoration Recommendation because those alternatives would commit available funding to fewer projects across fewer restoration categories.

### **4.3 Additional Criteria**

Table 4 provides a comparative analysis of all legal and policy criteria against which alternatives are evaluated. As shown in the table, on a comparative basis, the BNRC Restoration Recommendation is preferred under the following criteria.

- Recovery Period and Potential for Natural Recovery. Because the BNRC Restoration Recommendation funds additional actions across more restoration categories, including stream restoration and other actions within Butte Area One, their alternative would enhance the recovery period and potential for natural recovery to a greater degree than the other action alternatives.
- Restoration of Injured Resources. The BNRC Restoration Recommendation funds additional actions across more restoration categories; therefore, this alternative should restore the injured groundwater and surface water resources to a greater degree than the other action alternatives.
- Public Support. The BNRC Restoration Recommendation is based in part on a recent, broad public participation process and incorporates many of the ideas submitted to the BNRC by the public. This criterion will be considered further based on public input received during the 30-day public comment period for this draft restoration plan document.
- Benefits to Butte Area One. When compared to other action alternatives, the BNRC Restoration Recommendation would provide more direct benefit to Butte Area One because it funds additional actions across more restoration categories, including stream restoration and other actions within Butte Area One.
- Silver Bow Creek Ecosystem Health. When compared to other alternatives, the BNRC Restoration Recommendation would provide more direct benefit to Silver Bow Creek ecosystem health because it funds stream restoration in Silver Bow Creek and its tributaries.
- Long Term Effectiveness. The BNRC Restoration Recommendation would be more effective long term because it calls for removal of wastes that would otherwise continue to contaminate groundwater in perpetuity, and it would fund stream restoration and other projects not funded by other restoration alternatives.

Matching Funds and Cost Sharing. The BNRC Restoration Recommendation specifies a greater range of cost sharing than any other alternative.

- Normal Government Function. Improvements to publically owned municipal water systems are typically the responsibility of the local government. The NRDP considers the various water system improvement projects proposed in the alternatives in this plan to augment, not replace, normal government function because communities typically rely on a combination of grant funds and user fees to fund such projects. Also these proposals are an effective way to compensate the Butte community for the pervasive and extensive injuries to the groundwater resources underlying Butte Area One that were covered under Montana v. ARCO. Butte-Silver Bow acquired the public water system in 1992. Other factors to consider in evaluating this criterion for local public water projects are the local match and ratepayer rates.

**Table 4 Comparative analysis of restoration alternatives**

Assessment Criteria	No Action	BNRC Restoration Recommendation. Fund projects based on BNRC working session and public process	Alternative 1. Waste removal alternative with waste/cap area improvements	Alternative 2. Replacement of drinking water supply with waste/cap area improvements
Stage 1 Legal Criteria				
Technical Feasibility	All aspects of the alternative are technically feasible but does not achieve restoration objectives	All aspects of the alternative are technically feasible	All aspects of the alternative are technically feasible	All aspects of the alternative are technically feasible
Relationship of Expected Costs to Expected Benefits	No costs would be incurred and there would be no benefit	Wide-ranging benefit to BAO	Focused on waste removal	Focused on replacement of water supply
Cost-Effectiveness	Not applicable	All aspects of the alternative are cost effective; enhanced by cost matching	All aspects of the alternative are cost effective	All aspects of the alternative are cost effective
Results of Response Actions	Does not enhance or interfere with any response action	Enhances results of response actions. Does not interfere with response actions	Enhances results of response actions. Does not interfere with response actions	Enhances results of response actions. Does not interfere with response actions
Adverse Environmental Impacts	Mine waste contamination would continue to impact surface and ground water	Temporary impacts associated with construction activity	Temporary impacts associated with construction activity	Temporary impacts associated with construction activity
Recovery Period and Potential for Natural Recovery	Indefinite recovery period, poor potential for natural recovery	Alternative would advance recovery period and enhance potential for natural recovery	Alternative would advance recovery period and enhance potential for natural recovery but would not directly address stream restoration	Alternative would advance recovery period and enhance potential for natural recovery but would not address recovery of groundwater or stream restoration
Human Health and Safety	No change in human health and safety	Alternative would be protective of human health and safety	Alternative would be protective of human health and safety	Alternative would be protective of human health and safety
Federal, State, and Tribal Policies, Rules, and Laws	Not applicable	Alternative is consistent with Federal, State, and Tribal Policies, Rules, and Laws	Alternative is consistent with Federal, State, and Tribal Policies, Rules, and Laws	Alternative is consistent with Federal, State, and Tribal Policies, Rules, and Laws
Resources of Special Interest to the Tribes and DOI	No protection of resources of special interest	Alternative is consistent with the State MOA with the Department of Interior and Confederated Salish and Kootenai Tribes	Alternative is consistent with the State MOA with the Department of Interior and Confederated Salish and Kootenai Tribes	Alternative is consistent with the State MOA with the Department of Interior and Confederated Salish and Kootenai Tribes
Stage 2 Policy Criteria				
Restoration of Injured Resources	Alternative does not restore injured resources	Project restores injured resources and integrates with past remediation	Project restores injured resources and integrates with past remediation but does not address stream restoration	Project restores injured resources and integrates with past remediation but does not address stream restoration, groundwater restoration, or restoration of new waste removal areas
Public Support	Low public support	Alternative developed with public participation	Alternative developed with a limited subset of public participation categories	Alternative developed with a limited subset of public participation categories
Benefits to Butte Area One	No benefit to the injured resource or services provided by the injured resource	Highest benefit to the injured resource and replacement of lost services	Benefits the ground and surface water resource but does not replace lost services	Replaces only drinking water lost service and benefits surface water through reduction in sedimentation

<b>Assessment Criteria</b>	<b>No Action</b>	<b>BNRC Restoration Recommendation. Fund projects based on BNRC working session and public process</b>	<b>Alternative 1. Waste removal alternative with waste/cap area improvements</b>	<b>Alternative 2. Replacement of drinking water supply with waste/cap area improvements</b>
Silver Bow Creek Ecosystem Health	Not protective of Silver Bow Creek ecosystem health	Protective of Silver Bow Creek watershed and ecosystem health	Protective of Silver Bow Creek watershed and ecosystem health	Limited protection of Silver Bow Creek watershed and ecosystem health
Long-Term Effectiveness	Not protective long term	Protective long term for multiple restoration categories	Protective long term for limited restoration categories	Protective long term for limited restoration categories
Matching Funds and Cost Sharing	No matching funds	Incorporates matching funds and cost sharing	Does not incorporate matching funds and cost sharing	Does not incorporate matching funds and cost sharing
Coordination and Integration	No coordination and integration	Coordinates with ongoing and future response actions	Coordinates with ongoing and future response actions	Coordinates with ongoing and future response actions
Normal Government Function	Not applicable	Water system improvement component would augment normal government functions	Does not fund normal government functions	Water system improvement projects augments normal government functions

#### **4.4 Cost – Benefit Determination**

A significantly important criterion for NRDP restoration planning is cost-benefit. Because each of the alternatives have about the same costs and when an evaluation of benefits is applied across the range of restoration alternatives considered in this plan, the BNRC Restoration Recommendation delivers the greatest benefit to injured natural resources in Butte Area One and is preferred. The BNRC Restoration Recommendation would benefit Butte Area One by implementing projects that:

- reduce the potential for sedimentation and contaminant transport to surface water by revegetating areas previously reclaimed but where adequate vegetative diversity and abundance is not yet established;
- remove contaminated mining wastes left in place which currently impact groundwater and surface water;
- provide significant funding for improvements to public drinking water supply;
- restore area streams by enhancing riparian vegetation, removing barriers to fish passage, and improving in-stream flows;
- provide recreational opportunity associated with open space and surface water in and near Butte Area One; and
- create a fund for future projects that may complement on-going restoration projects and remedy actions.

### **5 Conclusions and Recommendations**

The Montana Natural Resource Damage Program staff conceptualized restoration projects for Butte Area One in their 2007 Draft Conceptual Restoration Plan. In 2010, the Butte Natural Resource Damage Restoration Council was formed and developed the *BAO Process Plan*, which was signed by the Governor in the spring of 2012, in order to guide their decision making as they drafted, with NRDP assistance, a restoration plan for Butte Area One. This

Process Plan called for providing opportunity for the public to participate in the restoration process. The BNRC executed a thorough campaign to solicit public input, and the citizens of Butte and the surrounding areas responded by submitting 100 completed restoration project idea forms which helped identify the restoration needs and desires for Butte Area One. During the past summer, the BNRC evaluated these public ideas along with those identified by other investigations. After many hours of deliberation, the BNRC developed the “BNRC Restoration Recommendation.” The BNRC Restoration Recommendation incorporates the restoration project ideas developed during this process and analyzes the restoration project alternatives generated during the planning and public participation process.

Based on the comparative analysis presented in Section 4 of this plan, the BNRC Restoration Recommendation is the preferred alternative to implement projects which are intended to restore the injured groundwater in Butte Area One, the surface water of Silver Bow Creek and its tributaries, and restore the services lost because of the injury to those resources. The BNRC Restoration Recommendation is preferred over the other restoration alternatives because it more completely achieves the legal and policy criteria set forth in the *Butte Area One Process Plan*. When compared to other action alternatives, the BNRC Restoration Recommendation should produce more benefits to Butte Area One injured resources and replaces more of the services lost because of the injury.

## **6 Restoration Plan Implementation**

The 2007 Butte Area One Draft Conceptual Restoration Plan (DCRP) provides that once the Butte Area One Restoration Plan is approved by the Governor, the NRDP, working primarily through its Butte staff member, will be responsible for “overseeing implementation of that plan, including design and construction oversight and ensuring the proper accounting of all expended funds.” It is the BNRC’s recommendation that all projects and expenditures derived from the BAO restoration fund be managed and operated from the Butte NRDP office to the greatest extent possible. The BAO DCRP originally assumed that Butte-Silver Bow would take the lead in implementing the BAO Restoration Plan pursuant to a Memorandum of

Understanding (MOU) with the NRDP. Under this approach, the county would be responsible for hiring and procuring needed employees, contractors and consultants for implementation of the plan and associated work. However, the subsequent BAO Process Plan, at page 12, provided that “other approaches to implementation of the final restoration plan can be considered as part of the development of the final restoration plan.” After further consideration and in light of the preferred BNRC Restoration Recommendation, those additional approaches could include State implementation of portions of the alternatives, such as mine waste removal and stream restoration, or private entities implementing other elements of the plan pursuant to a separate MOU with the NRDP or BSB. This would be in addition to BSB taking the lead on the implementation of certain projects, such as the Basin Creek water treatment plant and mine waste area improvements. Implementation of any part of the plan, of course, must be in compliance with all applicable laws and regulations, including procurement, health and safety, labor and prevailing wage laws.

Funding of BSB and other entities for project development, design and implementation work will be on a reimbursement basis. Reimbursement will occur following the submittal of a completed and correct invoice, with proper cost documentation of and a progress report on the activities covered under the invoice, pursuant to provisions of the applicable contractual arrangement with the NRDP.

As provided for in the 2008 Consent Decree, administrative costs incurred by the State related to the implementation of the BAO Restoration Plan shall continue to be funded by the BAO Restoration Fund. Those costs shall include, without limitation, in appropriate instances: costs of contracting and overseeing design and construction; accounting and auditing costs; cost of preparing annual reports; costs of obtaining independent technical review; costs of assuring that restoration funds are not spent on remedy; and providing for the participation of the BNRC and other public involvement and the State’s costs related thereto.

The BNRC Restoration Recommendation establishes seven project categories and proposes to fund six of those categories with specific amounts of money as specified in Table 3, above. The following procedure will be utilized to allocate expenses and interest earnings and

to track funds, and will: 1) optimize the amount of interest earned on the overall BAO Restoration Fund, thereby providing the most interest earning to the allocated categories; 2) separate and track the balances in the six funded project categories by using an Organizational Code (ORG) tracking system; and 3) calculate and allocate interest earned to each category. An individual ORG number will be assigned and used to track all expenses for each project category account. The interest earned on the overall BAO Restoration Fund will then be divided proportionately among these accounts based upon their individual balances at the end of each fiscal year-end.

The 2007 Butte Area One Draft Conceptual Restoration Plan also envisioned that the role of the BNRC would cease upon the approval by the Governor of a final BAO Restoration Plan that would allocate the entire \$28 million settlement amount earmarked for the BAO injured resources. It is anticipated that the Governor will consider approval of this plan in December 2012. However, this final BAO Restoration Plan, in paragraphs 3.2.6 and 3.2.7, reserves from present allocations, a total of \$2 million for recreation and “small/miscellaneous” projects to be allocated in the future and no later than the end of 2016. Accordingly, during this four year time period, from the beginning of 2013 through 2016, the BNRC may continue to meet as necessary or appropriate for the purpose of fulfilling its responsibilities as provided in paragraphs 3.2.6 and 3.2.7. The BNRC will continue to be staffed by the NRDP, and the BNRC will operate under the same rules and conditions that it has previously operated or chooses to subsequently adopt to the extent that those rules and conditions do not conflict with this BAO Restoration Plan or the other documents that have been approved by the Governor, as they relate to the BNRC. During this four year period, as requested by the BNRC chair, the NRDP shall report at BNRC meetings on the progress of the implementation of the BAO Restoration Plan. At such meetings the BNRC may comment on the implementation of the plan and propose changes in how the plan is being implemented. The NRDP will fully consider such BNRC input and work to resolve differences of opinion with the BNRC. If the BNRC disagrees with the resolution of differences as proposed by the NRDP, the BNRC shall have the option of bringing, in a timely manner, the matter to the Trustee Restoration Council for resolution. In

addition, the State will issue annual reports that will describe the status of BAO restoration project implementation.

The Governor shall make the final decision on the BAO Restoration Plan following consideration of the input of the Trustee Restoration Council, the BNRC, the NRDP and the public. Should it be necessary to make significant, substantial changes in this BAO Restoration Plan, such changes would be subject to the same review and public comment steps prior to a final decision by the Governor.

In the event the implementation of the BAO Restoration Plan, not including monitoring and operation and maintenance, is not concluded by the end of 2016, the BNRC may petition the Governor, through the TRC, with input from the public and NRDP, to extend its term.

Finally, it is understood that beginning in 2013 there will or may be changes in state and local elected officials, and it is possible that they may appoint new members to the BNRC. In such event, and like the original appointments to the BNRC, the Butte Silver Bow Chief Executive may appoint six qualified Butte citizens or local officials to the BNRC, subject to the approval of the Butte Silver Bow County Commissioners, and the Governor may appoint three qualified citizens or government officials to the BNRC, who would reflect more state-wide, rather than local, interests.



# Attachment 1: Definitions

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The short definitions that follow are intended to help applicants identify the types of projects that will restore, rehabilitate, replace, and/or acquire the equivalent of injured natural resources and/or lost services.

**Natural Resources:** “Natural resources” that may be addressed through UCFRB Restoration Fund projects include the land, fish, wildlife, biota, air, surface water, groundwater, and other resources that: 1) are owned, held in trust, managed or controlled by the State of Montana; 2) have been injured from exposure to and/or contact with hazardous substances generated by mining and mineral processing in the UCFRB conducted by ARCO and its predecessor, the Anaconda Company; and 3) were the subject of the Montana v. ARCO lawsuit. A description of the injured natural resources at the BAO site is provided the 2007 DCRP.<sup>11</sup>

**Services:** “Services” are the physical and biological functions, including the human use of those functions, performed by the natural resource, or that would have been performed by the natural resource had it not been injured by the release of hazardous substances. A service provided by an injured natural resource, or that would have been provided absent the injury to the natural resource, may also be addressed through UCFRB Restoration Fund projects. Services include ecological services such as flood control and erosion control, habitat, and food chains, as well as human services such as recreation and drinking water consumption.

**Injury:** “Injury” to a natural resource is the measurable adverse change in the chemical, physical, or biological quality or the viability of a natural resource resulting from exposure to a release of a hazardous substance.

**Baseline:** “Baseline” refers to the condition of a natural resource and the services it provided that would have existed had the discharge of the hazardous substance not occurred.

**No Action-Natural Recovery Period:** “No Action-Natural Recovery Period” refers to the time needed for recovery of an injured resource to baseline conditions if no restoration efforts are undertaken beyond response actions. This time period depends on many factors, including the extent of the injury, the persistence in the environment of the hazardous substance to which the natural resource is exposed, and the extent of response actions or other human intervention.

**Remedial Actions/Remediation:** “Remedial actions,” also referred to as response actions, are those measures undertaken by the EPA or the State of Montana at contaminated sites that are deemed necessary to protect public health or the environment and comply with environmental standards. Although response actions are not designed to restore injured

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<sup>11</sup>*Butte Ground and Surface Water Restoration Planning Process and Draft Conceptual Restoration Plan (DCRP), prepared by the NRDP, Nov. 2007, pp. 2-6.*

natural resources or services, they may have this effect to some extent. They may reduce or eliminate the length of time for natural recovery of an injured natural resource. Generally and collectively, remedial, removal, or response actions are also commonly referred to as “remediation.”

**Restoration:** The term “restoration” is used in both a general sense and specific sense in this document. Used in a general sense, “restoration” generally refers to the four types of actions authorized under federal law to address injuries to natural resources (i.e., restoration, rehabilitation, replacement, and acquisition of the equivalent natural resources). Used in the specific sense, “restoration” refers to actions that operate directly on the injured resources and services to return them to baseline conditions or to accelerate the recovery process. For example, in a situation where numerous sources are contaminating groundwater, removing the most significant sources would lessen the injury and result in the groundwater’s recovery, or “restoration,” to baseline sooner than would otherwise occur.

**Rehabilitation:** Actions constituting “rehabilitation” attempt to return the injured resources and services to a state different than their baseline condition, but still beneficial to the environment and the public. For example, where injury to a conifer forest resulted in a loss of upland big game habitat, planting grasses and shrubs would create upland bird habitat while only beginning the process of restoring upland big game habitat.

**Replacement:** Actions constituting “replacement” seek to create or enhance resources and services equivalent or very similar to those that have been injured, but away from the immediate site of the injury. For example, where an injury to a trout fishery has occurred, improvements to a nearby stream would enhance its trout fishery and would, in effect, constitute “replacement” of the injured fishery.

**Acquisition of Equivalent Resources:** Actions constituting “acquisition of equivalent resources” involve acquiring unimpaired resources comparable to those that are injured. Acquisition of equivalent resources can hasten recovery or protect the injured natural resources. For example, acquiring healthy land adjacent to injured land can relieve pressure on the injured land and hasten its recovery. Or acquisition of equivalent resources may compensate the public for its diminished ability to use the injured resources. For example, although acquiring unimpaired land for public use does not restore the land that has been injured, it does make other land available for public use.

## Attachment 2: BNRC Membership

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The Butte Natural Resource Damage Restoration Council consists of:

Elizabeth Erickson, Chairperson, appointed by B-SB Chief Executive Paul Babb

Mark Gollinger, appointed by B-SB Chief Executive Paul Babb

Ruth Lee, appointed by B-SB Chief Executive Paul Babb

John McKee, appointed by B-SB Chief Executive Paul Babb

Chad Okrusch, appointed by B-SB Chief Executive Paul Babb

Emmett Riordan, appointed by B-SB Chief Executive Paul Babb

Larry Curran, appointed by Governor Schweitzer

Steve Gallus, appointed by Governor Schweitzer

Helen O'Connor Joyce, appointed by Governor Schweitzer



## Attachment 3: BNRC Meeting Summaries

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Date	Major Topics Covered
4-8-10	Orientation Session on NRD Basics and Summary of Injuries to Butte Area One
5-10-10	Summary Presentations on BPSOU ROD and Remedy Status
6-10-10	Summary Presentations on Butte Mine Waste Covers and BRES Evaluation System
7-12-10	Tour of Butte Hill Mine Waste Cover Sites
7-15-10	BAO Sites Updates: Aquifer Test, Mine Caps and BNRC Meeting Procedures
8-5-10	Summary Presentation on BSB/ARCO Allocation Agreement
8-26-10	Tour of Butte Area One
9-30-10	Presentation on MBMG Aquifer Test
11-8-10	Briefing on UCFRB Advisory Council's Long Range Guidance Plan
12-9-10	Working Session on draft BAO Process Plan and Presentation on MBMG Blacktail Creek Groundwater/Surface Water Characterization Study
1-13-11	Working session on draft BAO Process Plan
2-10-11	Working session on draft BAO Process Plan
3-10-11	Presentation from MSU-FWP and CFWEP on Silver Bow Creek Fisheries
4-14-11	BNRC Action on draft BAO Process Plan
6-16-11	Field Trip to MT Tech's Native Plant Diversity Grant Project Sites
8-11-11	Presentation on DEQ's Use Attainability Analysis for Silver Bow Creek and the Clark Fork Coalition's Aquatic Restoration Strategy for the Upper Clark Fork Basin
9-8-11	Presentation from MBMG on Updated Parrot Tailings Cost Removal Estimate
10-6-11	Presentation from EPA on Parrot Tailings Remedial Decisions
11-3-11	Consideration of Column Study and Proposed Final BAO Process Plan
11-15-11	Working Session on Proposed Final BAO Process Plan
12-8-11	Presentation from BSB on Restoration Project Ideas and Priorities
1-12-12	Final Review and Approval of Proposed Final BAO Process Plan
1-18-12	Tour of Horseshoe Bend Water Treatment Plant with Montana Resources

Date	Major Topics Covered
2-7-12	Butte Water Preferred Option: Piping Silver Lake water to Feeley WTP and BSB Tree Planting Project Proposal
3-8-12	Brainstorming Session for Public Idea Campaign
3-14-12	Restoration Idea Public Workshop I at Quality Inn
3-20-12	Restoration Idea Public Workshop II at Butte Archives
4-17-12	Presentation from Montana Tech Metallurgical Engineering Design Team on the “Feasibility of Copper Extraction from the Parrot Tailings Site”
5-8-12	Expedited Action Request for BSB Tree Planting Project and Update from Butte Water on Silver Lake as a Replacement for Basin Creek
5-22-12	Review of BAO Restoration Ideas Submitted by Public
6-12-12	Funding Decision on BSB Tree Planting Project – Expedited Request and Montana Dept. of Environmental Quality Presentation on “Drinking Water Quality Regulations, Total Organic Carbon and Disinfection By-products”
6-26-12	Request by BSB Chief Executive for a Basin Creek Water Treatment Plant and Working Session on Restoration Category Determination and Straw Poll Exercise
7-10-12	MBMG Task Order 5 Amendment and Working Session on Waste Cap Improvements and Revegetation
7-24-12	Field Trip to Blacktail Creek in Butte Area One
7-26-12	Presentation by MBMG on the “Hydrologic Investigation of Groundwater Impacted by Wastes Left in Place in the BPSOU” and Working Session on Mine Waste Removal and Stream Restoration
8-2-12	Field Trip to Public Idea #50 Aspen Grove on Parrot Mine Dump and BSB Tree Planting Locations Near Granite Mountain Memorial
8-9-12	Working Session on Water System Improvements, Storm Water Controls, Recreation and Small Projects
8-23-12	Review of Consultant’s Evaluation of Butte Water’s Groundwater Restoration Plan from UCFRB Settlement and BSB Request for Basin Creek Water Treatment Plant and Working Session on BNRC Allocation of Funds to Restoration Categories
8-30-12	Working Session on Butte Area One Preferred Restoration Alternative
9-27-12	Review pre-Draft Butte Area One Restoration Plan
10-4-12	Review Revised pre-Draft Butte Area One Restoration Plan

## Appendix A: Summary of Restoration Ideas

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