

AMENDMENT 1

to the

**JULY 2007 ACTION MEMORANDUM
FOR THE REMOVAL ACTION FOR THE MIKE HORSE DAM
AND IMPOUNDED TAILINGS, LOWER MIKE HORSE CREEK,
BEARTRAP CREEK, AND THE UPPER BLACKFOOT
RIVER FLOODPLAIN REMOVAL AREAS,
UPPER BLACKFOOT MINING COMPLEX SITE**

**Helena National Forest – Lincoln Ranger District
Lewis and Clark County, Montana**

JULY 2012

AMENDMENT 1 TO ACTION MEMORANDUM

Subject: Amendment 1 to the July 2007 Action Memorandum for the Mike Horse Dam and Impounded Tailings, Lower Mike Horse Creek, Beartrap Creek and the Upper Blackfoot River Floodplain Removal Areas, Upper Blackfoot Mining Complex Site to identify an alternate repository location.

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AMENDMENT 1 TO JULY 2007 ACTION MEMORANDUM

I. PURPOSE AND SCOPE

The Purpose of this Amendment 1 to the *July 2007 Action Memorandum for the Removal Action for the Mike Horse Dam and Impounded Tailings, Lower Mike Horse Creek, Beartrap Creek and the Upper Blackfoot River Floodplain Removal Areas, Upper Blackfoot Mining Complex Site* (2007 Action Memorandum) is to conclude an alternatives analysis and identify an appropriate repository location for the wastes located on National Forest System lands (NFS) at the Upper Blackfoot Mining Complex (UBMC) (Figure 1). A reevaluation of repository options was needed because detailed investigations after the 2007 decision showed that the waste volume in the Mike Horse tailings impoundment was higher than estimated in the *Engineering Evaluation/Cost Analysis for the Mike Horse Dam and Impounded Tailings, Lower Mike Horse Creek, Beartrap Creek and the Upper Blackfoot River Floodplain Removal Areas, Upper Blackfoot Mining Complex, Lewis and Clark County, July 2007* (EE/CA), and design-level investigations for the Paymaster repository location selected in the 2007 Action Memorandum identified technical concerns regarding the suitability of that location, including steep slopes, stability concerns, space limitations, and geochemistry issues.

The reasons for the original 2007 Action Memorandum for a non-time critical Removal Action under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remain valid. This Amendment to the 2007 Action Memorandum describes the steps taken to identify and evaluate alternative repository locations and identifies the selected alternative for disposal of the wastes from the NFS lands of the UBMC Site.

The Montana Department of Environmental Quality (DEQ) will implement this action as a result of the joint agency *2008 Watershed Restoration Agreement between the State of Montana and the USDA Forest Service Northern Region for the Cleanup of the National Forest System Portion of the Upper Blackfoot Mining Complex Site* (WRA). The WRA was agreed to by the agencies in connection with the settlement of claims made against ASARCO, LLC (ASARCO) during its bankruptcy proceedings. Under the WRA the first action to be taken with the initial settlement payment is to remove the Mike Horse dam and tailings impoundment as provided in the 2007 Action Memorandum. Although delayed to identify the most-suitable repository location after design-level data identified concerns regarding the previously selected repository, this action remains the first priority of the agencies under the WRA and is the most urgent action needed to reduce the risks to human health and the environment at the UBMC. Additional settlement funds were recovered to address mine wastes on the private lands of the UBMC Site, and a separate settlement paid funds into a custodial trust to perform actions on former ASARCO-owned lands such as continued operation of a water treatment facility. The WRA directs the agencies to cooperate to the 'fullest extent possible' to maximize efficiencies and environmental benefits in the implementation of response and restoration actions at the UBMC Site.

The scope of this amendment is only to change the preferred repository location identified in the 2007 Action Memorandum. The remaining components of the selected Site Wide Alternative 4 as described in the Action Memorandum in Section V.A.1, pages 13-15, remain the same.

II. BACKGROUND AND SITE CONDITIONS

A. Background

The EE/CA identified risks to public health and the environment from mining and milling wastes located on National Forest System (NFS) lands, in accordance with the requirements of CERCLA and the National Contingency Plan (NCP), 40 CFR Part 300. The EE/CA also identified and analyzed alternative removal options for the waste components, as well as potential repositories for these wastes, and developed costs for these options. The draft of the EE/CA was issued for public comment in July 2006, and comments were received on the EE/CA from July 17, 2006, through September 18, 2006. See 2007 Action Memorandum, page 9. A responsiveness summary addressing the comments received was attached as Appendix J to the final EE/CA.

B. 2007 Preferred Removal Action

The preferred removal action identified in the 2007 Action Memorandum is described in detail in Section V of the 2007 Action Memorandum. In summary, the preferred removal action is Site Wide Alternative 4 as described in the EE/CA in Section 6.3.4. Site Wide Alternative 4 includes removal of the Mike Horse dam and impounded tailings, complete removal of wastes in Mike Horse Creek, partial removal of wastes in Beartrap Creek, and complete removal of wastes in the floodplain of the Blackfoot River. The preferred repository in the 2007 Action Memorandum is the Paymaster repository (Figure 2). The 2007 Action Memorandum provided that, should the Paymaster repository prove unsuitable, the First Gulch repository would be the alternate repository, and the Horsefly Creek repository was also identified as a location that would be considered should more capacity become necessary (2007 Action Memorandum, pages 13-14). The EE/CA also included numerous other removal and repository options as well as the results of repository field investigations.

The total estimated waste volume on NFS lands in 2007 was 470,000 cubic yards (cy), with 375,000 cy coming from the Mike Horse dam and impounded tailings area, and the removal cost estimate was \$26,700,000.00. See EE/CA, page 6-30, and 2007 Action Memorandum, pages 14 and 24.

C. Transition from Enforcement Actions to Agency Lead at UBMC

At the time of issuance of the 2007 Action Memorandum and the EE/CA, the Forest Service was conducting oversight of ASARCO as the responsible party for cleanup of the NFS lands within the UBMC. The Paymaster location was a logical choice because it already had a small repository on it and was on land owned by ASARCO. At the same time, the State was developing documentation to support the State's bankruptcy claim against ASARCO for cleanup of the remaining lands of the UBMC which were largely private lands owned by ASARCO. Ultimately, the bankruptcy settlement actions led to the agencies joining together through the WRA as the responsible entities for cleanup of the site.

The cleanup approach for the UBMC Site transitioned to better-coordinated agency actions with the adoption of the WRA and the withdrawal of ASARCO from Montana. The UBMC contains numerous individual waste sources that are located on either NFS lands or private lands, and other wastes which span both NFS and private lands. Segregating the waste sources and

response actions by land ownership and agency responsibility through separate projects and repositories would likely result in conflicts in site uses, additional costs, and less-effective solutions. In addition, upstream contaminated lands in the floodplain under one ownership would have the potential to re-contaminate remediated lands downstream under another ownership.

The agencies agreed to take a site-wide approach to cleanup in order to maximize the environmental benefits achievable with the settlement funds. Accordingly, the current evaluation of a repository location does not look only at the wastes from NFS lands in isolation. To consider the broader implications and recognize the full range of impacts of the decision, this decision considers the need for repository capacity for the additional mine wastes at the site and evaluates the costs and benefits of using a single repository capable of holding the wastes from the whole site. This approach is consistent with the requirements of CERCLA and the NCP that this removal action decision contribute, to the extent practicable, to the efficient performance of the long-term remedial action to be conducted at this site. See 42 USC § 9604(a)(2) and 40 CFR § 300.415(d). The 2007 Action Memorandum was issued as part of an enforcement action against ASARCO, and the Forest Service's ability to require ASARCO to remove and dispose of mine wastes was limited to the wastes on NFS lands. Since the action is now a coordinated agency action, it is practicable and thus appropriate under CERCLA and the NCP that this decision recognize that the disposal needs for the site include not only the removal action, but the remedial action as well.

D. New Information since the EE/CA and 2007 Action Memorandum

In accordance with the WRA, the State initiated design-level site investigation work in 2009 for the Paymaster repository and for the tailings impoundment/dam removal. The investigations showed that the waste volume in the Mike Horse tailings impoundment was higher than estimated in the EE/CA (421,000 cy instead of 375,000 cy). (Spectrum, 2010, Figure 5). In addition, the repository needed to also hold the wastes of Mike Horse Creek, Beartrap Creek, and the Blackfoot River located on NFS lands. This resulted in significant space and stability constraints at the Paymaster repository location, especially in consideration of the total waste quantity from both NFS and private lands, which is estimated at 1,000,000 cubic yards. See Repository Siting Study, page 2.

In addition, geochemical sampling of the native soils and subsoils at the Paymaster found levels of leachable heavy metals which would likely result in contamination at any location where water could saturate these soils and run off. (Terragraphics, 2010b). This precluded the use of these soils and subsoils for reclamation and restoration in any of the floodplain removal areas. Thus, a substantial volume of clean borrow material would need to be imported from somewhere outside the mineralized area. These issues raised serious concerns regarding the cost and suitability of the Paymaster location for more than a very limited volume of waste.

In 2009, DEQ also conducted an evaluation of a location in Shave Gulch in the mining area as a potential companion repository to hold additional mine waste (Figure 2). Geochemical results indicated that the soils of the Shave Gulch area were similar to the soils of the Paymaster and would not be suitable for reclamation applications. The other characteristics of Shave Gulch, such as depth to groundwater and geotechnical characteristics, are also very similar to the Paymaster. See Repository Siting Study, pages 13-14.

The First Gulch repository location (Figure 2) was again reviewed and determined to be too small, even for the revised volume estimates for the NFS lands alone. See Repository Siting Study, Appendix A, March 22, 2011, Memorandum, pages 2-3. In addition, the borrow material available at this location is limited. See Repository Siting Study, pages 11 and 37. The Horsefly Creek area (Figure 2) was also reviewed again. It is located either 10.6 or 12.8 miles from the tailings impoundment, depending on which highway approach is used, which is a substantial haul distance. The 2007 Action Memorandum had noted that costs are largely tied to the amount of waste removed and haul distance. 2007 Action Memorandum, page 17. At that point, the agencies began to consider the possibility of a repository location that had not been previously identified and that might be located closer to the UBMC.

In November 2009, the Section 35 area adjacent to U.S. Highway 279 was identified as a possible repository location during a field review (Figures 2, 3). The State was granted access to the property for investigation purposes in the spring of 2010. During the investigation of Section 35, concerns were expressed by neighboring landowners. Informational field trips and outreach efforts to the Lincoln community and nearby landowners identified certain concerns with the use of Section 35 as a mine waste repository. The agencies agreed to take a fresh look for alternative repository locations.

Pioneer Technical Services, Inc. (Pioneer), headquartered in Butte, Montana, was tasked with preparing a new analysis of possible repositories for the wastes at the UBMC. Pioneer is a qualified engineering firm with substantial experience and expertise in mine cleanups in Montana that had not previously been involved in the work relating to the UBMC. The Repository Siting Study prepared by Pioneer: (1) reviewed previous repository information; (2) summarized previous repository investigations; (3) developed specific repository alternatives for comparison, incorporating geotechnical analysis, geographic information, and costs; and (4) provided an analysis of the repository alternatives and a recommendation. The process that was followed and the repository options that were considered are discussed in more detail in Section III below. The Repository Siting Study and other technical documents prepared following the 2007 Action Memorandum supplement the EE/CA for this site by augmenting the available information on potential repository alternatives.

E. Public Comment Process

The Repository Siting Study was released for public comment on September 20, 2011. A summary of the analysis in the report (the Executive Summary) was distributed directly to over 300 people who were on the UBMC mailing list at the beginning of the comment period. The full Repository Siting Study was available online and at several document repositories in Helena and Lincoln.

The comment period was announced in legal ads and paid ads in the Blackfoot Valley Dispatch, Helena Independent Record, and Missoulian, as well as a paid ad in the Great Falls Tribune. The Forest Service issued a press release to various news media, which led to several news articles noting the issuance of the Repository Siting Study for public comment. In announcing the public comment period, the agencies specifically encouraged comment on any or all of the alternatives, noting that, if the recommended alternative was not ultimately selected for any reason, another of the alternatives could be selected without re-soliciting comments. See, for example, September 19, 2011, cover letter transmitting the Executive Summary, page 2.

At the request of the Upper Blackfoot Valley Community Council (UBVCC), the comment period was extended from October 21, 2011, to December 9, 2011, an additional 49 days. The extension of the comment period was announced with a press release, which led to several news articles regarding the extension.

Early in the comment period, on October 1, 2011, the agencies held a public field trip during which they discussed the Repository Siting Study and answered questions from the public while viewing some of the locations being discussed. On October 4, 2011, the agencies held an 'open house' in Lincoln from 4:00-7:00 p.m. for community members to ask questions and visit one on one in an informal setting with agency managers, legal staff, project leaders, and the engineer/primary author of the Repository Siting Study. Following the open house was a public hearing, which provided the opportunity for formal submission of verbal comments.

The agencies had offered to schedule additional meetings or field trips upon request, and at the request of Trout Unlimited (TU), agency representatives attended a meeting of the Blackfoot Valley Chapter of TU on October 11, 2011. The agencies provided a short summary of the project history and status and responded to questions. At the request of the UBVCC, the agencies attended a UBVCC meeting on November 28, 2011, to answer questions and provide additional information to help the public understand the process and the technical issues of siting a repository.

In addition, four informational news articles on different aspects of the project and its history were issued and published by the Blackfoot Valley Dispatch during the extended comment period, and the agencies included information on the process through publication of the "Mike Horse Messenger," an agency newsletter used to keep the public informed of developments relating to the site. Additional detail regarding the public involvement process relating to the repository evaluations is provided in the responses to the first four comments in Section I, Agency Public Process, of Appendix C, Public Comments and Responses.

A brief discussion of the comments received is presented in Section IV.B.2.c, Community Acceptance and Consideration of Public Comments, below. In addition, a summary of the comments received on the Repository Siting Study and the agency responses to those comments are attached as Appendix C, Public Comments and Responses. The full text of the comments and hearing transcript is included in the Administrative Record File for the project located at the Lincoln Ranger Station.

F. Site Conditions

The conditions of the UBMC today are largely the same as those at the time the 2007 Action Memorandum was issued. These are described in the 2007 Action Memorandum, Section II, Site Conditions and Background, pages 3 to 8. The condition of the Mike Horse dam remains of great concern, and technical evaluations resulted in the determination that it needed to be removed from service (USDA Forest Service, 2005). There remains the very real threat of failure of the Mike Horse dam.

The Mike Horse dam currently impounds approximately 421,000 cubic yards of metals-laden mill tailings. The dam failed in 1975 eroding tailings directly into the headwater streams of the Blackfoot River and the river itself, killing fish and aquatic life and causing substantial environmental damage, much of which continues today. Mine waste piles were also dumped

within the floodplain and/or streambanks of Mike Horse Creek, Beartrap Creek, and the Upper Blackfoot River during the mining era. These wastes are not contained or confined.

G. Other Actions since the 2007 Action Memorandum

Along with the field investigations and repository siting work, site maintenance activities have been conducted by the agencies since ASARCO's maintenance responsibilities at the site ended. In order to keep water from filling the impoundment, a diversion ditch was constructed in 2007 to convey the water of Beartrap Creek around the impoundment and through an overflow culvert which dumps the water into Mike Horse Creek. The ditch requires annual maintenance and monitoring. A sump ditch was constructed in 2010 to collect subsurface water before it flowed into the impoundment. Pumping of water from the sump ditch and/or impoundment was conducted in 2008, 2010, and 2011 to keep water from backing up against the dam. A drop inlet pipe was also installed in the dam in 2011 as a backup spillway to the diversion ditch. The diversion ditch and drop inlet pipe are only interim responses to better control water levels in the impoundment to reduce the risk of another catastrophic failure before the dam is removed from service. Seeps at the base of the dam are a continuing source of metals contamination to Beartrap Creek (one of the headwater streams to the Blackfoot River). Wastes lying within and adjacent to the floodplain throughout the headwaters and Upper Blackfoot River area are a source of continuous erosion and metals contamination to the surface waters of the site. See 2007 Action Memorandum, pages 4 -8.

H. State and Local Authorities' Roles

Under CERCLA and the NCP, the Forest Service is the lead agency for response actions for NFS lands, including the issuance of this decision, and DEQ is the support agency. As discussed above, DEQ will implement the response actions at the UBMC Site in accordance with the WRA. DEQ is also continuing to prepare the Remedial Investigation/Feasibility Study and will be the lead agency for the remedial actions at this site. However, as provided in paragraph 6 of the WRA, all further actions to be taken on NFS lands are subject to review and approval by the Forest Service. The State's Natural Resource Damage Program (NRDP) in the Department of Justice will lead in the design of the restoration component of the site cleanup on NFS and private lands.

The role of local authorities (Lewis and Clark County) at the site includes emergency response for fire, flood, ambulance, or law enforcement. The Lewis and Clark County sheriff is responsible for evacuation efforts should they be needed for any reason.

All of the agencies are cooperators in the Mike Horse Dam Emergency Response Plan.

III. REPOSITORY ALTERNATIVES CONSIDERED

A. Screening of Alternatives

The Repository Siting Study provides a detailed review of previous repository investigations, a fresh look at identification of new potential repositories, and a comparative analysis of known and potential new locations. Costs considered in the Repository Siting Study included only those costs that would vary depending on the repository selected, such as repository preparation and construction, waste haul and placement, land acquisition, and borrow costs. Concerns raised by the public during the comment period on the Repository Siting Study are

discussed in Section VI.B.2.c, Community Acceptance and Consideration of Public Comments, below and in Appendix C, Public Comments and Responses.

For each location, site-specific design considerations, such as the need for a bottom liner, were identified when necessary to reduce risks where there are less than ideal site conditions. These additional controls add complexity to a potential repository alternative, which is reflected in the estimated costs and may affect the level of protectiveness. Another important factor affecting costs is the amount of borrow material available at the location that can be used for repository construction as well as reclamation and restoration of the areas where the mine waste is removed. Distance from the repository location to the Mike Horse dam is another important cost factor. The more distant repository locations generally resulted in estimated higher costs per cubic yard of material. Finally, some repository areas are not large enough to hold all of the wastes and were considered in combination with other locations, which creates some duplication of effort and reduces efficiencies of scale, adding to the costs. The considerations affecting the effectiveness, implementability, and cost of each alternative are discussed in more detail in Chapter 4 of the Repository Siting Study.

The Repository Siting Study identified more than 60 potential locations that might be suitable repository locations. These locations were screened using scoring criteria for available space, slopes, capacity, hydrology, geology, geotechnical concerns, soil suitability, land ownership, access, potential for borrow materials, distance from the mining area, distance to human and environmental receptors, visibility, and short-term construction safety concerns for each of the alternatives. See Repository Siting Study, page 7, and Appendix A, May 2, 2011, memo.

Each of the alternatives retained and analyzed for detailed comparison in the Repository Siting Study is briefly described below. See Figure 2 for locations. One location is added here that was not included in the detailed comparison in the Repository Siting Study. The Shave Gulch area is included below due to its close proximity to the wastes of the site and the Paymaster Repository. The Shave Gulch area is very similar to the Paymaster and is included to accommodate additional volume if a lower-capacity alternative like the Paymaster were to be used.

1. Paymaster Repository Options 4 and 6

The Paymaster Repository area is located in the southeast quadrant of Section 20 in Township (T)15N, Range (R)6W on Trust property. This location is about 2.9 miles from the Mike Horse dam on dirt roads. Certain geotechnical and geochemical concerns identified at the Paymaster during design-level investigations are discussed in Section II.D above. In addition, the stability analysis conducted as part of the Repository Siting Study, (Section 4.2), pages 29-36, determined that the Paymaster Repository location would require a substantial constructed toe berm of additional materials that would have to be imported from outside the mining area. This alternative would also require a bottom liner due to the close proximity of groundwater within portions of the anticipated repository footprint. The proximity of this location to the Blackfoot River wetlands leaves little margin for error in design and construction. The capacity of this location is less than the total estimated volume required for the UBMC Site. This alternative is discussed in detail in Sections 4.4.1 and 4.4.2 of the Repository Siting Study, pages 29-36.

2. Shave Gulch Repository Site

This area is located in the center of Section 4, T15N, R6W, adjacent to Shave Gulch at its confluence with the Blackfoot River. About 2 miles from the Mike Horse dam on dirt roads, the Shave Gulch repository location is the closest of the repository alternatives evaluated and referenced in the Repository Siting Study. An initial estimate placed possible capacity of the Shave Gulch location at approximately 500,000 cy of waste. See Spectrum and Terragraphics, 2010. However, Pioneer's stability analysis determined that this location could practically be used only for a significantly lower volume. Repository Siting Study, pages 28-29. Shave Gulch can effectively be considered only to allow some very limited additional capacity in combination with other locations.

3. First Gulch Option 1

The First Gulch repository area is located in Sections 14 and 23, T15N, R7W, north of Highway 200 on NFS lands. First Gulch is an intermittent drainage that drains into the Blackfoot River wetlands. This area is about 6.7 miles from the Mike Horse dam on Highway 200 and dirt roads. Test pits were dug at this location and two monitoring wells were installed. The First Gulch repository location could accommodate approximately 400,000 cy of material and thus would not be a stand-alone alternative. The repository would need a constructed toe berm to contain the identified volume. Only limited borrow material is available at this location, so a separate borrow source would be needed for reclamation materials. This alternative is discussed in detail in Section 4.4.3 of the Repository Siting Study, pages 36-39.

4. Horsefly Creek

The Horsefly Creek repository area is located in Section 3, T14N, R7W, in the Horsefly Creek drainage, which is a perennial tributary to the Blackfoot River. This area is approximately 10.5 miles from the Mike Horse dam on Highway 200 and dirt roads, or 12.6 miles from the Mike Horse dam using Highway 279, Highway 200, and dirt roads. Horsefly Creek could contain the estimated total waste volume of the UBMC. This repository location has available clean borrow materials and, based on initial investigation, would need no exceptional geotechnical design considerations. Significant road improvements would be required. This alternative is discussed in detail in Section 4.4.4 of the Repository Siting Study, pages 39-42.

5. Section 35 Option 2

The Section 35 repository area is located in the northeast half of Section 35, T15N, R7W (Figure 3). The distance from this area to the Mike Horse dam is 8.5 miles on Highway 279, Highway 200, and dirt roads. Section 35 could contain the estimated total waste volume of the UBMC, and it has available clean borrow materials. Based on the initial investigation for Section 35, this location would need no exceptional geotechnical design considerations, and it could be designed and constructed to meet ARARs. This alternative is discussed in detail in Section 4.4.5 of the Repository Siting Study, pages 42-45.

6. Blackfoot River Site 1

The Blackfoot River repository area is located on State of Montana land in the southeast corner of Section 12, T14N, R8W. This area is adjacent to the Lincoln Solid Waste Transfer Station and is about 12.8 miles from the Mike Horse dam on Highway 200 and dirt roads. This location

could contain the estimated total waste volume of the UBMC, and it has available clean borrow materials. No test pits or boreholes were excavated for this location. However, the flat slopes suggest that this location would need no exceptional geotechnical design considerations. This alternative is discussed in detail in Section 4.4.6 of the Repository Siting Study, pages 45-48.

7. Alice Creek Sites 4 and 7

Alice Creek Site 4 is located on State of Montana land in the southwest corner of Section 16, T15N, R7W. This area is about 12.5 miles from the Mike Horse dam on Highway 200 and dirt roads. This location could contain the estimated total waste volume of the UBMC, and it has available clean borrow materials. No test pits or boreholes were excavated for this location. There is evidence of shallow groundwater in the area. This location may need specific geotechnical considerations with respect to groundwater. This alternative is discussed in detail in Section 4.4.7 of the Repository Siting Study, pages 48-51.

Alice Creek Site 7 is located on private land near the intersection of Sections 21, 22, 28, and 29 in T15N, R7W. This area is about 7.9 miles from the Mike Horse dam on Highway 200 and dirt roads. This location has available area to construct a repository with capacity for all of the wastes of the UBMC, and it likely has available clean borrow material. No test pits or boreholes were excavated for this location. There is evidence of shallow groundwater throughout the area as well as close proximity to several seasonal surface drainages. Because of the shallow groundwater concerns, Pioneer included a bottom liner system in the Repository Siting Study cost estimate for this alternative. This alternative is discussed in detail in Section 4.4.8 of the Repository Siting Study, pages 52-55.

8. McDonald Meadows Sites

The McDonald Meadows area has two potential repository locations between the Landers Fork of the Blackfoot River and Hardscrabble Creek in Sections 29 or 31/32 in T15N, R7W. These areas are between 12.7 and 13.4 miles from the Mike Horse dam on Highway 200 and dirt roads. Both locations are on private land within an area that has been previously explored for a potential gold mining project. These locations have suitable topography and would be large enough to hold all of the wastes of the UBMC. There does not appear to be a need for special geotechnical design considerations. These alternatives are discussed in detail in Section 4.4.9 of the Repository Siting Study, pages 55-58.

9. State Section 18 East of Rogers Pass

The State Section 18 repository area is located in Section 18, T17N, R5W, on state land. This location is 20.4 miles from the Mike Horse dam on Highway 200 and dirt roads. Section 18 has suitable topography and would be large enough to hold all of the wastes of the UBMC. There does not appear to be a need for special geotechnical design considerations. This alternative is discussed in detail in Section 4.4.10 of the Repository Siting Study, pages 58-61.

10. Hypothetical Site East of Rogers Pass

A hypothetical site on the east side of Rogers Pass was analyzed in the Repository Siting Study for the purpose of identifying the closest technically suitable area to the UBMC on the east side of the divide. Township 16N, R6W was identified as the nearest area. All of the potentially suitable lands in this area are privately owned. A repository in this area would be approximately

17.4 miles from the Mike Horse dam on Highway 200 and dirt roads. There are suitable areas and geotechnical conditions for a repository that could hold all of the wastes of the UBMC Site. This alternative is discussed in detail in Section 4.4.11 of the Repository Siting Study, pages 61-64.

B. Final Evaluation of Alternatives

1. Comparison Level Data vs. Design-Level Data Needs

As noted in the Repository Siting Study, some of the locations considered had more available data than others. Some of the areas had been identified and investigated in some detail by the agencies prior to the Repository Siting Study, and some areas were identified in the "fresh look" for new alternatives conducted by Pioneer as part of the study. In order to provide a fair basis for comparison of the alternatives, Pioneer developed a consistent set of assumptions to use throughout the evaluation. See Repository Siting Study, Sections 4.0, 4.1, 4.4, and subsequent sections for the assumptions relating to specific alternatives. Pioneer noted that the evaluation is not exhaustive because of the data limitations but is sufficient to make an informed and reasonable decision. Repository Siting Study, page 17. A comparison of alternatives is typically based on a limited data set. For example, as noted in the 2007 EE/CA, page 7-3, a cost estimate for comparison of alternatives purposes is expected to be accurate within a range of +50%/-30%, which is adequate for allowing a fair comparison of alternatives. See also "A Guide to Developing and Documenting Cost Estimates during the Feasibility Study," (EPA, 2000, Publication 540-R-00-002), pages 2-3 through 2-6. More extensive design-level data will be collected at the selected location to ensure that design and construction of the repository can and will meet the required criteria, such as protectiveness and compliance with ARARs. However, design-level data is not typically available, and is not needed, for an appropriate evaluation and comparison of alternatives. The agencies agreed with Pioneer's determination that there was sufficient data to make a reasonable and informed decision.

2. Screening and Comparison of Alternatives

Chapter 4.0 of the Repository Siting Study discussed each of the potential alternatives identified above in some detail, describing the advantages and disadvantages of each, and indicating whether each would be retained for the final comparison of alternatives. Certain of these alternatives, the Blackfoot River Site 1, Alice Creek Site 4, McDonald Meadow Sites 3 and 4, State Section 18, and the hypothetical site east of Rogers Pass, were not retained for further consideration because they cost more without affording better protectiveness than the alternatives that were retained. Some of these alternatives had additional issues, such as adverse impacts to sensitive areas such as the grizzly bear recovery area, wetlands, or recreational areas. Those considerations are discussed in detail in the separate section on each alternative and are summarized in Section 4.5 of the Repository Siting Study. Through this process, four alternatives were identified for final detailed evaluation.

The "no action" alternative, i.e., leaving the dam and impounded tailings in place, was necessarily rejected in the 2006-2007 EE/CA process and issuance of the 2007 Action Memorandum. See EE/CA, pages 6-28 and 7-1. That analysis has not changed. The 2007 Action Memorandum identified the Paymaster as the first choice for a repository location, and that alternative effectively serves as a "baseline" alternative for the current comparison of

alternatives. Since the Paymaster cannot hold the full estimated waste volume, the Repository Siting Study evaluated it in combination with First Gulch to make it a feasible alternative.

The three additional alternatives that were identified as the best alternatives for final comparison were Horsefly Creek, Alice Creek Site 7, and Section 35. These alternatives, along with the combined Paymaster/First Gulch alternative, are evaluated in further detail in Chapter 5.0 of the Repository Siting Study. As summarized in the section below, this analysis identified Section 35 as both the most protective and the most cost-effective of the potentially feasible alternatives.

IV. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Description of Selected Action

The preferred alternative for this removal action remains Site Wide Alternative 4 as described in the EE/CA in Section 6.3.4 and the 2007 Action Memorandum, pages 14-15, with the exception of the preferred repository location. Based on the evaluation of alternatives, as described herein and in the Repository Siting Study, Section 35, which is both the most protective and most cost-effective alternative, is selected as the preferred repository location. Design-level investigations will be completed on Section 35 to verify current information and to allow proper placement, design, and construction of a repository which will be appropriately protective and attain ARARs. If problems are identified during design-level investigations, other alternatives identified in the Repository Siting Study, such as Horsefly Creek, Alice Creek 7, or another alternative, could be considered further. Alternatively, a repository at First Gulch could be considered further for a portion of the waste, and other locations such as Paymaster or Shave Gulch could be considered further for smaller volumes of waste.

2. Post-Removal Site Controls

The repository area may include fencing or other barriers to protect the integrity of the repository cap and to help establish and protect vegetation, at least on a temporary basis. Monitoring will be conducted to detect and correct any problems with revegetation, stability, erosion, or other condition affecting the performance of the repository. Since this removal action will be followed by a remedial action, to be conducted in accordance with the WRA, monitoring and follow-up actions to address any concerns identified will be conducted in coordination with the remedial action.

B. Rationale for Selected Action

The selection of an action is based on evaluation of the alternatives utilizing the applicable criteria. The criteria for selection of a removal action are broken down into the categories of effectiveness, implementability, and cost. See Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA (EPA, 1993, Publication 9360.0-32). Each of these categories has a range of factors to be considered, which are summarized with respect to this decision below. More detailed discussion of many of the considerations is presented in the Repository Siting Study and in Appendix C, Public Comments and Responses.

1. Effectiveness

Effectiveness includes consideration of overall protection of human health and the environment, attainment of ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, and short-term effectiveness.

a. Protectiveness/ARARs

As identified in Sections 4.4.5 and 5.1 of the Repository Siting Study, Section 35 has at least three suitable repository locations and has suitable soils and geology. Separation from surface and groundwater is adequate in at least three locations on the Section 35 property. Careful placement, layout, and design of the repository on Section 35 will ensure appropriate separation from surface and groundwater and compliance with ARARs. The large size of the property (over 300 acres) and varied physical settings provide flexibility for siting and designing a repository which will need about 30 acres. Significant quantities of materials suitable as borrow, including the types and quantities of borrow needed for reclamation, are available on Section 35 so that only one area outside the mining area will need to be disturbed. See Repository Siting Study, Table 4.7, page 43. The large size of the parcel also allows for safer construction practices for project workers as well as a buffer zone to reduce impacts to neighboring landowners. This location's setting, suitable slopes, benched topography, and low-permeability soils combine to make this a safe and secure repository location. Section 35 is located within the already-impacted portion of the Blackfoot River and would not expand potential impacts outside that portion of the drainage basin. The favorable conditions at this location allow design parameters to be optimized and allow creation of the safest and most protective repository of all the alternatives considered.

The Horsefly Creek and Alice Creek 7 areas also offer a high level of effectiveness based on available information. However, the low permeability soils identified at Section 35 offer a particular advantage for repository construction there, and portions of Section 35 appear to offer better separation from groundwater. Thus Section 35 offers the best opportunity for construction of a protective repository. See also Repository Siting Study, Sections 4.4.4, 4.4.8, and 5.1.

Repositories using a combination of the Paymaster, First Gulch, and Shave Gulch locations could potentially be constructed to provide adequate protectiveness, but with less margin for error in design and construction due to geotechnical constraints and soil geochemistry. See also Repository Siting Study, Sections 4.4.1 through 4.4.3, and Section 5.1.

b. Long-Term Effectiveness and Permanence

As discussed above, the existing conditions at the Section 35 site enhance the natural protectiveness of the location and do not require artificial or engineered structures to compensate for less-than-ideal conditions. Reliance on engineered structures such as toe berms and liners can increase the risk of failure of the structures, including risks of installation defects, manufacturing defects, and degradation of any synthetic materials over time. The natural advantages of the Section 35 location offer the best combination of characteristics to ensure long-term effectiveness and permanence.

c. Reduction of Toxicity, Mobility, or Volume through Treatment

The isolation of the waste within a protective repository will reduce the mobility of the waste, although for the volume of mine wastes involved, treatment alternatives are not practicable. All of the alternatives evaluated in detail are similar under this criterion. See Section IV.C.4 below for discussion of alternative technologies and Section V of Appendix C, Public Comments and Responses, for additional discussion of treatment technologies.

d. Short-Term Effectiveness

Short-term effectiveness includes consideration of risks created by construction activities. Because of the need to haul in clean borrow even if the repository were located within the mining area, all of the repository alternatives would involve hauling of wastes and/or borrow materials on public highways, which does create short-term risks. The Section 35 alternative involves substantial haul of both wastes and borrow on the highways, but the short-term risks should be manageable. The agencies will require contractors to comply with all Montana Department of Transportation requirements, and will emphasize safety concerns in the performance of the work. DEQ has already completed a project to move and reconstruct the Meadow Creek Road approach to Highway 200 to create a safe approach for the UBMC mining area, eliminating one blind approach and restricting use of another. Impacts such as increased noise and traffic delays and concerns expressed by landowners regarding dust or other releases from haul trucks have also been considered and are discussed in more detail in Appendix C, Public Comments and Responses. Mitigation measures will be incorporated into project design and construction to reduce to the extent practicable the potential impacts of project activities to adjacent landowners, highway users, and the community of Lincoln.

2. Implementability

Evaluating implementability includes consideration of technical and administrative feasibility, availability of necessary services and materials, state acceptance, and community acceptance.

a. Feasibility

As indicated in the Repository Siting Study, the technical feasibility and constructability of repositories on the Section 35, Horsefly Creek or Alice Creek 7 alternatives is high. The technical feasibility of the Paymaster/First Gulch/Shave Gulch alternative is lower because of the geotechnical and geochemical concerns at those locations. The wide variety of borrow materials available at Section 35 enhances the feasibility of that location. The Horsefly Creek and Alice Creek 7 alternatives would also have available borrow, although not the wide variety of materials available on Section 35. The Paymaster/First Gulch/Shave Gulch alternative would require locating and importing borrow materials, which complicates the feasibility of that alternative compared to the others.

The Alice Creek 7 location presents some unique concerns regarding implementability. This alternative would have more potential impact than the others on sensitive wetland and wildlife habitat areas, as well as more potential impact on recreational opportunities, since Alice Creek is a very popular recreational corridor. This location is also in a designated grizzly bear recovery area.

One advantage of the Paymaster/First Gulch/Shave Gulch alternative is land ownership, since those locations are already owned or managed by either the Forest Service or the Custodial Trust, which would cooperate in providing access to its property for cleanup. The other three

locations are all privately owned, and the Repository Siting Study identifies the uncertainty regarding potential acquisition of access rights to those properties as the primary unknown in evaluating their feasibility.

To provide a fair basis for comparison, all three privately-owned properties were assumed to have similar implementability with respect to acquisition/access. Prior to publicly releasing the Repository Siting Study, the agencies obtained options to acquire the interests of the current owners of the alternative recommended in the Study, Section 35. If one of the other privately owned properties were to become the preferred alternative, the issue of access rights to that property would need to be resolved at that time.

b. State Acceptance

Also included in implementability is consideration of state acceptance of the proposed decision. For this decision, the State is in the role of support agency under CERCLA and the NCP, and state acceptance of the proposed action is to be considered in the decision along with community acceptance. The Montana Department of Environmental Quality has expressed its full support for the selection of Section 35 as the repository location, as described in a concurrence letter from Richard H. Opper, Director of DEQ, which is attached as Appendix A.

c. Community Acceptance and Consideration of Public Comments

To help evaluate community acceptance of the alternatives, the Repository Siting Study was issued for public comment. Several public involvement activities were conducted by the agencies, including numerous site tours, an open house, a public hearing for accepting verbal comments, as well as other meetings, press releases, and news articles. These activities are summarized in Section II.E above. The agency responses to the substantive comments are set forth in Appendix C, Public Comments and Responses.

While there were a number of comments that opposed use of Section 35 as a repository, there were also some comments that supported or recognized Section 35 as the most protective location for a repository. To the extent those opposing Section 35 favored another alternative, most advocated leaving or sealing the wastes in place. The approach of leaving, treating, or sealing the wastes in place was evaluated extensively in the 2006-2007 EE/CA process and was rejected in the 2007 Action Memorandum, after consideration of over 1900 public comments, most of which strongly opposed leaving the wastes in place. That alternative cannot meet the goal of stopping metals releases into the Blackfoot River system and poses a high risk of a future impoundment failure. Some of the comments opposing Section 35 supported using a repository like the Paymaster within the mining area. The technical problems with the Paymaster and similar locations within the mining area are discussed in Section III.A.1 above and in the Repository Siting Study.

Some of the concerns of adjacent landowners and community members were identified well before the Repository Siting Study was performed. As a result of that input, Pioneer, the engineering firm that prepared the Repository Siting Study, was tasked with conducting another broad-based search for potential new repository locations. The Repository Siting Study resulted in the identification of several potential repository alternatives not previously considered. The agencies also tasked the Pioneer with refining the prospects for a potential alternative on the east side of the Continental Divide, as requested by community members. These alternatives are no more effective than Section 35, but cost considerably more. It is also likely that, if any of them were to be highlighted as a likely repository area, that identification would trigger similar

concerns about the new location as those expressed by commenters opposing the use of Section 35.

The concerns expressed by neighboring landowners and some members of the Lincoln community about the potential impacts of utilizing Section 35 as a repository are documented in Appendix C, Public Comments and Responses. These issues include the temporary inconvenience/delays/potential safety concerns that would result from the increased use of the highway by haul trucks, and additional noise and dust from construction activities. While a number of comments addressed these impacts specifically with respect to Section 35, other comments recognized that many of the issues were common to all of the repository alternatives, because of the need to haul in clean borrow even if the repository is located within the mining area. As discussed in Appendix C, Public Comments and Responses, the agencies will implement mitigation measures to reduce the impact to the citizens of the Blackfoot Valley. Mitigation measures will include, for example, ensuring that dust does not blow from the trucks or the repository, and avoiding unnecessary impacts on traffic flow.

Some comments expressed concern about the potential negative impacts to the economy of Lincoln, including truck traffic during construction affecting highway travel. While construction activities routinely impact Montana's highways in the summer, the agencies understand the need to minimize impacts to recreational and commercial travel. As noted in Section XII of Appendix C, Public Comments and Responses, the maximum likely delay to a vehicle travelling on Highway 200 to Lincoln is approximately 4 minutes, with the average delay much shorter, which is not going to cause traffic to avoid or detour around Lincoln. Moreover, a project of this magnitude will also have some positive economic impacts to the Lincoln community. See Section XII of Appendix C, Public Comments and Responses.

Some nearby landowners also believed that the siting of a major waste repository adjacent to their property would lead to a decline in their property values, reduce their use and enjoyment of their property, and make their property difficult to sell. As discussed in Section X of Appendix C, Public Comments and Responses, the property value studies identified by the agencies indicate that the placement of a repository as contemplated here will not cause a significant loss in property value to adjacent property owners. In addition to the substantial buffer zone afforded by the size of the Section 35 parcel, the agencies intend to blend the repository into the landscape. The repository will be capped and revegetated with native vegetation, and the trees and contours of Section 35 will provide a further visual buffer from most adjacent areas, as well as the highway. Mitigation measures will be implemented to ensure that no dust blows from the trucks or the repository onto adjacent properties. DEQ is setting aside funds for the long-term maintenance of the repository to help ensure that it poses no risk to the adjacent property owners. These issues are discussed in more detail in Section X of Appendix C, Public Comments and Responses.

There is some strong opposition to selection of Section 35 in the community, particularly from neighboring landowners. However, other important considerations weigh in favor of selecting Section 35 as the repository location, including state acceptance of this preferred alternative, the many comments in the prior EE/CA comment period strongly opposing leaving the wastes in place, and the advantages of Section 35 in terms of effectiveness and cost. An important consideration in balancing these competing interests is that the concerns identified by most of the objectors relate to temporary impacts of the work, while the location where the mine wastes are to be placed is permanent. The additional level of protectiveness that can be achieved at

the selected location will have continuing, permanent benefits long after the temporary impacts have passed.

3. Cost

Cost estimates for each alternative were prepared by Pioneer using standard engineering and cost estimating practices, and included consideration of actual costs incurred on similar reclamation/remediation projects in Montana. The cost for each of the repository alternatives, with the exception of Shave Gulch, is included on page 66 of the Repository Siting Study, with detailed cost breakdowns in Appendix C of the Repository Siting Study, and a summary comparison of costs for the final alternatives evaluation presented in Section 5.3 of the Repository Siting Study. Costs for a Shave Gulch repository would be similar to the Paymaster, since it has similar geochemical and geotechnical characteristics and is a similar distance from the Mike Horse dam.

The cost variability between the repository locations is significantly affected by the haul distance from the Mike Horse area to the repository location, the availability of clean borrow material for reclamation and restoration of the removal areas, and whether or not a repository liner is needed. Costs considered in the Repository Siting Study included only those costs that would vary depending on the repository selected, such as repository preparation and construction, waste haul and placement, land acquisition, and borrow excavation and hauling costs. Costs that would not vary based on the repository location (such as design, mobilization, excavation of the waste, placement of clean fill, reclamation of the excavated area and stream banks, etc.) are not included in the Repository Siting Study cost estimates, because they would be consistent across all the alternatives considered.

The Section 35 repository location is 8.5 miles from the Mike Horse dam. While farther than some other repository locations, the overall costs for this alternative, estimated at \$9,883,271, are lower. The Alice Creek location has a shorter haul distance, but the anticipated need for a synthetic bottom liner and other factors result in higher costs, estimated at \$11,647,816. The Horsefly Creek location, with a cost estimate of \$11,790,733, is more expensive than Section 35, primarily due to the longer haul and more extensive road improvements needed. The Paymaster, First Gulch, and Shave Gulch locations are the closest, but due to the technical difficulties and the need to construct more than one repository, they are the most costly locations. The estimated costs for the Paymaster, which can hold only a portion of the wastes, is between \$11,182,943 and \$12,987,036 depending on which design option is used. Another repository would be needed for the remaining waste volume. The estimated costs for the Paymaster together with another location, as needed to hold the estimated total volume required, is \$15,237,461 (Repository Siting Study, Paymaster/First Gulch combination, page 66).

C. Additional Considerations

1. Sensitive Environments

The Blackfoot River is a native bull trout and westslope cutthroat trout fishery. Nora Creek, which bisects the Section 35 property, flows into Willow Creek which flows into the Blackfoot River. The Blackfoot River crosses the northwest portion of the Section 35 property. The Forest Service has been in informal consultation with the U.S. Fish and Wildlife Service regarding this

Amendment to the Action Memorandum. All Applicable or Relevant and Appropriate Requirements (ARARs) will be applied to the project during planning and design to minimize potential for impacts to threatened and endangered species.

2. Short-Term Impacts

Short-term impacts of the project were discussed in the 2007 Action Memorandum on pages 19-20, including impacts as a result of increased vehicle traffic in the area and on the highways, including delays for travelers. Short-term impacts are expected along approximately 5 miles of Highway 200 and one mile of Highway 279 to the Section 35 repository as a result of haul truck traffic, as well as the sights and sounds of construction activities. The period of greatest impact would be the approximately 100 construction days per year (summer) for approximately four construction seasons once construction activities commence.

The project can also be expected to provide some short-term economic benefits to the Lincoln area due to the commercial activity generated by a construction project of this scale as well as potential seasonal employment for skilled construction workers and unskilled laborers. See Section XII, Lincoln Area Economy, of Appendix C, Public Comments and Responses.

Should a different repository alternative be developed, the short-term impacts would not be eliminated, since all the alternatives involve significant highway use and some temporary noise and inconvenience impacts to neighboring landowners.

3. Contribution to Remedial Performance

Under CERCLA and the NCP, removal actions are required, to the extent practicable, to contribute to the efficient performance of any anticipated long-term remedial action. See 42 USC § 9604(a)(2); 40 CFR § 300.415(d). This removal action is to be followed by a remedial action for the UBMC, in accordance with the WRA. This amendment for a different repository location will improve remedial performance at the site over the 2007 Action Memorandum because it would provide the best performing facility with available capacity for all of the wastes of the UBMC. It will also provide the most cost-effective solution to ensure, to the extent possible, that the settlement funds are available for the entire site cleanup and restoration.

4. Description of Alternative Technologies

Alternative technologies investigated for this site are discussed on pages 20-21 of the 2007 Action Memorandum. A comprehensive summary of previous efforts and references to those efforts is found in the Repository Siting Study on page 6. Additional discussion of treatment options vs. disposal options is found in Section V of the Responsiveness Summary.

5. EE/CA

An EE/CA was originally prepared for this project that included the details of site characteristics and developed alternatives (2007 EE/CA). The September 2011 Repository Siting Study and its associated technical documents supplement the EE/CA and, with the rest of the administrative record, are the basis for this Amendment to the 2007 Action Memorandum.

6. Applicable or Relevant and Appropriate Requirements (ARARs)

In determining a repository location, the ARARs that must be considered consist primarily of location-specific ARARs. Location-specific ARARs for this determination include the following types of requirements:

- i. A repository may not be located in a floodplain or a wetland.
- ii. A repository may not be located in a seismic impact area, in an area with unstable soils or geology, or within 200 feet of a fault that had displacement in Holocene time.
- iii. Adequate separation of the wastes from groundwater and surface water is required.
- iv. A final decision on the location must consider impacts to threatened or endangered species and historical or archaeological resources, as well as the presence of any burial sites or human skeletal remains.

A table of location-specific ARARs for evaluation of repository locations for the UBMC is attached as Appendix B. These ARARs will require that certain portions of Section 35 be avoided, including wetland areas, surface waters such as the Blackfoot River and Nora Creek, and areas with shallow groundwater. However, compliance with these ARARs can and will be attained by placing the repository in an appropriate location on Section 35.

Contaminant-specific and action-specific ARARs will also apply to this action. However, these types of ARARs do not dictate the location of the repository as much as the manner in which the action is conducted. These requirements will be met through appropriate design and construction of the repository and implementation of the action.

Under Section 121(e) of CERCLA, 42 USC § 9621(e), no federal, state, or local permit shall be required for the portion of any removal or remedial action that is conducted entirely on-site. The definition of the term "on-site" is discussed in detail in Section III.A of Appendix C, Public Comments and Responses. Section 35, as well as several of the other locations considered, are "on-site" for the purposes of this action. Although no federal, state, or local permit will be required, the substantive requirements of any otherwise applicable permit laws will be met through the application of ARARs to the action.

7. Overall Costs

The total estimated cost for the portions of the project that are covered in this amendment is \$9,883,271.00. See Repository Siting Study, Appendix C, Table C.5. The Repository Siting Study costs do not directly compare to the costs evaluated in the EE/CA for several reasons: unit costs have changed since 2007, only a portion of the overall project costs are considered in the Repository Siting Study, the EE/CA costs considered only waste volumes from NFS lands, and detailed investigations determined that the impoundment has more volume than estimated in 2007. (Spectrum, 2010). In any event, costs for the overall action are justified, since removal of the Mike Horse dam and impounded tailings, as selected in the 2007 Action Memorandum and as amended hereby, remains the agencies' first priority for use of the ASARCO bankruptcy settlement funds under the WRA for the UBMC cleanup. Utilizing a repository at Section 35 is the most cost-effective feasible alternative for accomplishing that critical goal. In addition, these costs are significantly lower than the costs of dealing with another catastrophic failure of the Mike Horse dam.

8. References

Hydrometrics, 2007, Final EE/CA for the Mike Horse Dam and Impounded Tailings, Lower Mike Horse Creek, Beartrap Creek and Upper Blackfoot River Floodplain Removal Areas, Upper Blackfoot Mining Complex, Lewis and Clark County, Montana, prepared for USDA Forest Service and ASARCO LLC, June 2007.

Pioneer Technical Services, Inc., 2011, Repository Siting Study, Upper Blackfoot Mining Complex, prepared for Montana Department of Environmental Quality and Helena National Forest, September 20, 2011.

Spectrum Engineering, 2010, Mike Horse Impoundment and Floodplain 2009 Investigation Report on Tailings Handling, Impoundment Dewatering, Floodplain Test Pits Geotechnical and Geochemical Properties of Tailings and Alluvium, prepared for Montana Department of Environmental Quality, September 24, 2010.

Spectrum and Terragraphics, 2010, Upper Blackfoot Mining Complex Preliminary Design Report, February 2010.

Terragraphics, 2010a, Final Data Summary Report, Section 35 Upper Blackfoot Mining Complex, prepared for Montana Department of Environmental Quality, November 18, 2010.

Terragraphics, 2010b, Final Paymaster/Shave Data Summary Report Upper Blackfoot Mining Complex, prepared for Montana Department of Environmental Quality, November 22, 2010.

Terragraphics, 2011, Final Data Summary Report Addendum, Section 35 Upper Blackfoot Mining Complex, prepared for Montana Department of Environmental Quality. April 14, 2011.

USDA Forest Service, 2005, Evaluation of the Mike Horse Dam, A Report Prepared for the USDA Forest Service by Stephen Romero, USFS Missoula, January 2005.

USDA Forest Service, 2007, Action Memorandum for the Removal Action for the Mike Horse Dam and Impounded Tailings, Lower Mike Horse Creek, Beartrap Creek and Upper Blackfoot River Floodplain Removal Areas, Upper Blackfoot Mining Complex, Helena National Forest, Lincoln Ranger District, Lewis and Clark County, Montana, July 2007.

USDA Forest Service Northern Region and State of Montana, 2008, Watershed Restoration Agreement Between the State of Montana and the United States Department of Agriculture Forest Service Northern Region for the Cleanup of the National Forest System Portion of the Upper Blackfoot Mining Complex Site, April 2008.

V. THREATS TO PUBLIC HEALTH OR WELFARE AND THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Due to the concentrations of metals in waste and water sources, conditions at the site continue to meet the criteria for initiating a Response Action under CERCLA, 42 U.S.C. § 9604, and the National Contingency Plan (NCP), 40 CFR § 300.415(b)(2), there continues to be a threat of release and continued release of heavy metals to people and surrounding lands, surface water

and groundwater at the UBMC Site. This situation has not changed since issuing the EE/CA and 2007 Action Memorandum. See 2007 Action Memorandum, pages 10-13.

The Forest Service is using its authority under CERCLA to identify suitable locations on other than NFS lands for a repository for placement of wastes, and for directly removing wastes from NFS lands.

VI. ENDANGERMENT DETERMINATION


Actual or threatened releases of hazardous substances from this site remain the same as when the 2007 Action Memorandum was adopted. These threats, if not addressed by implementing the Removal Action selected in the 2007 Action Memorandum as modified by this Amendment, may present an imminent and substantial endangerment to human health and the environment.

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If no action is taken to remove, stabilize and isolate the wastes from the public, surface and groundwater, and the environment, then the upper Blackfoot River and localized areas will continue to be degraded and present a risk to human and ecological receptors. Without action, another failure of the Mike Horse dam and major release of tailings into the Blackfoot River can be expected.

VIII. RECOMMENDATION

This Amendment identifies, describes, and explains the need to modify the 2007 Action Memorandum for the removal and disposal of the Mike Horse dam and impounded tailings, and wastes in lower Mike Horse Creek, Beartrap Creek, and the Upper Blackfoot River on NFS lands within the UBMC Site. This amendment selects Section 35 as the preferred repository location because it is the alternative that is most protective of public health and the environment, and it is cost-effective. This amendment was developed in accordance with CERCLA, as amended, and is consistent with the National Contingency Plan. This decision is based on the administrative record for this removal action. Conditions at the site meet the National Contingency Plan criteria for a removal, 40 CFR § 300.415(b)(2), and I recommend your approval of this amendment.

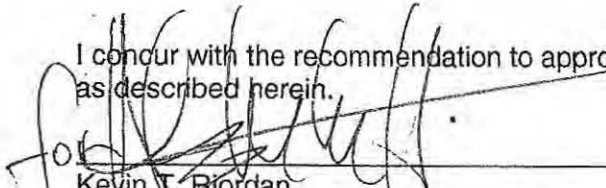


Bethany A. Ihle
On-Scene Coordinator, Forest Service

7/5/2012

Date

I concur with the recommendation to approve this amendment to the 2007 Action Memorandum as described herein.

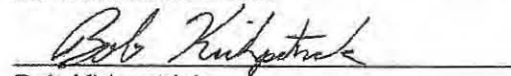


Kevin T. Riordan
Forest Supervisor, Helena National Forest

7/5/2012

Date

I concur with the recommendation to approve this amendment to the 2007 Action Memorandum as described herein.

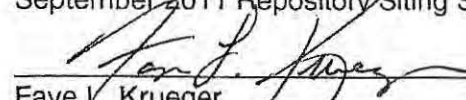


Bob Kirkpatrick
CERCLA Coordinator, Northern Region

7/6/2012

Date

I approve this amendment to the 2007 Action Memorandum, as described herein and as supported by the administrative record, including the supplemental information provided in the September 2011 Repository Siting Study.



Faye L. Krueger
Regional Forester, Northern Region

7/6/2012

Date

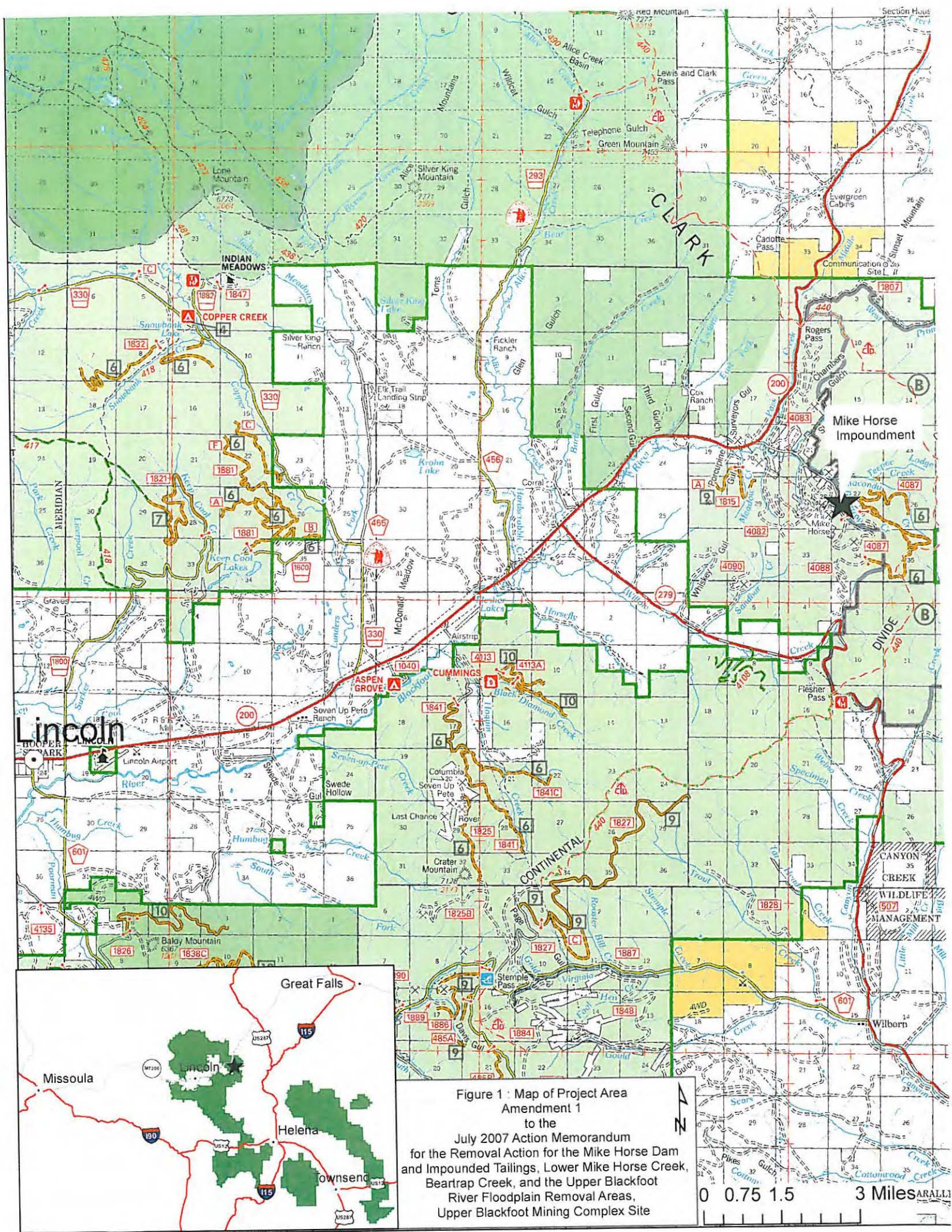
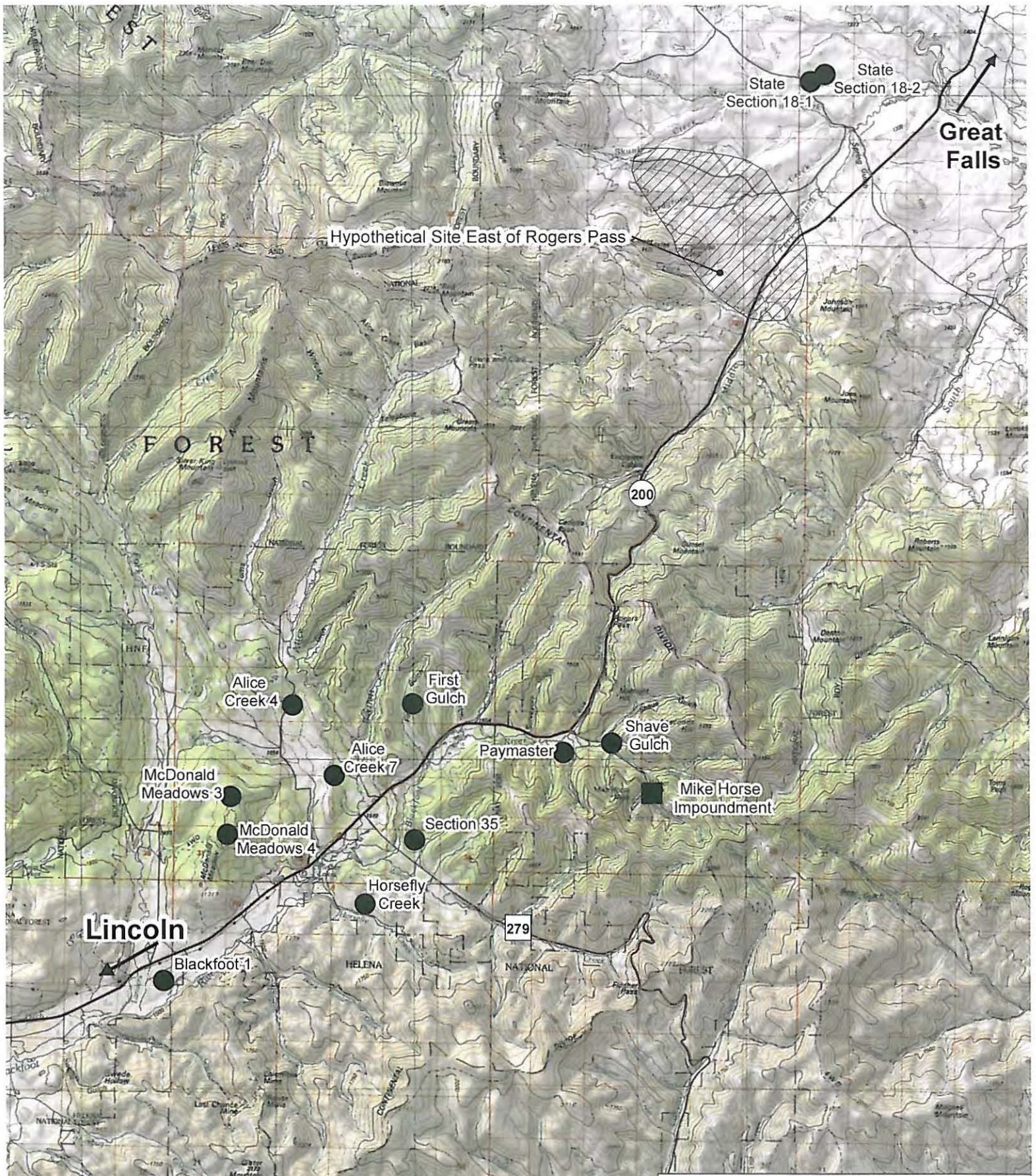


Figure 1 : Map of Project Area Amendment 1 to the July 2007 Action Memorandum for the Removal Action for the Mike Horse Dam and Impounded Tailings, Lower Mike Horse Creek, Beartrap Creek, and the Upper Blackfoot River Floodplain Removal Areas, Upper Blackfoot Mining Complex Site

0 0.75 1.5 3 Miles



Legend

- Mike Horse Impoundment
- Repository Sites
- Repository Area

0 0.5 1 2 Miles

Figure 2 : Map of Repository Areas Amendment 1 to the July 2007 Action Memorandum for the Removal Action for the Mike Horse Dam and Impounded Tailings, Lower Mike Horse Creek, Beartrap Creek, and the Upper Blackfoot River Floodplain Removal Areas, Upper Blackfoot Mining Complex Site

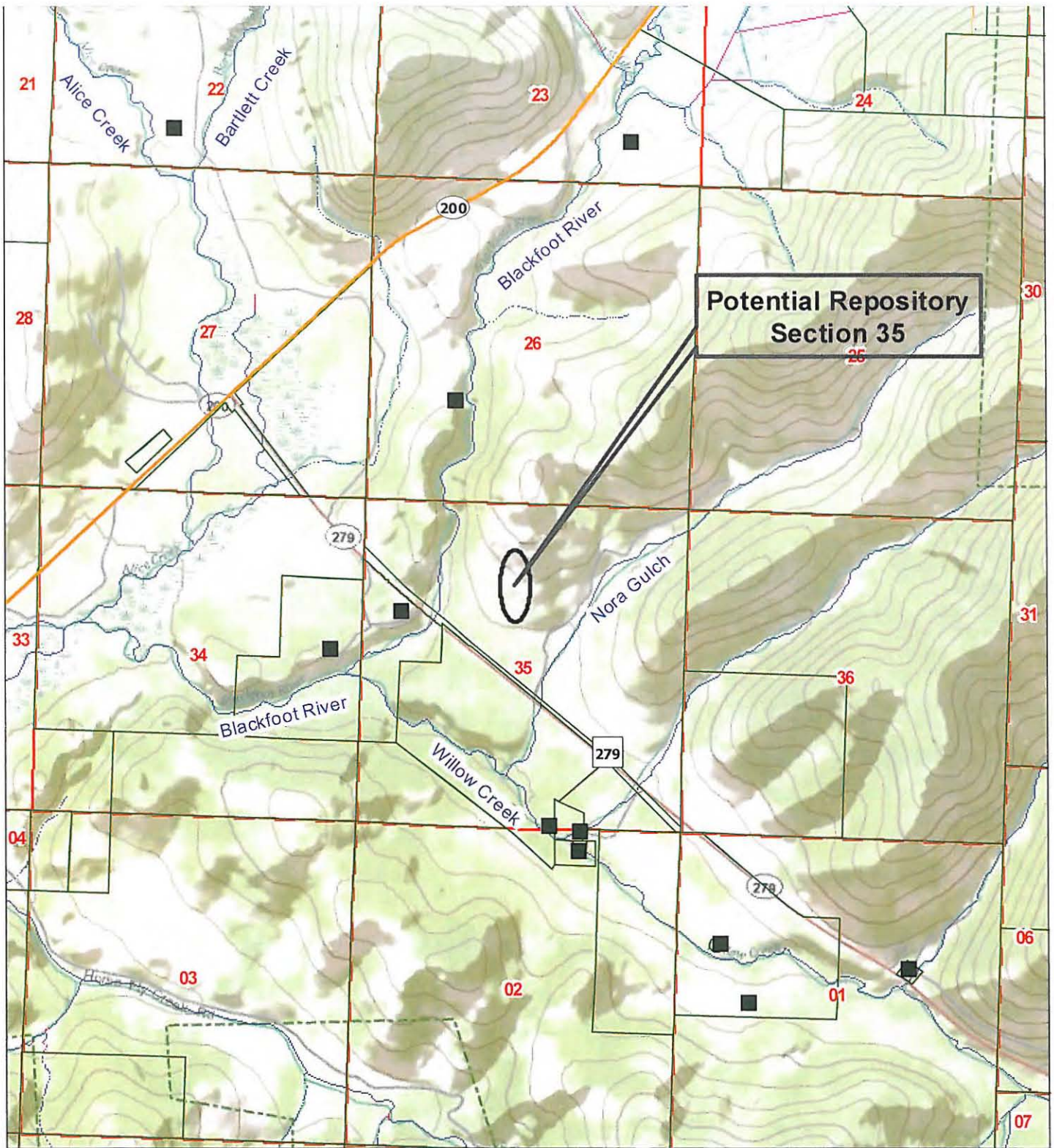


Figure 3: Area Residences

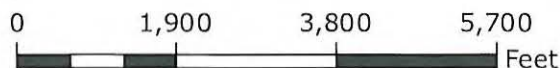
Within 2 Miles of a Potential Repository Location on Section 35

- Residence (includes both full- and part-time residences)
- Locations of the residences are approximate

Montana Department of Environmental Quality created this map as a general representation of information gathered from Cadastral data, aerial photos, and the Repository Siting Study.
June 2012



Actual location and size of the repository will be determined after design-level investigations are complete



1 inch = 2,286 feet