3.4 CULTURAL RESOURCES

This section of the EIS addresses the potential effects of the proposed project on cultural resources within the project area.

The scope of this project necessitates a phased approach to the National Historic Preservation Act (NHPA) Section 106 regulations. Various factors, including federal, state and private land ownership in two states, numerous alternatives and complex cultural resource issues preclude obtaining complete information on all the routes in the DEIS. Consequently, a Programmatic Agreement (PA) is being developed in consultation with the ACHP, MT SHPO, ID SHPO, other agencies, Tribes and interested parties. The PA allows a tiered process for the identification of cultural resources, evaluation of those resources for inclusion into the NRHP as historic properties, determination of the effects of the project on the historic properties, treatment of eligible properties, alternatives for preservation / protection or mitigation for those properties that may be adversely affected by the proposed project. The PA stipulations define the involvement and responsibilities of key agencies, signatories, and consulting parties throughout this process and provide the mechanism to fulfill the agency obligations under the NHPA.

The cultural resource chapter takes a broad perspective on the potential for cultural resource impacts in the project area. This chapter documents limited information on known cultural resources and proposes a model approach to predicting potential impacts but is not intended to suffice for Section 106 compliance. The PA allows for completion of Section 106 compliance to the appropriate level, (usually 100% survey coverage) by conducting the field inventory, cultural resource site recordation and evaluation, National Register site evaluation and effect determinations on the Preferred Alternative only. The PA allows the project to move forward under the NEPA process, assuming adequate recognition of National Register eligible sites (historic properties) and the disclosure of potential project impacts to those sites. This Section 106 public involvement process, through the PA, will result in the final determinations of project effects to historic properties. Resolution of any adverse effects will be outlined in a historic properties treatment plan to be developed as part of the PA.

In order to comply with NEPA, the analysis of effects to cultural resources is based on the known cultural resources and the assumption that unevaluated sites are potentially eligible for the National Register. Each alternative is compared by the number of sites that would be impacted by the project. Until the Preferred Alternative is identified and 100% surveys are conducted the predicted impacts are limited to comparing the potential extent of cultural resource impacts by alternative.
For purposes of the analysis presented in this chapter, potential physical impacts to cultural resources were evaluated within a 1 mile study corridor (0.5 mile either side of centerline) Potential visual impacts to cultural resources were evaluated within an 8 mile study corridor (four miles either side of centerline).

The cultural resource section begins with a discussion of the project background, including, among other topics, the geographic and environmental setting, the regional cultural history, and the regulatory setting for the project area. This is followed by a discussion of data collection methods and results, including an evaluation of the relative impacts of the alternatives within each of 6 analysis zones. The final section of the report discusses mitigation measures that have been proposed to reduce impacts to cultural resources.

3.4.1 Project Geography and Environment

The proposed project traverses federal, state and private lands in Idaho and Montana. The project begins at the proposed new Townsend substation, which is located approximately five miles south of Townsend, Montana, and generally proceeds south into Idaho, connecting with the Midpoint substation located

approximately 10 miles northeast of Jerome, Idaho. For analysis purposes, the study area is divided into six zones, each of which contains one or more proposed alternatives (Figure 2-1).

3.4.1.1 Montana

The Montana portion of the study area lies within the Northern Rocky Mountain Physiographic province (Hunt 1967) and crosses through four ecoregions from north to south: the Townsend Basin, the Elkhorn Mountains-Boulder Batholith, the Dry Intermontane Sagebrush Valleys, and the Red Rock River Valley (ftp://ftp.epa.gov/wed/ecoregions/mt/mt_front_1.pdf).

The Missouri River is the dominant drainage within the Townsend Basin. The soils in this region are generally alluvial silts and sands developed in basin fill. The Elkhorn Mountains-Boulder Batholith ecoregion's topography is characterized by the Pipestone District. This district is composed of volcanic granite and sedimentary rock outcrops (Alt and Hyndman 1986). These outcrops contrast sharply with the surrounding rolling hills and the broad road river valleys. This region is bounded to the north by a series of mountain ranges including the Elkhorn Range and the Boulder Range.

The Montana portion of the study area lies within the Northern Rocky Mountain Physiographic province (Hunt 1967). The Red Rock River Valley and Jefferson Valley encompass the majority of the Montana portion of the project area. The Red Rock River Valley and Jefferson Valley cross through three Level IV ecoregions from north to south: the Townsend Basin, the Elkhorn Mountains-Boulder Batholith, and the Dry Intermontane Sagebrush Valleys (Woods, *et al.* 2002). These three ecoregions within the Jefferson and Red Rock River Valleys are characterized by the following topographic and geologic features.

The study area continues south into the Red Rock River Valley, which encompasses the Jefferson Valley, with the Tendoy Range to the west and low rolling hills to the east. This valley's deposits consist largely of tertiary fill which was deposited between about 40 and 30 million years ago (Alt and Hyndman 1972). Between Clark Canyon Dam and Monida Pass there are deep Beaverhead gravel deposits that form rounded hills covered with short grasses (Alt and Hyndman 1986).

The Beaverhead River Valley is the dominant topographic feature of the Dry Intermontane Sagebrush Valley Region. This valley trends northeast/southwest and is composed of tertiary basin fill which is a mixture of gravel, sand, silt, and clay deposited by rivers and streams. The Beaverhead River is part of the headwaters of the Missouri River and has incised a 190 meter deep canyon across the Blacktail Range. To the west of the Beaverhead Valley is the Pioneer Mountain Range. This range is composed of folded Precambrian sedimentary rocks near the center and Paleozoic and Mesozoic sedimentary rocks near the flanks (Alt and Hyndman 1972).

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3.4.1.2 Idaho

The Idaho segment of the study area is contained within the Snake River Plain Physiographic Region as described by Hunt (1967). The Snake River plain was created by volcanism and shaped by hydrology. The bedrock is a combination of basaltic lava fields and rhyolite domes deposited between 17 million and 2,000 years ago.

The Idaho segment of the study area is contained within the Snake River Plain Physiographic Region as described by Hunt (1967). The Snake River Canyon was created by a complex series of volcanic events fueled by the movement of volcanic hotspots across that portion of the continent. The bedrock is a combination of basaltic lava fields and rhyolite domes deposited between 17 million and 2,000 years ago (Green and Currey 1988). The Snake River itself is a product of mountain building in the uplifted Rocky Mountain Region. The bedrock geology of the Snake River plain is mostly Miocene epoch extrusive volcanic basalt and rhyolite. This region has been sporadically impacted by an active geothermal "hotspot." Over the last 11 million years this hotspot has slowly migrated northeast across the Snake River Plain to its current center in the Yellowstone Caldera. This hotspot has resulted in the formation of numerous volcanic features. These include; Hells Half Acre Lava Field, Cerro Grande Lava Field, North and South Robbers Lava Field, the Great Rift, Kings Bowl Lava Field, and Craters of the Moon Lava Field.

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At the southern end of the Bitterroot Mountain Range the Continental Divide and Idaho-Montana border follow the crests of the Beaverhead/Tendoy Mountains and the Centennial Mountain Range. The Centennial Mountain Range is one of few ranges in the Rocky Mountains that trend east-west. Monida Pass crosses north to the south between the eastern end of the Beaverhead/Tendoy Mountains and the western end of the Centennial Mountain Range. The MSTI alternatives are confined within Monida Pass.

From Monida Pass, the project area passes through Pleasant Valley and follows Beaver Creek and Beaver Canyon south onto the Snake River Plain. This high plain is a broad topographic depression which extends east-west in an arc across southern Idaho. It is characterized by low hills and plains with intermittent alluvial valleys composed of shallow silts and sands. The vegetation is a sagebrush steppe consisting of grasses, cacti, and various sagebrush species. The Snake River meanders approximately 400 miles from Yellowstone National Park in Wyoming west across the southern edge of the Snake River plain before turning north to its eventual confluence with the Columbia River

3.4.1.3 Vegetation within the Study Corridor

The vegetation along the proposed MSTI study corridor varies greatly. In the Montana portion, the alternatives are concentrated in low grasslands surrounded by mid-seral stage forests in the surrounding hills. These forests are subalpine at high elevations along the Continental Divide and xeric montane at lower elevations. Subalpine forests are characterized by lodgepole pine (*Pinus contorta*), with occasional whitebark pine (*Pinus albicaulis*) and subalpine fir (*Abies lasiocarpa*). Xeric montane forests are primarily made up of Douglas fir (*Pseudotsuga menzeii*) with thinner ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*) and western larch (*Larix occidentalis*). Most of the Snake River Plain is dominated by sagebrush steppe (Chatters 1998:36-37).

Most of the Snake River Plain is dominated by shadscale and sagebrush steppes. These vegetative communities are present at lower elevations and have relatively low biodiversity. These communities are dominated by sagebrush (*Artemesia spp.*) and shadscale (*Atriplex spp.*) other common vegetation includes rabbitbrush (*Chrysothamnus spp.*), mountain mahogany (*Cercocarpus spp*). The Snake River Plain itself

has almost no naturally forested areas, but the surrounding hills may contain juniper woodland or woodland forest ecotones (Henrikson *et al.* 2009:2 and INL 2005:14).

3.4.1.4 Prehistoric Environment

The Pleistocene epoch was a time of cool and wet environment. During this time glaciers dominated the high elevations and lower elevations were scattered with pluvial lakes. Between the end of the Pleistocene and the middle of the Holocene, the environment was significantly wetter. This led to a series of pluvial lakes with access to diverse resources. The prevalence of resources along the boundaries of these prehistoric lakes has led archaeologists to suggest a form of tethered nomadism with the resource-rich lakes at the center.

Human occupation in the study area begins during the Anathermal Environmental Period. The Anathermal Period (12,700 to 9500 BP) begins at the end of the Pleistocene and coincides with a shift in the earth's axis causing increased seasonality in the northern hemisphere (Pastor, et. al: 2000:417). The Anathermal was dry from 12,700 to 11,000 BP. From 12,000 to 11,000 BP there was a severe drought known as the Clovis Drought (Haynes 1990). From 11,000 to 9500 BP the climate was wetter and cooler. The cooler and wetter climate became warm and dry again around 9500 BP. This marks the beginning of the Altithermal Period (9500 to 5800 BP). The Altithermal exhibits a drying trend with increased maximum temperature and seasonality. In the middle of the Altithermal, around 7300 BP, the climate once again became very dry until 6400 BP. During the Altithermal, summers averaged 2 degrees Celsius warmer and winters were cooler than today (COHMAP Members 1988). The Altithermal led into the Neoglacial Period (5800 to 2500). During the Neoglacial Period the climate became cooler. The Neoglacial Period began with very dry climatic conditions and moisture increased throughout the period. Mid-Neoglacial stratigraphy shows large clast sizes in alluvial a sediments, suggesting high volume water flow. This trend of increasing moisture continues into the beginning of the Medithermal Period (2500 BP to present), the modern climate, which is marked by comparatively short wet and dry cycles and environmental instability. (COHMAP Members 1988, Thompson and Pastor 1995)

3.4.2 Regional Culture History

The following discussion is not intended to be a comprehensive history of all archaeological work that has been conducted in the study area. It is intended to provide a contextual framework with which sites can be analyzed and compared. Examination of the known culture history of the MSTI study area can assist in assessing the type of cultural resources that may be encountered and provides a context with which to assess the significance and temporal relationships of these resources.

3.4.2.1 Prehistory

The study corridor transects an area of archaeological transition. The archaeology of the Montana segment is a combination of the Eastern Columbia Plateau (Walker 1998) and the Northern Plains. South of the Continental Divide in Idaho, the archaeology most closely resembles that of the Northern Great Basin, but shows strong influence from both the Northern Plains and the Eastern Columbia Plateau (D'Azavedo 1986).

Cultural chronologies often have significant differences and should be applied with caution. Each has advantages and shortfalls. The chronologies displayed below for western Montana show a great deal of continuity (Figure 3.4-1). Various other chronologies are in use by a variety of organizations. Many of these rely on the projectile point typology for the northwestern Plains suggested by Frison (1991). Even though the technologies are similar, this model is not utilized for the MSTI study area, because the Montana segment of the study corridor is in the Eastern Columbia Plateau culture area. Southwestern

Montana chronologies are indicated below and outline the Foor (1994) and Roll and Hackenberger (1998) models. They are very similar but the increased specificity within the Middle Prehistoric Period of the Foor model allows for continuity in the Columbia Plateau while acknowledging the technological divisions of the Northwestern Plains typology.

The Snake River Plain exhibits more confusion in cultural chronologies than most areas. Idaho National Laboratory (INL) uses a Snake River Plain chronology that is technologically based, focusing on lithic tool types and their associated hunting practices (INL 2005). This chronology is adapted from the model suggested by Ringe *et al.* (1988). The advantage of this chronology is that it exhibits continuity with those immediately to the north in Montana. The disadvantage is that it is more discontinuous with models of Great Basin prehistory. The discussion below relies more heavily on the more recent model created by Plew (2008). This model is an adaptation of the chronology suggested by B. Robert Butler (1978). The Plew model has two advantages; it is based on an adaptive strategy model that includes changes in environment, subsistence practices and technology rather than technology alone, and it allows for the division of components into units that are more meaningful in a holistic analysis. Plew also uses terminology comparable to other regions of the Great Basin.

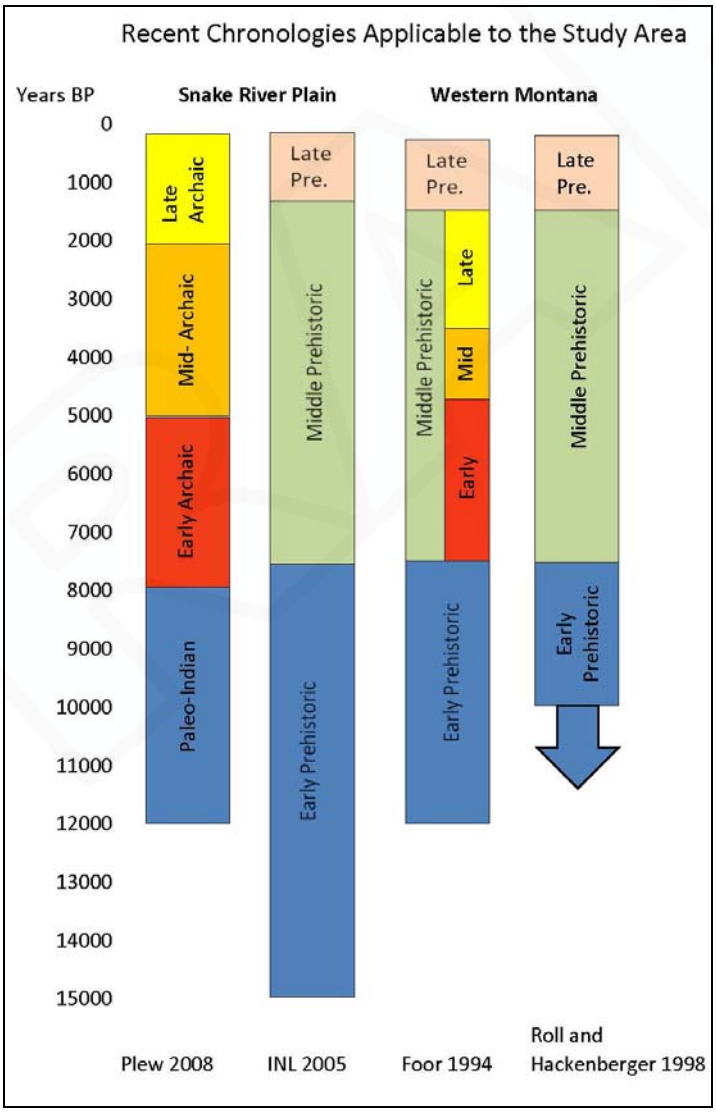

Figure 3.4-1. Recent Cultural Chronologies of the Study Area

Both western Montana models shown in Figure 3.4-1 are more similar to the INL Snake River Plain model rather than the Plew model this cultural overview concentrates on. The Plew model terminology more closely represents that utilized by the Archaeological Survey of Idaho. Although there is some variation in dates, a rough correlation can be made between the two models by suggesting that the Plew Paleo-Indian Period and the INL Early Prehistoric Periods are essentially the same. The Middle Prehistoric of INL can be said to contain both the Early and Mid-Archaic Periods of Plew and the Late Prehistoric Period of INL can be correlated to the Late Archaic of Plew.

3.4.2.2 Paleo-Indian/Early Prehistoric Period

This period coincides with the end of the Pleistocene epoch. The two major characteristics of the Paleo-Indian/Early Prehistoric Periods are the use of large, finely-crafted projectile points and a subsistence system based on the procurement of remnant Pleistocene megafauna. The Paleo-Indian/Early Prehistoric Period is generally characterized by high residential mobility and low population density. The high mobility practiced by these populations led to a substantial reliance on faunal resources (Kelly and Todd 1988). Due to reliance on fauna and megafauna, including the now extinct mammoth, giant bison, camel, and ground sloth, the peoples of this period are seen as specialized hunters. To a lesser extent, small animal and plant resources were also procured, which Martin and Smith (1999) refer to as the Northwest Plains Pleistocene-Holocene Transition Adaptation.

In both sections of the study area the period can be separated into three distinct technological complexes; Clovis, Folsom, and Plano. Each of these group's adaptive survival strategies focused on hunting of specific animals and changes in technology are temporally associated with extinction events that would have required a shift to a new subsistence. The Paleo-Indian/Early Prehistoric peoples employed the use of sophisticated tools of stone, bone, wood, and antler. They constructed portable shelters of brush and hide (Knight 1989). The three subperiods are largely identified by their distinctive projectile points. All Paleo-Indian projectile points are thought to be spear points.

The Clovis adaptation is the earliest undisputed Paleo-Indian tradition. Clovis projectile points tend to be large, well manufactured, lanceolate in shape, and are fluted on either side to approximately one-third the length of the biface (Foor 1994; Tankersley 2002). Folsom points are similar in appearance to Clovis points but are generally smaller and have bifacial flutes that extend for two-thirds of the tools length (Tankersley 2002). Folsom points are typically associated with the remains of an extinct form of bison (*Bison antiquus*). Numerous late Paleo-Indian traditions overlap and extend beyond the Folsom Subperiod. These are generally lumped together as the Plano Complex.

The Plano occupation is the most widespread and longest lasting of these traditions. Both extinct and modern animal remains are found in association with Plano artifacts. Plano points indicate a time of technological florescence, with a variety of unnotched lanceolate and stemmed point styles becoming common. Plano Subperiod projectile point types include Hell Gap, Midland, Eden, Scottsbluff, Agate Basin, Windust, Haskett, Lake Mojave, and Parmann (Butler 1986). The Agate Basin projectile point is the most frequently identified Plano-point type in western Montana (Foor 1994). This projectile point is long and narrow with a thick, lenticular cross-section (Frison 1991).

Southwestern Montana Early Prehistoric Period
The Early Prehistoric Period lasted from before 10,000 years before present (BP) to around 7,000 BP. There are only a few stratified sites associated with the Northern Plains Paleo-Indian Period near the current study area. The Anzick site near Wilsall, Montana, is located on the Shield River. This site is identified as a Clovis Subperiod burial. The site was discovered through earth-moving activity and was

disturbed before a systematic study could be conducted (Frison 1991). Barton Gulch in Madison County, Montana, is a stratified site with one component yielding a distinctive lanceolate projectile point with a deep basal notch. The stratum this artifact was recovered in radiocarbon dates to around 8,800 BP. A deeper component yielded different lanceolate projectile points with a defined parallel-oblique flaking pattern. This stratum radiocarbon dates to 9,400 years BP (Frison 1991).

The Everson Creek/Black Canyon Creek Site complex is a series of 19 lithic procurement sites located near the Continental Divide west of Dillon, Montana (Bonnichsen, *et al.* 1992:285). Of these, Mammoth Meadow has seen the most archaeological investigation. The well-stratified Mammoth Meadow I site was excavated between 1985 and 1993. The work at Mammoth Meadow I identified 11 cultural horizons spanning from the Late Pleistocene to the Late Prehistoric. Faunal remains identified include *Bison antiquus* and mammoth (Bonnichsen, *et al.* 1992:297-316). There are several important sites exhibiting Paleo-Indian cultural materials in southwestern Montana. The Indian Creek site near Townsend, Montana contains Clovis, Folsom, and Agate Basin evidence. A Folsom site was identified at Lima Reservoir. The Barton Gulch and MacHaffie sites both contain Agate Basin Complex projectile points (Hill, *et al.* 2005:109-110).

Comment 3C; p. 3.4-7, Paragraph 1 Replacement:
The Everson Creek/Black Canyon Creek Site complex is a series of 19 lithic procurement sites located near the Continental Divide west of Dillon, Montana (Bonnichsen, *et al.* 1992:285). Of these, Mammoth Meadow has seen the most archaeological investigation. The well-stratified Mammoth Meadow I site was excavated between 1985 and 1993. The work at Mammoth Meadow I identified 11 cultural horizons spanning from the Late Pleistocene to the Late Prehistoric. Faunal remains identified include *Bison antiquus* and mammoth (Bonnichsen, *et al.* 1992:297-316). There are several important sites exhibiting Paleo-Indian cultural materials in southwestern Montana. The Indian Creek site near Townsend, Montana contains Clovis, Folsom, and Agate Basin evidence. The MacHaffie site spans a complete cultural chronology from Folsom to Middle Archaic. Another Folsom site was identified at Lima Reservoir and the Barton Gulch site contains Agate Basin Complex projectile points (Hill, *et al.* 2005:109-110).

Southern Idaho Paleo-Indian Period. The Great Basin Paleo-Indian Period lasted from 12,000 to 8,000 BP and was composed of the same three Subperiods as in Montana: Clovis, Folsom, and Plano. Evidence of the Clovis culture in Idaho was established by the discovery of the Simon Clovis Cache in Camas County. The cache included five complete Clovis points and preforms (Butler 1986:128).

The Folsom Subperiod (11,000 to 10,600 BP) is identified by two archaeological sites, the Wasden site and Wilson Butte Cave near Twin Falls, Idaho. The Wasden site is a series of three collapsed lava tubes. Only one of these tubes, Owl Cave, has seen full scale data recovery excavation. The original excavation by B. Robert Butler in 1966 produced extensive bison remains with non-diagnostic cultural materials. The site was reexamined later by Susanne Miller who identified three Folsom point fragments were uncovered with associated “elephant,” bison and camel remains (Butler 1986). The site was also found to have a Plano component (see below). Wilson Butte Cave had evidence of human occupation dating as far back as 10,800 BP. The artifacts uncovered include projectile points, stone tools, knives, bone, and datable charcoal materials (Butler 1986:128).
The Folsom Subperiod (11,000 to 10,600 BP) is identified by two archaeological sites, the Wasden site and Wilson Butte Cave near Twin Falls, Idaho. The Wasden site is a series of three collapsed lava tubes. Only one of these tubes, Owl Cave, has seen full scale data recovery excavation. The original excavation by B. Robert Butler in 1966 produced extensive bison remains with non-diagnostic cultural materials. The site was reexamined later by Susanne Miller, who recovered four fluted projectile point fragments associated with “elephant,” bison, and camel remains (Butler 1986). Based on the brief identification of fluting and spatial association with an occupation period within the culture-historical sequence established for the two published layers at Owl Cave, these points were assumed to be Folsom (Idaho Museum of

Natural History ND). Due to a lack of funding and time, in-depth lithic analyses were not conducted. The Wasden site was also found to have a Plano component (see below). Wilson Butte Cave had evidence of human occupation dating as far back as 10,800 BP. The artifacts uncovered include projectile points, stone tools, knives, bone, and datable charcoal materials (Butler 1986:128).

The Plano stone tool technology (10,600 to 8,000 BP) consisted of a variety of large, unfluted lanceolate projectiles found in context with bison "kills" (Butler 1986). Plano technologies appear immediately following Folsom and have a longer duration. The Plano component at the Wasden site was found to consist of at least two bison killing events with the remains of at least 30 bison recovered. Excavations at Veratic Cave suggested distinct occupations within the Plano Subperiod which have been interpreted as being distinct early and late Plano Subperiods. Excavations at Veratic cave show a focus on hunting of mountain sheep, showing that Plano Subperiod peoples were not exclusively adapted to hunting bison (Butler 1986:129).

3.4.2.3 Snake River Plain Archaic (Middle and Late Prehistoric) Period

In the Snake River the Archaic Period (Middle and Late Prehistoric Periods) lasts from 8,000 to 250 BP. It is characterized by large side and corner-notched projectile points. The change from the lanceolate and stemmed projectile points of the late Paleo-Indian to the Archaic side-notched types is abrupt in the archaeological record and is attributed to the invention of the atlatl or spear thrower (Frison 1991). The stylized Archaic projectile points were most likely hafted as darts and propelled with an atlatl (Grayson 1993). The first part of this period is associated with a climate change known as the Altithermal Period. The Altithermal is characterized by warmer and drier conditions. It is generally believed that both big game and human populations increased at this time because of favorable climatic conditions (Grayson 1993).

In Idaho, projectile points change through time during the Archaic Period much like the Montana point sequence. The Western Idaho Burial Complex lasts for 2,000 years and straddles the Early/Middle Archaic divide. The complex involves the interment of high quality unused lithic materials such as large bifacial blades and Turkey Tail projectile points. Ground stone tools, such as manos and metates, became more commonplace through the Archaic. Metates are grinding slabs on which seeds are milled using a rectangular or round stone mano. Basin shaped metates are particularly common in southern Idaho and are often recovered with round manos (Butler 1986). The repeated processing of food with non-portable objects indicates a semi-sedentary lifestyle. This lifestyle is further established with the discovery of numerous camps, villages, and the continued repeated use of rockshelters (Butler 1986).

Snake River Plain Early Archaic (Late Prehistoric) Period. The Early Archaic (Middle Prehistoric) lasted from 8,000 to 5,000 BP. It retained the big game hunting focus but switched to different game types from the preceding Plano Period. The similarity in lifeways with the Paleo-Indian Period is shown by continued occupation at many Paleo-Indian sites including Owl Cave, Veratic Rockshelter, and Wilson Butte Cave (Butler 1986:130).

Snake River Plain Middle Archaic (Late Prehistoric) Period. The Middle Archaic represents the period from 5,000 to 2,000 BP. Over time there was an increase in the use of lower ranked resources indicating probable population growth and circumscribed group territories. The Middle Archaic coincides with the beginning of the cooler and wetter conditions of the Neoglacial Period. The oldest semi-subterranean dwellings date to the Middle Archaic Period as shown at the Givens Hot Springs site (Butler 1986:130). There is evidence of an increase in the use of floral resources. This increase could have been produced by a change in the temperature, necessitating a broader based subsistence pattern. This theory is supported by the gradual increase in ground stone tools, indicating plant processing, and the increasing use of smaller game and secondary resources.

Snake River Plain Late Archaic (Late Prehistoric) Period. The Late Archaic dated to between 2,000 and 250 BP and is broadly recognized in the archaeological record by several indicators. These include a change in projectile point types, the presence of Fremont style ceramics, and the introduction of identifiably Numic Rosegate series projectile points. The change in projectile point types is attributed to the introduction and widespread use of the bow and arrow (Frison 1991; Grayson 1993). These new types include small side-notched and corner-notched projectile points such as the Desert Side-notch, Avonlea, and Rosegate series. The period also contains the introduction of both Great Salt Lake Gray and Intermountain Brownware style ceramics (Butler 1983). Great Salt Lake Grayware is indicative of Northern Fremont occupations. The introduction of Intermountain Brownware could represent either diffusion of technology or an influx of Numic populations from other parts of the Great Basin. The end of Fremont occupations in the Snake River Plain postdates the end in the Salt Lake Region. The Late Archaic Period ends with the arrival of European trade goods and the arrival of European explorers in the region around 250 years ago (Meatte 1990).

Another significant discovery associated with Idaho's Late Archaic is the use of lava tubes for the cold storage of bison meat. Excavations at the Baker Cave uncovered the first reasonably complete and temporally controlled collections from the Late Archaic in the Great Basin Culture Area of Idaho (Plew *et al.* 1987). The Wahmuza Site also focuses on a Late Archaic component. This component has features indicative of Numic populations and suggests that there was cultural continuity in the area for at least 2000 years (INL 20005). The Late Archaic Period is well represented in the archaeological record and Fremont Pottery has been located at many sites including Clover Creek and Kanaka Rapids. There is evidence of Late Archaic style housepits at Givens Hot Springs, Big Foot Bar, and Swan Falls. These houses are generally smaller than their Middle Archaic counterparts and are thought to be associated with Numic peoples (Butler 1986:132-133)

3.4.2.4 Southwestern Montana Middle Prehistoric Period

The Middle Prehistoric Period lasted from approximately 7,000 to 1,500 BP. Foor (1994) divides the period into three subperiods: Early, Middle, and Late, based on projectile point chronology. Mummy Cave, Bitterroot, Salmon River, and Oxbow side-notched projectile point types are common temporally sensitive artifacts found in Montana that date to the Early-Middle Prehistoric Period (Foor 1994). The Middle Prehistoric Period is identified by the presence of the McKean Complex (Foor 1994). This lithic tool complex has been the subject of much controversy due to the wide array of projectile point types. This controversy largely stems from the McKean type site in northeast Wyoming, which produced a wide ranging assemblage of projectile point styles, which William T. Mulloy-interpreted as variations of a single point type (Frison 1991:89). For example, two projectile points within this complex are the Duncan and Hanna types. Duncan has broad notches making it look almost stemmed, while Hanna is side-notched. This wide variety of projectile point forms may indicate a decline in inter-occupational dynamics, such as trade networks, during the Middle Archaic (Deaver and Deaver 1986). The Late Middle Prehistoric Period is identified by the introduction of large corner-notched dart points, commonly called Pelican Lake points, into western Montana (Foor 1994).

The Middle Prehistoric also marks the florescence of game drives in the area. This method of communal hunting, herding groups of animals into both constructed and naturally restricted areas for slaughter, was used at high elevations for deer and elk and at low elevations for bison. Pronghorn could be trapped in either of these settings

The Early-Middle occupation shows a focus on pronghorn procurement with some bison and the use of local lithic sources. The Middle-Middle/Late-Middle occupation shows the use of bison and evidence of stone boiling pits (Deaver and Deaver 1986:86).

3.4.2.5 Southwestern Montana Late Prehistoric Period

The Late Prehistoric Period started with the incorporation of bow and arrow technology around 1500 BP and ended with the arrival of European trade goods including the horse around 250 BP. In the Montana archaeological record the Avonlea point is the chronological indicator of bow and arrow technology. These projectile points are generally characterized as being side-notched with a concave base. Following the Avonlea tool complex were a variety of small side-notched and corner-notched projectile points often associated with various ethnic groups (Foor 1994). Projectile point types from this period include Plains, Prairie, Desert Side-notched, Blue Dome, Beaverhead, and Columbia Valley Corner-notched (Foor 1994).

Game drives and animal traps continued to be used during this period. Several sites located near the MSTI study area date to this time period including LaMarche Animal Trap, the Logan Buffalo Jump, the Sphinx site, and the White Tail site.

3.4.2.6 Montana Historic Period

The Lewis and Clark Expedition: Montana 1805–1806. The entrance of the Lewis and Clark expedition in July of 1805 to the area now associated with the MSTI study area was marked by exhaustion, frustration, injury, and illness (University of Nebraska Press 1988; Ambrose 1996:255). When the explorers reached the area near Townsend, Montana, just north of proposed MSTI Zone 1, on July 22, the party's Native American guide Sacajawea recognized her homeland and the summer territory of her peoples, the Shoshone (Ambrose 1996:255). Lewis noted in his journal that this greatly cheered his frustrated party: "The Indian woman recognizes the country and assures us that this is the river on which her relations live, and that the three forks are at no great distance. This piece of information has cheered the spirits of the party who now begin to console themselves with the anticipation of shortly seeing the head of the Missouri yet unknown to the civilized world" (University of Nebraska, Lincoln ~~Nada~~). From there, William Clark planned to lead an overland expedition ahead of the main party canoeing the Missouri River. The goal of this overland trek was to find the Shoshone, in order to trade goods for horses to haul their supplies over Lemhi Pass to the Salmon River. Camp was set at a locality presently under Canyon Ferry Reservoir, and on the morning of July 23 Clark set off with a small party on foot, while Lewis continued along the Missouri (Ambrose 1996:256).
Comment C5; p. 3.4-10, Paragraph 4 Reference Citation Correction:
(University of Nebraska, Lincoln NDa)

The river party entered the proposed project area in Zone 1 on the 23rd, and stopped to camp that night at a location approximately four miles south of the present day town of Toston, and then camped above Trident, MT on the 24th (University of Nebraska, Lincoln ~~Dab~~). The expedition reached the present day town of Three Forks on July 27, 1805 and rested while Lewis wrote a description of the river valley (Ambrose 1996:257-258). At their camp near the headwaters of the Missouri River, Lewis named the three waterways that converge to form the Missouri the Gallatin's River, Maddison's River (*sic*) and Jefferson's River, after the secretary of the treasury, secretary of state, and president of the United States, respectively (Ambrose 1996:258-259). After the arrival of Clark later on July 27th, the reunited expedition spent two days making preparations and waiting for Clark to overcome an illness (Ambrose 1996:259).

All of the proposed project Alternatives in Zone 1 would cross the Missouri River, and thus the Lewis and Clark NHT, in the vicinity of Townsend, MT. After crossing the Missouri, Alternative 1A would head generally west, and would not encounter the trail again. Alternatives 1B and 1D would cross the trail on the Missouri River and would then parallel the trail for a short distance near Cardwell, MT. In stark contrast, Alternative 1C would essentially follow the path traveled by Lewis and Clark from Townsend,

MT south to Three Fork, MT along the Missouri River and then west to the Jefferson River in the vicinity of Cardwell, Montana,

Starting August 1, 1805 Lewis led overland parties ahead of the river travelers, scouting for the Shoshone as Clark followed the Jefferson River upstream through the Jefferson Valley heading south, through Zone 2 of the proposed project. Lewis and Clark reunited on August 4, 1805 at the confluence of the Big Hole, Beaverhead , and Ruby Rivers, which join to form the Jefferson River at the southern end of the Jefferson Valley near the present day town of Twin Bridges, MT. As the party continued traveling south, Sacajawea sighted a hill known as "Beaver's Head" by the Shoshone on August 7th (University of Nebraska Press 1988; Ambrose 1996:260-262), which is located in today's Beaverhead Rock State Park near present day Dillon, MT. Alternatives 2C and 2E would approximately follow the Lewis and Clark NHT through the Jefferson Valley. Alternatives 2A, 2B, and 2D would follow the eastern edge of the Pioneer Mountains through the present day Interstate 15 corridor and would not be visible from the Lewis and Clark NHT in Zone 2.

From the vicinity of the "Beaver's Head", the expedition traversed southwest into the area associated with MSTI Zone 3 and camped on August 10, 1805 in today's location of Dillon on the Beaverhead River (University of Nebraska Press 1988). MSTI Alternatives 3A, 3B, and 3C pass approximately 5–10 miles west of Dillon.

On August 9, 1805, while leading another scouting party, Meriwether Lewis finally sighted members of the Shoshone Tribe for the first time, although contact was not made. On August 12th Lewis became the first American explorer to set eyes on Idaho and the Bitterroot Range of the Rocky Mountains to the west (Ambrose 1996:264-266). Instead of seeing the short descent to the Columbia River he had expected, Lewis "discovered immense ranges of high mountains still to the West of us with their tops partially covered with snow" (*sic*) (University of Nebraska Indic). Then on August 13, 1805 the scouting party made contact with the Shoshone and a trading friendship was established with the tribe and its chief, Cameahwait (Ambrose 1996:268-270). Several days were spent at the Shoshone camp, trading goods and procuring information about the wilderness and travel route across Lemhi Pass ahead. Chief Cameahwait and a small group of Shoshone accompanied Lewis back to ~~the river fork~~ and Clark met them on August 17th, 1805 (Ambrose 1996:277). This location, later known as Camp Fortunate, is presently under Clark Canyon Reservoir.

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Alternatives 3B and 3C meet the Beaverhead River south of Dillon and would pass Clark Canyon Reservoir on its east bank. MSTI Alternative 3A would skirt west of the reservoir. On August 18, 1805 Clark set out west with a group of men for reconnaissance, planning to stay two days at the Shoshone village to make canoes (Ambrose 1996:279). On August 24th, 1805 Lewis left Camp Fortunate with the remaining party and proceeded west to cross Lemhi Pass in to Idaho (Ambrose 1996:281). The Montana

leg of Lewis and Clark's 1805 journey exited the proposed MSTI study area from Zone 3, west of Clark Canyon Reservoir and Alternative 3A.

On his return journey in 1806 Lewis parted from Clark at Traveler's Rest and trekked northeast past Missoula, Montana (University of Nebraska Press 1993). Meanwhile, Clark roughly retraced his westbound course, traveling back through the MSTI study area. Clark traveled through Gibbons Pass on July 6, 1806, stayed again at Camp Fortunate July 6–10, and traveled the Beaverhead River past today's town of Dillon on July 10th and up the Jefferson River to Three Forks on July 13, 1806 (University of Nebraska Press 1993). By July 14, 1806 Clark was east of the MSTI study area, traveling past locations of the modern towns of Bozeman and Livingston, and down the Yellowstone River (University of Nebraska Press 1993).

The Lewis and Clark National Historic Trail is part of the National Trails System. Most of the trail follows the Missouri and Columbia Rivers. Much has changed in 200 years but trail portions remain intact. At 3,700 miles (5,950 km), the trail is the second longest of the 23 National Scenic and National Historic Trails. It begins at Hartford, Illinois, and passes through portions of Missouri, Kansas, Iowa, Nebraska, South Dakota, North Dakota, Montana, Idaho, Oregon, and Washington. The portion of the trail that is within the project analysis area is along the Missouri River, the Jefferson River, the lower Big Hole River, and then along the Beaverhead River to Clark Canyon Reservoir south of Dillon, MT. At Clark Canyon Reservoir, the trail proceeds west through Horse Prairie, and over Lemhi Pass to Idaho~~the Beaverhead River where it forks into the Big~~ Hole River ~~upstream~~ to the Big Hole River near Dillon. South of Dillon the trail proceeds to the west and departs from the MSTI project area.

Native Groups and Historic Settlement. Most of the early treaties were signed in 1855. Congress could not provide appropriations for construction and annuities until these treaties were finally ratified in 1859. There was significant tension between the Native Americans and government agents during this time since it appeared to tribal governments that the U.S. government wsa making no effort to fulfill its treaty responsibililties (Beckham 1998:155)

The Bitterroot Salish, and Pend d'Oreille peoples were the primary inhabitants of the Montana segment of the study area. The Bitterroot Salish, the Kootenai and Pend d'Oreille traditionally lived in the Big Hole, Madison, and Upper Missouri drainages, while the Pend d'Oreille traditionally lived in the Clark Fork and Bitterroot drainages (Malouf 1998:198). These peoples had several interactions with European explorers, but did not see permanent European settlement in their territory until Father De Smet arrived and established the St. Mary's Mission in 1841 (Ruby and Brown 1992:77). A group of Iroquois, displaced from their land in the eastern plains settled with the Flathead in 1820 and warned about the "Black Robes" (Malouf 1998: 306). The first official talks with the US Government occurred at the council of Hellgate. This council led to a signed treaty between the Flathead, Pend d'Oreille and territorial governor Stevens in 1855. This treaty established a reservation north of current day Missoula. The Bitterroot Salish, the Kootenai and Pend d'Oreille resisted relocation and in 1871, James Garfield came to the area to negotiate for final relocation. Under the terms that Garfield provided some families relocated. Several agreements over the next 20 years led to other small groups relocating but it was not until 1891 that the last of the Bitterroot Bitterroot Salish, the Kootenai and Pend d'Oreille moved to the reservation. Other peoples were known to live in and journey through the Montana section of the study area. As discussed above, the Lewis and Clark expedition encountered the Shoshone in the area. Shoshone groups did inhabit the area, but were more concentrated in the areas to the south and west (See Idaho impacts on Native Groups). The Blackfeet, a plains culture, were the traditional enemies of the Bitterroot Salish, the Kootenai and Pend d'Oreille. The sporadic warfare and overlapping territorial boundary between the nations caused both groups to claim the area that now contains the northernmost section of the MSTI study area. The Blackfeet were consigned to their own reservation, located around the current town of Browning, Montana in 1855.

Frontier Gold Rush to Southwestern Montana

On Lewis and Clark's westbound journey in 1805, Lewis noted lead deposits near the end of the Missouri River, but made no notice of rocks or mineral deposits elsewhere (Ambrose 1996:254). Lewis, Clark, and President Jefferson all discounted any metallurgic deposits in the Rocky Mountains as impossible to mine, considering accessibility for development, extraction, and transportation of ores from Montana as inconceivable. While Lewis' party camped on Beaverhead Creek, explorer Donald Jackson made note of gold nuggets he found in a tributary branching to the west (Ambrose 1996:254). Later this tributary was named Grasshopper Creek and in the 1860s the Bannack Mining District was developed along this waterway. The Bannack Mining District was one of many large, multi-mine areas created on the mountains and rivers in the region during the frontier mining boom (Montana DEQ 2010).

The first discovery of placer gold in the Montana Territory took place in 1858 on Gold Creek, west of today's town of Deer Lodge (Godfrey 2003:34). By about 1862, gold mining in states to the ~~east~~ had begun to decline and the frontier gold rush reached Montana in full force between 1862 and 1864. The gold rush caused a population boom so large and swift that Congress declared the region to be "the Montana Territory" in 1863 and granted statehood in 1889 (Godfrey 2003:34, 57). The boom began with placer claims of gold retrieved by sluicing, which later developed into large scale placer dredging for a variety of metals (Godfrey 2003:34; Montana DEQ 2010). In contrast, one large placer deposit of raw sapphire gems was dredged in the Orofino Mining District, which was lacking in prolific metal deposits (Montana DEQ 2010e) The 1860s also saw an enormous number of lode claims patented in mountain ranges of the Montana Territory by a full range of miners, from individual prospectors to large-scale mining companies out of the eastern United States. Many mining companies were formed on location during the boom of industry development in Montana, some small and short-lived, some large and prosperous (Montana DEQ 2010). While mining districts were initially focused on gold, major deposits of silver were soon discovered and silver mining boomed in the Pioneer Mountains by the 1880s. After which, the early rush to mine gold and silver began to wane, many districts expanded their focus to include deposits of non-precious metals, such as copper, lead, zinc, iron, and tungsten (Montana DEQ 2010).

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Montana Mining Districts' Geographic and Geologic Features

The MSTI study area encompasses historic mining districts that are concentrated in the Pioneer and Highland Mountains of southwestern Montana. These mining districts grew around the lode ore deposits in hard rock of the mountains and placer ore and gem deposits focused in the gulches and waterways of

the Big Hole, Beaverhead, Jefferson, and Ruby River Basins (Russell Country 2005). These basins sit on the Paleoproterozoic Suture Zone, the Sedimentary Basin Precambrian Provinces, the Basin and Range Structural Province and the Helena Structural Salient tectonic zones (Vuke *et al.* 2007). The variety of geologic deposits containing ores extracted during the historic mining era include continental and marine deposits of: Tertiary basin fill, consisting of Oligocene to Pliocene heterogeneous mixtures of gravels, sands, silts, and clays deposited by alluvial action; the Colorado Group, consisting of shale from four geologic formations; Mississippian, Pennsylvanian, and Permian deposits consisting of limestone, dolomite, and sandstone; Devonian and Cambrian deposits consisting of shale, limestone, and sandstone; Younger Cretaceous granitic rocks, predominantly consisting of quartz monzonite; and Archean undifferentiated metamorphic rocks formed from igneous and sedimentary parent rocks (Vuke *et al.* 2007).

The MSTI study area encompasses 13 historic mining districts that are concentrated in the Pioneer and Highland Mountains of southwestern Montana, the largest of which is the Butte-Anaconda NHLD.

Montana Mining Transportation Networks

The pre-contact Native American trail networks followed by Lewis and Clark on their westward journey, while sometime widened and cleared by early trappers and traders, remained primitive when first used for transportation in the early days of mining (Godfrey 2003:44). With the influx of population in the 1860s, some of these trails were widened and used in addition to the system of roads later developed by the miners. For high-quantity exportation of goods to locations far from the Montana Territory, rivers were used until the Northern Pacific Railroad was established in 1883 (Godfrey 2003:44; Montana DEQ 2010). Then, in 1902 Congress abolished the Missouri River Commission and the Missouri River was no longer used as a main thoroughfare for commercial transportation, leaving the Montana export market dependent on overland roads and railways (Ingram 1976:1).

Historic Mining Districts within and near the MSTI Study Corridor

Butte-Anaconda National Historic Landmark District. The Butte-Anaconda National Historic Landmark District (NHLD) is located on the west side of the Continental Divide in southwestern Montana. The NRHP registration site for the Butte-Anaconda National Historic Landmark District is included in Appendix C.4.1. This district was designated as a National Historic Landmark in July 1961 (Strahn *et al.* 2006:174). Many of the historic buildings that characterize this district remain, and as a result the Butte Anaconda is the largest historic landmark district in the country (Crain and Whitney 2009:11). The creation of the Butte-Anaconda Mining District and founding of the cities of Butte, Anaconda, and Walkerville, Montana were funded by the mining, smelting, and railroading industries of the 19th and 20th centuries. National themes of the district involve mainly the copper industry and the formation of labor unions (Crain and Whitney 2009:7-8). The main period of significance for the Butte-Anaconda district was between 1876 and 1934 (Strahn *et al*. 2006:6–7). The towns of Butte, Anaconda, and Walkerville were connected by the BA&P Railway. Anaconda grew around the smelting and refining industry, exclusively processing ores mined in the Butte district. Butte and Walkerville were settled early as mining camps and then founded as cities in 1872 (Strahn *et al.* 2006:7–9). The mining district and three towns saw numerous, exponential economic and population booms in the mid- to late-19th century due to their silver and copper load ore mining industry. Then in 1893, the repeal of the Sherman Silver Act sent market prices for silver into severe decline. Butte, Anaconda, and Walkerville were able to continue their expansion during the silver decline, supported by the wealth of copper ore and diversified mining options available in the district (Strahn *et al.* 2006:15). At the turn of the century large immigrant groups from Europe and other countries came to Butte for the employment opportunities, but the community's expansion was heavily impacted by the mining conflicts known as the War of the Copper Kings. The legal conflicts over mining rights were mostly resolved by 1906 and newly consolidated mining interests caused copper production to boom again (Strahn *et al.* 2006:17–18). Butte and the

surrounding communities saw their peak of performance and highest population during World War I, when copper was in high demand by the military. When the Great Depression dealt a heavy hit to the Butte-Anaconda economy, thousands of Butte residents deserted the mining district. This exodus took place concurrent to a long strike in 1934by workers at one of the large mining companies (Strahn *et al.* 2006:18–19).

In 1884, when the first smelter was built in Anaconda to process ore from Butte, a long period of heavy environmental pollution in Deer Lodge Valley began (Strahn *et al.* 2006:62-66). Ranchers and farmers experienced enormous losses of livestock and harvests when the smelter pollution degraded the soils and air. State officials and the Deer Lodge Farmer's Association started litigation in 1903 against the Anaconda Company that constructed the smelter. Increasing the height of the smoke stack on the smelter to 585 feet in 1918 was seen as a solution to the problem, meant to funnel the smoke high enough above the valley that winds would disperse it elsewhere. Pollution control devices were also built into the stack. Pollution from the smelter continued to plague the mining district and valley until the smelter was closed in 1980 (Strahn *et al.* 2006:62-66).

The Butte-Anaconda National Historic Landmark is today afforded specific protections by federal law as an essential component to the history of the United States and the national and global economies. The Butte-Anaconda National Historic Landmark district involves areas associated with MSTI Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 2D.

Argenta Mining District. The town of Argenta, Montana was founded under the name Montana in January 1865 on Rattlesnake Creek, approximately 15 miles west of today's Dillon, Montana (Montana DEQ 2010a). The area surrounding the mining town later known as Argenta had been subject to prospecting and placer sampling since 1862, but the Montana Lode was not claimed until June 25, 1864, when prospectors William Beekan, Charles S. Ream, and J.A. Brown declared the Montana Mining District (Montana DEQ 2010a). The Montana Lode was discovered in the Humboldt anticline of the Pioneer Mountain Range. The district encompassed their claims to the General Grant, Montezuma, Great Western, Morning, Prolific, and Ream lode mines, although these mines did not immediately prove economically viable.

The first producing silver mine of the district, the Legal Tender, was discovered by A.M. Esler early in 1865 and proved rich enough to open ore transport to Wales for smelter. Then in 1866 the first smelter in Montana was built in Argenta by Samuel Hauser and James Stuart, funded by the St. Louis and Montana Mining Company. This enabled the multitude of mines in the Argenta Mining District to begin extraction and production of the silver, lead, gold, copper, and zinc from the Montana Lode. Expansion of the plant in 1870 allowed processing of ores extracted from the historic mining districts of Blue Wing, Moose Creek, and Vipond. Additional smelters were built in the Argenta district in 1866 and 1867 using the profits from local mines. Subsequent to the collapse of the company in 1872, the St. Louis and Montana smelter plant was closed. The high quality ore had dwindled by the early- to mid-1870s and the town of Argenta was largely deserted by 1874, with most of the remaining low grade products being outsourced to larger smelter plants in the region. Finally, due to economic repercussions after an 1893 repeal of the Sherman Silver Act, all mining in the Argenta district ceased. However, discovery of gold deposits saw small mines opened in Argenta district gulches in the early 20th century and then again during the Great Depression in 1935. At the district's height of success 3,000 miners owned mineral claims and the town had blossomed to a population of 1,500 (Montana DEQ 2010a). MSTI Alternatives 3A and 3C cross northwest-southeast through the southeast corner of the historic Argenta Mining District. Alternative 3B passes approximately 3.75 miles east of the district.

Bannack Mining District. Montana Territory's first large-scale gold deposit discovery occurred in the historic Bannack Mining District between 1862 and 1875 (Montana DEQ 2010b). The district also hosted the first quartz lode mining in the territory and the dredging of Grasshopper Creek, the first successful dredging operation in the U.S, between 1895 and 1902. The Bannack placer activity and lode mining took place at the southern end of the Pioneer Mountain Range. The mining of Bannack was incredibly prolific, but relatively short in duration. Several thousand people were residents of the town of Bannack by 1863 and on May 26, 1864 it became the first capitol of Montana Territory. However, issues with the Bannack district water works and emigration of residents to larger towns in the area depleted the livelihood of Bannack and in 1864, the capitol was moved to Helena.. Minor gold extraction continued in the Bannack Mining District as companies overcame the lack of water by building ditches to supply the dredging operations. By the early 1890s several mills had been built along Grasshopper Creek, but by 1902 the gold deposits on the creek were depleted and sporadic mining at older locations in the district had to be relied on. The short but productive life of gold mining in the Bannack district holds a distinct place in the history of the Montana Territory, even though Bannack itself had become a ghost town by 1953. In 1954 the town was bought and preserved as a historic landmark, being a prime example of the boom town era. In 1960 Bannack was established as a historic park, then as a National Historic Landmark in 1962, and was adopted into the National Register of Historic Places in 1975. Although the town of Bannack has been well preserved as a state park, few historic structures remain at actual mine locations throughout the district (Montana DEQ 2010b). An arm of the Bannack Mining District extends approximately 4.5 miles southeast from the main district body. MSTI Alternative 3A crosses the end of this arm north-northeast to south-southwest. Alternatives 3C and 3B pass approximately 1.0 and 4.0 miles east of the arm, respectively.

Blue Wing Mining District. Montana Territory's Blue Wing historic mining district shares its southern boundary with the Bannack Mining District and therefore is also located at the southern end of the Pioneer Mountain Range. Like the Argenta Mining District, Blue Wing began by discovery and claiming of silver ores in 1864, while the surrounding mining districts focused on gold (Montana DEQ 2010c). One small mill was built in Blue Wing, but it was not commercially viable and smelting of the ores extracted from Blue Wing was largely done in the Argenta factories and then outsourced when those smelters were closed. After the 1860s mining boom, Blue Wing intermittently continued to produce ores until the Depression era (Montana DEQ 2010c). MSTI Alternative 3C skirts the northeast corner of the Blue Wing historic mining district by approximately 0.5 miles, while Alternatives 3A and 3B pass approximately 3.0 and 7.5 miles to the east.

Bryant Mining District. The historic Bryant (aka Hecla or Glendale) Mining District was one of the largest and most productive districts in the Montana Territory, initially established in a region with many gold claims, but proving deficient in gold and abundant in silver, lead, copper, and zinc ore (Montana DEQ 2010d). Located approximately 15 miles north of the Argenta historic Mining District, the Bryant district is located in the Pioneer Mountain Range. William Spurr was the first prospector to claim a lode in the Bryant district in 1872, although his claim was subsequently bought and developed by James A. Bryant and P.J. Grotevant. This discovery sparked an influx of prospectors to the area and many mines were developed, sponsoring the building of Trapper City. Ore production followed quickly on the heels of multiple discoveries at several locations in the Bryant district and large shipments of silver ore were outsourced to Wales for smelting in 1873. Trapper City fell by the wayside when larger lodes were mined from nearby mountains and the construction of mills sponsored the founding of Lion City in the 1870s and the town of Hecla in 1881. This also populated the industrial area of Glendale with millers in 1875, where a satellite industry of charcoal supply flourished to feed the smelters. As the Bryant district was largely dependent on silver ore, the large drop in demand after the 1893 repeal of the Sherman Silver Purchase Act caused abandonment of many mines and smelters between 1895 and 1904, including the destruction of Bryant's industrial heart at Glendale. However, several mines continued production via Lion City after 1904. Even after these mines closed in 1915 the Bryant district brought in substantial

profits until 1922 using ores left in slag piles at the destroyed Glendale site. Intermittent production continued as properties in the district were bought and sold by a string of companies, although relatively little profit resulted in the years between 1923 and 1965 (Montana DEQ 2010d). MSTI Alternative 2D passes north-south through the eastern portion of the Bryant Historic Mining District, while Alternatives 2A and 2B pass 0.5 and 1.0 miles from the district's eastern boundary, respectively. MSTI Alternatives 2C and 2E are approximately 12.75 miles east.

High Ore Mining District. The High Ore (aka Comet) Historic Mining District is located on the eastern slope of the Continental Divide, approximately two miles northwest of the present day town of Boulder, Montana. Mining in High Ore included gold, silver, lead, and zinc placer and lode ores, beginning production around 1869 (Montana DEQ 2010f). The Comet and Alta Mines in the High Ore district were developed over the Comet Lode in 1879 and then put into production again in 1883. Although hindered by issues with smelter locations, production from the Comet Mine was only slightly impacted by the silver recession and the Depression in 1893. After changing hands several times between 1906 and 1926, the mining district boomed with the construction of a large mill in Comet and became second in operation size, next to Butte. The mill was closed and salvaged in 1941 and the town of Comet was abandoned. Since then the district has had only small, sporadic mining production (Montana DEQ 2010f). MSTI Alternative 1A crosses east-west through the High Ore Historic Mining District's north half.

Melrose Mining District. The Melrose Historic Mining District was the intermittent focus of placer gold mining after 1866 and has mines located in Soap Gulch and on Camp and Wickiup Creeks (Montana DEQ 2010g). The district is located toward the south end of the Highland Mountains. Lode mining for silver and lead ore also occurred in the northern Melrose District, but the 1900 abandonment of the Glendale Smelter impacted the demand for production from the Melrose mines. Between 1909 and 1911 a mine in Soap Gulch exported ores that produced copper, silver, and gold (Montana DEQ 2010g). MSTI Alternatives 2A, 2B, and 2D pass north-south approximately 0.75 miles west of the southwest corner of Melrose Soap Gulch Historic Mining District. Alternatives 2C and 2E pass Melrose Camp Creek Mining District approximately 7.5 miles to the southeast.

Orofino Mining District. The Orofino (aka Champion) Historic Mining District was initially subjected to placer activities exploring for gold deposits in the 1860s, but was mainly active in lode mining in the 1880s (Montana DEQ 2010e). The small district is located on the western slope of the Continental Divide, approximately 15 miles north-northwest of the present day town Butte, Montana. Champion City, built around the Champion mine, was the heart of the Orofino district, experiencing its heyday around 1890 and decline by 1978. The Orofino-Champion district became an area of sapphire mining after the gems were discovered in Dry Cottonwood Creek in the 1890s. Between 1900 and 1903 large amounts of sapphires were manually dredged from the creek and then in 1906 a hydraulic dredge was designed to dredge deep for both sapphires and gold. The Variegated Sapphire Company mined the area profitably between 1907 and 1910, when profit stopped outweighing cost. The Consolidated Gold and Sapphire Mining Company moved a dredge to the creek in 1909, but it was not a big producer and was abandoned in 1910. A poor gem and gold economy and lawsuits between companies over land and mineral rights also served to halt dredging in the Orofino district. Sporadic dredging attempts were made between 1914 and 1920, with such minor results that production then ceased (Montana DEQ 2010e). MSTI Alternative 1A crosses northeast-southwest inside the northern boundary of the Orofino-Champion Historic Mining District.

Pipestone Mining District. The historical record of the Pipestone Mining District consists of one short period of placer gold mining between 1932 and 1941 (Montana DEQ 2010h). The high of production from three district claims in 1935 was 4.8 ounces of gold and 4.0 ounces of gold were recovered in 1941 by a sluice miner. The Pipestone Historic Mining District is located on Pipestone Creek. Lode mining

occurring on several claims in Dry Creek reached maximum ore production in 1935, while one mine, known alternately as the Blue Bell and the Marsh, was the site of a small mill that peaked in production in 1941 (Montana DEQ 2010h). MSTI Alternatives 1B, 1C, and 1D cross east-west immediately inside the southern boundary of the Pipestone Historic Mining District.

Radersburg Mining District. Placer activities began in the Radersburg Mining District, south of the town of Radersburg, Montana, circa 1866 after the discovery of gold in the gravels of the gulches (Montana DEQ 2010i). Prospectors John Keating and David Blacker also started lode claiming in 1866 after discovering the Keating Lode northwest of Radersburg while exploring for the source of the placer gold. The Radersburg Historic Mining District, originally known as the Cedar Plains district, is located over a portion of the southeastern Elkhorn Mountains and into the valley to the southeast, approximately six miles south of the modern town of Townsend, Montana. In 1870 the Keating mill was established, soon followed by construction of four additional mills. However, the production capacity from the five mills remained relatively low and when the simple shallow ores were depleted after a few years, lode mining in the Radersburg district lessened as attention was turned to more productive nearby regions. Then in the 1880s, construction of the Northern Pacific Railway and a large industrial furnace in the town of Toston brought miners back to the Radersburg district to take advantage of the cheap processing and shipping from the area. The silver recession of 1893 that negatively affected so many mining districts in the Montana Territory also impacted Radersburg, but production resumed in1899 and lode mining carried the district through 1948. Placer dredging was last operated in the Radersburg Mining District between 1940 and 1942, ceasing during World War II due to mining restrictions (Montana DEQ 2010i). MSTI Alternatives 1A, 1B, and 1D enter the Radersburg Historic Mining District's northeast corner and then diverge. Alternatives 1B and 1D roughly bisects the district to the southwest and Alternative 1A branches west-southwest through the district approximately 2.0-3.5 miles northwest of Alternatives 1B and 1D. Alternative 1C skirts around the Radersburg Mining District boundary approximately 1.5 miles to the east.

Rochester Mining District. The Rochester (aka Rabbit) Historic Mining District is located in the southeast Highland Mountains. This geographic region was too dry for placer mining, but the gold ores of the Watseca Lode were discovered in the 1860s and by 1869 there were several mills constructed and a camp of around 800 miners working the area (Montana DEQ 2010j). In 1871 Rochester district gold mining had declined, but mining legislation enacted in 1872 revived lode mining and put the district back in high-capacity production by 1880. During this time, several small smelters were in operation in and around the town of Rochester. Industry continued to expand in Rochester, with the Watseca in maximum production between 1898 and 1905. Rising operating costs resulted in sale and abandonment of most Rochester district mines by 1907. The district remained out of production until 1926, when an additional mill was constructed for three silver and lead lode claims that were mined for three years. In 1932, mining in the Rochester historic district ended (Montana DEQ 2010j). MSTI Alternatives 2C and 2E pass the Rochester Historic Mining District northeast-southwest approximately one mile east of the district's southeast corner. Alternatives 2A, 2B, and 2D pass north-south approximately 7.25, 7.5, and 10.0 miles to the district's west.

Silver Star Mining District. Noted as encompassing some of the most well known and oldest mines in the Montana Territory, the Silver Star Historic Mining District is located approximately seven miles north of the present day town of Twin Bridges, Montana (Montana DEQ 2010k). In the 1860s frontier town boom era, the district of Silver Star was a highly important mining community. One of the first quartz claims owned in the Montana Territory, the Green Campbell mine, began production from a gold lode in 1867 and was so prosperous it was named the most valuable quartz mine in the country in 1870. Subsequently many major operations were mining and milling quartz lode ores in the Silver Star district, expanding over production of minor mines established in the district before 1871. The mining camps of Silver Star and Ragtown (later Iron Rod) on the Jefferson River became well-populated boom towns and

the Silver Star Mining District had many smelters and mills supporting the communities. Silver Star opened a post office in 1869, and in 1872 had a population of 250. The continually growing mining industry in the district kept the town of Silver Star at the forefront of Montana Territory trading until the 1880s. The community of Whitehall took the highest trading honor when the Northern Pacific Railroad came in 1883, and a branch line subsequently built between Whitehall and Twin Bridges helped revitalize mining interests in the Silver Star district by lowering transportation costs. Beginning in 1910, issues with ore depletion, operating limitations, and lowered economic demand began weighing on the Silver Star district's production. Mining continued through the 1930s, but most operations did not revitalize after cessation predicated by World War II mining regulations. Despite a small chrome mine kept in business until 1944 by military demand during WWII, the Silver Star mining boom came to its end (MDEQ 2010k). MSTI Alternatives 2C and 2E bisect the Silver Star Historic Mining District from northeast to southwest. Alternatives 2A, 2B, and 2D are located approximately 16.5 miles west of the district.

Utopia Mining District. The historic Utopia Mining District was one of the lesser operations in the Montana Territory (Montana DEQ 2010L). It is located toward the southeastern end of the Pioneer Mountains above Birch Creek. The Utopia district experienced the same metallurgic-focused, frontier era mining boom-and-bust cycle as the districts of Argenta, Blue Wing, Bannack, and Bald Mountain Historic Mining Districts to the south. O.D. Farlin and W.L. Farlin first discovered and laid claim to lode ore deposits during the prospecting boom of the mid-1860s, but production peaked relatively late in the Utopia district, between 1902 and 1923, despite an influx of claims in the 1860s. The lode deposits in Utopia contained mostly copper ore; gold and silver were not the major metals extracted. This served as the underlying cause of late development. The costs of large-scale copper mining and transportation outweighed the profits in the initial frontier mining boom. The Northern Pacific Railroad arrived in 1883, but still the Utopia Mining District was not a significant contender in the market until the early 20th century. Between the 1870s and 1902 small-scale mining in the Utopia district produced iron ore as a supporting industry for smelters in districts to the north that were busy processing large quantities of gold and silver. Small placer operations were attempted on Birch Creek in the 1880s, but proved unprofitable and were abandoned. In 1902 a major smelting company moved to the Utopia district, re-opened the copper mines, and developed the industrial resources in the Birch Creek area. The Utopia miners' venture established the mining camp of Farlin. Production from the area mines peaked in 1904 and began descent in 1905, significantly decreasing between then and 1923. With the closing of the most prolific mine in the Utopia district in 1923, large-scale production ended. The historic Utopia district saw a few intermittent periods of very minor production, solely based on the relative diversity of the lode ore minerals, and produced some tungsten in the final years (Montana DEQ 2010L). MSTI Alternative 2D crosses south through the far southeast corner of the Utopia Historic Mining District, while Alternatives 2A and 2B pass approximately 0.5 and 2.75 miles to the east, respectively.

Livestock Ranching in Southwestern Montana

The influx of population during the gold and silver rush in southwestern Montana and the subsequent development of supporting industries predicated the movement of sheep and cattle herds to the area. Herds of thousands were brought to the state, first from Utah and Oregon, then from as far as Texas (Ingram 1976:16). John Grant began small-scale livestock grazing in the Beaverhead Valley in the 1850s, but circa 1863, market demand turned national attention to free range ranching opportunities in southwestern Montana. John F. Bishop and Richard Reynolds moved the first large-scale sheep herd from Oregon to a ranch outside Bannack, Montana in 1869 (Ingram 1976:16). The route this herd took passed to the west of today's Clark Canyon Reservoir, where MSTI Alternative 3A is proposed. Myron Jeffers also used this route to Bannack to herd cattle from Texas, via Fort Hall and Post Henry (Idaho Falls), Idaho in 1871 (Ingram 1976:19). In large part this travel followed the routes associated with MSTI Alternatives 4A and 3A, although he also crossed areas associated with 5B, 5C, and 5D. The 1870s saw so many livestock ranchers immigrating to southwestern Montana that the area became overstocked and

market prices lowered. Drought hit the region's valleys in the 1880s, forcing the market to further decline and ranchers started selling livestock at "panic prices" (Ingram 1976:19). These environmental issues, combined with the introduction of homesteading and property fencing, resulted in the formation of cattle companies in an attempt to carry the industry. However, closed-range ranching necessitated feed hay farming and by 1886 costs rose to the extent that ranchers disbanded from the cattle companies and moved their herds to open ranges in central and eastern Montana (Ingram 1976:19). Small-scale ranching and farming continued in southwestern Montana, but the region was no longer at the head of the national livestock market.

Transportation in Southwestern Montana

Stage Routes and Communication . Early explorers and prospectors, following the lead of Lewis and Clark, used existing trails traditional to the Native Americans of the region. As ores were discovered and claimed in the Pioneer and Highland Mountains, miners found it necessary to widen and improve these trails to haul mining equipment and supplies from the freight rivers to their mine locations. Wagon roads were usually built by the individual who needed the access. The official process involved a petition to the newly formed Montana State legislature for a charter to build a toll road, ferry, or bridge (Ingram 1976:57). The individual would collect tolls predicated on wagon size and load and use the money for maintenance of the passage. However, if maintenance proved difficult and a road became impassable, travelers would refuse to pay tolls and could eventually get a charter repealed.

Population growth in the 1860s also introduced need for a standard mode of communication between Montana and the other states. In 1862, mining district residents joined together and petitioned congress for a mail route from Salt Lake City, Utah to Fort Benton on the Missouri River (Ingram 1976:21). The petition was approved and the following routes were developed into corridors suited to stage travel (as mapped by Ingram 1976:49-51):

Main Overland North Stage Route. Jeffers' herding route from Idaho became the Main Overland North Stage Route from the state line to Red Rock at the south end of Clark's Canyon. In 1863 this stage route was used by Ben Holladay as one of the first postal routes (Ingram 1976:20). Today this route is U.S. Interstate 15; MSTI Alternatives 3A, 3B, and 3C cross and/or parallel the Main Overland North stage route as they now do I-15.

Overland #2 Stage Route. From Clark's Canyon Reservoir, the Overland #2 Stage Route continued north along today's I-15, but split south of Dillon to follow the Beaverhead River to Beaverhead Rock and then east to Virginia City. MSTI Alternatives 3B and 3C follow I-15, but south of Dillon the alternatives head north, whereas Overland #2 headed northeast.

Overland #3 Stage Route. When the Overland #2 split south of Dillon, the Overland #3 Stage Route continued north along the valley between the Pioneer Mountains and Highland Mountains. It passed Divide, Montana and followed the valley as it wound west of Butte and then north to Deer Lodge. I-15 today follows this path, with MSTI Alternatives 3A, 3B, 3C, 2A, 2B, and 2D roughly paralleling the freeway through the valley. A small branch of trail from the south end of Clark's Canyon split to the west, crossing MSTI Alternative 3A. This branch was considered a separate section of the Overland #3.

Pioneer of Gold Trail. The Pioneer of Gold Trail was a stage route named after, and following the path of, one of the initial gold rush routes from Idaho. The route split from the western branch of Overland #3 on Horse Prairie Creek, headed north past Bannack, and crossed northeast to Beaverhead Rock. This trail was used between 1862 and 1873, when it was abandoned in favor of other overland routes (Ingram 1976:50). MSTI Alternatives 3A and 3B cross the location of the Pioneer of Gold Trail.

The Pony Express. Southwest Montana's communication needs were also served by William Vernon, who hosted a short-lived Pony Express mail route from the eastern states to Butte, Montana in 1866 (Ingram 1976:20). Vernon would have crossed areas now associated with MSTI Alternatives 1B, 1C, and 2C.

Railroads

Major U.S. transcontinental railroad companies rarely emerged whole. Rather, they were gradually formed through mergers of many small operations created individually (Robertson 1991:303). The railway system of southwestern Montana originated through many small operations focused on local mining and logging industries. As each rail was expanded the lines gradually joined and eventually this regional system became a major western component of the transcontinental railroad system. The following are short descriptions of the railroad operations responsible for creating the historic railway system within the southwestern Montana MSTI study area (adapted from Robertson 1991:277–336):

Anaconda Copper Mining Company. This company was incorporated in 1895 and operated Montana lines connecting Bonner, Butte, Fife, McNamara Landing, and Trout Creek between 1904 and 1949. A line connecting Anaconda and Butte crossed an area now associated with the northwestern ends of MSTI Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 2D.

This company was incorporated in 1895 to grade and lay rails for railroad lines in Montana connecting Bonner, Butte, Anaconda, Fife, McNamara Landing, and Trout Creek. The first train was run on the tracks in October of 1903 and the Anaconda Copper Mining Company operated active railroads between 1904 and 1949. One of their lines connecting Anaconda and Butte crossed an area now associated with the northwestern ends of Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 2D.

Great Northern Railway Company. The Great Northern Railway Company was incorporated in 1899 by the St. Paul, Minneapolis, and Manitoba Railway Company, the St. Paul and Pacific Railroad Company, and the Minneapolis and St. Cloud Railroad Company. First listed as operating independently in 1890, Great Northern was the only line built without the assistance of federal land grants. The line crossed northern Montana, with a system branching southwest through Helena, Montana to Butte, Montana. In 1970 Great Northern merged into the Burlington Northern Railroad Company. The far southwest section of the Montana line crosses the area now associated with MSTI Alternative 1A on the southwestern edge of the Elkhorn Mountains.

Butte, Anaconda, and Pacific Railway Company. Incorporated in 1892, this company was first listed as a Great Northern Railway Company subsidiary. The Butte, Anaconda, and Pacific then operated independently between 1894 and 1970, when it fell under ownership of the Anaconda Company. Then in 1985 it was ceded to the Rarus Railway Company. This rail line from Anaconda to Butte, which is part of the Butte-Anaconda NHLD, crosses the area now associated with the northwestern ends of MSTI Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 2D.

The Montana Central Railway Company. Montana Central was incorporated in 1886. After operating independently until 1890, the company began operating as a subsidiary to the Great Northern Railway Company. In 1907 the Montana Central was sold outright to the Great Northern. The portion of this line joining Wickes and Butte, Montana crossed the area now associated with MSTI Alternative 1A on the southwestern edge of the Elkhorn Mountains.

Northern Pacific Railway Company. Incorporated from the Northern Pacific Railroad Company in 1896, the Northern Pacific Railway Company was a common carrier between 1896 and 1970, when it merged into Burlington Northern, Inc. The Northern Pacific Railway operated a wide-branching network of rails from Minnesota to Washington and Oregon. A portion of this system crossed from Three Forks,

Montana through Butte and Anaconda, to Missoula, Montana. This is a route now associated with MSTI Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 2D.

Gaylord and Ruby Valley Railway Company
Incorporated from the Montana Southern Railway Company in 1897, Gaylord and Ruby Valley Railway Company operated a small line between Butte and Whitehall, Montana between 1898 and 1899. In 1899 the line was sold to the Northern Pacific Railway Company. This short railroad would have crossed the area now associated with the northwestern ends of MSTI Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 2D. The line would have continued to roughly parallel the routes of MSTI Alternatives 1B and 1C to the Whitehall area.

Montana Railway Company. The Montana Railway Company was incorporated in 1881 and operated a short line between Stuart and Anaconda, Montana between 1884 and 1908. The small copper transportation company was listed as a non-operating subsidiary of Montana Union Railway Company (subsidiary to Union Pacific Railway Company) in 1888 and non-operating subsidiary of Northern Pacific Railway Company in 1897. By 1908 Montana Railway had merged into the Northern Pacific Railway Company. The line out of Anaconda extended to Stuart, in the area now associated with the northwestern connection of MSTI Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 2D.

Northern Pacific and Montana Railroad Company. Incorporated from four companies in early 1888, the Northern Pacific and Montana was listed as a non-operating subsidiary of Northern Pacific Railroad Company in 1889, having been leased in late 1888. In 1896 it was fully merged into the Northern Pacific Railway Company. One of two main lines of the Northern Pacific and Montana connected Logan and Butte, Montana, partially paralleling the route now associated with MSTI Alternatives 1B, 1C, and 2C.

Montana Southwestern Railway Company. Reorganized and incorporated in 1928 from the Montana Southern Railway Company, Montana Southwestern operated between 1931 and 1933 between Divide and Coolidge, Montana. The line was then inactive until abandoned in 1941. The line spurred from the Oregon Short Line Railroad in the town of Divide, a location now associated with MSTI Alternatives 2A, 2B, and 2D.

Chicago, Milwaukee, St. Paul, and Pacific Railroad Company. Incorporating six railroad companies in 1927, the Chicago, Milwaukee, St. Paul, and Pacific operated lines across the western states between 1928 and 1980. The trains served as common carriers, largely for the agricultural industry. Economic difficulties resulted in the abandonment of the Montana sections on June 15, 1974 and scrapping was completed by 1980. The main line operated by this company included stops in Missoula, Butte, and Three Forks, Montana and crossed the area now associated with the northwestern ends of MSTI Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 2D. The line would have continued to roughly parallel the routes of MSTI Alternatives 1B and 1C to the Three Forks area.

3.4.2.7 Idaho Historic Period

European-American Exploration of the Snake River Valley

The Historic Period in the region began with visits by Euro-American explorers and fur trappers in the early 1800s. In 1810, Major Andrew Henry led American trappers from a Missouri River trading post down the Madison River to Henry's Lake and Henry's Fork of the Snake River (Chittenden 1935). In 1812, William Price Hunt reached southeast Idaho and followed the South Fork of the Snake River. He was leading an expedition from St. Louis, Missouri to Fort Astoria, Oregon Territory at the mouth of the Columbia River. Hunt's efforts opened trade between the Shoshone People and Fort Astoria. In the early 1800s, the Hudson's Bay Company (HBC) initially controlled the trading of European manufactured

goods for furs in southeastern Idaho. HBC traders would follow seasonal movements of the Shoshone (Gehr et al. 1982).

Trapper Andrew Henry crossed the Snake River, Idaho in 1811 on his way to New Mexico (Hutchinson 1993:17). Although Henry's exact path through the valley went unrecorded, it is known he established a small fort in the winter of 1810 at Henry's Fork of the Snake River near today's St. Anthony, Idaho. A separate party of Astorian explorers stopped at Henry's post later in 1811 and explored the river south of the present day town of Fort Hall, Idaho(Hutchinson 1993:17). An offshoot of the Astorian party led by David MacKenzie then traveled west along a Native American trail that later became the main Oregon Trail. This journey passed another trail branching north at what would later be known as the junction of Goodale's Cutoff at Brownlee's Ferry (Hutchinson 1993:17). MSTI Zones 4, 5, and 6 are located in the eastern Snake River Plain.

Fur Traders and Missionaries in the Snake River Plain

By 1816 trappers had discovered the large population of beavers available within the Snake River Valley and on waterways to the north (Hutchinson 1993:18). In 1820, Donald Mackenzie of the Hudson's Bay Company led the first trapper party that reached the current location of Boise, Idaho. Mackenzie and company partially traveled the route of the future Goodale's Cutoff emigrant trail. By 1826, beaver trappers had explored nearly all the traditional Native American trails they would use for overland travel (Hutchinson 1993:17). Importing supplies by wagon train for hunting posts in the new fur trade empire developed many trails into main roads and posts were established along these routes (Hutchinson 1993:18). In 1824, the Hudson's Bay Company Snake River operations were infringed upon by American companies out of St. Louis, Missouri and their market competition greatly depleted beaver populations in the valley (Hutchinson 1993:19). In 1834, the Rocky Mountain Company, an American fur trade enterprise, broke a supply contract with trapper and trader Nathaniel Wyeth. In response, Wyeth established Fort Hall on the Ross Fork of the Snake River as a permanent fur trade post (Hutchinson 1993:19). However, the venture failed and was abandoned in 1856.

Trappers were followed by missionary expeditions intent on expanding European-American religion to Native Americans in the west. In 1834, Presbyterian missionary Jason Lee accompanied Wyeth to Fort Hall to scout opportunities for religious expansion. Lee's interest in developing emigrant trails focused on reaching camps of the Nez Perce and Salish, whom he had heard were seeking missionaries (Hutchinson 1993:42). Missionary emigrants took advantage of the hospitality offered by trappers in the valley and were supported in their travels by supplies and assistance from trading posts. In return, the trappers expanded into the stock raising business, adopting worn oxen from emigrant wagon trains and swapping them for rehabilitated animals (Hutchinson 1993:42). By 1840, demand for beaver fur had declined and low prices forced many of the experienced mountain men to become guides for emigrant parties (Hutchinson 1993:19). Fort Hall was transformed from a fur post to a trading post for emigrants crossing the Rocky Mountain region on their way to Oregon and California. Thus, the Snake River Plain became central to cultural exchange between the Great Plains and the Pacific (Hutchinson 1993:1).

Native Groups and Historic Settlement

The Idaho portion of the study area is considered to be the traditional territory of the Shoshone, Bannock and Paiute peoples. These groups were also known to inhabit part of what is now Montana, an area traditionally associated with the Salish and Kootenai and Pend d'Oreille peoples. The Shoshone had horses by the late 17th century, which dramatically increased their range and allowed them to travel as far as Canada (Murphy and Murphy 1986:300). The Shoshone had more interaction with early European explorers than their neighbors to the north. Although these groups did not become as involved with the fur trade as other groups, their proximity to the Oregon Trail provided regular interaction and trade with the increasing flow of emigrating groups in the 1840s.

There was no significant settlement of the Shoshone-Bannock and Paiute aboriginal areas in southern Idaho until the 1860s. During this time, Mormon settlers began to occupy the Bear River Valley, near today's Soda Springs, Idaho (Murphy and Murphy 1986:302). In 1860, gold was discovered at Pierce, Idaho. The resulting Idaho Gold Rush saw the settlement of the Salmon River drainage and the Sawtooth Mountains. During the 1860s, the U.S. Government negotiated treaties with the Shoshone and Bannock. In 1867, the boundaries of Fort Hall Reservation were established by executive order near the current city of Pocatello, Idaho. A second reservation was created for the Sheepeater and Lemhi Shoshone bands located in the Lemhi Valley, but it was terminated in 1875 and its peoples relocated to Fort Hall (Murphy and Murphy 1986:302). The Fort Bridger treaty, which originally established the reservation, also guaranteed the Shoshone and Bannock the right to hunt and gather on their traditional lands that remain unoccupied. Unlike the targeted denial of these rights that took place in Montana, the Idaho Shoshone and Bannock peoples utilized these rights and continue to exercise them today.

The Oregon Trail, Goodale's Cutoff, and Emigration through the Snake River Plain

In 1836, missionary Marcus Whitman successfully immigrated to Oregon with his wife and family over what would become the Oregon National Historic Trail, but there remained little incentive for other emigrants to make the long, arduous, and dangerous journey. After 1840, promotional campaigns succeeded in encouraging several groups from east of the Mississippi River to head to Oregon and California. By 1843, over 1,000 people had made the trip west.(Hutchinson 1993:1). In 1842, one wagon train was led over the Oregon National Historic Trail by United States Indian Commissioner Elijah White, but the group had to abandon their wagons at Fort Hall and continue on foot. Meanwhile, Joseph Chiles headed east from California on horseback in 1842 with the resolute belief he could prove wagon travel over the entire Oregon National Historic Trail was possible. He was convinced he could lead a wagon train back from Fort Hall, Idaho to California in the 1843 emigration season. Chiles accomplished his goal on the eastward trip; determining wagon travel was possible across Granite Pass in Idaho. Then, in 1843, Marcus Whitman led almost 1,000 emigrants west from Fort Hall. Even though Granite Pass was usable after 1842, the Sierra Nevada Mountain Range continued to prevent wagon passage, but in 1844, Elisha Stevens succeeded in taking a wagon train along the entire Oregon National Historic Trail to California (Hutchinson 1993:4). In 1848 and 1849, the discovery of gold in California triggered mass emigration over the Oregon National Historic Trail and traffic congestion and overtaxed natural resources encouraged use of alternate trails through Idaho, including Goodale's Cutoff (Hutchinson 1993:82). In the 1860s, gold had also been discovered in the Boise Basin, Idaho, and Pioneer and Highland Mountains in Montana. This prompted many people to settle in the Snake River Valley and Camas Prairie and build farms and ranches along the roads to support the Idaho mining communities and emigrant traffic (Hutchinson 1993:4).

Goodale's Cutoff from the Main Oregon (National Historic) Trail. Goodale's Cutoff is a northern branch emigrant trail that split from the main Oregon National Historic Trail at Fort Hall. There are several variants of this trail, but the main routes crossed the Snake River at Ferry Butte and headed northwest across the Snake River Plain, past Big Southern Butte to the Big Lost River. The trail continued west past the present day town of Arco, Idaho, skirted the north end of the Craters of the Moon Lava Flow, then rolled through foothills and across Camas Prairie near today's Fairfield, Idaho. The trail then rejoined the Oregon Trail at Ditto Creek near Boise, Idaho (Hutchinson 1993:93-162). The cutoff was used by trappers and traders for years and there is material evidence that emigrant wagons made it over the trail as early as 1852 (Hutchinson 1993:130; 1972). The guiding landmark used for the trail west of Snake River was Big Southern Butte; the cutoff traveled around the northern edge of the landform (Wells 1972; INL 2010). The eastern portion of the cutoff was mapped as "Jeffers Road" in 1859 by Governor K. Warren, while the western portion of the cutoff was mapped as "New Emigrant Road" by Alonzo Leland in 1863 (Hutchinson 1993:130; Wells 1972). During the Salmon River gold rush in 1862, Tim Goodale led a party of miners over the cutoff, effectively bypassing an attack on emigrants at Massacre Rocks on the main Oregon Trail. Years later, when these miners had become influential people

in Idaho, they renamed the trail "Goodale's Cutoff" in his honor (Hutchinson 1993:130; Wells 1972). Goodale's Cutoff crossed areas now associated with MSTI Alternatives 5A, 5B, 5C, and 5D, on the west side of the Snake River, northwest of Fort Hall. The NRHP registration form for Goodale's Cutoff is included in Appendix C.4.1.

By the late 19th century several associations had formed to record the history of the Oregon Trail and overland trails across the country that were associated with westward emigration (Hutchinson 1993:5). Members of the Oregon-California Trails Association (OCTA) have assisted the Idaho BLM and Idaho State Historical Society (ISHS) in relocating and marking the Idaho trails. In 1985 Peter Laudeman of the Idaho BLM prepared federal management plans to protect emigrant trails on public lands. In 1978, Public Law 950625 dedicated the primary 1841–1848 emigrant route as the Oregon National Historic Trail (Hutchinson 1993:5). In 1989, local Idaho historian Fred Dykes published the story of the Jeffers Road and Goodale's Cutoff in southeast Idaho (Dykes 1989 and 1995). Today, the towns, irrigation systems, road construction, power lines, agricultural expansion, and industrial development that followed western emigration across Idaho have destroyed portions of Goodale's Cutoff (Hutchinson 1993:132). However, there are continuous and discontinuous variants and remnants of the trail visible around Big Southern Butte. Some sections are still used as unimproved roads (Hutchinson 1993:135). The trail crosses an area that is now restricted by the Department of Energy (DOE) and designated as the Idaho National Laboratory (INL) (Hutchinson 1993:142-143). Atomic City (formerly Midway), Idaho is located northeast of Goodale's Cutoff. This community once housed INL construction workers and employees. These areas are now associated with MSTI Alternatives 5A, 5B, 5C, 5D, and 6A. Goodale's Cutoff also crossed the northern portion of today's Craters of the Moon National Monument and Preserve, which MSTI Alternative 6A skirts to the south (Hutchinson 1993:146).

Nez Perce National Historic Trail. This trail commemorates the route taken by around 750 non-treaty Nez Perce during the Nez Perce War of 1877. Facing removal to the Lapwai reservation, a raid undertaken against white ranchers brought the army to action and forced the Nez Perce to flee. The Nez Perce, under the command of Chiefs Joseph and White Bird fled from the Wallowa Valley of Oregon combining with Chief Looking Glass along the way. The route crossed the Salmon River Valley of Idaho where the battle of White Bird was fought, then traversed the Bitterroot Mountains into Montana. From Lolo pass the route went south to the Big Hole battlefield and eventually north toward Canada (Walker 1998: 434).

The flight began as a route to reach safety with allies to the east, but the Crow and Flathead were not interested in bringing war on themselves. This left Canada as the non-treaty Nez Perce's best option. They were pursued by General Howard of the US Army and eventually intercepted after almost 1,200 miles of flight only 40 miles from the Canadian border (Walker 1998:435). Over 100 of the Nez Perce made it to Canada but some 375 surrendered and were forced to go to reservations in Oklahoma (Ruby and Brown 1992: 147).

The trail the Nez Perce followed was not established during the flight. It consisted of a route taken through an existing network of trails that had been used by indigenous groups for at least 9,000 years. The Nez Perce National Historic Trail crosses the MSTI study area twice. These crossings are near Dubois, Idaho and the site of a defunct resort, Lidy Hot Springs. For a short distance in the I15 corridor, the trail closely parallels the border between Zones 4 and 5 fo the proposed project, and thus Alternatives 4A, 5A, 5B, 5C and 5D could all potentially impact the Nez Perce NHT.

Transportation in Southern Idaho

Stage Routes and Communication

In 1848, the only mail delivery available to mining and trade communities in the west was piecemeal service granted by emigrant parties charging carrying fees per letter (Hutchinson 1993:163). This system was unconventional and unreliable; traveling parties often changed course en route or failed to locate recipients. A more organized system emerged in Idaho after the initiation of the federal mail service in 1850. Private contractor Ben Holladay purchased a government contract in 1862 from Russell, Majors, and Waddell and shifted the route through southern Idaho and into Wyoming. By 1864, Holladay had added two more tri-weekly mail routes; one from Corinne, Utah through Idaho Falls, Idaho to Virginia City, Montana. With the entrance of railroad systems into southern Idaho, Holladay's postal delivery route was quickly encroached upon by the Union Pacific railway construction. In 1866, Holladay sold his contract to Wells, Fargo, and Company, who then closed the mail line in 1869 when stage delivery was outdated by the transcontinental railroad (Hutchinson 1993:163). Today, Holladay's delivery route is followed by I-15, which is paralleled and/or crossed by MSTI Alternatives 4A, 5B, 5C, and 5D between Idaho Falls and the Idaho-Montana state line.

Railroads

Railway systems did not reach Idaho until comparatively late in the period of western rail expansion. Although railroad prospectors were actively surveying Idaho by 1868, the population was not large enough to justify land grants from the U.S. Congress until the late 1890s (Athearn 1971:313). The following are short descriptions of the three railroad operations responsible for creating the southern Idaho railway system within the MSTI study area (adapted from Robertson 1991:213–225):

Idaho Southern Railroad Company. This railroad was incorporated in 1908 and began grading and laying of rails the same year. The company's railways were operated between 1909 and 1916. After abandonment, scrapping took place in 1918. One long-line of the Idaho Southern Railroad Company passed east-west through Shoshone and would have crossed the area now associated with MSTI Alternative 6A.

Utah and Northern Railroad. Brigham Young wanted a railroad running north from Ogden to tap the growing trade with Montana mining camps. Montana miners were becoming regular customers for Utah's farm products and shipments of salt which were needed to refine silver ore. Also, there was the prospect of a transfer point for Montana-bound freight, similar to what was being off-loaded from Central Pacific cars at Corinne, Utah. This freight was shipped to Corinne by railroad and transferred by the freight companies to their own heavy wagons for the 400-mile journey to the mining camps. Corinne was two days closer to Montana by wagon than Ogden, and was at the southern end of a route up the Malad Valley leading into Idaho (Strack 2005).

The Utah and Northern Railroad was organized on August 23, 1871 to build a three-foot or narrow-gauge route north from a terminal with Central Pacific, Union Pacific, and Utah Central at Ogden to Soda Springs, Idaho Territory (Athearn 1971:238). Construction began on August 26, 1871 (Beal 1980:5) with a ground-breaking ceremony held adjacent the Central Pacific line three miles south of Brigham City, Utah. Brigham Young and James Camell, president of the Utah Division of the Central Pacific, and other community and church officials were present. In 1874, the rail line reached and ended at Franklin, Idaho. In 1878, the Union Pacific Railroad acquired the line through bankruptcy and resumed construction of the renamed Utah and Northern Railway north through Idaho and on to Montana. Three and a half years later, on December 15, 1881, the Utah and Northern narrow-gauge railroad was completed to Butte, Mont., 397 miles north of Ogden (Reeder 1981:243-252).
In 1882, the recently organized and constructed Oregon Short Line was assigned control of Utah and Northern operations. Branches and mainlines of the former Utah and Northern Railroad crisscrossed areas

now associated with MSTI Alternatives 4A, 55A, 5B, 5C, 5D, and 6A. A section of abandoned narrow-gauge roadbed remains in MSTI Alternative 5D.

Oregon Short Line Railroad. This company was incorporated in 1881 and operated many lines and spurs throughout southern Idaho. In 1899, the Oregon Short Line was an operating subsidiary of the Union Pacific Railroad Company and was leased in whole by the Union Pacific in 1936. Main lines and numerous spurs of the Oregon Short Line-Union Pacific rail system were operated from Shoshone, Idaho, through Pocatello and Idaho Falls, north to the Montana border. These lines crisscrossed areas now associated with MSTI Alternatives 4A, 5A, 5B, 5C, 5D, and 6A.

Salmon River Railroad. This line was incorporated in 1901 with the goal of linking Blackfoot, Idaho with Mackay, Idaho. Branch lines to Moreland and Aberdeen were also planned. Construction began in the spring of 1901 and finished in the spring of 1902. The branch lines were completed in 1909. Operations were immediately leased to the Oregon Short Line. The Salmon River Railroad never operated indecently. These lines still cross areas associated with MSTI Alternatives 5A, 5B, 5C, and 5D,

Union Pacific Railroad. The Union Pacific Railroad was incorporated in 1862 and laid the first rails west in 1865. In 1869 the golden spike driven at Promontory Summit, Utah by officials of the Union Pacific and Central Pacific marked the inauguration of the transcontinental railroad (UPRR 2010). Early in its history the Union Pacific acquired rail lines located throughout the West and Pacific Northwest. In southern Idaho, the Union Pacific Railroad controlled the Oregon Short Line, Utah and Northern Railroad, the Yellowstone Branch, Salmon River Railroad and mainlines, spurs branch lines.

The Carey Act Settlement Initiative in Idaho

To settlers in the early 20th century the Snake River Plain was largely considered uninhabitable and unproductive desert (ISHS 2003:1). In 1894, the U.S. Congress passed the Carey Act, an initiative to irrigate and populate arid regions through federal, state, and private cooperation. The federal government began the process by instructing the General Land Office to make available for reclamation up to one million acres of federal land designated as "desert in character" in each western state. When the state received its land patents from the government, it in turn entered into contracts for plans developed by private companies. In Idaho, over half a million acres were patented, with World War I veterans given preference as settlers. The Idaho State Board of Land Commissioners and State Engineer were originally the state Carey Act administrators, but in 1919 the responsibility was handed to the Department of Reclamation and the State Engineer, whose title was changed to Commissioner of Reclamation (ISHS 2003:3-4). The state entered into contracts with private developing companies, who in turn contracted the water rights to settlers. Settlers paid an entry fee to the state and were required to improve their 160 acre plots on a construction and production schedule spanning three years. At the end of three years if the settlers could prove they met the requirements, they received their land patents. The state was responsible for contracting the private operating companies to oversee long-term maintenance and administration (ISHS 2003:4-5).

Today, southern Idaho is driven by an economy of agriculture and supporting industries. The Snake River Plain hosts a large network of canals supporting thousands of farms producing feed crops, sugar beets, potatoes, alfalfa, grain, orchards, and vineyards (ISHS 2003:2). The canals supply irrigation to grazing pastures for ranches that contribute livestock and its subsidiary industries to the state economy. The first three decades of the 20th century saw the desert wastelands of southern Idaho turn into a driving market force; towns such as Twin Falls, Jerome, and American Falls owe their livelihood to the Carey Act of 1894 (ISHS 2003:3).

Atomic City and the Idaho National Laboratory

Atomic City, located northeast of Goodale's Cutoff, was populated in 1949 as a community of employees from INL (Hutchinson 1993:142). The INL is a federally funded engineering laboratory focused on regional, national, and global research and development for the Department of Energy, Department of Defense (DOD), Department of Homeland Security (DHS), and National Aeronautical and Space Administration (NASA) (INL 2010a). The facility also hosts engineering and scientific research into five additional energy resources, artificial intelligence, robotics, and microbiological, geological, and environmental studies (INL 2010a). The INL grounds were used in the 1940s by the United States Navy to test artillery. In 1951, INL hosted one of the 20th century's most momentous events when it produced the first useable amounts of nuclear-powered electricity (INL 2010b). This was the world's first peaceful usage of nuclear power. Today, the reactor responsible for this production, Experimental Breeder Reactor Number 1, is registered as a National Historic Landmark. INL nuclear scientists also invented the technology that powered the world's first nuclear submarine, the USS Nautilus. Between 1953 and 1994, thousands of naval officers have been trained on full-scale submarine prototypes (INL 2010b; INL 2010c). Today, INL has built and operated over 50 nuclear reactors and has many scientific facilities that remain active in research and development. MSTI Alternative 5A crosses the INL north to south.

3.4.3 Tribal Treaty Rights and Contemporary Land Use

Native American organizations with interest in the MSTI study corridor include: the Shoshone-Bannock Tribes, the Shoshone-Paiute Tribes (including Western Shoshone and Paiute), the Confederated Salish and Kootenai Tribes (ethnographically consisting of the Flathead, the Pend d'Oreille and the Kootenai), the Blackfeet Nation, and the Nez Perce Tribe.

3.4.3.1 Traditional Territories

Because of the high residential mobility of prehistoric and historic Native American peoples, it is impossible to say that any given area was the traditional territory of a single group. The Idaho portion of the study area is considered to be the traditional territory of the Northern Shoshone and Bannock peoples, but the area was also utilized by the Western Shoshone. The area was also known to be utilized seasonally by the Nez Perce.

The Montana segment of the MSTI study area is the traditional territory of the Bitterroot Salish, Pend d'Oreille, and Shoshone-Bannock peoples. The territories of the Flathead and Pend d'Oreille are separated by the Continental Divide with the Pend d'Oreille inhabiting the west side in the drainages of the Clark Fork and Bitterroot Rivers. The area to the east of the Continental Divide which comprises the drainages of the Big Hole, Beaverhead, Madison, and Missouri River drainages was inhabited by the Bitterroot Salish . The southern parts of both the Bitterroot Salish and Pend d'Oreille aboriginal territories were also the northernmost reaches of the Shoshone-Bannock territories, which are centered in southern Idaho. These parts of western Montana were also used by the Blackfeet, and Nez Perce peoples.

The historic Blackfeet were a plains-based people specialized in bison hunting. Their territory is ethnographically recorded to the northeast of the study area, but their actual range overlapped with that of the Bitterroot Salish. The Blackfeet had the horse after 1730 which increased their range (Dempsey 2001:607). After this time they were regularly in conflict with the Bitterroot Salish, Crow, and the Sioux peoples. At the time of European contact, relations between the Bitterroot Salish and Blackfeet Nations were strained and limited to warfare and raiding.

The Nez Perce culture was traditionally centered to the west of the study area in the Lower Snake, Wallowa, and Clearwater drainages. They were known to make yearly trips into the study area in what was referred to as "the road to the buffalo." The Nez Perce people still utilize the area around Yellowstone Park for bison hunting.

3.4.3.2 Treaties and Treaty-based Subsistence Use

A number of treaties were signed between the US Government and bands of the Shoshone and Bannock Tribes, though only one was ever ratified by congress. The Fort Bridger Treaty of 1868 (15 Stat 73) confirmed the Fort Hall Indian Reservation that was established the previous year. Article IV of the treaty also guaranteed the Shoshone–Bannock Tribes the right to continue traditional practices on unoccupied land. These practices include hunting, gathering, fishing, and spiritual use over most of the study area. This guaranteed access to floral and faunal resources is still used by the Shoshone-Bannock people today.

The Western Shoshone signed the Ruby Valley Treaty on October 1, 1863. This treaty created the Duck Valley Reservation on the Idaho/Nevada border. This treaty attempted to restrict the territory of the Western Shoshone to "abandon the roaming life" at some point in the future (Thomas 1986:263).

The major treaties affecting the Bitterroot Salish and Pend d'Oreille people are the Hell Gap Treaty, signed on July 16, 1855 and the Judith River Treaty, signed on October 17, 1855. The Hell Gap Treaty was signed by the Bitterroot Salish, and Upper Pend d'Oreille Tribes. It established the Flathead, or Jocko, reservation and guaranteed the affected groups the rights to hunt, gather, and fish in unoccupied areas outside of the reservation (Beckam 1998: 154). The original treaty ceded 12,806,000 acres but by the time the reservation survey was finished in 1892 the reservation contained 1,242,696 acres (Lahren 1998:491). When the state of Montana was established, it attempted to suppress the right to off reservation resource procurement (Malouf 1998: 310). Although the Hell Gap treaty set up the conditional Flathead reservation, all of the Bitterroot Salish and Pend d'Oreille were not removed to the reservation until 1891.

The Judith River Treaty of 1855 was signed by the Flathead, Pend d'Oreille, Kootenai, Blackfeet and Nez Perce Tribes. It established tribal hunting grounds for bison hunting (Malouf 1998:306). The Judith River Treaty also established the official tribal territory in northern Montana that was subsequently decreased by an un-ratified treaty in 1868 (15 Stats 635) and the Sweetgrass Hills Treaty of 1887.

3.4.3.3 Traditional Land Use

Every part of the landscape served a purpose to the Native American inhabitants. Many current travel corridors, including the I-15 corridor utilized by several of the MSTI alternatives, follow Native travel corridors. Uplands were used for summer and fall botanical procurement including camas, bitterroot, and berries. These areas were also extensively used for hunting of large mammals. Extreme highlands were used spiritually and for lookouts. Riverine and lowland environments were used during the late spring and summer for collecting aquatic resources, small game, and wide base botanical resource procurement. These low areas were also the sites of semi-sedentary winter settlements.

When the horse became available resource use changed dramatically. Aboriginal ranges increased as it was possible to travel long distances in a single day. Before the horse most tribes hunted bison, but only

the Blackfeet and Bitterroot Salish were especially dependent on bison hunting. After Native Americans acquired horses in Idaho and Montana, bison hunting became a more significant part of the subsistence base of the Pend d'Oreille, Nez Perce, and Shoshone. The horse provided a significant advantage in hunting and allowed the transportation of meat and hides to faraway locations.

Traditional Cultural Properties (TCP) would be scattered throughout the MSTI study area. These would include sites of cultural importance spiritual and subsistence purposes. Spiritual sites in the MSTI study area would probably be confined to high altitude environments, areas of unique geology within the lowland lava flows, and where rock art panels are located. In both segments, there are likely to be traditional resource procurement areas in every environment. These may include, but are not limited to hunting and fishing grounds, camas meadows, and berry gathering sites.

3.4.4 Regulatory Setting

The following sections provide a brief summary of the laws, regulations, executive orders and state statutes relevant to the identification, management, and protection of cultural resources in the MSTI study area. More information on these mandates is provided in Table 3.4-1, which is at the end of this section.

3.4.4.1 Montana

In Montana, the routes for the proposed project traverse federal lands administered by the Bureau of Land Management (BLM), Forest Service (USFS). These federal agencies have responsibilities under the National Environmental Policy Act (NEPA) of 1969 and Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended, to assess the effects federal undertakings may have on significant cultural resources and, when feasible, to mitigate adverse effects to these resources as a result of the undertaking. These agencies are also responsible for protecting cultural resources under their jurisdiction according to the requirements set forth in the Federal Land Policy and Management Act (FLPMA) of 1976, the National Forest Management Act (NFMA) of 1976, and the Archaeological Resources Protection Act (ARPA) of 1979 (King 2004). For the proposed project, the BLM is taking the lead for the Section 106 compliance. A Section 106 Programmatic Agreement (PA) is being prepared, setting forth the criteria for identifying and managing cultural resources within the project area.

On state lands, the Montana Department of Natural Resources and Conservation (MDNRC) is responsible for ensuring the protection of cultural resources on State lands as required by the Montana Antiquities Act and the Montana Environmental Policy Act (MEPA). The Montana Department of Environmental Quality (MDEQ) is responsible for issuing a certificate of compliance for the proposed transmission line under Major Facility Siting Act (MFSA), which requires and assessment of potential impacts to cultural resources and an estimate of the costs that would be incurred in mitigating these impacts. The Montana State Historic Preservation Office (SHPO) at the Montana Historical Society (MHS) has responsibilities for protecting cultural resources under the Montana Antiquities Act and MEPA as well as a significant role in the Section 106 compliance process.

The NHPA and MFSA require consultation with Native American groups. The Montana BLM has initiated the consultation process with the five federally recognized tribes in Montana by sending each tribe a letter describing the MSTI project, a map of the alternatives, and a request for information. Once the final alternatives have been selected, and the NEPA process formally initiated, the appropriate federal agencies will also be required to initiate government-to-government consultation with Native American groups claiming historic affiliation with the lands crossed by the proposed transmission line.

An agreement has been drafted between NorthWestern Energy (NorthWestern), MDEQ, and MDNRC to assure that the requirements of the two agencies for identifying and managing cultural resources are being met as they pertain to the issuing of the MFSA permit (Appendix C.4.2).

3.4.4.2 Idaho

In Idaho the proposed project alternative routes cross lands managed by private entities, the BLM, the USFS, the Department of Energy (DOE), and the State. All federal regulations that apply in Montana and were described above are also applicable in Idaho, where BLM has again taken the lead federal role in Section 106 compliance. The Idaho Antiquities Act of 1963 is the primary state law that provides for the management and protection of cultural resources on state lands. The State of Idaho does not have any regulations or statutes requiring an in-depth cultural resource study on private lands. Once federal involvement is initiated, the federal agencies will be required to comply with NEPA and Section 106 of NHPA.

Table 3.4-1. Relevant Laws and Regulations Regarding Cultural Resources in the Study Corridor

Law	Description
Antiquities Act (1906)	This was the first law to protect and preserve cultural resources on federal lands. It makes it illegal to remove cultural resources from federal lands without a permit, establishes penalties for illegal excavation and looting, and allows the President to establish historic monuments and landmarks.
Idaho Antiquities Act Idaho Code, Chapter 41, Sections 67-4114 (1963)	The Act outlines the penalties for willfully or recklessly damaging, destroying, or harming an archaeological or historical site or any marker or monument referring to such a site on State lands. It also requires that permits be obtained from the board of trustees of the ISHS prior to any excavation of an archaeological or vertebrate paleontological site on any State lands and that any artifacts, objects, or fossils that may be collected during the excavation remain the property of the State of Idaho. In general, it provides for the protection of cultural resources on state lands.
National Historic Preservation Act (1966)	Establishes the National Register of Historic Places (National Register); defines the Section 106 requiring federal agencies to consider effects of an action on significant cultural resources that are either on, or eligible for, the National Register.
National Trails System Act (1968)	Promotes the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air outdoor areas and historic resources and trails of the Nation.
National Environmental Policy Act (NEPA) (1969)	NEPA requires federal agencies to analyze the impacts of an action on the human environment, including cultural resources, to ensure that federal decision makers are aware of the environmental consequences of a project before implementation.
Executive Order 11593 "Protection and Enhancement of the Cultural Environment" (1971)	Directs land holding federal agencies to identify and nominate historic properties to the National Register and requires that these agencies avoid damaging historic properties that might be eligible to the National Register.
Archaeological and Historic Preservation Act (AHPA) (1974)	The AHPA addresses impacts to cultural resources resulting from federal activities and provides a funding mechanism to recover, preserve, and protect archaeological and historic data.

Law	Description
Federal Land Policy and Management Act (FLPMA) (1976)	Requires the BLM to manage their lands on the basis of multiple use in a manner that will "protect the quality of…historical…resources and archaeological values". FLPMA is a comprehensive law that provides for long-range land use planning, permits to regulate the use of public lands, and enforcement of public land laws and regulations.
National Forest Management Act of 1976	Requires the USFS to manage their lands and associated resources (including cultural resources) in manner that accounts for these resources and allows for public appeal of management policies.
American Indian Religious Freedom Act (AIRFA) (1978)	Requires federal agencies to consult Native American groups when a proposed land use might conflict with traditional Indian religious beliefs or practices, to avoid interference with these beliefs to the extent possible, and maintain access to religious or sacred areas whenever feasible.
Archaeological Resources Protection Act (ARPA) (1979)	ARPA establishes civil and criminal penalties for the unauthorized excavation, removal, damage, alteration, or defacement of archaeological resources, prohibits trafficking in resources from public lands, and directs federal agencies to establish educational programs on the importance of archaeology.
Native American Graves Protection and Repatriation Act (NAGPRA) (1990)	NAGPRA establishes the right of Native American groups to claim ownership of human remains, funerary objects, sacred objects, and objects of cultural patrimony found on federal or tribal lands. It requires federal agencies and museums to identify holdings of such objects and work towards their repatriation with Native American groups claiming a cultural affiliation with the items. Excavation or removal of these resources requires consultation, as does the discovery of these items during land use activities.
Executive Order 13007 "Indian Sacred Sites" (1996)	Directs agencies responsible for managing federal lands to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and maintain the confidentiality of sacred sites.
Montana Human Skeletal Remains and Burial Site Protection Act (1999)	Provides legal protection to all unmarked burial sites by preventing unnecessary ground disturbance and identifying procedures to be followed if anyone discovers human skeletal remains.
Executive Order 13287 "Preserve America" (2003)	Encourages the federal government to take a leadership role in the protection, enhancement, and contemporary use of historic properties and establishes new accountability for agencies with regard to inventories and stewardship.
Memorandum for the Heads of Executive Departments and Agencies Regarding Government-to-Government Relations with Native American Tribal Governments	Directs each federal agency to operate within a government-to-government relationship with federally recognized tribal governments; consult with tribal governments; and assess the impact of plans, projects, programs, and activities on tribal trust resources and assure that tribal rights are taken into account during consideration of such plans, projects and activities.
Montana Environmental Policy Act (MEPA)	State agencies must consider the identification and preservation of heritage properties on State lands. Some permits, licenses, and reclamation applications may require consideration of resources on non-State lands.

Law	Description
Montana Major Facility Siting Act (MFSA)	For transmission lines, MFSA applications must contain cultural resource data for each alternative facility location and its impact zones. Impact zones include any lands where construction and operation of the facility, including the construction of access roads, may directly affect the integrity of archaeological and architectural resources. Lands with known cultural sites from which the facility would be clearly visible and where the values of cultural resources may be significantly affected by the visual presence of the facility are also considered impact zones.
Montana State Antiquities Act	Directs State agencies to avoid, whenever possible, State actions or State assisted actions that substantially alter heritage properties on lands owned by the State.
Idaho State Statue 18-0727-18-0728	Prohibits the destruction of all graves and burial sites on state lands.
Idaho State Statue 18-7035	Protects all deposits, formations and archaeological materials within caves on state lands.
Bridger Treaty	The Fort Bridger Treaty of 1868 (15 Stat 73) confirmed the Fort Hall Indian Reservation that was established the previous year. Article IV of the treaty also guaranteed the Shoshone–Bannock Tribes the right to continue traditional practices on unoccupied land. These practices include hunting, gathering, fishing, and spiritual use over most of the study area. This guaranteed access to floral and faunal resources is still used by the Shoshone-Bannock people today.

(Adapted from NorthWestern 2008a).

3.4.5 Cultural Resource Definitions

Cultural resources are defined as any prehistoric or historic district, site, building, structure, trail, or object considered to be important to a culture, subculture, or community for scientific, traditional, religious purposes, or any other reason. Cultural resources are generally divided into five main categories: prehistoric, historic, multicomponent, architectural, and traditional cultural properties (BLM 2002:6, 2004:G2; MSTI Draft PA 4/9/2010:4; Power Engineers 2008a).

Prehistoric, Historic, and Multicomponent Archaeological Resources are locations where human activity has measurably altered the earth or left deposits of physical remains (e.g., stone projectile points, bottles). Federal acts and regulations (e.g., NHPA, 36 CFR part 800) use the term "prehistoric" to refer to archaeological resources associated with Native Americans prior to contact with European-Americans. This term is also commonly understood to mean cultural resources that pre-date the use of written records for an area. Prehistoric resources in Montana and Idaho may include stone circles, rock cairns, lithic scatters, rock art locales, and many other types. Historic archaeological resources are generally those that post-date European-American contact with Native Americans. In Montana and Idaho, the vast majority date to the 19th and 20th centuries and consist of mining-related features, homesteads, historic trash dumps, and linear features such as railroads or trails. Multicomponent cultural resources have both a prehistoric and historic components which are spatially related.

The distinction between "prehistoric" and "historic" cultural resources is somewhat arbitrary. Based on oral tradition, some Native American groups do not distinguish their past by pre- and post- contact with European-Americans, but rather see one long continuous history. Furthermore, while performing

traditional activities in the 21st century, Native Americans may still create artifacts and features that resemble those identified by archaeologists as prehistoric.

Architectural Resources are standing buildings or structures and may include houses or cabins, barns, dams, lined canals, and bridges. In southwestern Montana and southeastern Idaho, many architectural resources are associated with mining, homesteading, or agricultural activities.

Traditional Cultural Properties (TCPs) are cultural resources associated with cultural practices and beliefs of a living community that are intimately tied to its past and are important in maintaining the continuing cultural identity of that community (Parker and King 1998). In Montana and Idaho, TCPs are overwhelmingly associated with contemporary Native American groups and may include locations of historic events, sacred areas, traditional hunting and gathering areas, sources of raw material for stone tools, or native plants and animals. Native Americans consider these resources essential for the persistence of their traditional culture.

There is one identified TCP near the MSTI study corridor. This TCP's name is confidential it is located approximately three miles west of the Alternative 5A and will not be physically impacted by this project.

Furthermore, cultural resources can be classified as either sites or isolated finds based on the quantity, density, and type of cultural material present at a locale. Generally, isolated finds consist of a single object (e.g., projectile point, bottle) or feature (e.g., mining adit, stone circle). Sites tend to consist of several artifacts or features within a definable area. However, these classifications are arbitrary and highly dependent on the type of resource, geographical area where the resource was found, regulatory definitions, or the discretion of the documenting archaeologist. For example, an isolated stone tool may be classified as a site if the tool type is of particular scientific interest. As stipulated in the draft PA, the BLM definitions for what constitutes an archaeological site and an isolate will be utilized for the field inventory of the selected alternative (MSTI Draft PA 2010:12).

3.4.6 Determining National Register Eligibility of Sites

For the purposes of this EIS, significant sites are defined as being eligibile for inclusion in the National Register of Historic Places (NRHP). Only sites that are eligible for or are listed on the NRHP need be evaluated for adverse impacts resulting from a Federal undertaking, such as this proposed project. Sites that are eligible for inclusion in the NRHP are characterized by criteria A through D as defined by the NHPA of 1966 as ammended Eligible sites must also satisfy one or more of the following criteria (36 CFR 60.6; 36 CFR 800; National Park Service 1997:12-21; Neumann and Sanford 2001):

A. That are associated with events that have made significant contribution to the broad patterns of our history; or
B. That are associated with the lives of persons significant in our past; or
C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. That has yielded, or may likely to yield, information important to prehistory or history.

Only sites that are eligible for or are listed on the NRHP require consideration of adverse impacts resulting from a Federal undertaking, such as the MSTI project. Cultural resources with unknown NRHP eligibilities are sites that have been identified, but for which NRHP status is not known. These sites are treated as eligible for inclusion in the NRHP until they are formally evaluated, and therefore must be

evaluated for adverse impacts from the proposed project. Sites for which the lead agency and SHPO disagree on NRHP eligibility, are assigned an indeterminate status until an agreement is reached or resolved by submission to the Keeper of the Register. . These sites are treated as eligible for inclusion in the NRHP as well. Lastly, sites that are not eligible for inclusion in the NRHP do not need to be considered for adverse impacts resulting from a Federal undertaking. As detailed in the Draft PA, the pedestrian cultural resource inventory will formally re-evaluate all sites with indeterminate NRHP status within the selected alternative's APE (MSTI Draft PA 4/19/2010:9).

This analysis evaluates the effects on the following sites that are either listed on or eligible for NRHP:

3.4.7 Native American Consultation

Refer to Chapter 6 for an in depth review of the Native American consultation process.

3.4.8 Section 106 Process and Programmatic Agreement

The Bureau of Land Management (BLM) is the lead agency for compliance with the National Historic Preservation Act (NHPA). Section 106 of the NHPA requires the federal agency to take into account to the effect of the undertaking- in this case, the grant of right-of-way- on historic properties and afford the Council a reasonable opportunity to comment. 36 CFR §800.8, the regulations implementing Section 106 of the NHPA, encourages federal agencies to coordinate their efforts to comply with Section 106 with the NEPA review process, in order to facilitate early planning for cultural resources, and to accommodate timely and efficient government to government consultation with the tribes, as well as effective participation by the public.

On October 16, 2008, the BLM initiated Section 106 consultation with the Nez Perce Tribe, the Blackfeet Nation, and the Confederated Salish and Kootenai Tribes by letter. Consultation with the Shoshone-Paiute Tribes has occurred through the ongoing Wings and Roots Program. Consultation was initiated with the Shoshone-Bannock Tribes through a presentation made to the Fort Hall Business Council on October 10, 2008. In Feb. of 2010 the BLM initiated Section 106 consultation with the Butte-Anaconda NHLD, a Certified Local Government under 36 CFR §800.2.

Current efforts to identify historic properties that may be affected by the proposed undertaking have consisted of Class I investigations and helicopter reconnaissance of the project area. The results of these investigations are presented in Section 3.4.10. A Class III pedestrian cultural resources survey will be conducted for the selected alternative only; the decision to limit survey to the sslected alternative was made by the lead and cooperating agencies, in consultation with the Idaho and Montana State Historic Preservation Offices and was based upon NorthWestern's commitment to plan for the avoidance of cultural resources in the siting of structures and facilities related to the transmission line. During initial scoping meetings NorthWestern made presentations to the cooperative agencies which demonstrated the flexibility of the design process in terms of accommodating the avoidance of historic properties and demonstrated how ground disturbance could be minimized through use of helicopters to install the transmission line.

The Programmatic Agreement is presently being developed in consultation with the ACHP, MT SHPO, ID SHPO, Tribal entities, and other agencies. The PA will define the roles of key agencies, signatories, and consulting parties. In addition, the PA will set forth the process for the identification of cultural resources, evaluation of those resources for inclusion into the NRHP, treatment of eligible resources, and mitigation were necessary for those resources that may undergo an adverse impact from the proposed project.

As previously discussed, The PA allows for completion of Section 106 compliance to the appropriate level, (usually 100% survey coverage) by conducting the field inventory, cultural resource site recordation and evaluation, National Register site evaluation and effect determinations on the Preferred Alternative only. The PA allows the project to move forward under the NEPA process, assuming adequate recognition of National Register eligible sites (historic properties) and the disclosure of potential project impacts to those sites. This Section 106 public involvement process, through the PA, will result in the final determinations of project effects to historic properties. Resolution of any adverse effects will be outlined in a historic properties treatment plan to be developed as part of the PA.

In order to comply with NEPA, the analysis of effects to cultural resources is based on the known cultural resources and the assumption that unevaluated sites are potentially eligible for the National Register. Each alternative is compared by the number of sites that would be impacted by the project. Until the Preferred Alternative is identified and 100% surveys are conducted the predicted impacts are limited to comparing the potential extent of cultural resource impacts by alternative.

3.4.9 Methods

Four separate methods of data collection were employed for this EIS. The first was a search of agency and state cultural resource files to identify previously identified sites within the one mile wide study corridor. Second a low-level helicopter reconnaissance survey was conducted along the Montana alternatives to identify additional cultural resources. Third a site density model was developed to augment the file searches and aerial reconnaissance information. Lastly, selected sites, identified as being significant, were analyzed for visual impacts .

3.4.9.1 Records Search

Existing data on cultural resources within the project area were compiled from previous inventories provided by the Idaho and Montana SHPOs and other agencies. Although, in general, no new data were collected as part of this project, an aerial reconnaissance was conducted of the alternatives in Montana to fulfill requirements of the MSFA Application. Additional details on data compilation are provided in the following sections. As part of the PA, and at the direction of the lead agencies, a Class III inventory of cultural resources will be performed on the selected alternative.

The baseline data for cultural resources was compiled by NorthWestern Energy from the BLM and USFS offices and the SHPOs in 2006, 2007, 2008 and 2009. Additional information was provided by the Beaverhead-Deerlodge National Forest in March 2010 that focuses on previously conducted inventories within the forest. This effort suffices for the Class I inventory. The resulting dataset is comprised of information detailing the previously conducted cultural resource investigations and previously recorded sites within the 1 mile study corridor (0.5 miles on either side of the route centerline). Due to the volume of data, some cultural resource reports were omitted, including many of the negative findings reports from the MDNRC because these represented small inventory areas (typically less than three acres) that lacked cultural resources (NorthWestern 2008a). It is estimated that 90 percent of all reports summarizing previous cultural resource investigations within the study area were reviewed for the analysis of impacts to cultural resources (NorthWestern 2008a).

Approximately 487 previously conducted inventories within the MSTI study area were located through the data compilation process described above. Previously conducted inventories are listed in Appendix C.4.4, and Appendix C.4.5 includes maps depicting the locations of previously conducted cultural inventories. These inventories consisted of linear and block acreage pedestrian surveys, test excavations (i.e. evaluation), and data recovery (i.e., mitigation) excavations, and historic context overviews. Together these inventories covered about 5% of the total project area. Several of these inventories no

longer meet current standards and, upon review, it was determined that the cultural resource locations and the previous inventory areas frequently do not correspond to one another. Due to this lack of correlation, information from these problematic inventories was not incorporated into the following cultural resource impact analysis.

3.4.9.2 Field Survey

Montana Facilities Sighting Act requires that an archaeological survey be conducted for each alternative route and facility location to determine potential adverse impacts that may occur to cultural resources as a result of the proposed action. Due to the large scale of the project, MDEQ granted permission to NWE to conduct a low-level helicopter reconnaissance survey of the proposed alternatives in Montana as a substitute for the on-the-ground survey as required by MFSA. A copy of the agreement is presented in Appendix C.4.2. The agreement is contingent upon the guarantee of a full Class III survey of cultural resources along the final alignment, assuming such an alignment is ultimately selected and approved. It should be noted that this helicopter reconnaissance survey does not respond to, nor satisfy any requirements of Section 106, the BLM, or other federal agencies, nor does it replace the requirements stipulated in the PA for conducting a cultural resource inventory.

The helicopter reconnaissance survey was conducted by Power Engineers on June 16 and 17, 2008 along the alternative power line routes in Montana under ARPA permit # Bev 41-21-01 and Cultural Resource Use Permit (CRUP) #M 97925 (Power Engineers 2008a). No helicopter surveys were conducted for the Local Routing Options (LROs) or other project components, nor were any conducted to address changes in alternative routes that were developed after June 17, 2008. No aerial reconnaissance surveys were conducted in Idaho.

The helicopter reconnaissance survey identified 56 sites. Of these, 45 are within the current project area; 43 historic sites and two prehistoric sites. The historic sites are primarily components of the built environment representing mining sites, homesteads, and other historic buildings. The prehistoric sites consist of one large stone circle site (which contains approximately 15-20 stone circles) and one small stone circle site (which contains four stone circles). Brief descriptions, photographs and UTM locations were recorded for all cultural resources identified through the aerial reconnaissance (Confidential Appendix C.4.6).

3.4.9.3 Site Density Model

Previously conducted inventories of cultural resources cover only an estimated 5% of the project area, and thus a site density model was developed to help compensate for the paucity of existing data and facilitate a comparison of alternatives. The site density model used statistics developed from existing data to predict the likelihood of encountering cultural resources within the study corridor in areas where actual inventories have not been conducted.

The site density model was based on a series of envelope models. Envelope models are statistical calculations focused on a single attribute within a defined area of space. These models are developed from the qualitative environmental attributes associated with the previously identified sites within the one mile study corridor.

Environmental attributes associated with the previously identified sites and included in the envelope models include distance to water, elevation, slope, and aspect. For each of these variables, an average was calculated from which a standard deviation is determined. In order to provide a more inclusive range for each environmental attribute, the standard deviation was subtracted from the minimum value and added to maximum value. Then to refine the environmental variable to include the majority of sites, but not the

outlying sites, the standard deviation was subtracted and added to the average value. Essentially, two ranges of values were created; the first is a larger more inclusive range; the other is a constricted more exclusive range. The larger range of values provides a better representation of a given environmental attribute's diversity within the one mile study corridor by going beyond that provided by the cultural resources, thereby avoiding the homogenization of environmental variables. The smaller range of values accounts for the majority of cultural resources within a given environmental attribute, thus allowing for a scaled predictive model. Maps depicting modeling results are provided in Appendix C.4.7.

The envelope models were then combined into the overall site density model, which was used to predict areas of High, Medium, and Low site density for cultural resources. These site density areas are defined as follows:

High Site Density– Areas having existing site clusters (3 or more previously identified sites within 0.5 mile of each other), or areas that are identified by the agencies as regions of high site densities (such as historic mining districts), or consist of areas that do not have previously identified sites, but are recognized as high probability tracts by the site density model.

Medium Site Density– Areas having spatially discrete sites, or areas that have no previously identified sites, but are recognized as medium probability tracts by the site density model.

Low Site Density– Areas with no previously identified sites and recognized as low probability tracts by the site density model.

3.4.9.4 Visual Impact Analyses

There were three different methods used to evaluate potential visual impacts from the proposed project. These were as follows:

1. Project Component Visual Impact Model
2. Sensitive Point Visual Impact Model
3. Sensitive Point Tally

The first two methods were models run with GIS software. They were applied to a list of sites identified by agency archeologists familiar with local conditions in the project area as being particularly sensitive (Table 3.4-2).

The project component visual impact model was utilized when a large area of land is sensitive throughout and a single point analysis cannot accurately characterize potential impact. Fifteen sites were analyzed using this method (Table 3.4-2). The sensitive point visual impact model was utilized to evaluate which portions of the MSTI alternatives are visible from a single sensitive point. Twenty-four sites were analyzed using this method (Table 3.4-2). These models are described in more detail below. The third method, Sensitive Point Tally, was applied to the entire list of 84 visually sensitive cultural sites. The method is to simply count how many sites are within four miles of each MSTI alternative.

Both the project component visual impact model and the sensitive point visual impact model utilize Visual Impact Distance Divisions to categorize potential visual impacts to cultural resources, which are defined as follows:

- Immediate Foreground 0 to 300 feet Dominating Visual Impact
- Foreground 300 feet to 1 mile Strong Visual Impact
- Middle Ground 1 mile to 4 miles Moderate Visual Impact

For each model the visual impacts to cultural resources associated with the alternatives are quantified by level of impact per mile, thereby allowing each alternative's visual impacts to be compared.

Project Component Visual Impact Model. The project component visual model was used to analyze visual impacts for cultural resources that encompass large tracts of land (e.g. mining districts). This visual analysis was conducted from evenly spaced points (one every 0.25 mile) along the alternatives towards the cultural resource over the 8 mile visual study corridor, 4 miles on either side of the alternative. For example, the shaded areas shown on the figures in Confidential Appendix C.4.8 are those areas of the cultural resource site (e.g. mining district or historic trail) that would be able to see one or more of the MSTI alternatives. The locations of these resources evaluated with this model are provided in the maps in Confidential Appendix C.4.8. For Montana, these areas focus on historic mining districts. For Idaho, these areas focus on NRHP listed sites and the confidential TCP. A total of 15 sites were evaluated.

Table 3.4-2. Agency Identified Cultural Resources Incorporated into Visual Project Component Visual Impact Analysis Model

State	Resource	Project Component Visual Impact Model?	Sensitive Point Visual Model?	Sensitive Point Tally?	Representative Photograph Appendix C.4.9
Montana	1. Argenta Mining District	Yes	Yes	Yes	Yes
	2. Bannack Mining District	Yes	Yes	Yes	Yes
	3. Blue Wing Mining District	Yes	No	Yes	No
	4. Bryant/Glendale Mining District	Yes	Yes	Yes	Yes
	5. Butte Anaconda National Historic Landmark District	Yes	No	Yes	Yes
	6. Champion/Orofino Mining District	Yes	No	Yes	No
	7. High Ore Mining District	Yes	No	Yes	No
	8. Melrose Mining District	Yes	No	Yes	No
	9. Pipestone Mining District	Yes	No	Yes	Yes
	10. Ramsey Mining District (Representative Point within the Butte Anaconda NHLD)	Yes	Yes	Yes	Yes
	11. Radersburg Mining District	Yes	No	Yes	No
	12. Rochester Mining District	Yes	Yes	Yes	Yes
	13. Silver Star Mining District	Yes	Yes	Yes	Yes
	14. Utopia Mining District	Yes	Yes	Yes	Yes
	15. Jefferson County Court House NRHP Listed Site	No	Yes	Yes	No
	16. Elkhorn NRHP Listed Site	No	Yes	Yes	No
	17. Three Forks Missouri River NHL (representing the Lewis and Clark NHT)	No	Yes	Yes	No
	18. Big Hole Pump Station	No	Yes	Yes	No
	19. LaMarche Game Trap NRHP Listed Site	No	Yes	Yes	No
	20. Silver Star Pictograph NRHP Eligible Site	No	Yes	Yes	No
	21. Monida Pass (Representing the Nez Perce NHT)	No	Yes	Yes	No
	22. Tash Ranch NRHP Listed Site	No	Yes	Yes	No
	23. Boulder Hot Springs Hotel NRHP Listed Site	No	No	Yes	No
	24. Montana Deaf and Dumb Asylum NRHP Listed Site	No	No	Yes	No
	25. Granite Apartments NRHP Listed Site	No	No	Yes	No

Table 3.4-2. Agency Identified Cultural Resources Incorporated into Visual Project Component Visual Impact Analysis Model

State	Resource	Project Component Visual Impact Model?	Sensitive Point Visual Model?	Sensitive Point Tally?	Representative Photograph Appendix C.4.9
	26. Lorraine Apartments NRHP Listed Site	No	No	Yes	No
	27. Methodist Episcopal Church of Anaconda NRHP Listed Site	No	No	Yes	No
	28. New Brunswick House NRHP Listed Site	No	No	Yes	No
	29. US Post Office Anaconda NRHP Listed Site	No	No	Yes	No
	30. Washoe Theatre NRHP Listed Site	No	No	Yes	No
	31. Anaconda Copper Mining Company Smoke Stack NRHP Listed Site	No	No	Yes	No
	32. Club Moderne NRHP Listed Site	No	No	Yes	No
	33. Sheehan Boarding House NRHP Listed Site	No	No	Yes	No
	34. St. Mark's Episcopal Church NRHP Listed Site	No	No	Yes	No
	35. Zion Swedish Evangelical Lutheran Church NRHP Listed Site	No	No	Yes	No
Montana	36. Hawthorne Grade School NRHP Listed Site	No	No	Yes	No
	37. Longfellow Grade School NRHP Listed Site	No	No	Yes	No
	38. Madison Grade School NRHP Listed Site	No	No	Yes	No
	39. Toston Bridge NRHP Listed Site	No	No	Yes	No
	40. Silver Bow Brewery Malt House NRHP Listed Site	No	No	Yes	No
	41. Silver Bow County Poor Farm Hospital NRHP Listed Site	No	No	Yes	No
	42. Wold (Cue) Barn NRHP Listed Site	No	No	Yes	No
	43. Browne's Bridge (North) NRHP Listed Site	No	No	Yes	No
	44. Browne's Bridge (South) NRHP Listed Site	No	No	Yes	No
	45. Potential TCP 1	No	No	Yes	No
	46. Potential TCP 2	No	No	Yes	No
	47. Potential TCP 3	No	No	Yes	No
	48. Potential TCP 4	No	No	Yes	No

Table 3.4-2. Agency Identified Cultural Resources Incorporated into Visual Project Component Visual Impact Analysis Model

State	Resource	Project Component Visual Impact Model?	Sensitive Point Visual Model?	Sensitive Point Tally?	Representative Photograph Appendix C.4.9
Montana	49. Potential TCP 5	No	No	Yes	No
	50. Potential TCP 6	No	No	Yes	No
	51. Potential TCP 7	No	No	Yes	No
	52. Potential TCP 8	No	No	Yes	No
	53. Potential TCP 9	No	No	Yes	No
Idaho	54. Confidential TCP	Yes	No	Yes	No
	55. Goodale's Cutoff	Yes	No	Yes	No
	56. Spencer Rock House NRHP Listed Site	Yes	No	Yes	No
	57. Powerline Cave Complex Recommended NRHP Eligible Site	Yes	No	Yes	No
	58. St. James Episcopal Mission NRHP Listed Site	Yes	No	Yes	No
	59. Wasden Cave NRHP Eligible Site	Yes	No	Yes	No
	60. Twin Butte Cave Recommended NRHP Eligible Site	Yes	No	Yes	No
	61. Baker Cave III NRHP Eligible Site	Yes	No	Yes	No
	62. Daniel A. Hunt House NRHP Listed Site	Yes	No	Yes	No
	63. Wilson Butte Cave Site	Yes	No	Yes	No
	64. Sam Glass Grave Site NRHP Eligible Site	No	No	Yes	No
	65. Corrine, Utah-Bannack City, Montana Road NRHP Eligible Site	No	No	Yes	No
	66. Oregon Short Line Railroad NRHP Eligible Site	No	No	Yes	No
	67. Utah and Northern Railroad NRHP Eligible Site	No	No	Yes	No
	68. Union Pacific Railroad NRHP Eligible Site	No	No	Yes	No
	69. Cedar Butte Prehistoric Recommended NRHP Eligible Site	No	No	Yes	No
	70. Roadside Cave NRHP Eligible Site	No	No	Yes	No
	71. Bobcat Cave NRHP Eligible Site	No	No	Yes	No
	72. Rock Butte Recommended NRHP Eligible Site	No	No	Yes	No
	73. Rock Corral Butte	No	No	Yes	No

Table 3.4-2. Agency Identified Cultural Resources Incorporated into Visual Project Component Visual Impact Analysis Model

State	Resource	Project Component Visual Impact Model?	Sensitive Point Visual Model?	Sensitive Point Tally?	Representative Photograph Appendix C.4.9
	Recommended NRHP Site				
	74. McTucker Road NRHP Eligible Site	No	No	Yes	No
	75. Coffee Point Recommended NRHP Eligible Site	No	No	Yes	No
	76. Cerro Grande Historic Town Recommended NRHP Eligible Site	No	No	Yes	No
	77. Table Legs Butte NRHP Eligible Site	No	No	Yes	No
	78. Kettle Butte NRHP Eligible Site	No	No	Yes	No
	79. Lost River Road NRHP Eligible Site	No	No	Yes	No
	80. Aberdeen-Springfield Canal NRHP Eligible Site	No	No	Yes	No
	81. Taber Road NRHP Eligible Site	No	No	Yes	No
	82. Holiday Inn Cave NRHP Eligible Site	No	No	Yes	No
Idaho	83. Kiser Homestead NRHP Eligible Site	No	No	Yes	No
	84. Wapi Flow Rock Shelter NRHP Eligible Site	No	No	Yes	No
	85.				
	86.				
	87.				
	88.				
	89.				
	90.				
	91.				
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	95.				
	96.				
	97.				
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	99.				
	100.				
	101.				
	102.				
	103.				

Table 3.4-2. Agency Identified Cultural Resources Incorporated into Visual Project Component Visual Impact Analysis Model

State	Resource	Project Component Visual Impact Model?	Sensitive Point Visual Model?	Sensitive Point Tally?	Representative Photograph Appendix C.4.9
	104.				
	105.				
	106.				
	107.				
	108.				
	109.				
	110.				
	111.				
	112.				

Sensitive Point Visual Impact Model. The sensitive point visual impact model was used to analyze visual impacts to cultural resources that could be characterized by a single point or for larger sites in which a single point, representative of the site, could be identified. The 24 sites selected for analysis were chosen because they represent a variety of site types and are geographically distributed along the MSTI study corridor. The sensitive point visual impact analysis was conducted from the cultural resource looking towards the alternatives. The results are provided in Confidential Appendix C.4.10. The shaded areas in the figures in this appendix are those areas visible from the sensitive site. Any areas further than four miles from any MSTI alternative were excluded from the analysis since they are determined to be at a great enough distance to be negligibly impacted.

Sensitive Point Tally. A sensitive point tally was also calculated for all 84 sensitive single point cultural sites, detailing how many sites were within each alternative. This proximity based analysis includes the simplifying assumption that all of the sites would be equally impacted by the presence of proposed project. Maps detailing the location of listed sites that could be visually impacted are provided in Appendix C.4.11. The intention of the analysis is not to provide a definitive evaluation of visual impacts, but is simply to allow for a comparison of potential visual impacts to these resources among the proposed alternatives in each zone.

3.4.10 MSTI Impacts to Cultural Resources

The structure of this section is to first present the results of the overall impact from the proposed project on the project analysis area. Following that overview, the potential impacts to alternatives within each zone are presented. At the end of each of these zone sections is a synopsis of how the alternatives within that zone compare with each other. Finally, at the end of section 3.4.10 is an overall summary of impacts across zones.

3.4.10.1 Impact Overview

The previously conducted inventories combined with the helicopter sruvey revealed a total of 782 previously identified sites within the 1 mile study corridor. Additional details on the sites are provided in Appendix C.4.12 and Confidential Appendix C.4.13 includes maps of site locations. Of these 782 sites, 340 are historic, 374 are prehistoric, 66 are multicomponent, and 2 are unknown. Note the numbers do not

appear to add up to the total sites, because some of the sites are counted multiple times where various alternatives overlap.

When examined on a project-wide basis, the site density model is clearly dominated by areas identified as medium site densities and high site densities. Medium site density areas account for 64% of the study corridor and high site density areas account for 33%, while low site density areas account for only 2% (Figure 3.4-2). This distribution probably results from the location of project alternatives in relatively flat areas, in lower elevations, and in close proximity to water, environmental factors favorable to the presence of cultural resources.

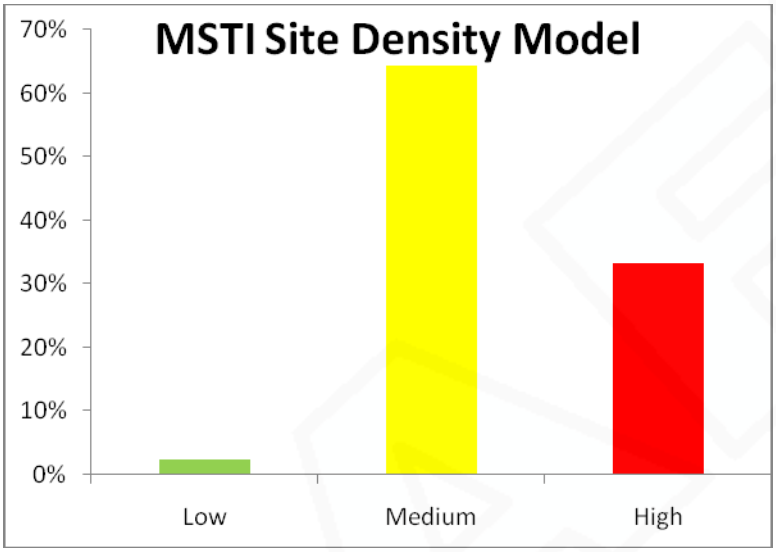

Figure 3.4-2. Site Density Model Overview

On a per acre basis the site density model predicts approximately one site for every 848 acres within the one mile study corridor. When site density per acre is examined by site categories there is one prehistoric site for every 1,748 acres, one historic site for every 3,577 acres, and one multicomponent site for every 15,604 acres.

This site density model, and to a lesser degree the site per acre calculations, conform to other regionally conducted models that have predicted a relatively high site density in portions of the project area. Specifically, Deaver and Deaver (1984) focused on prehistoric sites within the Butte BLM District which included four resource areas; Garnet, Great Falls, Headwaters, and Dillon. Overall, the site density for the district was 2.0 -7.5 sites per 1,000 acres. Among the individual resource areas, Dillon had the highest site density of 5.0-7.51 sites per 1,000 acres which equated to approximately one site to every 130-150 acres (Deaver and Deaver 1984:74). Knight's 1989 model of site densities within the Beaverhead Deerlodge National Forest found the region to have a relatively low prehistoric site density, but a high historic mining site density at a ratio of 9:1 (Knight 1989:104). Subsequently, it can be assumed there are numerous undiscovered sites throughout the study area that could be impacted by the MSTI project.

However, the skewed distribution of site densities within the one mile study corridor could also reflect the limitations of the data used to develop the model. As previously stated, only 5% of the project study corridor has been previously inventoried for cultural resources, resulting in a limited number of identified sites with which to construct the model. Given the limited data, the model was used to predict conditions in 95% of the project area that has not been inventoried; such a broad extrapolation is inevitably

associated with the relatively high degree of uncertainty. Accordingly, the model and its results should be viewed in conjunction with the other analyses, described in subsequent sections, to evaluate potential impacts to cultural resources in the project area.

Maps showing the results of the sensitive point visual impact modeling are provided in Confidential Appendix C.4.10. Maps showing the results of the project component visual impact modeling are provided in Confidential Appendix C.4.8.

The following discussion details the potential impacts to cultural resources by alternatives for each analysis zone.

3.4.10.2 Impacts from Alternatives in Zone 1

Alternative 1A

There are 138 previously identified sites associated with Alternative 1A. Sixteen of these sites are prehistoric and 122 are historic (Figure 3.4-3). Six of these sites are eligible for inclusion in the NRHP, 19 have unresolved NRHP eligibilities, 109 have unknown NRHP eligibilities, and four are not eligible for inclusion in the NRHP. This alternative has an average of one previously recorded site per 379 acres.

The 16 prehistoric sites associated with Alternative 1A include nine lithic scatters, five stone circle sites, one rock alignment site, and one rock art site (Figure 3.4-3). The rock alignment is eligible for inclusion in the NRHP. Two lithic scatters, the rock art site, and one stone circle site have unresolved NRHP eligibilities. The remaining 11 sites have unknown eligibilities. Size data was available for six of the lithic scatters. One of these scatters exceeds the standard deviation from the average size of the analyzed lithic scatters and the remaining five scatters exceed the average size. Of the 16 previously recorded prehistoric sites associated with Alternative 1A, all but nine lithic scatters are complex feature sites.

The 122 historic sites include 52 mining sites, 25 homesteads, 20 buildings, seven roads, three railroads, three irrigation complexes, three mining districts (Champion Orofino, High Ore, and Radersburg), two transmission lines, one timber harvest site, one stock raising site, one cemetery, one hunting blind, and three unclassified historic sites (Figure 3.4-1). Of these sites, one transmission line, two mining sites, the stock raising site, and one homestead are eligible for inclusion in the NRHP. Nine mining sites, two roads, the hunting blind, one building, one homestead, and one unclassified historic site have unresolved eligibilities. Ninety-eight sites have unknown eligibilities and one road, one mining site, one transmission line, and one building are not eligible. Of the 122 historic sites, the Champion Orofino mining district, High Ore mining district, and Radersburg mining district are the only complex feature historic sites on the alternative route.

At its crossing of the Missouri River south of Townsend, MT, Alternative 1A would cross the Lewis and Clark NHT. The alternative heads west after the crossing and would not encounter the trial again.

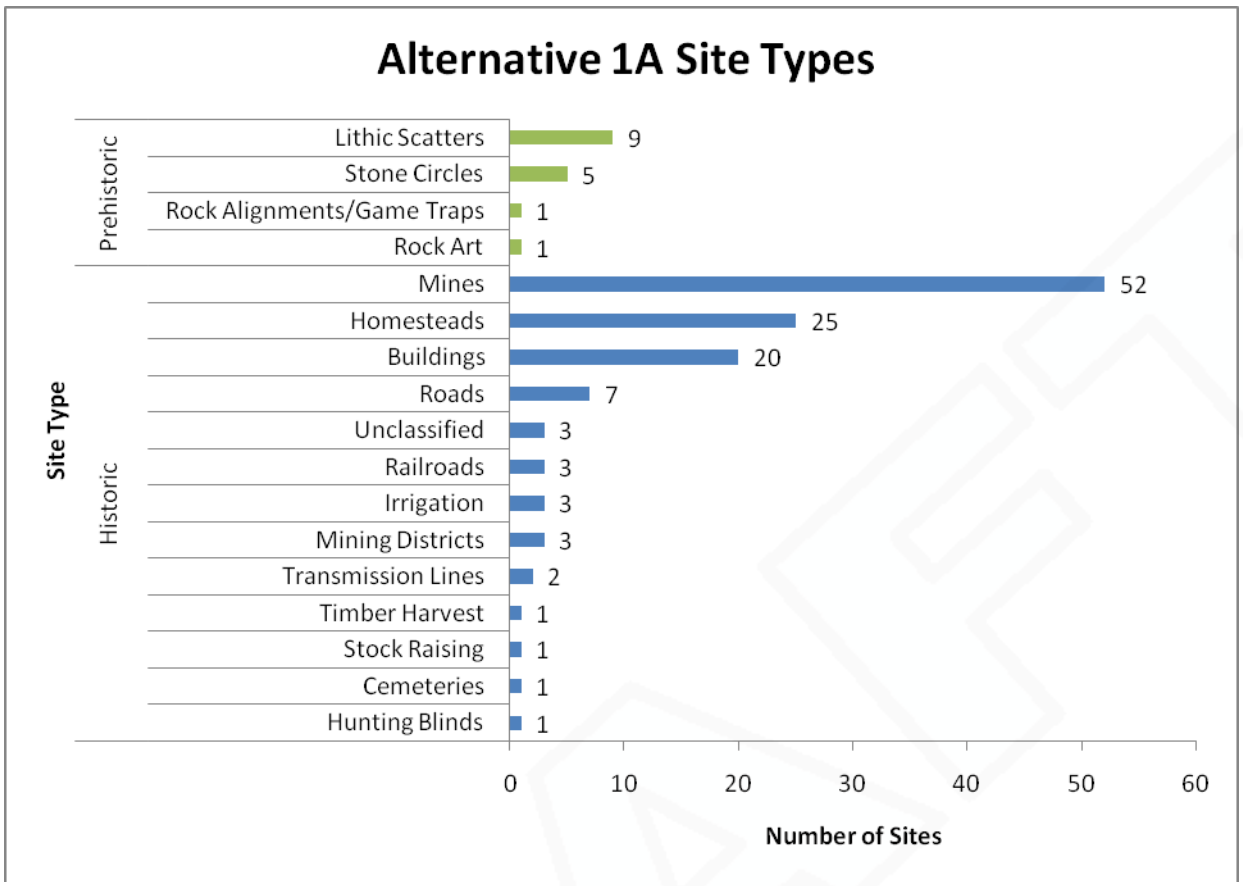

Figure 3.4-3. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 1A

Site Density Model

The site density model predicts that 29 percent of the project area associated with Alternative 1A consists of high cultural site densities, 63 percent consists of medium site densities, and 8 percent consists of low site densities (Figure 3.4-4). In total 92 percent of the project area for 1A would traverse areas with a least a medium predicted site density.

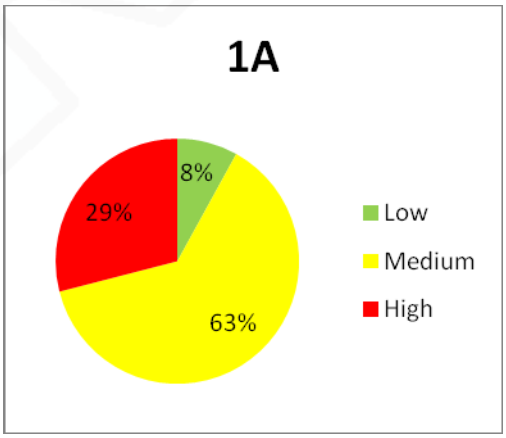

Figure 3.4-4. Alternative 1A Site Densities.

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Four agency identied cultural resources would be visible from Alternative 1A (Figure 3.4-5). These are the Butte Anaconda NHLD, Champion Orofino mining district, High Ore mining district, and Radersburg mining district. The length of Alternative 1A that may impact each cultural resource is detailed below.

- Butte Anaconda NHLD – 0.08 mile Foreground and 4.14 miles Middle Ground.
- Champion Orofino mining district – 0.82 mile Immediate Foreground, 2.03 miles Foreground, and 9.06 miles Middle Ground.
- High Ore mining district – 2.62 miles Immediate Foreground, 3.44 miles Foreground, and 8.52 miles Middle Ground.
- Radersburg mining district – 13.91 miles Immediate Foreground, 15.00 miles Foreground, and 18.82 miles Middle Ground.

Alternative 1A would also have a visual impact on the Lewis and Clark NHT in the vicinity of the Alternative's crossing of the Missouri River south of Townsend, MT.

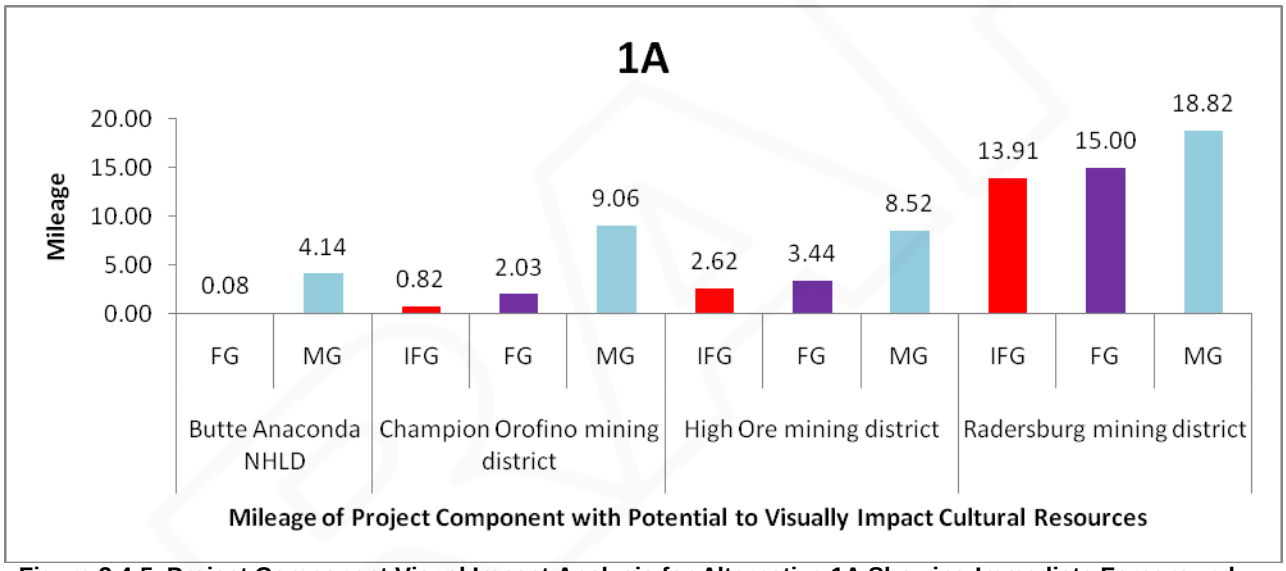

Figure 3.4-5. Project Component Visual Impact Analysis for Alternative 1A Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis

Two agency identified sensitive point cultural resources l are located within the study corridor of Alternative 1A. The Jefferson County Court House would be visually impacted, while the Elkhorn Fraternity Hall will not be in the line of sight with any MSTI alternative. From the Jefferson County Court House 0.49 miles of the alternative would be visible in the Middle Ground (Figure 3.4-).

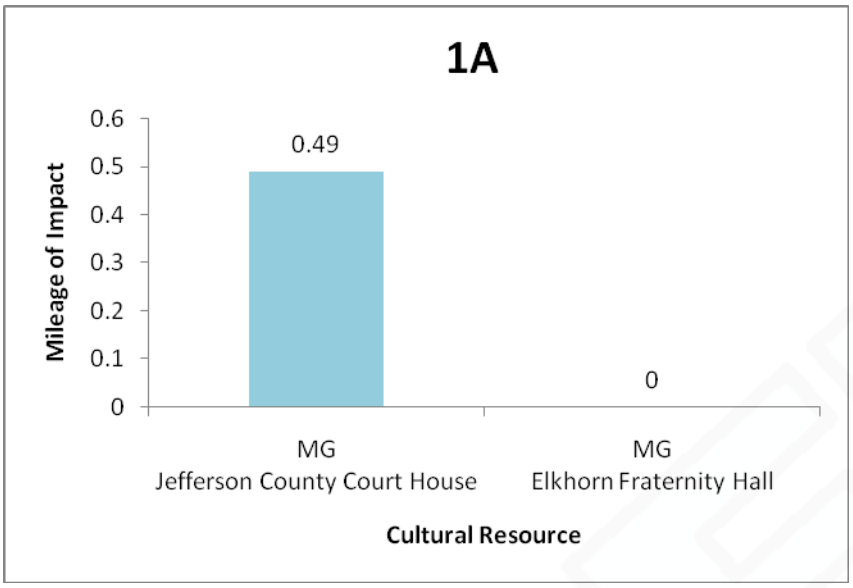

Figure 3.4-6. Sensitive Visual Impact Analysis for Alternative 1A showing Middle Ground (MG) Impacts.

Sensitive Point Tally
Of the 84 sensitive visual points that were included in the qualitative proximity analysis, 18 would be within the visual study corridor of Alternative 1A.

Alternative 1B

There are 89 previously identified sites associated with Alternative 1B. Twenty-three of these sites are prehistoric, 62 are historic, and four are multicomponent (Figure 3.4-). Of these sites, one is listed in the NRHP, two are eligible for inclusion in the NRHP, five have unresolved NRHP eligibilities, 73 have unknown NRHP eligibilities, and eight are not eligible for inclusion in the NRHP. This alternative has one previously recorded site per 649 acres.

The 23 prehistoric sites associated with Alternative 1B include 20 lithic scatters, one stone circle site, one rockshelter, and one unclassified prehistoric site (Figure 3.4-). Three lithic scatters and the stone circle site have unresolved NRHP eligibilities, 18What? have unknown eligibilities, and one lithic scatter is not eligible. Size data was available for six of the lithic scatters,all six are below the average size of analyzed lithic scatters. Of the previously recorded prehistoric sites in Alternative 1B, the stone circle site and rockshelter site are the only complex feature sites.

The 62 historic sites in Alternative 1B include 20 homesteads, 14 mining sites, 11 buildings, four railroads, four historic trash dumps, two roads, one stock raising site, one rock cairn/landmarker, one irrigation site, the Butte Anaconda NHLD, the Pipestone mining district, the Radersburg mining district, and one unclassified historic site (Figure 3.4-7). The Butte Anaconda NHLD is listed in the NRHP. One building, one homestead, and one railroad are eligible for inclusion in the NRHP. One mining site has unresolved eligibility. Fifty sites have unknown eligibilities. One road, one building, one mining site, two homesteads, and two historic trash dumps are not eligible. The Butte Anaconda NHLD and the Pipestone mining district are complex feature sites.

The four multicomponent sites in Alternative 1B include three historic feature with lithic scatter sites and one historic trash dumpwith associated lithic scatter (Figure 3.4-). All the multicomponent sites have unknown NRHP eligibilities and none are complex feature sites. Have we previously defined complex vs. multicomponent?

At its crossing of the Missouri River south of Townsend, MT, Alternative 1B would cross the Lewis and Clark NHT, but would then head west and would not encounter the trail again until the alternative reaches the vicinity of Cardwell, MT, where it would parallel the trail for a short distance before the trail diverges to the sourth and down the Jefferson River Valley.

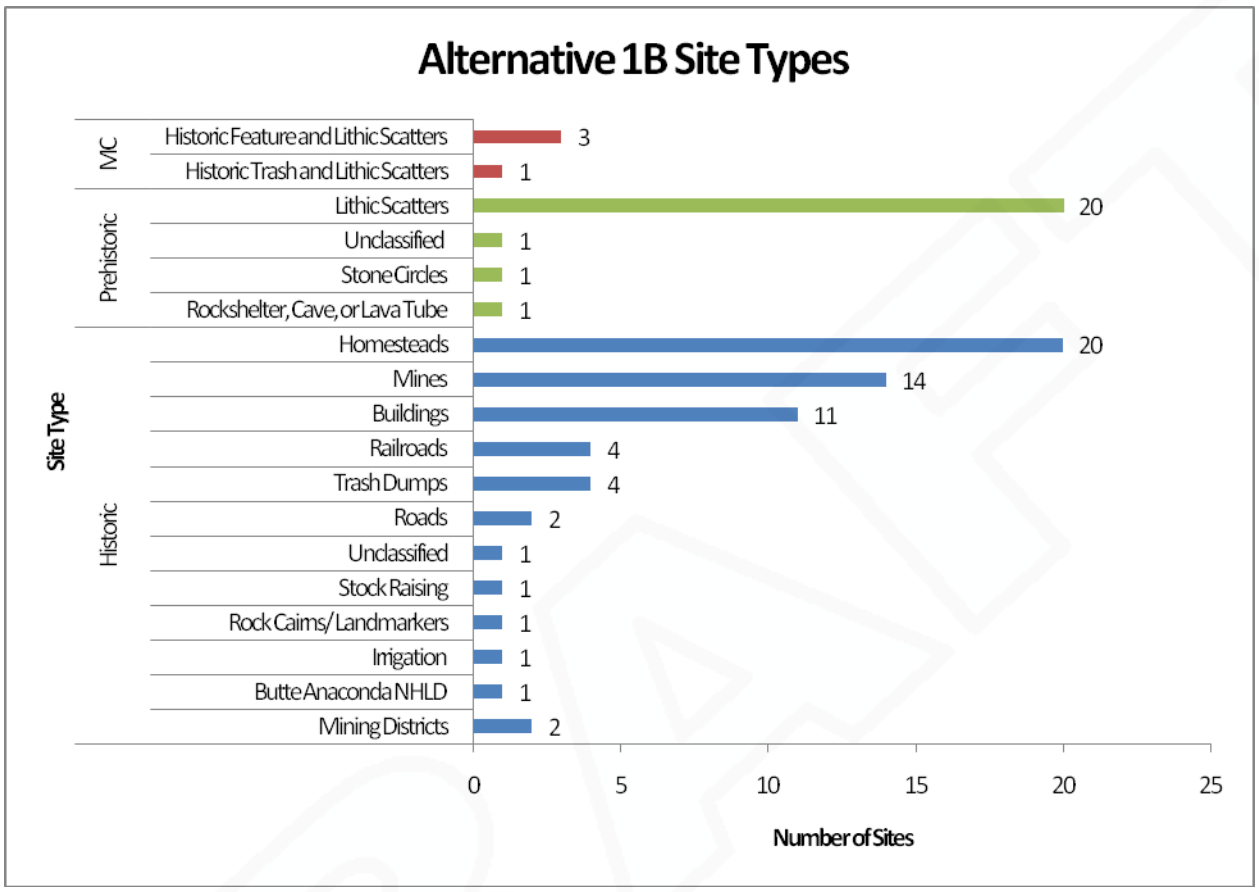

Figure 3.4-7. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 1B

Site Density Model

The site density model predicts that 36% of the project area associated with Alternative 1B consists of high cultural site densities, 61 percent consists of medium site densities, and 3 percent consists of low site densities (Figure 3.4- 3.4-8). In total, 97% of the project area for1B would traverse areas with at least a medium predicted site density.

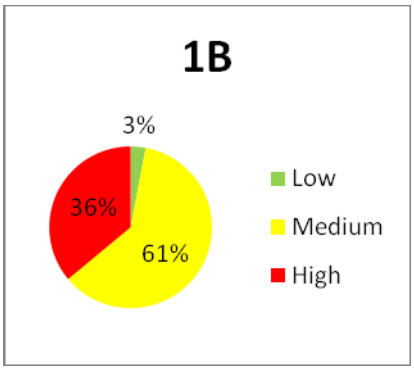

Figure 3.4-8. Alternative 1B Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Three agency identified cultural resources would be visible from Alternative 1B (Figure 3.4-9). These are the Butte Anaconda NHLD, Pipestone mining district, and Radersburg mining district. The length of Alternative 1B that may impact each cultural resource is detailed below.

- Butte Anaconda NHLD – 0.18 mile Immediate Foreground, 6.82 miles Foreground, and 13.32 miles Middle Ground.
- Pipestone mining district – 6.36 miles Immediate Foreground, 7.25 miles Foreground, and 13.00 miles Middle Ground.

Radersburg mining district – 13.80 miles Immediate Foreground, 15.39 miles Foreground, and 21.22 miles Middle Ground

Alternative 1B would also have a visual impact on the Lewis and Clark NHT in the vicinity of the Alternative's crossing of the Missouri River south of Townsend, MT and could potentially have dispersed impacts to the trail in the vicinity of Cardwell, MT.

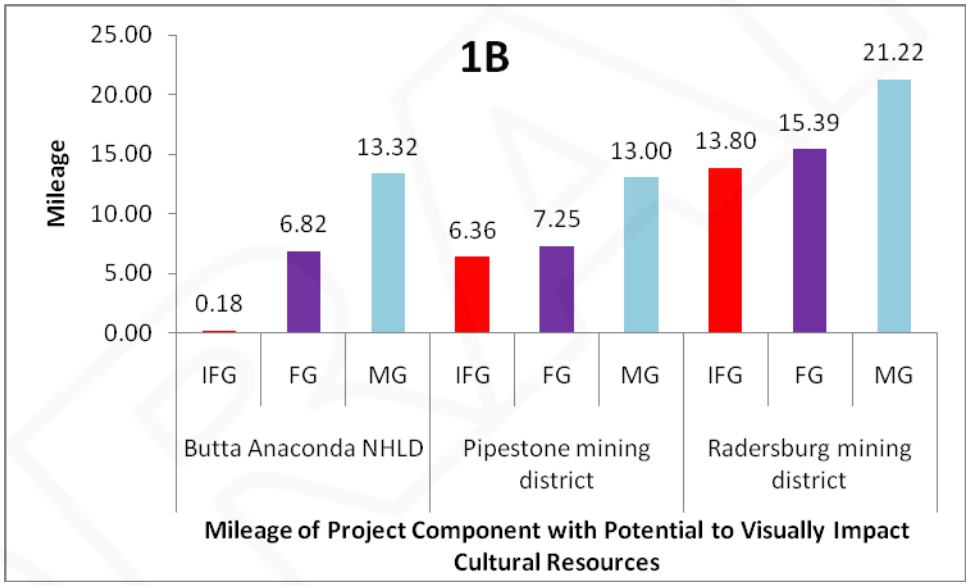

Figure 3.4-9. Project Component Visual Impact Analysis for Alternative 1B Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis

One of the agency identified sensitive point cultural resources is located within Alternative 1B, the Butte Anaconda NHLD. From this resource, 3.28 miles of the alternative will be visible in the Middle Ground (Figure 3.4-10).

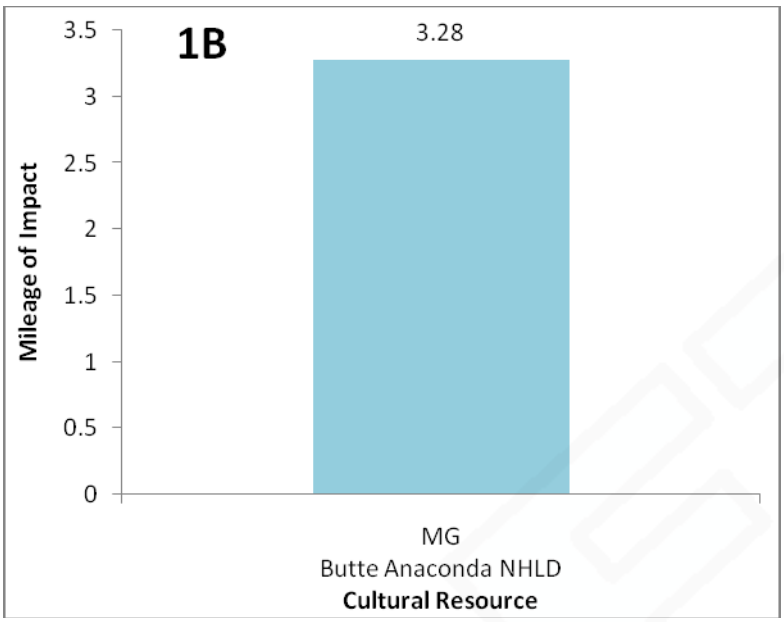

Figure 3.4-10. Sensitive Point Visual Impact Analysis for Alternative 1B Showing Middle Ground (MG) Impacts

Sensitive Point Tally
Of the 84 sensitive visual points that were included in the qualitative proximity analysis, ten would be within the visual study corridor of Alternative 1B.

Alternative 1C

There are 80 previously identified sites associated with Alternative 1C. Thirty-two of these sites are prehistoric, 44 are historic, and four are multicomponent (Figure 3.4-11). One of these sites is listed in the NRHP, five are eligible for inclusion in the NRHP, six have unresolved NRHP eligibilities, 60 sites have unknown eligibilities, and eight are not eligible for inclusion in the NRHP. This alternative has one previously recorded site per 759 acres.

The 32 prehistoric sites associated with Alternative 1C include25 lithic scatters, three stone circle sites, two rock alignment/ sites, one rockshelter site, and one unclassified prehistoric site (Figure 3.4-). Four of the lithic scatters have unresolved NRHP eligibilities, 27 of the sites have unknown eligibilities, and one lithic scatter is not eligible. Size data was available for nine of these lithic scatters. All nine scatters are smaller than the average size of the analyzed lithic scatters. Three stone circle sites, two rock alignment/ sites, and the rockshelter site are complex feature sites.

The 44 historic sites in Alternative 1C include12 homesteads, nine mining sites, six buildings, five irrigation sites, four railroads, two historic trash dumps, one stock raising site, one road, the Butte Anaconda NHLD, the Pipestone mining district, and two unclassified historic sites (Figure 3.4-). Of these sites, the Butte Anaconda NHLD is listed in the NRHP. One irrigation site and three railroads are eligible for inclusion in the NRHP. Thirty-two sites have unknown NRHP eligibilities. One irrigation site, one mining site, three homesteads, and two historic trash dumps are not eligible. The Butte Anaconda NHLD is a complex feature site.

The four multicomponent sites in Alternative 1C consist of three historic feature and lithic scatter sites and one historic trash dump with associated lithic scatter (Figure 3.4-11). All of these sites have unknown NRHP eligibilities and none are complex feature sites. See comment on 1B

At its crossing of the Missouri River south of Townsend, MT, Alternative 1C would cross the Lewis and Clark NHT and would approximately follow the route of the NHT from Townsend south to Three Forks, and then west to the vicinity of Cardwell, where the Lewis and Clark NHT would diverge from Alternative 1C , heading south down the Jefferson River Valley while Alternative 1C continued west.

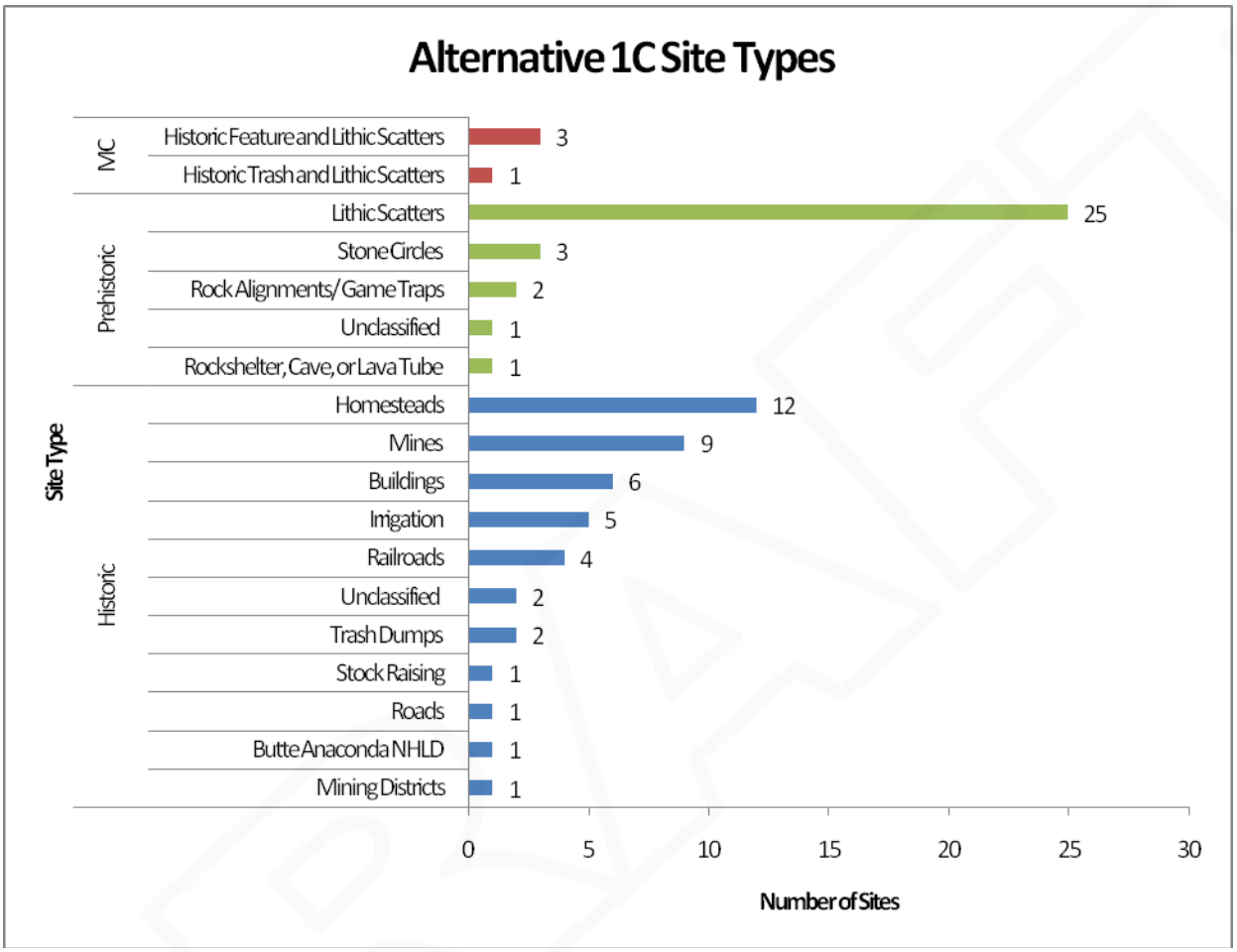

Figure 3.4-11. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 1C

Site Density Model

The site density model predicts that 29 percent of the project area associated with Alternative 1C consists of high site densities, 68 percent consists of medium site densities, and 3 percent consists of low site densities (Figure 3.4-12). In total 93 percent of the project area for 1C would traverse areas with at least a medium predicted site density.

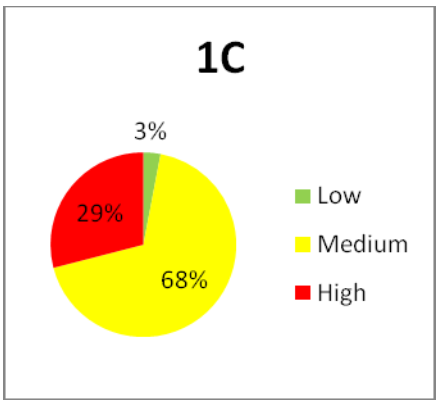

Figure 3.4-12. Alternative 1C Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Three agency identified cultural resources would be visible from Alternative 1C (Figure 3.4-13). These are the Butte Anaconda NHLD, Pipestone mining district, and Radersburg mining district. The length of Alternative 1C that may impact each cultural resource is detailed below.

- Butte Anaconda NHLD – 0.80 mile Immediate Foreground, 8.44 miles Foreground, and 19.57 miles Middle Ground.
- Pipestone mining district – 6.36 miles Immediate Foreground, 7.25 miles Foreground, and 13.00 miles Middle Ground.
- Radersburg mining district – 11.12 miles Middle Ground.

Alternative 1C would also have potential visual impacts to the Lewis and Clark NHT at the Alterntive's crossing of the Missouri River and through most of the proposed 1C project area between Townsend and Cardwell, MT.

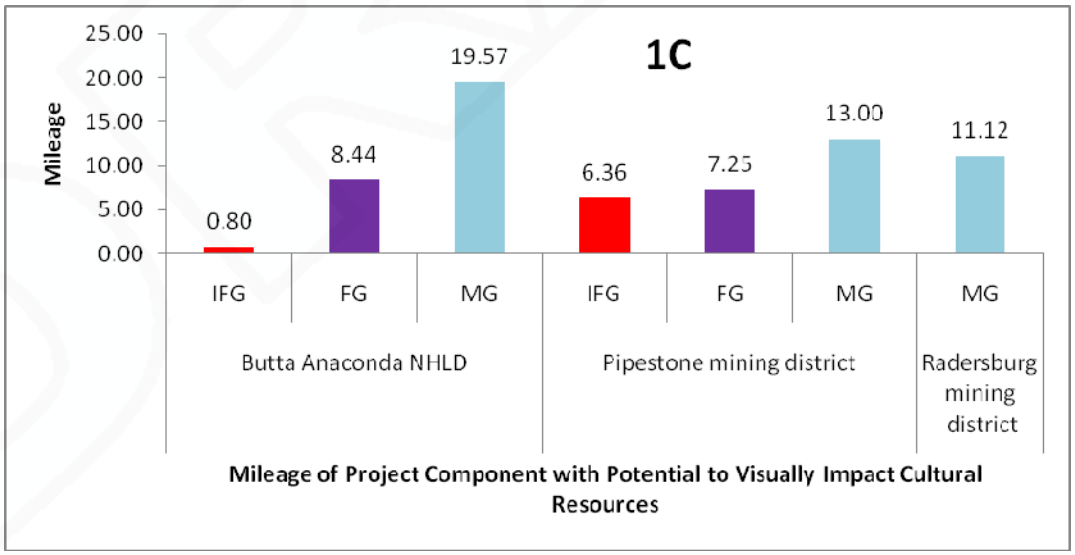

Figure 3.4-13. Project Component Visual Impact Analysis for Alternative 1C Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis
Two agency identified sensitive point cultural resources would be impacted by Alternative 1C. These are the Butte Anaconda NHLD and the Three Forks of the Missouri NHL, which is associated with the Lewis and Clark NHT (Figure 3.4-14). The length of Alternative 1C that will be visible from each site is detailed below.

- Butte Anaconda NHLD – 6.95 miles Middle Ground.
- Three Forks of the Missouri NHL – 5.19 miles Middle Ground.

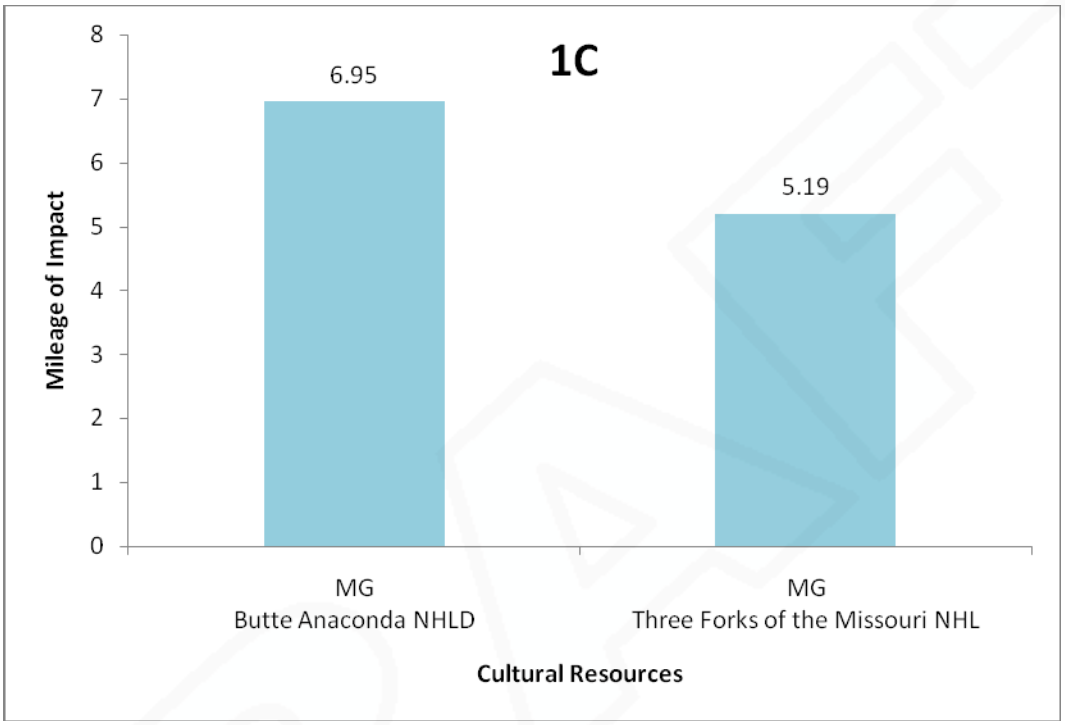

Figure 3.4-14. Sensitive Visual Impact Analysis for Alternative 1C Showing Middle Ground (MG) Impacts

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, 15 would be within the visual study corridor of Alternative 1C.

Alternative 1D

There are 50 previously identified sites associated with Alternative 1D. Thirteen of these sites are prehistoric, 35 are historic, and two are multicomponent (Figure 3.4-15). Three of these sites are eligible for inclusion in the NRHP, two have unresolved eligibilities, 38 have unknown eligibilities, and seven are not eligible for inclusion in the NRHP. This alternative has one previously recorded site per 692 acres.

The 13 prehistoric sites in Alternative 1D include 12 lithic scatters and one stone circle site (Figure 3.4-15). The stone circle site and one lithic scatter have unresolved NRHP eligibilities, 10 sites have unknown NRHP eligibilities, and one lithic scatter is not eligible. Size data was available for one of the lithic scatters; at 1.20 acres, the scatter is below the average size of the analyzed lithic scatters. Of the previously recorded prehistoric sites in Alternative 1D, the stone circle site is the only complex feature site.

The 35 historic sites in Alternative 1D include 14 homesteads, seven buildings, four railroads, two mining sites, two historic trash dumps, one stock raising site, one rock cairn/landmarker, one irrigation site, one road, and two mining districts (Pipestone and Radersburg) (Figure 3.4-). One building, one homestead, and one railroad are eligible for inclusion in the NRHP. Twenty-six sites have unknown NRHP eligibilities and one road, one building, one mining site, two homesteads, and one historic trash dump are not eligible for the NRHP. Of the previously recorded historic sites in Alternative 1D, the Pipestone mining district and Radersburg mining district are the only complex feature sites.

The two multicomponent sites in Alternative 1D incldue one historic trash dump with associatedlithic scatter, and one historic feature and lithic scatter site (Figure 3.4- 3.4-15). Both sites have unknown NRHP eligibilities and neither is a complex feature site.

At its crossing of the Missouri River south of Townsend, MT, Alternative 1D would cross the Lewis and Clark NHT, but would then head west and would not encounter the trail again until the alternative reaches the vicinity of Cardwell, MT, where it would parallel the trail for a short distance before the trail diverges to the south and down the Jefferson River Valley.

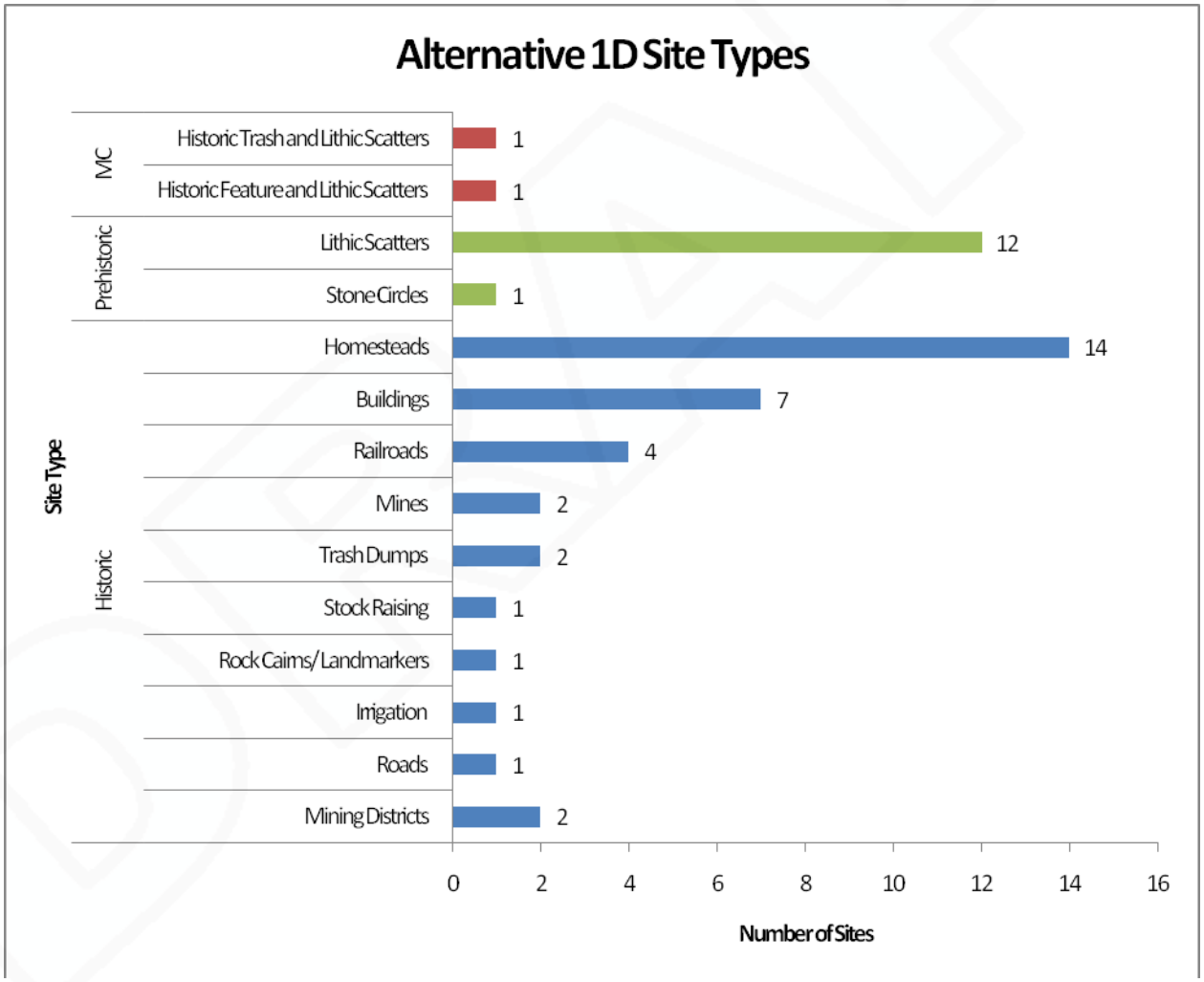

Figure 3.4-15. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 1D

Site Density Model

The site density model predicts that 38 percent of the project area associated with Alternative 1D consists of high site densities area, 61 percent consists of medium site densities, and one percent consists of low site densities (Figure 3.4-16). In total, 99 percent of the project area for 1D would traverse areas with at least a medium predicted site density.

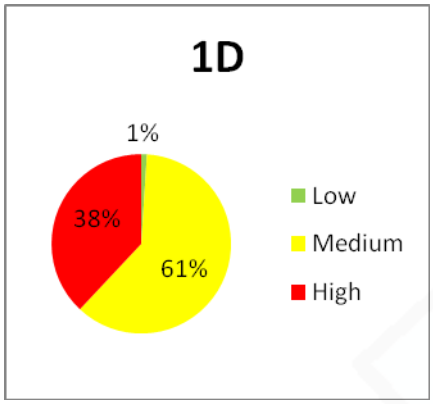

Figure 3.4-16. Alternative 1D Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Two agency identified cultural resources would be visible from Alternative 1D (Figure 3.4-17). These are the Pipestone and Radersburg mining districts. The length of Alternative 1D that may impact each cultural resource is detailed below.

- Pipestone mining district – 4.26 miles Immediate Foreground, 4.71 miles Foreground, and 8.07 miles Middle Ground.
- Radersburg mining district – 13.80 miles Immediate Foreground, 15.39 miles Foreground, and 21.22 miles Middle Ground.

Alternative 1D would also have a visual impact on the Lewis and Clark NHT in the vicinity of the Alternative's crossing of the Missouri River south of Townsend, MT and could potentially have dispersed impacts to the trail in the vicinity of Cardwell, MT.

Figure 3.4-17. Project Component Visual Impact Analysis for Alternative 1D Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis

None of the agency identified sensitive point cultural resources would be impacted by Alternative 1D.

Sensitive Point Tally

None of the 84 agency identified sensitive point cultural resources would be impacted by Alternative 1D.

Zone 1 Summary

Alternative 1A has the highest number of previously recorded sites (138) and is the third longest alternative in Zone 1(Table 3.4-3Table 3.4-). In terms of site NRHP eligibilities, Alternative 1A would potentially impact five eligible sites, 19 sites of unresolved edibility and 109 sites of unknown eligibility. This alternative also has the highest number of above-average size prehistoric lithic scatter sites and the highest number complex feature sites of any alternative in Zone 1 Alternative 1A has the lowest high site density, second highest medium site density, and highest low site density predicted. Overall, 92 percent of the 1A study corridor is predicted to have at least a moderate site density, the lowest of all the alternatives in Zone 1. Alternative 1A has the third highest Immediate Foreground, second highest Foreground, and third highest Middle Ground visual impact per the project component model. The sensitive point visual impact analysis for Alternative 1A identified potential impacts to one of the points included in the model, the Jefferson County Courthouse),from which 0.49 miles of Alternative 1A would be visible. Eighteen of the sites included in the sensitive point tally could be impacted visually by the alternative. Alternative 1A would have the fewest impacts to the Lewis and Clark NHT, which would be limited to the vicinity of the alternatives crossing of the Missouri River south of Townsend, MT. The available data indicate that Alternative 1A would have the third highest impact on cultural resources of all the alternatives in Zone 1.

Alternative 1B has the second highest number of previously recorded sites (89) and is the second longest alternative in Zone 1 (Table 3.4-3). In terms of site NRHP eligibilities, Alternative 1B would potentially impact one NRHP listed landmark, two NRHP eligible sites, five sites of unresolved eligibility, and 73 sites of unknown eligibility. This alternative has the third highest number of complex feature sites of any alternative in Zone 1. Alternative 1B has the second highest high site density, third highest medium site density, and second lowest low site density predicted. Overall, 97 percent of the 1B study corridor is predicted to have at least a moderate site density. Alternative 1B has the highest Immediate Foreground, highest Foreground, and highest Middle Ground visual impact per the project component model. The sensitive point visual impact analysis for Alternative 1B identified potential impact to one of the points included the model, the Butte Anaconda NHLD, from which 3.28 miles of Alternative 1B would be visible . Ten of the sites included in the sensitive point tally could be impacted visually by the alternative. Compared with the other alternatives in Zone 1, Alternative 1B would have a moderate visual impact on the Lewis and Clark NHT, with potential impact occurring the alternatives crossing of the Missouri River south of Townsend, MT, and for a short distance in the vicinity of Cardwell, MT. The available data indicate that Alternative 1B would have highest impact on cultural resources of all the alternatives in Zone 1.

Alternative 1C has the third highest number of previously recorded sites (80) and is the longest alternative in Zone 1 (Table 3.4-3). In terms of site NRHP eligibilities, Alternative 1C would potentially impact one NRHP listed landmark, five NRHP eligible sites, six sites of unresolved eligibility, and 60 sites of unknown eligibility. This alternative has the second highest number of complex feature sites of any alternative in Zone 1. Alternative 1C ties for the lowest high site density, has the highest medium site density, and ties for the second highest low site density predicted. Overall, 97 percent fo the 1C study corridor is predicted to have t least a moderate site density. Alternative 1C has the lowest Immediate Foreground, lowest Foreground, and third highest Middle Ground visual impact per the project component model. The sensitive point visual impact analysis for Alternative 1C identified potential impacts to two of the sites that were included in the model, the Butte Anaconda NHLD and the Three Forks of the Missouri River NHL. From these sites, a combined 12.14 miles of Alternative 1C would be visible in the Middle Ground.. Nineteen of the sites included in the sensitive point tally could be impacted visually by the alternative, the highest of any of the alternatives in Zone 1. Alternative 1C would have far more impact on the Lewis and Clark NHT than any of the other alternatives in Zone 1, as it would follow the approximate path of the NHT for most of its length between Townsend and Cardwell,

MT. The available data indicate that Alternative 1C would have the second highest impact on cultural resources of all the alternatives in Zone 1.

At approximately 54 miles long, Alternative 1D is the shortest of the alternatives in Zone 1 by at least 27 miles and would consequently have relatively few impacts compared to the other alternatives in Zone 1. Alternative 1D would potentially impact the fewest previously recorded sites (50). In terms of NRHP eligibilities, Alternative 1D potentially impact no listed sites, three eligible sites, 2 sites of unresolved eligibility, and 38 sites of unknown eligibility. While it has the highest proportion of the study area with at least a moderate site density (99 percent), it is not dramatically higher than the other alternatives. Alternative 1D has the second highest Immediate Foreground, third highest Foreground, and lowest Middle Ground visual impact per the project component model. The sensitive point visual impact analysis for 1D identified impacts to none of the points included in the model, and none of the sites included in the sensitive point tally were within the study corridor of Alternative 1D. Compared with the other alternatives in Zone 1, Alternative 1D would have a moderate visual impact on the Lewis and Clark NHT, with potential impact occurring the alternatives crossing of the Missouri River south of Townsend, MT, and for a short distance in the vicinity of Cardwell, MT. The available data indicate that Alternative 1D would have the fewest impacts to cultural resources of all the alternatives in Zone 1.

In summary, of the four alternatives within Zone 1, Alternative 1B will likely have the highest impact on cultural resources (Table 3.4-3). This is due to its overall length (second longest), relatively high number of previously identified sites, predicted medium to high site densities, and high visual impacts identified by the project component visual impact model. Alternative 1C will likely have the second highest impact on cultural resources. The second longest alternative in Zone 1, Alternative 1B has a relatively high number of previously identified sites, medium to high predicted site densities, and has high visual impacts identified by both the project component and the sensitive point visual impact models. It would also have far more impact on the Lewis and Clark NHT than the other Alternatives in Zone 1. Alternative 1A will likely have the third highest impact on cultural resources. The third longest Alternative, it has the highest number of previously identified sites, medium to high predicted site densities, and relatively high visual impacts identified by the project component visual impact analysis model. Alternative 1D will likely have the lowest impact on cultural resources. The shortest of the Zone 1 Alternatives, it has the fewest previously identified sites. Its predicted site densities are the highest, but are comparable to the other three zones. Its visual impacts identified by the project component visual impact analysis model are also comparable. It has no visual impacts identified by the sensitive point visual impact model and none of the points included in the sensitive point tally are within the study area of 1D. From a cultural resources perspective, alternative 1D is the preferred alternative in Zone 1.

Table 3.4-3. Comparison of Alternatives in Zone 1

Zone 1					
Alternative Miles in Length		**1A 81.75 miles**	**1B 90.23 miles**	**1C 94.89 miles**	**1D 54.06 miles**
Previously Identified Sites NRHP Evaluations	Total	138	89	80	50
	Listed	0	1	1	0
	Eligible	6	2	5	3
	Unresolved	19	5	6	2
	Unknown	109	73	60	38
	Not Eligible	4	8	8	7
Site Density Model	High	29%	36%	29%	38%
	Medium	63%	61%	68%	61%
	Low	8%	3%	3%	1%
Visual Impact Miles – Project Component	IFG	17.36	20.34	7.16	18.06
	FG	20.55	29.46	15.69	20.10
	MG	40.54	47.54	43.69	29.29
Visual Impact Miles – Sensitive Point	IFG	0	0	0	0
	FG	0	0	0	0
	MG	0.49	3.28	12.14	0
Sensitive Point Tally		18	10	19	0
Impact on Cultural Resources		Third Highest	Highest	Second Highest	Lowest

3.4.10.3 Impacts to Cultural Resources Within and Around Zone 2

Alternative 2A

There are 46 previously identified sites associated with Alternative 2A. Seventeen of these sites are prehistoric, 25 are historic, and four are multicomponent (Figure 3.4-18). One of these sites is listed in the NRHP, two of the sites are eligible for inclusion in the NRHP, two have unresolved eligibilities, and 41 have unknown NRHP eligibilities. This alternative has one previously recorded site per 649 acres.

The 17 prehistoric sites associated with Alternative 2A include 15 lithic scatters, one rock alignment site, and one stone circle site (Figure 3.4-18). One lithic scatter is eligible for inclusion in the NRHP. One lithic scatter and the rock alignment site have unresolved NRHP eligibilities. The remaining 14 sites have unknown NRHP eligibilities. Size data was available for eight of the lithic scatters. These eight are below the average size of the analyzed lithic scatters. Of the previously recorded prehistoric sites in Alternative 2A, the rock alignment site and the stone circle site are complex feature sites.

The 25 historic sites associated with Alternative 2A include seven mining sites, seven homesteads, two historic trash dumps, two buildings, two roads, one irrigation site, the Butte Anaconda NHLD, the Bryant mining district, and two unclassified historic sites (Figure 3.4-18). The Butte Anaconda NHLD is listed in the NRHP and the irrigation site is eligible for inclusion in the NRHP. The remaining 23 historic sites have unknown NRHP eligibilities. Of the previously recorded historic sites in Alternative 2A, the Butte Anaconda NHLD and the Bryant mining district are the only complex feature sites.

The four multicomponent sites in Alternative 2A consist of two historic trash dumps with associated lithic scatter, and two historic feature and lithic scatter sites (Figure 3.4-18). All four sites have unknown NRHP eligibilities and none are complex feature sites.

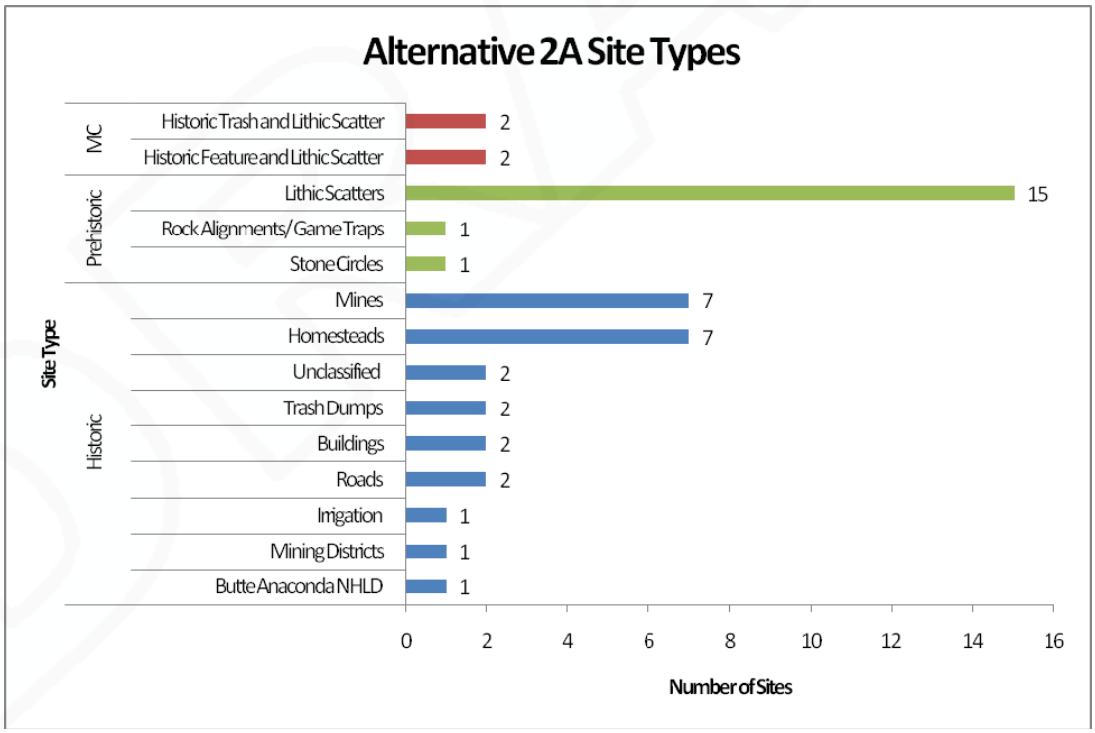

Figure 3.4-18. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 2A

Site Density Model

The site density model predicts that 45 percent of the project area associated with Alternative 2A consists of high site densities, 54 percent consists of medium sitedensities, and one percent consists of low site densities(Figure 3.4-19).

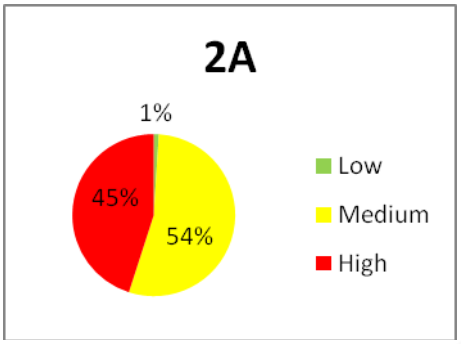

Figure 3.4-19. Alternative 2A Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Five agency identified cultural resources would be visible from Alternative 2A (Figure 3.4-20). These are the Butte Anaconda NHLD and the Argenta, Bryant, Melrose, and Utopia mining districts. The length of Alternative 2A that may impact each cultural resource is detailed below.

- Butte Anaconda NHLD – 0.18 mile Immediate Foreground, 6.82 miles Foreground, and 13.32 miles Middle Ground.
- Argenta mining district – 0.69 mile Middle Ground.
- Bryant mining district – 1.46 miles Foreground and 13.03 miles Middle Ground.
- Melrose mining district – 9.83 miles Middle Ground.
- Utopia mining district – 8.40 miles Middle Ground.

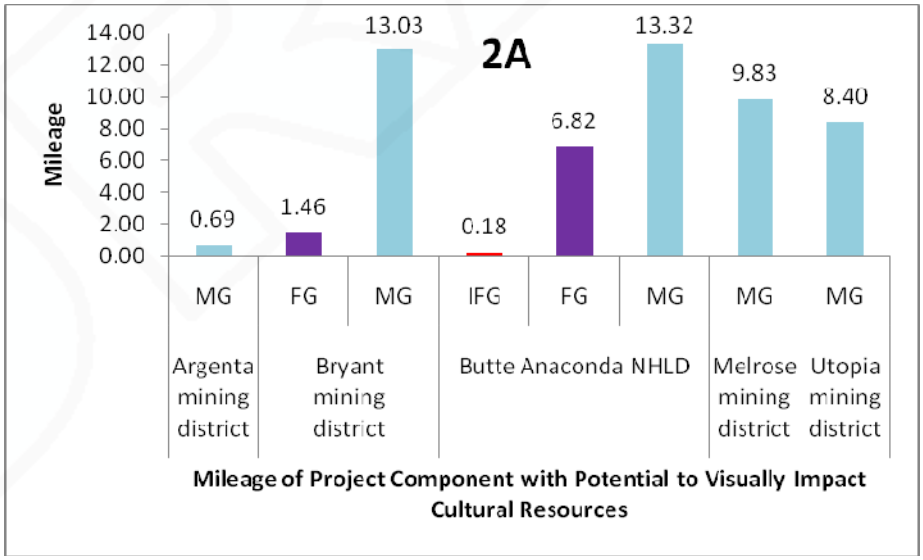

Figure 3.4-20. Project Component Visual Impact Analysis for Alternative 2A Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis

Four agency identified sensitive point cultural resources will be impacted by Alternative 2A. These are the Butte Anaconda NHLD, the Bryant mining district , the La Marche Game Trap, and the Utopia mining district (Figure 3.4-21). The length of Alternative 2A that will be visible from each site is detailed below.

- Butte Anaconda NHLD – 3.28 miles Middle Ground.
- Bryant mining district– 0.02 mile Middle Ground.
- La Marche Game Trap – 1.02 miles Middle Ground.
- Utopia mining district – 0.01 mile Middle Ground.

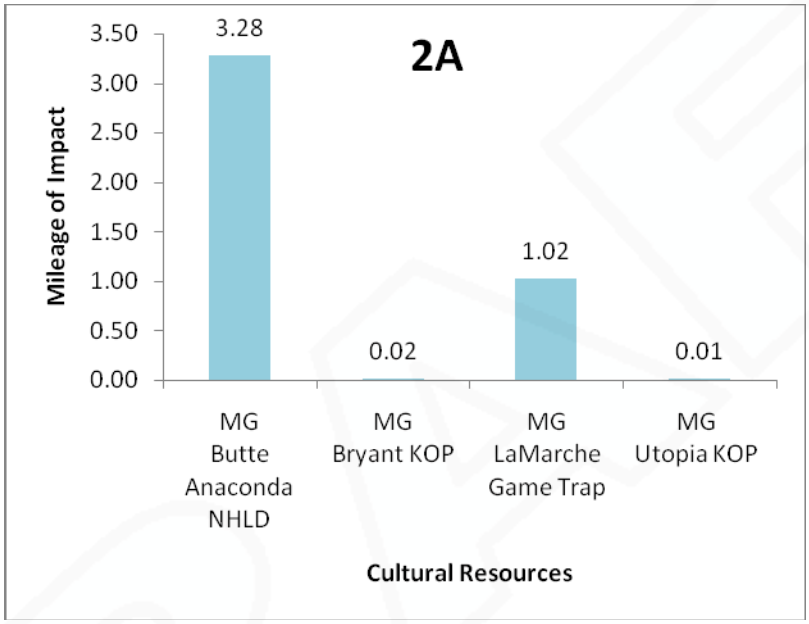

Figure 3.4-21. Sensitive Point Visual Impact Analysis for Alternative 2A Showing Middle Ground (MG) Impacts

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, 12 would be within the visual study corridor of Alternative 2A.

Alternative 2B

There are 45 previously identified sites associated with Alternative 2B. Seventeen of these sites are prehistoric, 26 are historic, and two are multicomponent (Figure 3.4-22). One of these sites is listed in the NRHP, two are eligible for inclusion in the NRHP, three have unresolved eligibilities, and 39 have unknown NRHP eligibilities. This alternative has an average of one previously recorded site per 812 acres.

The 17 prehistoric sites associated with Alternative 2B include 14 lithic scatters, two stone circle sites, and one rock alignment site (Figure 3.4-22). One lithic scatter is eligible for inclusion in the NRHP and one lithic scatter and the rock alignment/game trap site have unresolved NRHP eligibilities. The remaining 14 prehistoric sites have unknown NRHP eligibilities. Size data was available for six of the lithic scatters. These scatters are below the average size of the analyzed lithic scatters. Of the previously

recorded prehistoric sites in Alternative 2B, the rock alignment site and both the stone circle sites are complex feature sites.

The 26 historic sites associated with Alternative 2B include eight homesteads, eight mining sites, two historic trash dumps, two irrigations sites, two buildings, one road, the Butte Anaconda NHLD, and two unclassified historic sites (Figure 3.4-22). The Butte Anaconda NHLD is listed in the NRHP and one irrigation site is eligible for inclusion in the NRHP. One homestead has unresolved NRHP eligibility and the remaining 23 historic sites have unknown NRHP eligibilities. Of the previously recorded historic sites in Alternative 2B, the Butte Anaconda NHLD is the only complex feature site.

The two multicomponent sites in Alternative 2B are historic feature and lithic scatter sites (Figure 3.4-3.4-22). Both of these sites have unknown NRHP eligibilities and neither is a complex feature site.

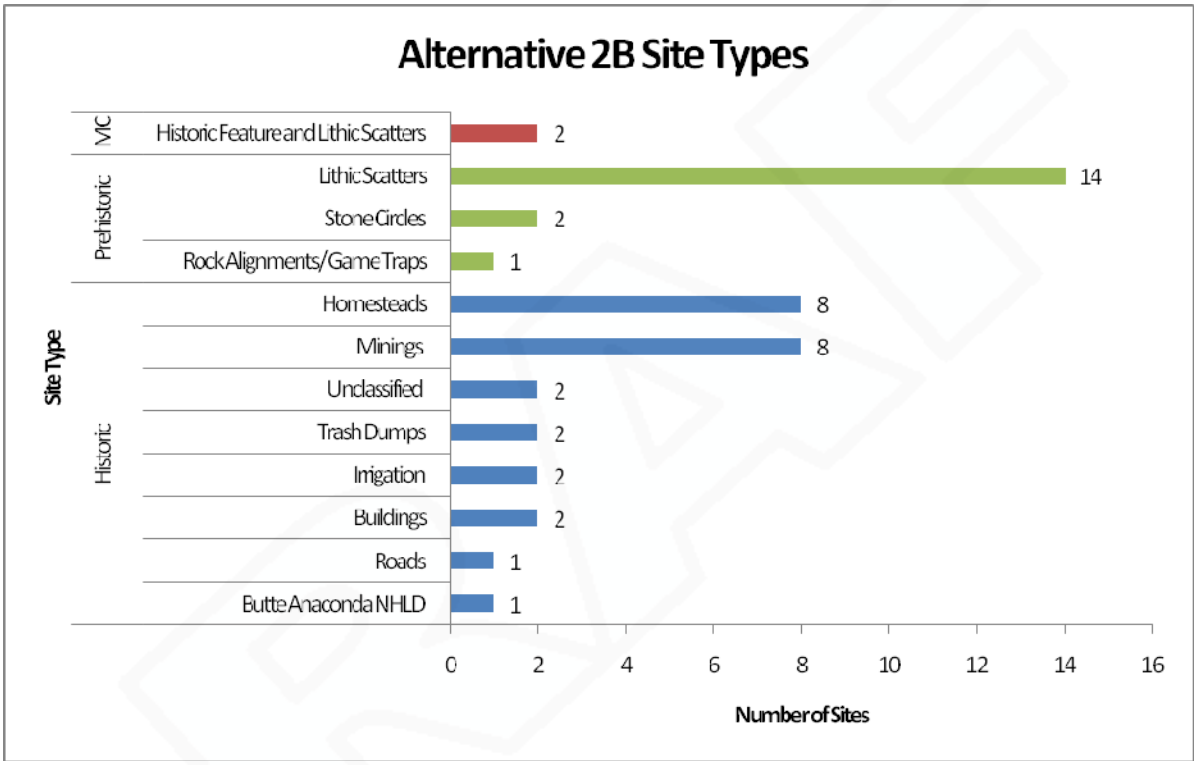

Figure 3.4-22. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 2B

Site Density Model

The site density model predicts that 46 percent of the project area associated with Alternative 2B consists of high site densities, 53 percent consists of medium site densities, and one percent consists of low site densities (Figure 3.4-23).

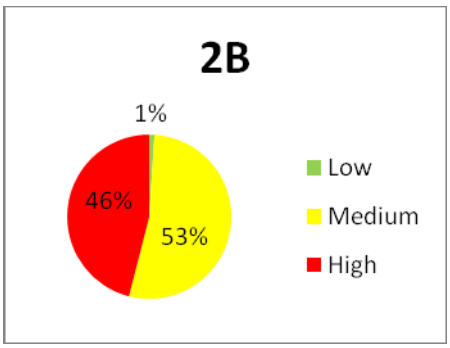

Figure 3.4-231. Alternative 2B Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Three agency identified cultural resources would be visible from Alternative 2B (Figure 3.4-24). These are the Butte Anaconda NHLD, the Melrose mining district, and the Utopia mining district. The length of Alternative 2B that may impact each cultural resource is detailed below.

- Butte Anaconda NHLD – 0.18 mile Immediate Foreground, 6.82 miles Foreground, and 13.32 miles Middle Ground.
- Melrose mining district – 10.06 miles Middle Ground.
- Utopia mining district – 7.13 miles Middle Ground.

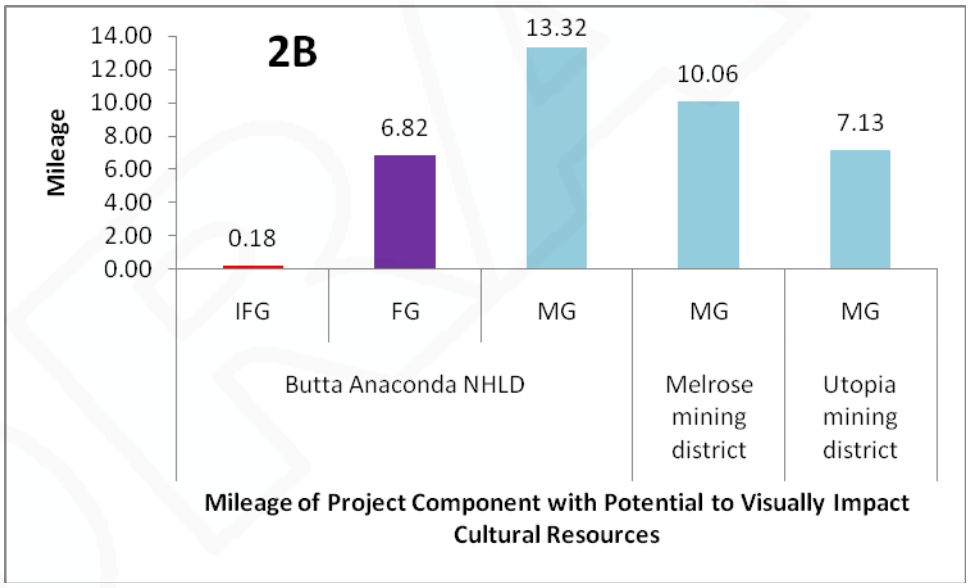

Figure 3.4-2. Project Component Visual Impact Analysis for Alternative 2B Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis

Two agency identified sensitive point cultural resources would be impacted by Alternative 2B. These are the Butte Anaconda NHLD and the Bryant mining district (Figure 3.4-25). The length of Alternative 2B that will be visible from each site is detailed below.

- Butte Anaconda NHLD – 3.28 miles Middle Ground.

- Bryant mining district – 0.06 mile Middle Ground.

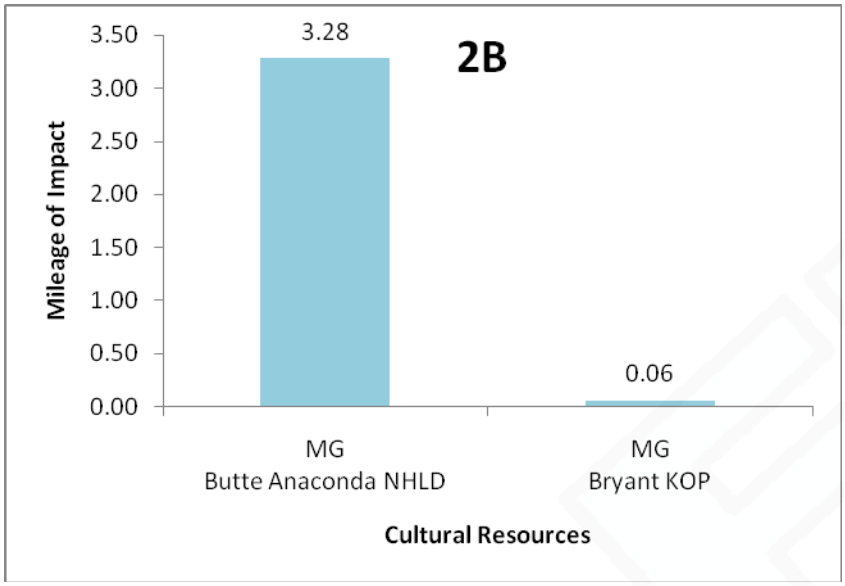

Figure 3.4-25. Sensitive Point Visual Impact Analysis for Alternative 2B Showing Middle Ground (MG) Impacts

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, ten would be within the visual study corridor of Alternative 2B.

Alternative 2C

There are 68 previously recorded cultural resources associated with Alternative 2C. These include 43 historic sites, 23 prehistoric sites, and two multicomponent sites (Figure 3.4-26). One of these sites is listed in the NRHP, two sites are eligible for inclusion in the NRHP, five sites have unresolved eligibilities, 58 sites have unknown eligibilities, and two sites are not eligible. This alternative has one previously recorded cultural resource per 845 acres of study area.

The 23 prehistoric sites consist of 14 lithic scatters, three rock alignment/game trap sites, three stone circle sites, one cave, one rockshelter, and one unclassified prehistoric site (Figure 3.4-26). One rock alignment/game trap site and three lithic scatters have unresolved NRHP eligibilities and the remaining 19 prehistoric sites have unknown NRHP eligibilities. Eleven of the 14 lithic scatters have size data. Ten of these are smaller than the average of the analyzed lithic scatters. The lithic scatter that does exceed the average has an unresolved eligibility. The three rock alignment/game trap sites and the three stone circle sites are complex feature sites.

The 43 historic sites consist of 19 mining sites, eight homesteads, four buildings, three railroads, three roads, two historic trash dumps, the Silver Star mine, one irrigation site, the Butte Anaconda NHLD, and one unclassified historic site (Figure 3.4-26). The Butte Anaconda NHLD is listed in the NRHP and one road and one irrigation site are eligible for inclusion in the NRHP. One mining site and one railroad have unresolved NRHP eligibilities. Thirty-six historic sites have unknown NRHP eligibilities, and one homestead and one railroad are not eligible for the NRHP. The Butte Anaconda NHLD is the only historic complex feature site.

The two multicomponent sites in Alternative 2C are historic feature with lithic scatter sites (Figure 3.4-26). Both have unknown NRHP eligibilities and neither is a complex feature site.

For most of its length, Alternative 2C would parallel the Lewis and Clark NHT, which could result in dispersed visual impacts to the trail.

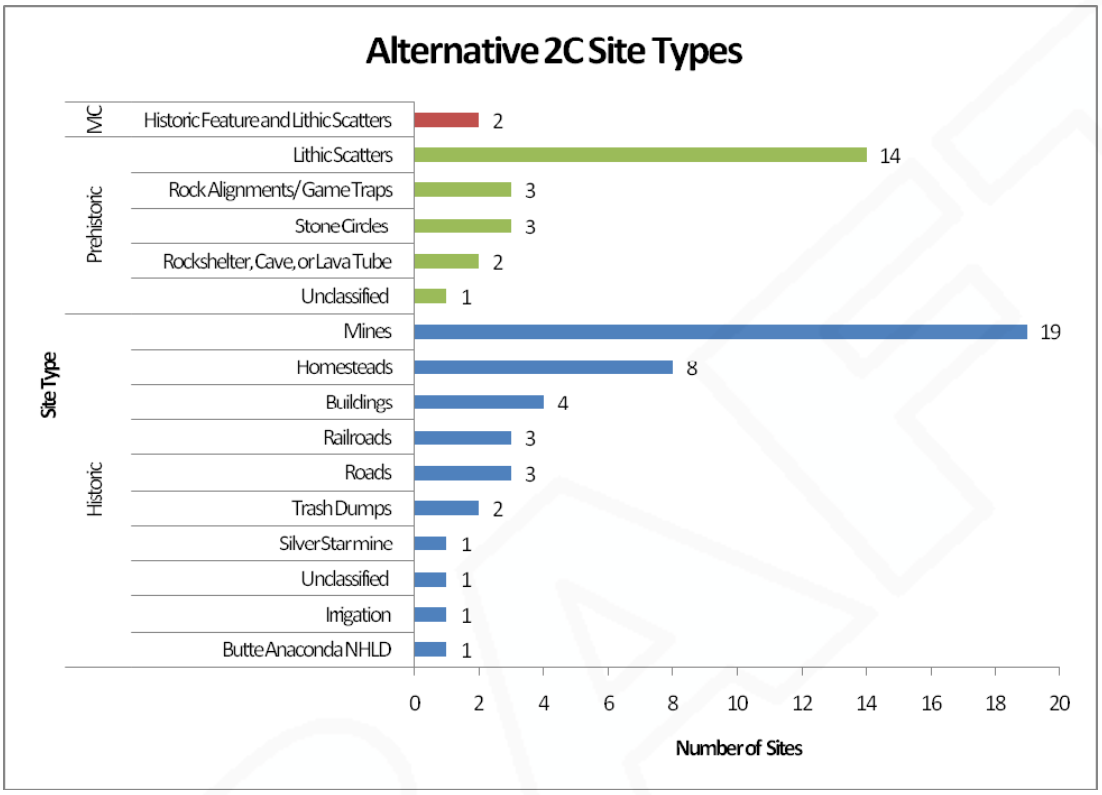

Figure 3.4-26. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 2C

Site Density Model

The site density model predicts that 41 percent of the project area associated with Alternative 2C consists of high site density areas, 56 percent consist of medium site density areas, and three percent consists of low site density areas (Figure 3.4-27).

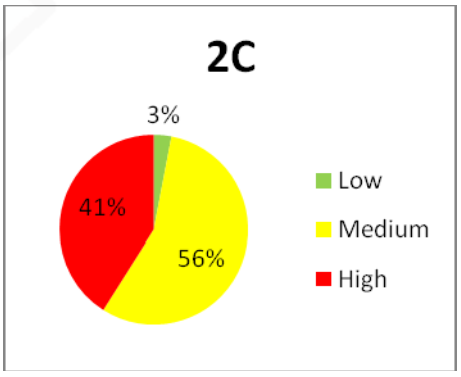

Figure 3.4-27. Alternative 2C Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Five agency identified cultural resources will be visible from Alternative 2C: Butte Anaconda NHLD, Pipestone mining district, Rochester mining district, Silver Star mining district, and Utopia mining district (Figure 3.4- 3.4-28). The length of Alternative 3A that may impact each cultural resource is detailed below.

- Butte Anaconda NHLD – 0.18 mile Immediate Foreground, 6.82 miles Foreground, and 13.32 miles Middle Ground.
- Pipestone mining district – 2.47 miles Immediate Foreground, 3.38 miles Foreground, and 10.97 miles Middle Ground.
- Rochester mining district – 6.80 miles Middle Ground.
- Silver Star mining district – 3.73 miles Immediate Foreground, 4.49 miles Foreground, and 8.48 miles Middle Ground.
- Utopia mining district – 0.73 mile Middle Ground.

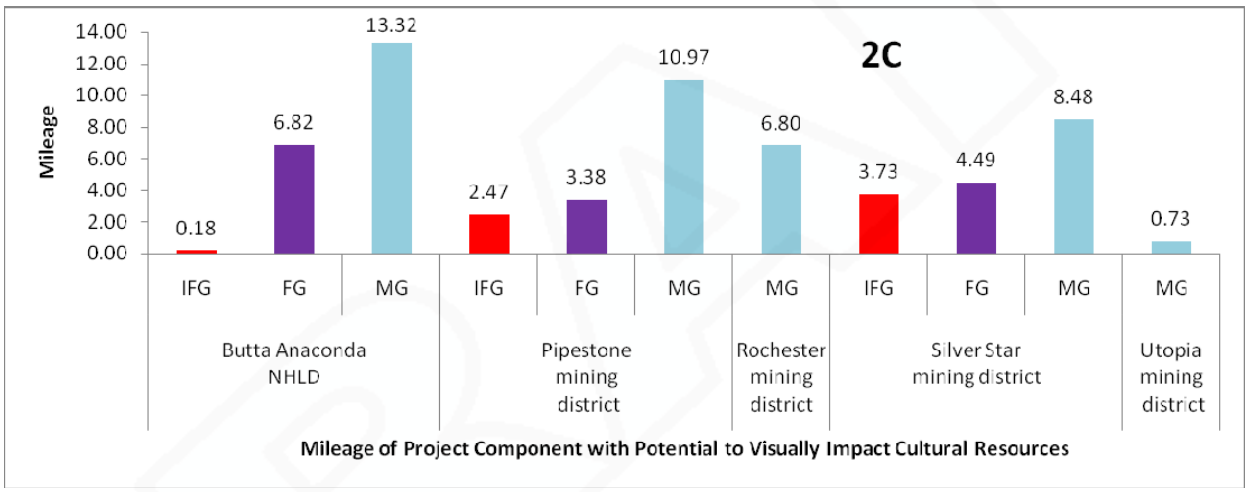

Figure 3.4-28. Project Component Visual Impact Analysis for Alternative 2C Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis

Four agency identified sensitive point cultural resources will be impacted by Alternative 2C. These are the Butte Anaconda NHLD, the Rochester KOP, the Silver Star KOP, and the Silver Star rock art site (Figure 3.4- 3.4-29). The length of Alternative 2C that may impact each cultural resource is detailed below.

- Butte Anaconda NHLD – 3.28 miles Middle Ground.
- Rochester KOP – 0.42 mile Middle Ground.
- Silver Star KOP – 1.12 miles Foreground and 1.25 miles Middle Ground.
- Silver Star Rock art site – 0.26 mile Foreground and 0.52 mile Middle Ground.

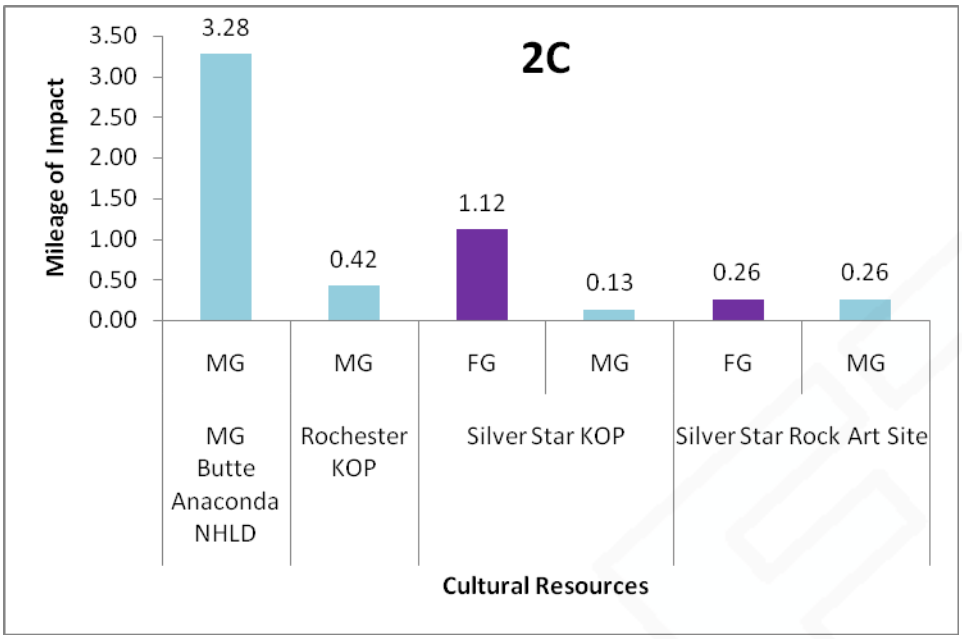

Figure 3.4-29. Sensitive Point Visual Impact Analysis for Alternative 2C Showing Foreground (FG) and Middle Ground (MG) Impacts

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, 12 would be within the visual study corridor of Alternative 2C.

Alternative 2D

There are 60 previously recorded cultural resources along this alternative including 46 historic sites, 12 prehistoric sites, and two multicomponent sites (Figure 3.4-30). One site is listed in the NRHP, three are eligible for inclusion in the NRHP, two sites have unresolved eligibilities, 53 sites have unknown eligibilities, and one is not eligible for inclusion in the NRHP. This alternative has one previously recorded cultural resource per 699 acres of study area.

The 12 prehistoric sites consist of 11 lithic scatters and one rock alignment/game trap site (Figure 3.4-30). One lithic scatter is eligible for inclusion in the NRHP and the rock alignment/game trap site has unresolved NRHP eligibility. The remaining 10 prehistoric sites have unknown NRHP eligibilities. Nine of the lithic scatters have size data and all nine are smaller than the average of the lithic scatters analyzed. The rock alignment/game trap site and stone circle site are complex feature sites.

The 46 historic sites consist of the Butte Anaconda NHLD, 10 mining sites, two mining districts, seven roads, five railroads, five homesteads, four historic trash dumps, three irrigation sites, three buildings, two town sites, one cemetery, and three unclassified historic sites (Figure 3.4-30). The Butte Anaconda NHLD is listed in the NRHP, one road and one railroad are eligible for inclusion in the NRHP, and one building has unresolved NRHP eligibility. Thirty-nine sites have unknown NRHP eligibilities and the remaining historic trash dump is not eligible for the NRHP. The two town sites are complex feature sites.

The two multicomponent sites are both historic feature with lithic scatter sites (Figure 3.4-30). Both sites have unknown NRHP eligibilities and neither is a complex feature site.

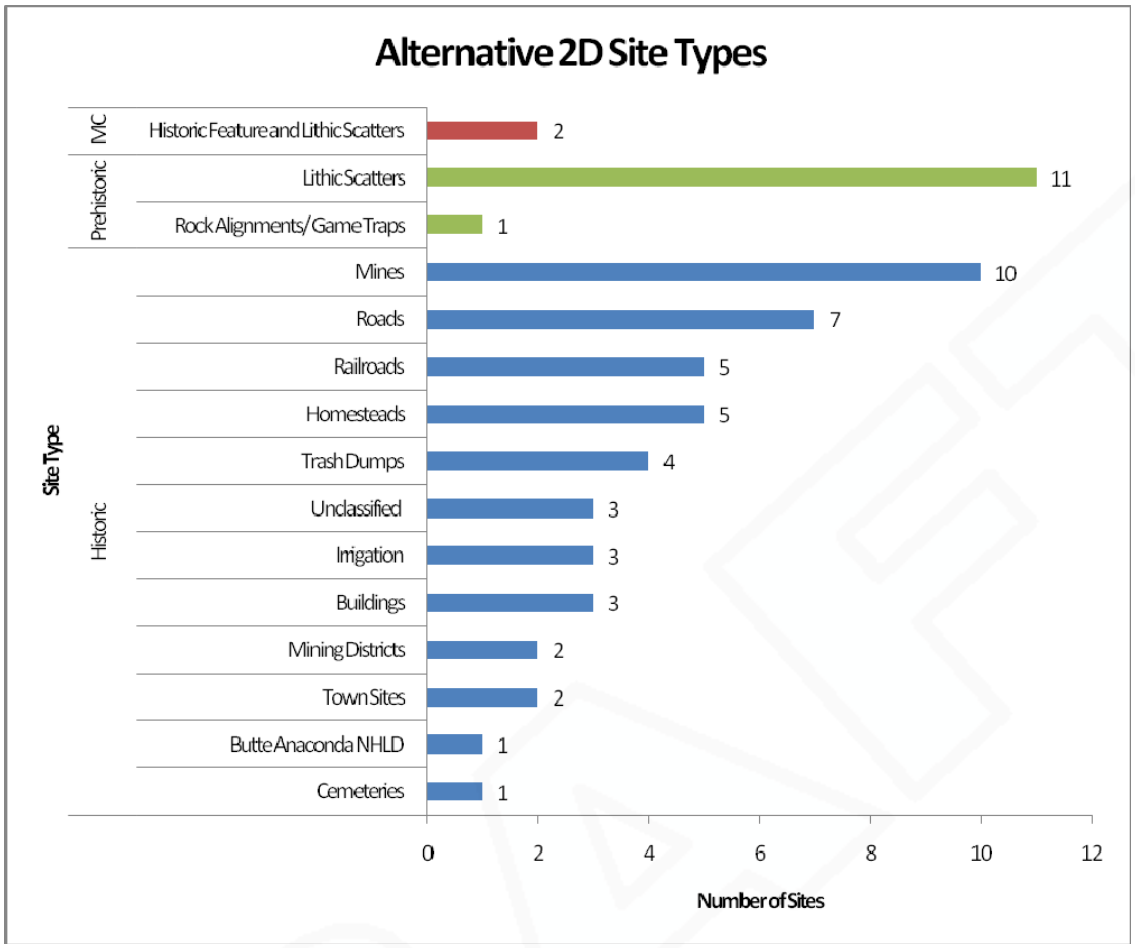

Figure 3.4-30. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 2D

Site Density Model

The site density model indicates that this alternative consists of 29 percent high site density areas, 65 percent medium site density areas, and six percent low density areas (Figure 3.4-31). This distribution shows that over half of the alternative has moderate probability of encountering unrecorded resources, while the remaining portions of the alternative consists of interspersed areas of high site density and low site density.

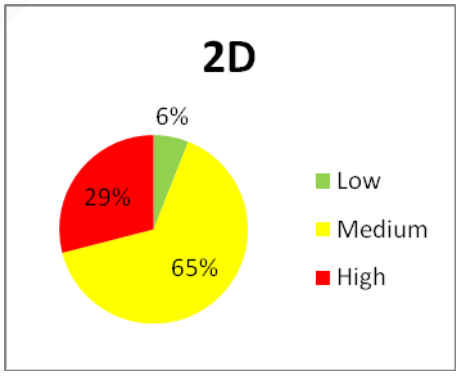

Figure 3.4-31. Alternative 2D Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Five agency identified cultural resources will be visible from Alternative 2D: The Argenta mining district, Bryant mining district, Butte Anaconda NHLD, Melrose mining district, and Utopia mining district (Figure 3.4-32). The length of Alternative 2D that may impact each cultural resource is detailed below.

- Argenta mining district – 0.95 mile Middle Ground.
- Bryant mining district – 7.88 miles Immediate Foreground, 8.52 miles Foreground, and 13.95 miles Middle Ground.
- Butte Anaconda NHLD – 0.37 mile Immediate Foreground, 3.99 miles Foreground, and 15.46 miles Middle Ground.
- Melrose mining district – 0.23 mile Foreground, and 8.93 miles Middle Ground.
- Utopia mining district – 0.74 mile Immediate Foreground, 1.63 miles Foreground, and 8.36 miles Middle Ground.

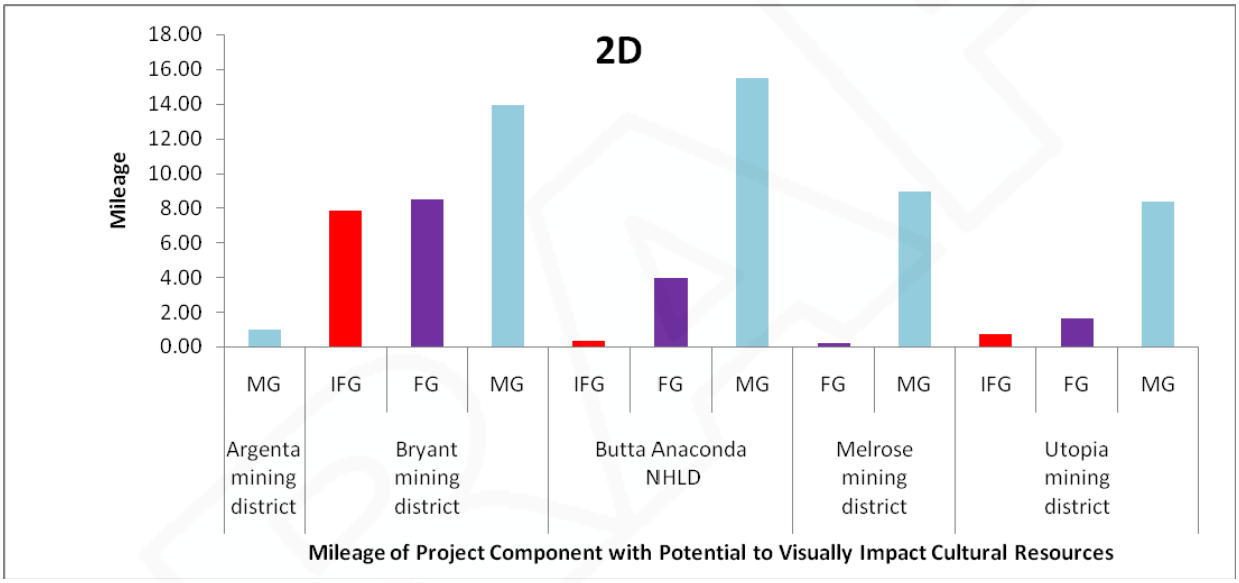

Figure 3.4-32. Project Component Visual Impact Analysis for Alternative 2D Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis

Three agency identified sensitive point cultural resources will be impacted by Alternative 2D. These are the La Marche Game Trap, Bryant KOP, and Utopia KOP (Figure 3.4-33). Of the four identified, Monida Pass is the only resource with no viewshed impact. The length of Alternative 2D that may impact each cultural resource is detailed below.

- Bryant KOP – 1.26 miles Middle Ground.
- Utopia KOP – 0.17 mile Middle Ground.
- LaMarche Game Trap – 1.53 miles Middle Ground.
- Monida Pass – 0.0 mile.

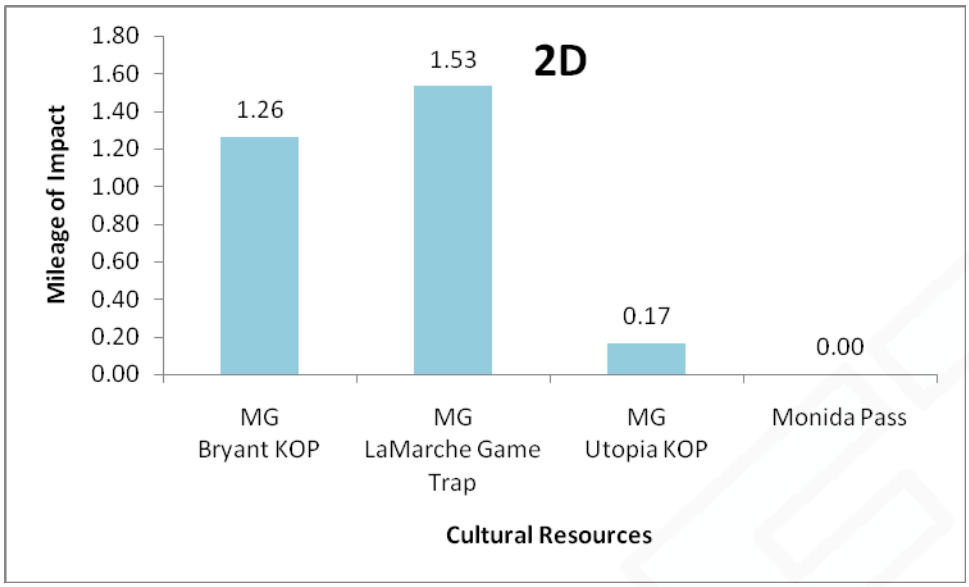

Figure 3.4-33. Sensitive Point Visual Impact Analysis for Alternative 2D Showing Middle Ground (MG) Impacts

Sensitive Point Tally
Of the 84 sensitive visual points that were included in the qualitative proximity analysis, 17 would be within the visual study corridor of Alternative 2D.

Alternative 2E

There are 28 previously recorded cultural resources associated with this alternative, consisting of 13 prehistoric sites and 15 historic sites (Figure 3.4-34). One of the sites associated with Alternative 2E has an unresolved NRHP eligibility and the remaining 27 have unknown NRHP eligibilities. This alternative has one previously recorded cultural resource per 1,224 acres of study area.

The 13 prehistoric sites consist of seven lithic scatters, three rock alignment/game trap sites, and three stone circle sites (Figure 3.4-34). All 13 sites have unknown NRHP eligibilities. All seven lithic scatters associated with this alternative have size data and each falls below the average size of the analyzed lithic scatters. The three rock alignment/game trap sites and three stone circle sites are complex feature sites.

The 15 historic sites consist of seven mining sites, two railroads, two historic trash dumps, two roads, the Silver Star mine, Lewis and Clark NHT, and one irrigation site (Figure 3.4-34). One railroad has an unresolved NRHP eligibility and the remaining 14 sites have unknown NRHP eligibilities.

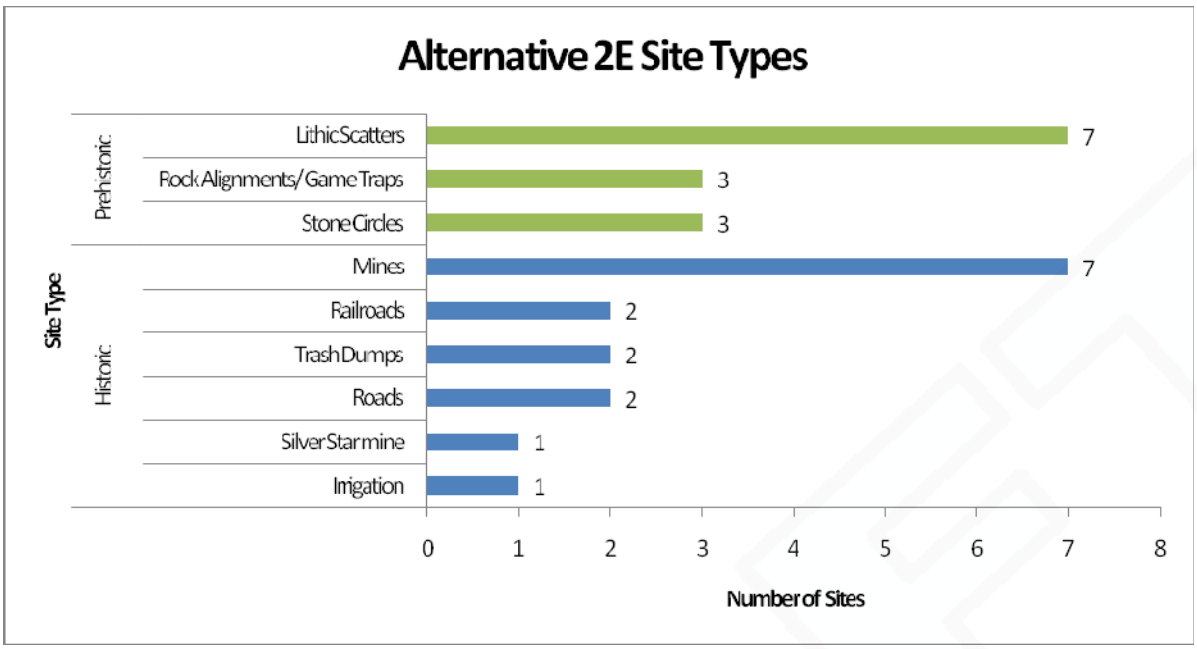

Figure 3.4-3. Previously Recorded Prehistoric and Historic Sites within Alternative 2E

Site Density Model

The site density model indicates that this alternative consists of 46 percent high site density areas, one percent low density areas, and 53 percent medium site density areas (Figure 3.4-35).

This distribution shows that over half of the alternative has moderate probability of encountering unrecorded resources, while the remaining portions of the alternative consists of interspersed areas of high site density and low site density.

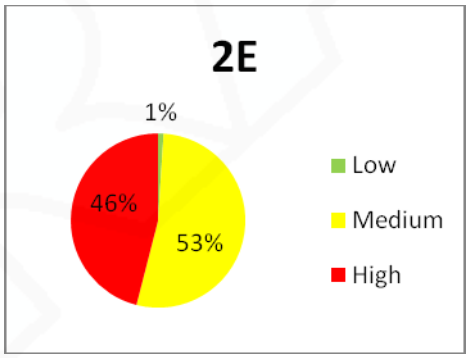

Figure 3.4-35. Alternative 2E Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Four agency identified cultural resources will be visible from Alternative 2E: the Pipestone mining district, Rochester mining district, Silver Star mine, and Utopia mining district (Figure 3.4-36). The length of Alternative 2E that may impact each cultural resource is detailed below.

- Pipestone mining district – 0.37 mile Immediate Foreground, 0.84 mile Foreground, and 6.04 miles Middle Ground.
- Rochester mining district – 6.80 miles Middle Ground.

- Silver Star mine – 3.73 miles Immediate Foreground, 4.49 miles Foreground, and 8.48 miles Middle Ground.
- Utopia mining district – 0.73 mile Middle Ground.

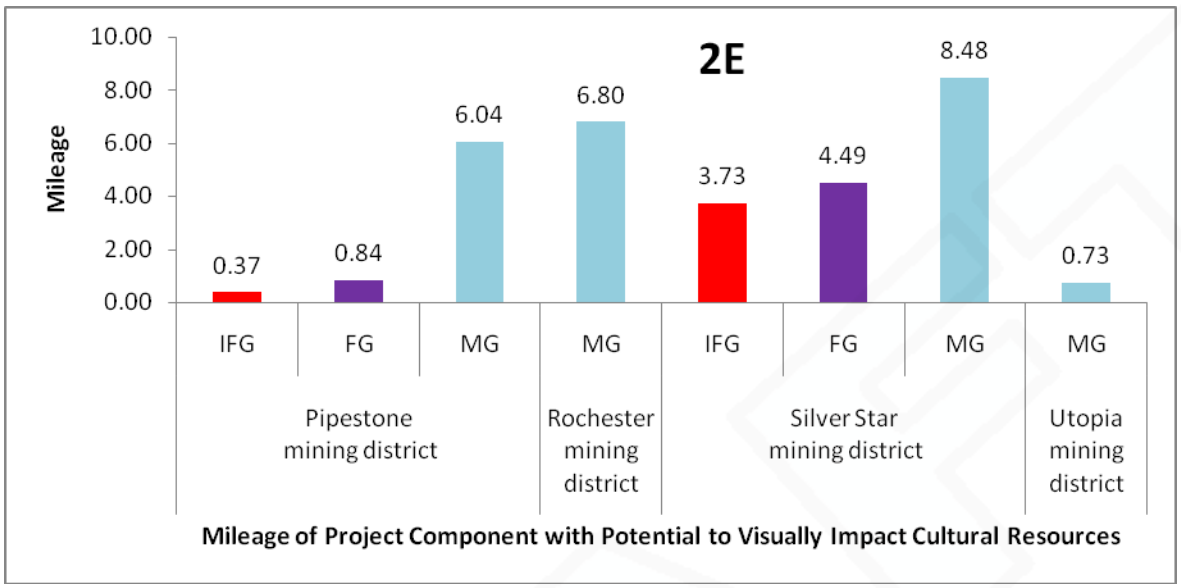

Figure 3.4-36. Project Component Visual Impact Analysis for Alternative 2E Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts.

Sensitive Point Visual Impact Analysis
Three agency identified sensitive point cultural resources will be impacted by Alternative 2E. These are the KOPs at Rochester mining district, the Silver Star mining district, and the Silver Star Rock art site (Figure 3.4-37). The length of Alternative 2E that may impact each cultural resource is detailed below.

- Rochester mining district – 0.42 mile Middle Ground.
- Silver Star mining district – 1.12 miles Foreground and 1.25 miles Middle Ground.
- Silver Star Rock art site – 0.26 mile Foreground and 0.52 mile Middle Ground.

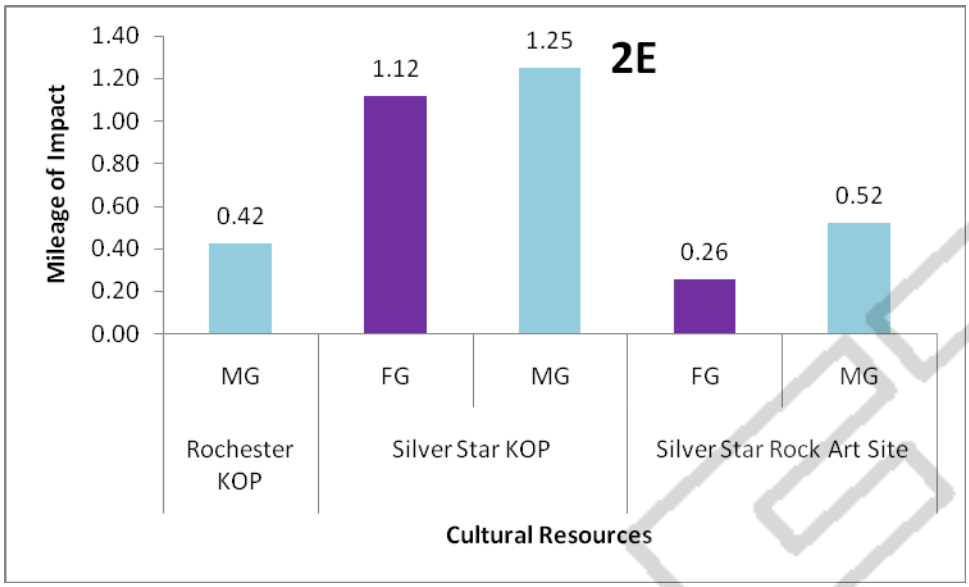

Figure 3.4-37 Point Visual Impact Analysis for Alternative 2E Showing Foreground (FG) and Middle Ground (MG) Impacts

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, three would be within the visual study corridor of Alternative 2D.

Zone 2 Summary

Alternative 2A has the third highest number of previously recorded sites and is the shortest alternative (Table 3.4-4). In terms of site NRHP eligibilities, Alternative 2A is tied for the third highest number of unresolved sites, has the second highest number of unknown sites, and will potentially impact one NRHP listed site and two NRHP eligible sites. This alternative also has three complex feature sites. Alternative 2A has the second highest high site density, third highest medium site density, and is tied for the lowest low site density. This alternative has the fourth highest Immediate Foreground, highest Foreground, and third highest Middle Ground visual impacts per the project component model. Alternative 2A will impact four sensitive points and has the highest Middle Ground mileage. Through comparison of all five alternatives in Zone 2, Alternative 2A is considered as having the second highest impact on cultural resources.

Alternative 2B has the fourth highest number of previously recorded sites and is the third longest alternative (Table 3.4-4). In terms of site NRHP eligibilities, Alternative 2B has the second highest number of unresolved sites, third highest number of unknown sites, and will potentially impact one NRHP listed site and two NRHP eligible sites. This alternative also has three complex feature sites. Alternative 2B has the highest high site density, is tied for the lowest medium site density, and is tied for the lowest low site density. This alternative has the lowest Immediate Foreground, fourth highest Foreground, and fourth highest Middle Ground visual impact per the project component model. The sensitive point visual impact analysis for Alternative 2B involved two sensitive points that have the third highest Middle Ground mileage. Through comparison of all five alternatives in Zone 2, Alternative 2B is considered as having the third highest impact on cultural resources.

Alternative 2C has the highest number of previously recorded sites and is the longest alternative (Table 3.4-4). In terms of site NRHP eligibilities, Alternative 2C has the highest number of unresolved sites, highest number of unknown sites, and will potentially impact one NRHP listed site and two eligible sites.

This alternative also has seven complex feature sites. Alternative 2C has the third highest high site density, the second highest medium site density, and the second highest low site density. This alternative has the second highest Immediate Foreground, second highest Foreground, and second highest Middle Ground visual impact per the project component model. The sensitive point visual impact analysis for Alternative 2C involved four sensitive points and is tied for the highest Foreground and have the second highest Middle Ground mileage. Through comparison of all five alternatives in Zone 2, Alternative 2C is considered as having the highest impact on cultural resources.

Alternative 2D has the second highest number of previously recorded sites and is the second longest alternative (Table 3.4-4). In terms of site NRHP eligibilities, Alternative 2D is tied for the third highest number of unresolved sites, has the fourth highest number of unknown sites, and will potentially impact three eligible sites. This alternative also has four complex feature sites. Alternative 2D has the lowest high site density, the highest medium site density, and the highest low site density. This alternative has the highest Immediate Foreground, third highest Foreground, and highest Middle Ground visual impact per the project component model. The sensitive point visual impact analysis for Alternative 2D involved three sensitive points and has the fourth highest Middle Ground mileage. Through comparison of all five alternatives in Zone 2, Alternative 2D is considered as having the fourth highest impact on cultural resources.

Alternative 2E has the lowest total number of previously recorded sites and is the fourth longest alternative (Table 3.4-4). In terms of site NRHP eligibilities, Alternative 2E has the lowest number of unresolved sites and the lowest number of unknown sites. This alternative will not impact any listed or eligible sites. This alternative also has seven complex feature sites. Alternative 2E is tied for the highest high site density, lowest medium site density, and lowest low site density. This alternative has the third highest Immediate Foreground, lowest Foreground, and lowest Middle Ground visual impact per the project component model. The sensitive point visual impact analysis for Alternative 2E involved three sensitive points and is tied for the highest Foreground and has the lowest Middle Ground mileage. Through comparison of all five alternatives in Zone 2, Alternative 2E is considered as having the lowest impact on cultural resources (Table 3.4-4Table 3.4-).

Alternatives 2C and 2E could parallel the Lewis and Clark National Historic Trial for most of its length in Zone 2. Alternatives 2A, 2B, and 2D would not be in the vicinity of the trail.

In summary of the five alternatives within Zone 2: Alternative 2C will likely have the highest impact on cultural resources because it is the longest (Table 3.4-4). It has the highest number of previously identified sites, medium to high predicted site densities and high visual impacts identified by both the project component and the sensitive point visual impact models. Alternative 2A will likely have the second highest impact on cultural resources. This is due to its relatively high number of previously identified sites, predicted medium to high site densities, and the overall highest visual impacts identified by both the project component and sensitive point visual impact models. Alternative 2B will likely have the third highest impact on cultural resources because of its length (third longest), a relatively high number of previously identified sites, and the second highest visual impacts identified by the project component visual impact model. Alternative 2D will likely have the fourth highest impact on cultural resources. This is due to its length (second longest), the highest number of previously identified sites, predicted medium to high site densities, and the highest visual impacts identified by the project component visual impact model. Alternative 2E will likely have the lowest impact on cultural resources this is because it is the shortest. It has the least amount of previously identified sites, a medium to high predicted site density, and the lowest visual impacts identified by both the project component and sensitive point visual impact models.

Table 3.4-4. Comparison of Alternatives in Zone 2

Zone 2						
Alternative Miles in Length		**2A 57 miles**	**2B 57 miles**	**2C 90 miles**	**2D 63 miles**	**2E 54 miles**
Previously Identified Sites NRHP Evaluations	Total	46	45	68	60	28
	Listed	1	1	1	1	0
	Eligible	2	2	2	3	0
	Unresolved	2	3	5	2	1
	Unknown	41	39	58	53	27
	Not Eligible	0	0	2	1	0
Site Density Model	High	45%	46%	41%	29%	46%
	Medium	54%	53%	56%	65%	53%
	Low	1%	1%	3%	6%	1%
Visual Impact Miles – Project Component	IFG	1.64	0.18	6.38	8.99	4.10
	FG	19.85	6.82	14.69	14.37	5.33
	MG	32.24	30.51	40.3	47.65	22.05
Visual Impact Miles – Sensitive Point	IFG	0	0	0	0	0
	FG	0	0	1.38	0	1.38
	MG	4.33	3.34	4.09	2.96	2.19
Sensitive Point Talley		12	10	12	17	3
Impact on Cultural Resources		Second Highest	Third Highest	Highest	Fourth Highest	Lowest

3.4.10.4 Impacts to Cultural Resources within and Around Zone 3

Alternative 3A

There are 42 previously recorded cultural resources along this alternative. These include 21 prehistoric sites, 18 historic sites, and three multicomponent sites (Figure 3.4-38). One site is eligible for inclusion in the NRHP and the other 41 sites have unknown NRHP eligibilities. The density of previously recorded resources along this alternative is one site per 1,098 acres.

The 21 prehistoric sites consist of 11 lithic scatters, eight stone circle sites, one individual artifact, and one cave (Figure 3.4-38). All the prehistoric sites have unknown NRHP eligibilities. Eight of the lithic scatters have size data. All of these are small and fall below the average size of the analyzed lithic scatters. The eight stone circle sites are complex feature sites.

The 18 historic sites consist of eight buildings, five homesteads, one rock cairn/landmarker, one railroad, one historic trash dump, Lewis and Clark NHT, and two unclassified historic sites (Figure 3.4-38). One railroad is eligible for inclusion in the NRHP and the remaining 17 historic sites have unknown NRHP eligibilities. There are no historic complex feature sites on Alternative 3A.

The three multicomponent sites consist of two historic features and associated lithic scatter sites and one historic trash dump with associated lithic scatter (Figure 3.4-38). All three multicomponent sites have unknown NRHP eligibilities and none are complex feature sites.

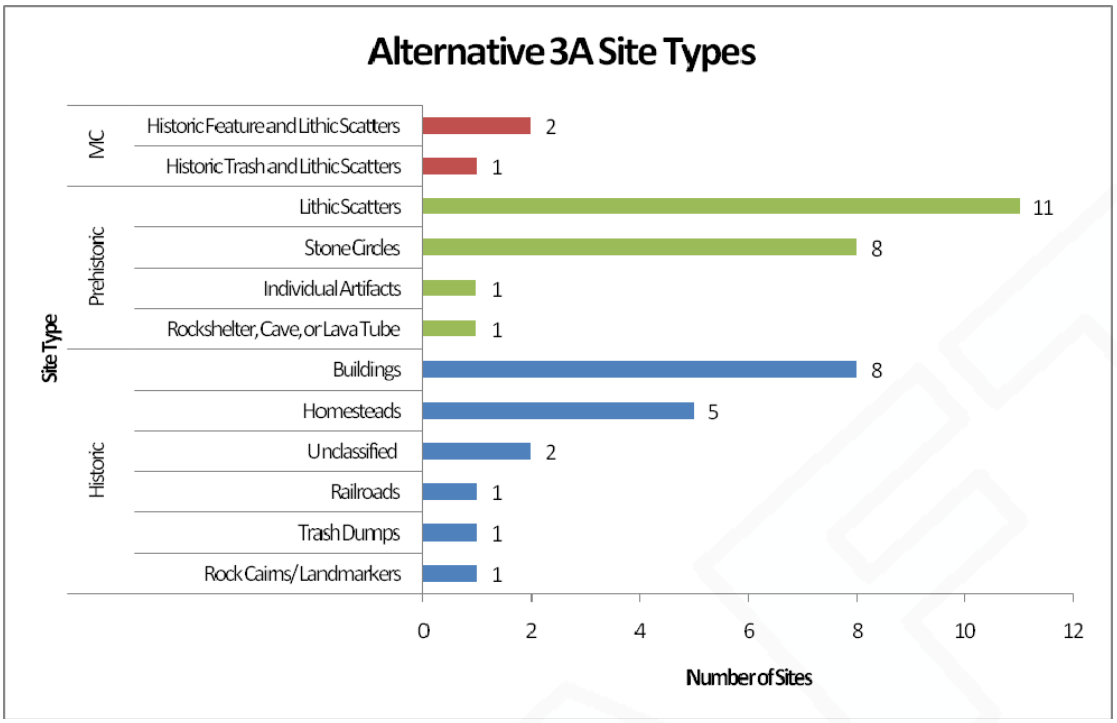

Figure 3.4-38. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 3A

Site Density Model

The site density model indicates that this alternative consists of 22 percent high site density areas, 71 percent medium site density areas, and 7 percent low site density areas (Figure 3.4-39). The preponderance of medium probability areas indicates that most of the study area will have a moderate probability of encountering undiscovered resources with smaller areas of high and low density interspersed.

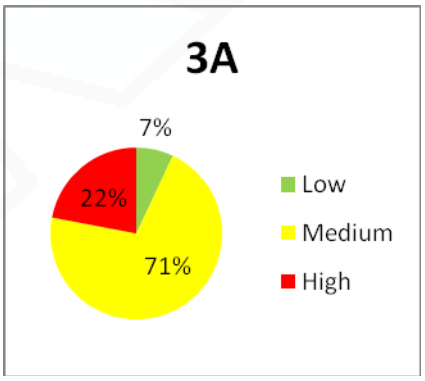

Figure 3.4-39. Alternative 3A Site Densities.

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Four agency identified cultural resources will be visible from Alternative 3A: Argenta mining district, Bannack mining district, Blue Wing mining district, and Utopia mining district (Figure 3.4-40). The length of Alternative 3A that may impact each cultural resource is detailed below.

- Argenta mining district – 0.86 mile Immediate Foreground, 1.77 miles Foreground, and 7.65 miles Middle Ground.
- Bannack mining district – 1.39 miles Immediate Foreground, 2.28 miles Foreground, and 8.85 miles Middle Ground.
- Blue Wing mining district – 5.96 miles Middle Ground.
- Utopia mining district – 1.18 miles Middle Ground.

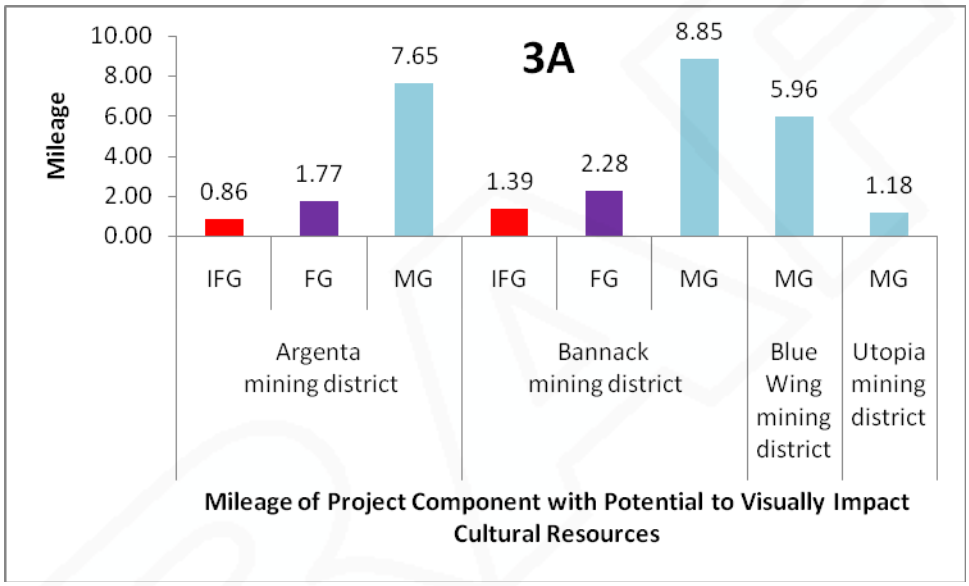

Figure 3.4-40. Project Component Visual Impact Analysis for Alternative 3A Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive point visual impact analysis

Two agency identified sensitive point cultural resources will be impacted by Alternative 3A. These are KOPs at the Argenta and Bannack mining districts (Figure 3.4-41). The length of Alternative 3A that may impact each cultural resource is detailed below.

- Argenta KOP – 1.63 miles Middle Ground.
- Bannack KOP – 0.79 mile Foreground and 1.96 miles Middle Ground.
- Lewis and Clark NHT,

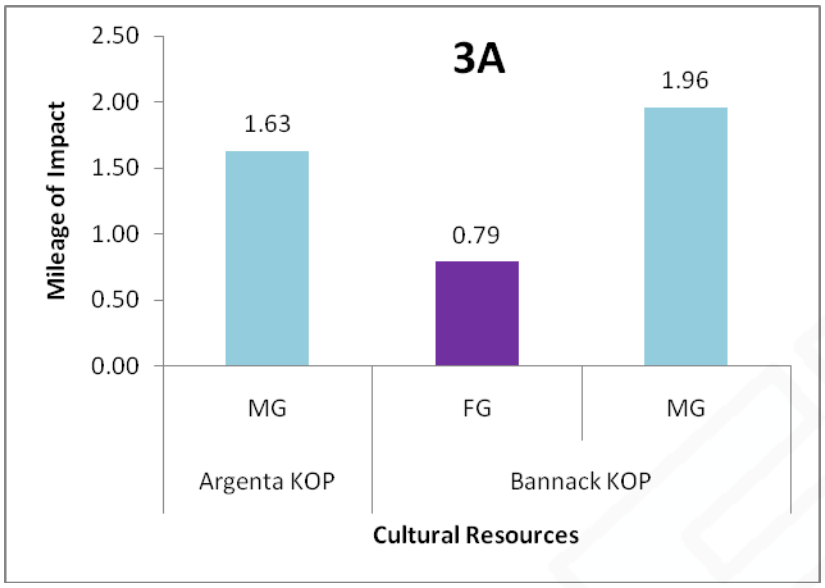

Figure 3.4-41. Sensitive Point Visual Impact Analysis for Alternative 3A Showing Foreground (FG) and Middle Ground (MG) Impacts

Sensitive Point Tally
Of the 84 sensitive visual points that were included in the qualitative proximity analysis, two would be within the visual study corridor of Alternative 2D.

Alternative 3B

There are 46 previously recorded cultural resources along this alternative. These include 14 historic sites, 31 prehistoric sites, and one multicomponent site (Figure 3.4-42). Four sites are eligible for inclusion in the NRHP, four sites have unresolved NRHP eligibilities, and 38 sites have unknown NRHP eligibilities. The density of previously recorded resources along this alternative is one site per 953 acres.

The 31 previously recorded prehistoric sites consist of 21 lithic scatters, six stone circle sites, two cave sites, one rockshelter/cave, and one unclassified prehistoric site (Figure 3.4-42). Two lithic scatters and the rockshelter/cave are eligible for inclusion in the NRHP. Two lithic scatters and two stone circle sites have unresolved NRHP eligibilities. The remaining 24 prehistoric sites have unknown NRHP eligibilities. Fourteen of the lithic scatters have available size data. One of these is 78.5 acres in size, making it more than one standard deviation above the average size of the analyzed lithic scatters. Of the other 13 lithic scatters, three are slightly smaller than average and the other 10 are very small. The six stone circle sites, two caves, and the rockshelter/cave are all complex feature sites.

The 14 historic sites consist of five buildings, four homesteads, three mining sites, a railroad, Lewis and Clark NHT, and a cemetery (Figure 3.4-42). The railroad is eligible for inclusion in the NRHP and the remaining 13 sites have unknown NRHP eligibilities. None of the historic sites are complex feature sites.

The multicomponent site is a historic trash dump with associated lithic scatter (Figure 3.4-42). It has an unknown NRHP eligibility and is not a complex feature site.

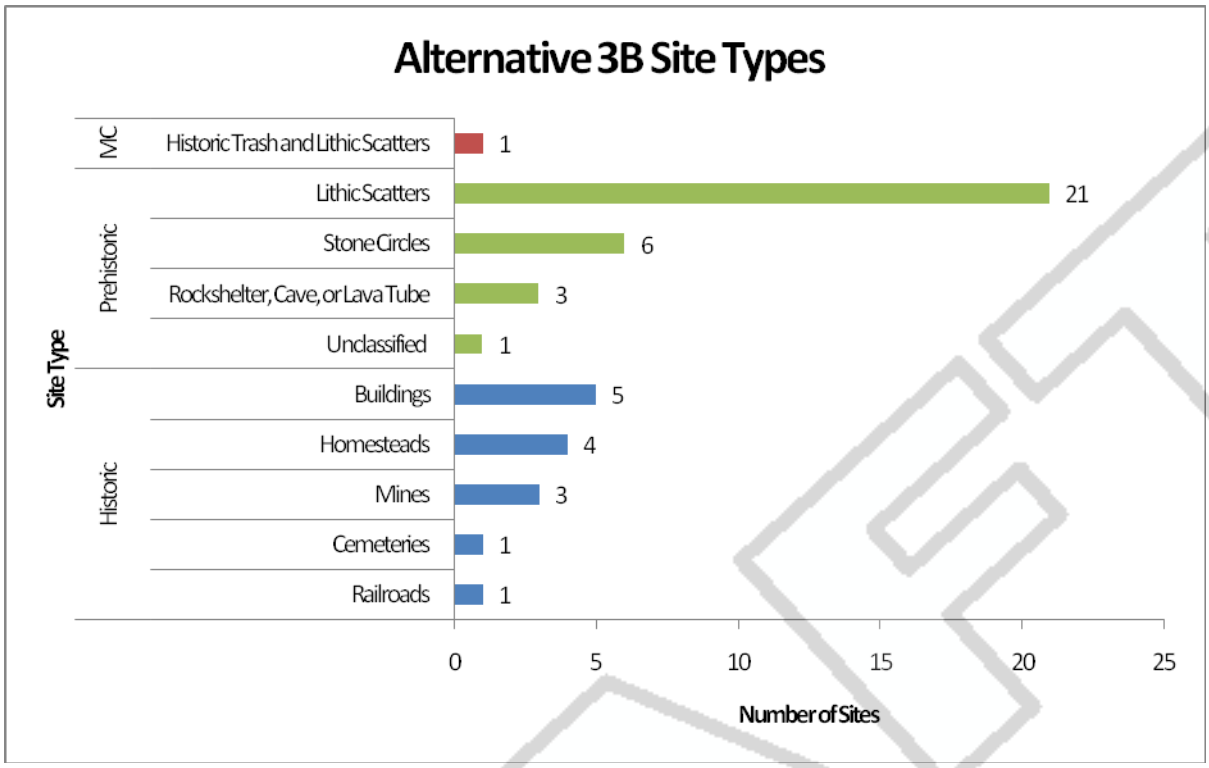

Figure 3.4-42. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 3B

Site Density Model

The site density model indicates that this alternative consists of 24 percent high site density areas, 72 percent medium site density areas, and four percent low site density areas (Figure 3.4-43). The preponderance of medium probability areas indicates that most of the study area will have a moderate probability of encountering undiscovered resources with smaller areas of high and low density interspersed.

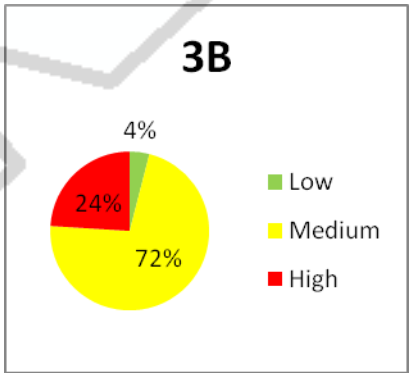

Figure 3.4-434. Alternative 3B Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Three agency identified cultural resources will be visible from Alternative 3B: Argenta mining district, Bannack mining district, and Utopia mining district (Figure 3.4-44). The length of Alternative 3B that may impact each cultural resource is detailed below.

- Argenta mining district – 4.21 miles Middle Ground.
- Bannack mining district – 0.64 miles Middle Ground.
- Utopia mining district – 0.22 mile Middle Ground.
- Lewis and Clark NHT,

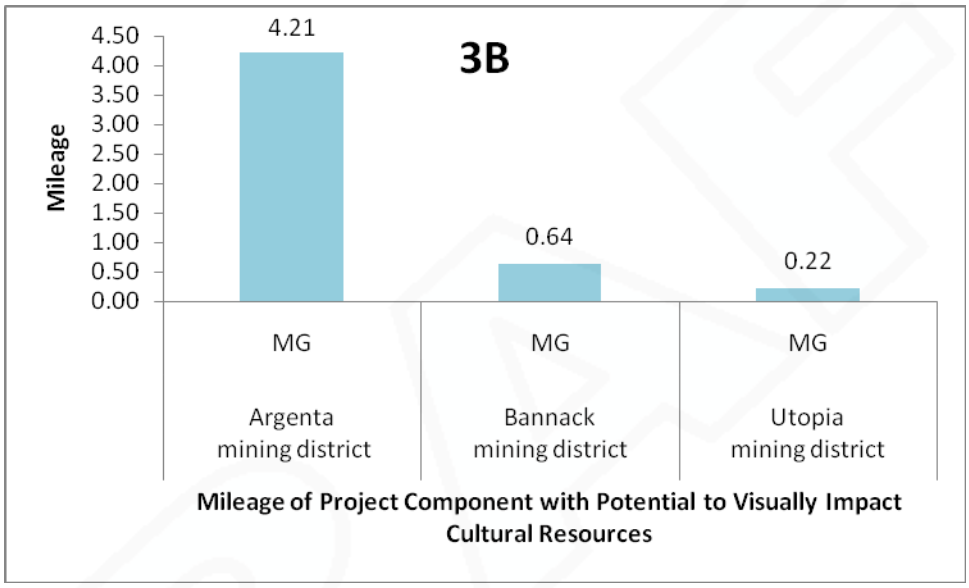

Figure 3.4-44. Project Component Visual Impact Analysis for Alternative 3B Showing Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis

One agency identified sensitive point cultural resource will be impacted by Alternative 3B, the Tash Ranch (Figure 3.4-45). The proposed project will be visible for 2.83 miles in the Middle Ground of the resource's viewshed.

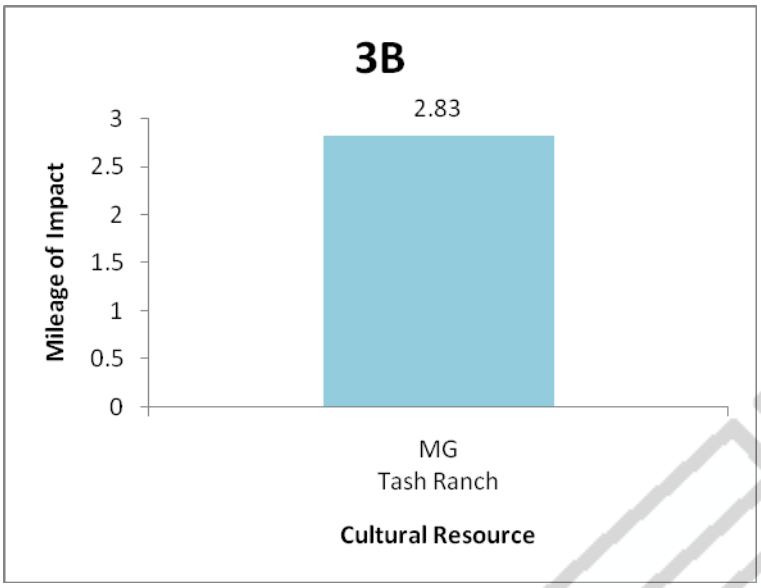

Figure 3.4-45. Sensitive Point Visual Impact Analysis for Alternative 3B Showing Middle Ground (MG) Impacts

Sensitive Point Tally
Of the 84 sensitive visual points that were included in the qualitative proximity analysis, one would be within the visual study corridor of Alternative 2D.

Alternative 3C

There are 45 previously recorded cultural resources associated with this alternative. These include 28 prehistoric sites, 14 historic sites, two multicomponent sites, and one unclassified site (Figure 3.4-46). Of these sites, three are eligible for inclusion in the NRHP, three have unresolved NRHP eligibilities, and 38 have unknown NRHP eligibilities. The density of previously recorded resources along this alternative is one site per 740 acres.

The 28 prehistoric sites consist of 19 lithic scatters, one rockshelter, and eight stone circle sites (Figure 3.4-46). Two of the lithic scatters are eligible for inclusion in the NRHP. One lithic scatter and two stone circle sites have unresolved NRHP eligibilities. The remaining 23 prehistoric sites have unknown NRHP eligibilities. Twelve of these lithic scatters have size data. Two of these are larger than the average of the lithic scatters analyzed; both are more than one standard deviation above average. The rockshelter and all eight stone circle sites are complex feature sites.

The 14 historic sites consist of five buildings, four homesteads, three mining sites, one cemetery, and one railroad (Figure 3.4-46). The railroad is eligible for inclusion in the NRHP and the remaining 13 sites have unknown eligibilities. None of these are complex feature sites.

The two multicomponent sites are both historic trash dumps with associated lithic scatter (Figure 3.4-46). Both have unknown NRHP eligibilities and neither is a complex feature site.

The unclassified site consists of a rock cairn with no temporally diagnostic indicators (Figure 3.4-46). It has an unknown NRHP eligibility and is not a complex feature site.

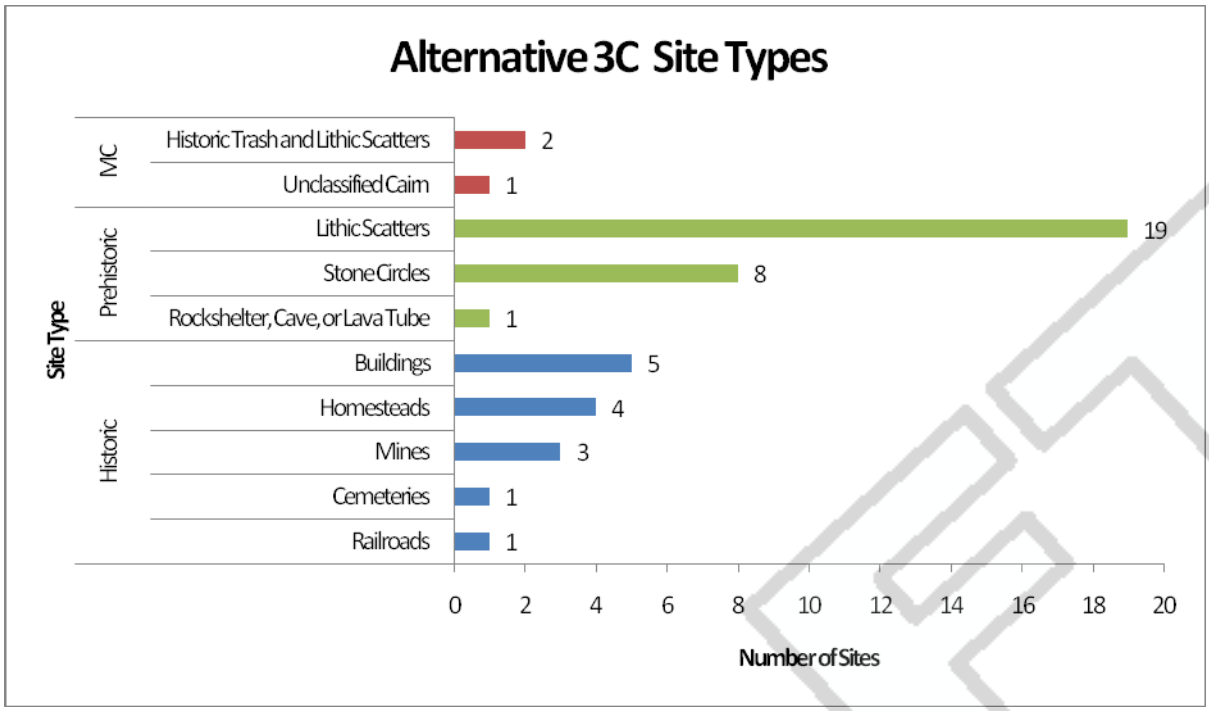

Figure 3.4-46. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 3C

Site Density Model

The site density model indicates that this alternative consists of 17 percent high site density areas, 77 percent medium site density areas, and six percent low site density areas (Figure 3.4-47). The preponderance of medium probability areas indicates that most of the study area will have a moderate probability of encountering undiscovered resources with smaller areas of high and low density interspersed.

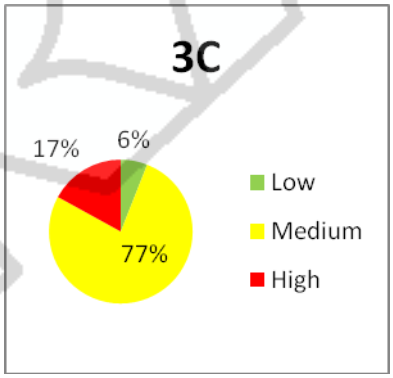

Figure 3.4-47. Alternative 3C Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Three agency identified cultural resources will be visible from Alternative 3C: Argenta mining district, Bannack mining district, and Blue Wing mining district (Figure 3.4- 3.4-48). The length of Alternative 3C that may impact each cultural resource is listed below.

- Argenta mining district – 0.91 mile Immediate Foreground, 2.66 miles Foreground, and 8.70 miles Middle Ground.
- Bannack mining district – 5.17 miles Middle Ground.
- Blue Wing mining district – 7.41 miles Middle Ground.

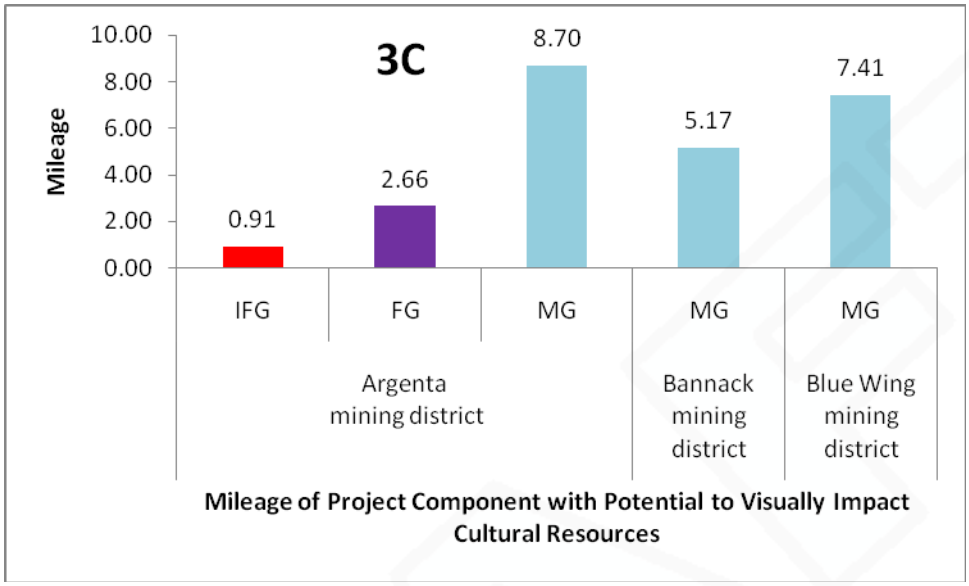

Figure 3.4-48. Project Component Visual Impact Analysis for Alternative 3C Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts.

Viewshed Analysis Sensitive Point Visual Impact Analysis(inconsistent and sequential order)

Two agency identified sensitive point cultural resources will be impacted by Alternative 3C. These are KOPs at the Argenta and Bannack mining districts (Figure 3.4-49). The length of Alternative 3C that may impact each cultural resource is detailed below.

- Argenta KOP – 1.74 miles Middle Ground.
- Bannack KOP – 1.27 miles Middle Ground.

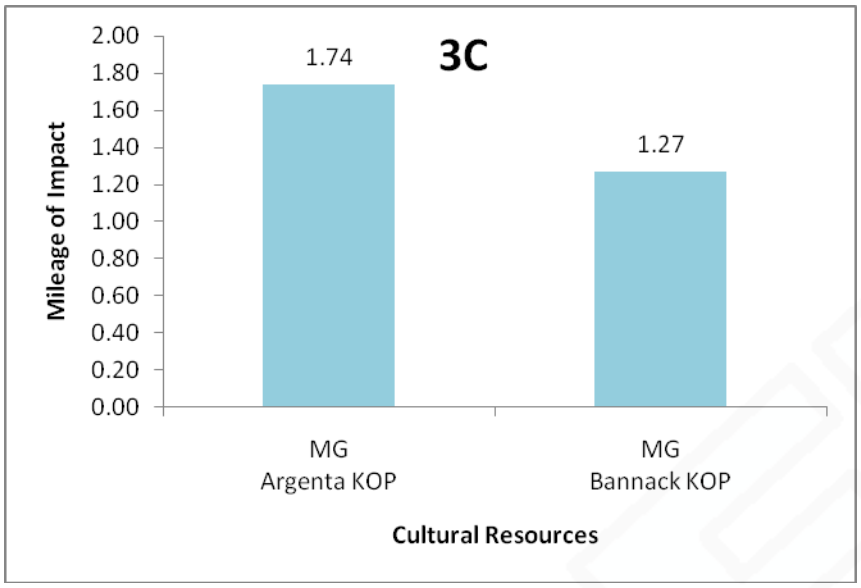

Figure 3.4-49. Sensitive Point Visual Impact Analysis for Alternative 3C Showing Middle Ground (MG) Impacts

Sensitive Point Tally
Of the 84 sensitive visual points that were included in the qualitative proximity analysis, two would be within the visual study corridor of Alternative 2D.

Zone 3 Summary

Alternative 3A has lowest number of recorded sites and is the longest of the alternatives (Table 3.4-5). It has the lowest number of eligible and unresolved sites and the highest number of unknown eligibility sites. The alternative will not impact any listed sites and only one eligible site. There are eight prehistoric complex feature sites along this alternative. This alternative has the second highest percentage of high site density areas, the lowest percentage of medium site density, and the highest percentage of low site density areas. It has the highest project component visual impacts in the Immediate Foreground and Foreground and is tied for highest Middle Ground impacts to the Argenta and Bannack mining districts. In the sensitive point visual impact assessment this alternative has the highest impact in the Immediate Foreground, Foreground, and Middle Ground. Through comparison of all three alternatives, Alternative 3A is considered as having the highest impact on cultural resources.

Alternative 3B is tied for the highest number of recorded sites and is the second longest of the alternatives (Table 3.4-5). It impacts the most eligible and unresolved sites. It impacts the least number of unknown sites and does not impact any listed sites. This alternative has the highest percentage of high density site area, the second highest medium density area, and the smallest low density area. The project component visual assessment has no impacts in the Immediate Foreground or the Foreground. The Middle Ground visual impacts are the lowest of the alternatives. The sensitive point visual impact assessment shows no impact in the Immediate Foreground or the Foreground. The Middle Ground visual impact is the lowest of any model. Through comparison of the three alternatives, Alternative 3B has the lowest impact on cultural resources.

Alternative 3C is tied for the highest number of previously identified sites and is the shortest of the alternatives (Table 3.4-5). This alternative impacts the second highest number of eligible sites, the second highest number of unresolved sites, the second highest number of sites with unknown eligibility, and no listed sites or landmarks. It has eight prehistoric sites with complex features. This alternative has the

lowest percentage of predicted high site density areas, the highest percentage of medium site density areas, and the second highest percentage of low site density areas. In the project component visual impact analysis, the Immediate Foreground and Foreground are the second highest and the Middle Ground is tied for highest of the alternatives. In the viewshed analysis there is no Immediate Foreground or Foreground impact and the Middle Ground impact is the second highest. Through comparison of the three alternatives, Alternative 3B has the second highest impact on cultural resources.

All of the Alternatives in Zone 3 would cross the Lewis and Clark NHT in the vicinity of Clark Canyon Reservoir.

In summary of the three alternatives within Zone 3: Alternative 3A will likely have the highest impact on cultural resources because it is the longest (Table 3.4-5). It has a high number of previously identified sites, medium to high predicted site densities, and the highest visual impacts identified by both the project component and sensitive point visual impact models. Alternative 3C will likely have the second highest impact on cultural resources. This is due to its high number of previously identified sites, medium predicted site densities, and second highest visual impacts identified by both the project component and the sensitive point visual impact models. Alternative 3B will likely have the lowest impact on cultural resources because its number of previously identified sites and predicted site densities are comparable to the two other alternatives, but it has the lowest visual impacts identified by both the project component and the sensitive point visual impact models.

Table 3.4-5. Comparison of Alternatives in Zone 3

Zone 3				
Alternative Miles in Length		**3A 72 miles**	**3B 67 miles**	**3C 72**
Previously Identified Sites NRHP Evaluations	Total	42	45	45
	Listed	0	0	0
	Eligible	1	4	3
	Unresolved	0	4	3
	Unknown	41	37	38
	Not Eligible	0	0	1
Site Density Model	High	22%	24%	17%
	Med	71%	72%	77%
	Low	7%	4%	6%
Visual Impact Miles – Project Component	IFG	2.25	0	0.91
	FG	4.05	0	2.66
	MG	21.28	5.07	21.28
Visual Impact Miles – Sensitive Point	IFG	0	0	0
	FG	0.79	0	0
	MG	3.59	2.83	3.01
Sensitive Point Talley		6	5	3
Impact on Cultural Resources		Highest	Lowest	Second Highest

3.4.10.5 Impacts to Cultural Resources Within and Around Zone 4

Alternative 4A

Previously Identified Sites (not consistent)

There are 25 previously identified sites within Alternative 4A. Eighteen of these are prehistoric, five are historic, and two are multicomponent sites (Figure 3.4-50). All of these sites have unknown NRHP eligibilities. This alternative has one previously recorded site per 513 acres.

The 18 prehistoric sites consist of one stone circle site and 17 lithic scatter sites (Figure 3.4-50Figure 3.4-). All of the prehistoric sites have unknown NRHP eligibilities. Size data was available for one of these lithic scatters. At less than one acre, it is below the average size of the analyzed lithic scatters. The stone circle site is a complex feature site.

The five historic sites consist of two historic trash dumps, the town of Beaver, Idaho, one building, and one road (Figure 3.4-50 Figure 3.4-). All the historic sites have unknown NRHP eligibilities and the town of Beaver is the only complex feature site.

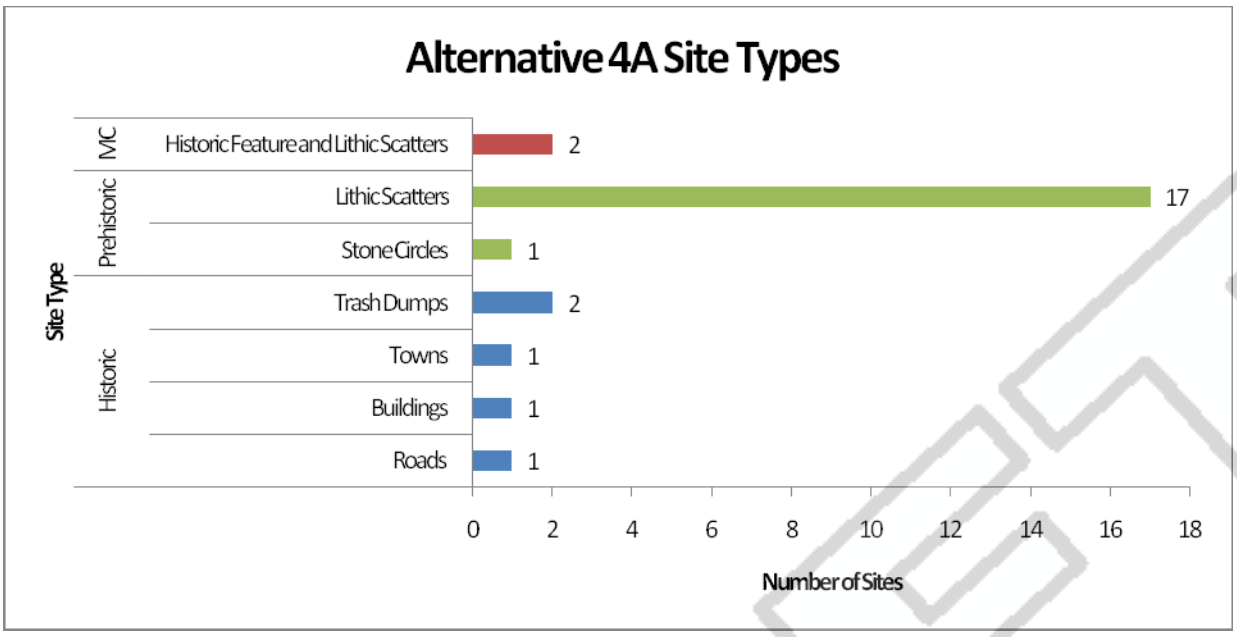

Figure 3.4-50. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 4A

Site Density Model

Nineteen percent of the alternative is in high site density areas, 75 percent is in medium site density areas, and six percent is in low site density areas (Figure 3.4-51). The alternative is dominated by medium site density area. Only 25 percent of the area is split between the low and high density areas. This shows that most of the alternative will likely encounter a moderate number of undiscovered cultural resources.

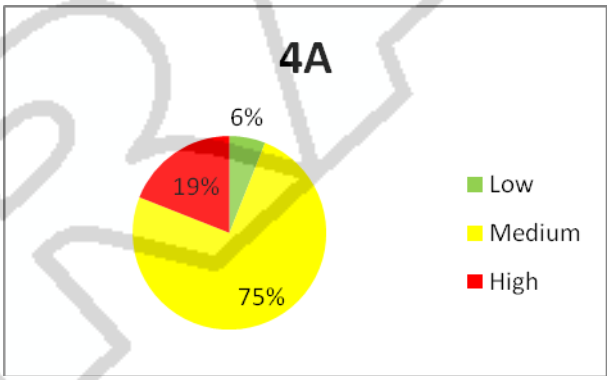

Figure 3.4-51. Alternative 4A Site Densities

***Project* Visual Impact Analysis Results**

Component Visual Impact Analysis

Alternative 4A will not visually impact any agency identified cultural resources.

Sensitive Point Visual Impact Analysis

Only two agency identified sensitive point cultural resources are located within Alternative 4A. One of these, Monida Pass, had no visual impacts. The other is the Spencer Rock house. The Spencer Rock House's viewshed will have 2.74 miles of this alternative visible in the Middle Ground (Figure 3.4-52). The length of Alternative 4A that may impact each cultural resource is detailed below.

- Spencer Rock House – 2.74 miles Middle Ground.
- Monida Pass – 0.0 mile. What about the Nez Perce NHT?

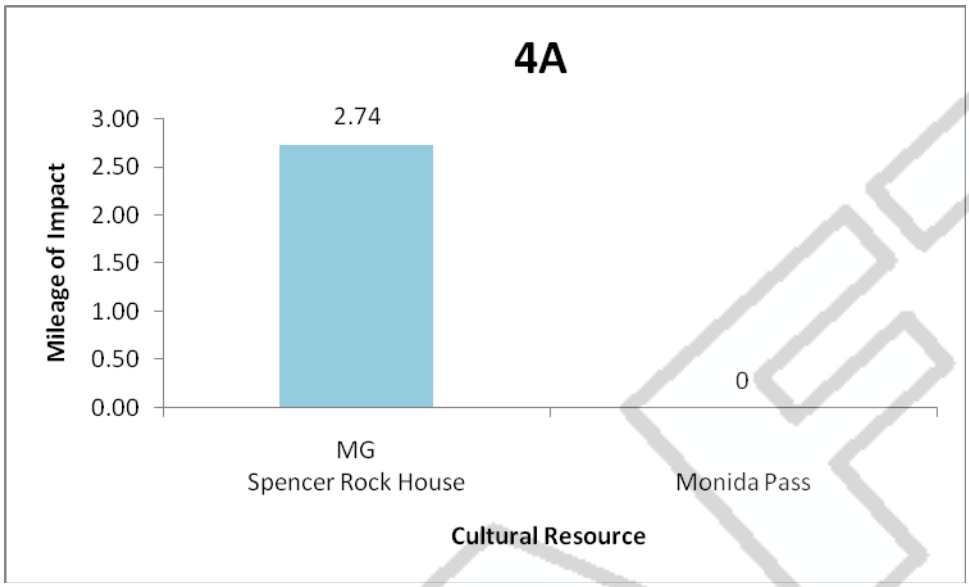

Figure 3.4-52. Sensitive Point Visual Impact Analysis for Alternative 4A Showing Middle Ground (MG) Impacts

Sensitive Point Tally
Of the 84 sensitive visual points that were included in the qualitative proximity analysis, seven would be within the visual study corridor of Alternative 4A.

Zone 4 Summary

Alternative 4A is the only alternative in the zone and therefore has no comparable data (Table 3.4-6). There are 25 previously identified sites in this zone and they all have unknown NRHP eligibilities. Two of them are complex feature sites. The site density model shows that most of the alternative will likely encounter a moderate number of undiscovered cultural resources. The sensitive point model indicates the alternative will visually impact the Spencer Rock House. Alternative 4A crosses the Nez Perce National Historic Trail at a location approximately 10 miles north of Dubois, Idaho. The alternative in this location is in the vicinity of Interstate 15 and is therefore will not be intruding on the integrity of the trail in a remote location. It will, however, be visible to visitors along the trail some distance from the actual site of the crossing and therefore will have some substantial impact on the visual integrity of the site. Alternative 4A is the only alternative in Zone 4 and therefore will have the highest impact on cultural resources.

Table 3.4-6. Alternative 4A Summary

Zone 4			
Alternative Miles in Length		**4A 20.02 miles**	
Previously Identified Sites NRHP Evaluations		Total	25
		Listed	0
		Eligible	0
		Unresolved	0
		Unknown	25
		Not Eligible	0
Site Density Model		High	19%
		Med	75%
		Low	6%
Visual Impact Miles	Project Component	IFG	0
		FG	0
		MG	0
	Sensitive Point	IFG	0
		FG	0
		MG	2.74
Sensitive Point Talley			5
Impact on Cultural Resources			Highest

3.4.10.6 Impacts to Cultural Resources Within and Around Zone 5

Alternative 5A

Previously Identified Sites (In consistent term)

There are 136 previously identified sites within Alternative 5A. One hundred six of these are prehistoric, 10 are historic, and 20 are multicomponent (Figure 3.4-53). One site is listed in the NRHP and the rest have unknown NRHP eligibilities. This alternative has one previously recorded site for every 509 acres.

The prehistoric sites consist of 104 lithic scatters and two caves (Figure 3.4-53Figure 3.4-). Site size data is available for five lithic scatters. Four of the five are larger than the average analyzed lithic scatter. One of these lithic scatters encompasses 261 acres and is the largest of the analyzed lithic scatters. One cave is identified as Powerline Cave and the other is unnamed. Powerline Cave is a collapsed lava tube. All the prehistoric sites have unknown NRHP eligibilities. The two caves are complex feature sites.

The 10 previously recorded historic sites consist of three buildings, one railroad, one canal, one road, Goodale's Cutoff, a dosimetry calibration laboratory, and two unclassified historic sites (Figure 3.4-53) Goodale's Cutoff is listed in the NRHP and the remaining nine sites have unknown NRHP eligibilities. Goodale's Cutoff is a complex feature site.

There are 20 multicomponent sites including 11 historic trash dumps with associated lithic scatter, and nine historic features with an associated prehistoric lithic scatter (Figure 3.4-53). All of multicomponent sites have unknown NRHP eligibilities and none are complex feature sites.

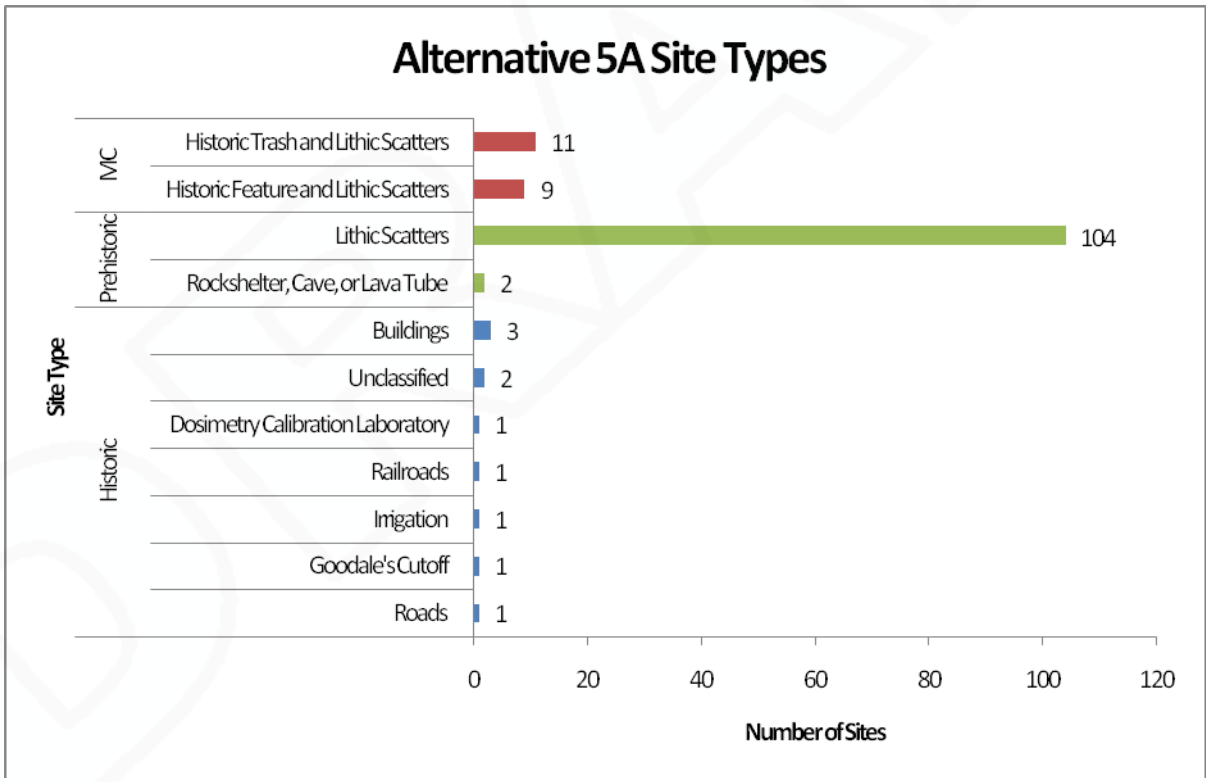

Figure 3.4-53. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 5A

Site Density Model

The site density model indicates that this alternative consists of 42 percent high site density areas and 58 percent medium site density areas. There are no low density areas within Alternative 5A. (Figure 3.4-54). This indicates that there is moderate to high probability of encountering undiscovered cultural resources along the alternative.

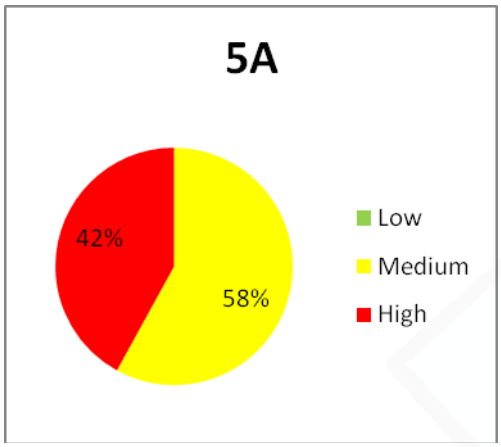

Figure 3.4-54. Alternative 5A Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Two agency identified cultural resources will be visible from Alternative 5A: the confidential TCP and Goodale's Cutoff (Figure 3.4- 3.4-55). The length of Alternative 5A that may impact each cultural resource is detailed below.

- Confidential TCP – 6.70 miles Middle Ground.
- Goodale's Cutoff – 0.12 mile Immediate Foreground, 1.02 miles Foreground, and 7.89 miles Middle Ground.

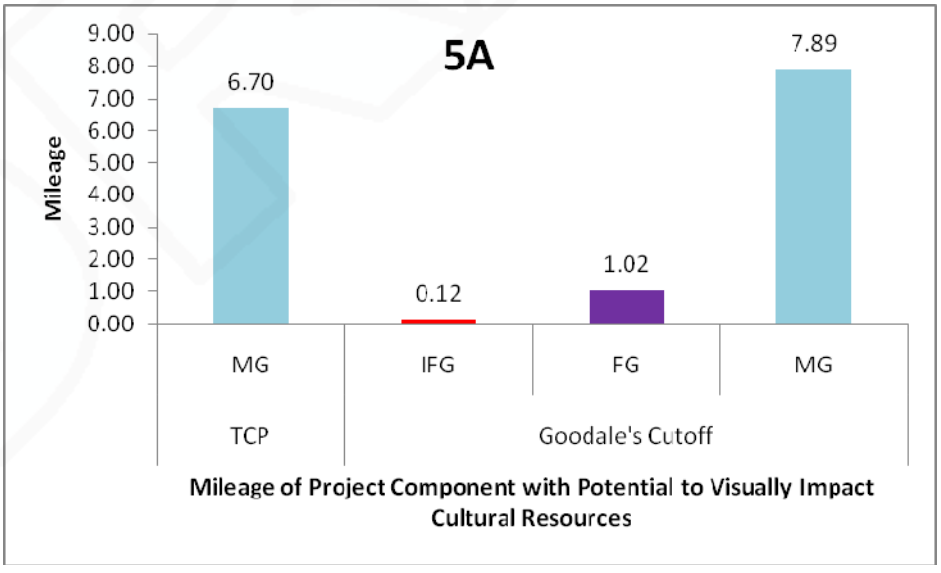

Figure 3.4-55. Project Component Visual Impact Analysis for Alternative 5A Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis
Two agency identified sensitive point cultural resources will be impacted by Alternative 5A. These are Goodale's Cutoff and Powerline Cave (Figure 3.4-56). The length of Alternative 5A that will be visible from each site is detailed below.

- Goodale's Cutoff – 1.30 miles Middle Ground.
- Powerline Cave – 0.98 mile Foreground and 5.86 miles Middle Ground.

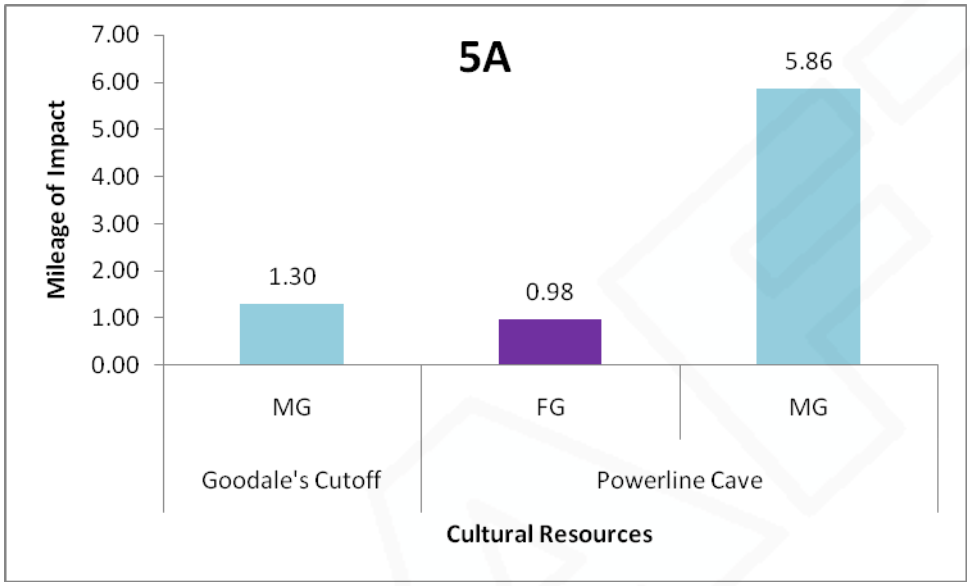

Figure 3.4-56. Sensitive Point Visual Impact Analysis for Alternative 5A Showing Foreground (FG) and Middle Ground (MG) Impacts

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, 11 would be within the visual study corridor of Alternative 5A.

Alternative 5B

Previously Identified Sites (inconsistent)

There are 52 previously recorded sites within Alternative 5B (Figure 3.4-57). These include 33 prehistoric sites, eight historic sites, and 11 multicomponent sites. One historic site is listed in the NRHP and the remaining sites have unknown NRHP eligibilities. This alternative has one recorded site per 1,403 acres.

The 33 prehistoric sites consist of 28 lithic scatters, one cave, three individual artifacts and one unclassified prehistoric site (Figure 3.4-57). All the prehistoric sites have unknown NRHP eligibilities. Two of the 28 lithic scatters have available size data. One of these is smaller and the other is larger than the average size of the analyzed lithic scatters. The large site is a dispersed scatter consisting primarily of lithic material The cave is a complex feature site.

The eight historic sites consist of three historic transportation routes a historic trash dump, a cairn, a hunting blind, and two unclassified historic sites (Figure 3.4-57). The transportation sites consist of Goodale's Cutoff, part of the Union Pacific Railroad, and the A-2 Clark County Road. Goodale's Cutoff is listed in the NRHP and the remaining seven historic sites have unknown eligibilities. Goodale's Cutoff is a complex feature site.

The 11 multicomponent sites consist of 10 historic trash dumps with associated lithic scatter, and one historic feature with an associated lithic scatter (Figure 3.4-57). All these sites have unknown NRHP eligibilities and none are complex feature sites.

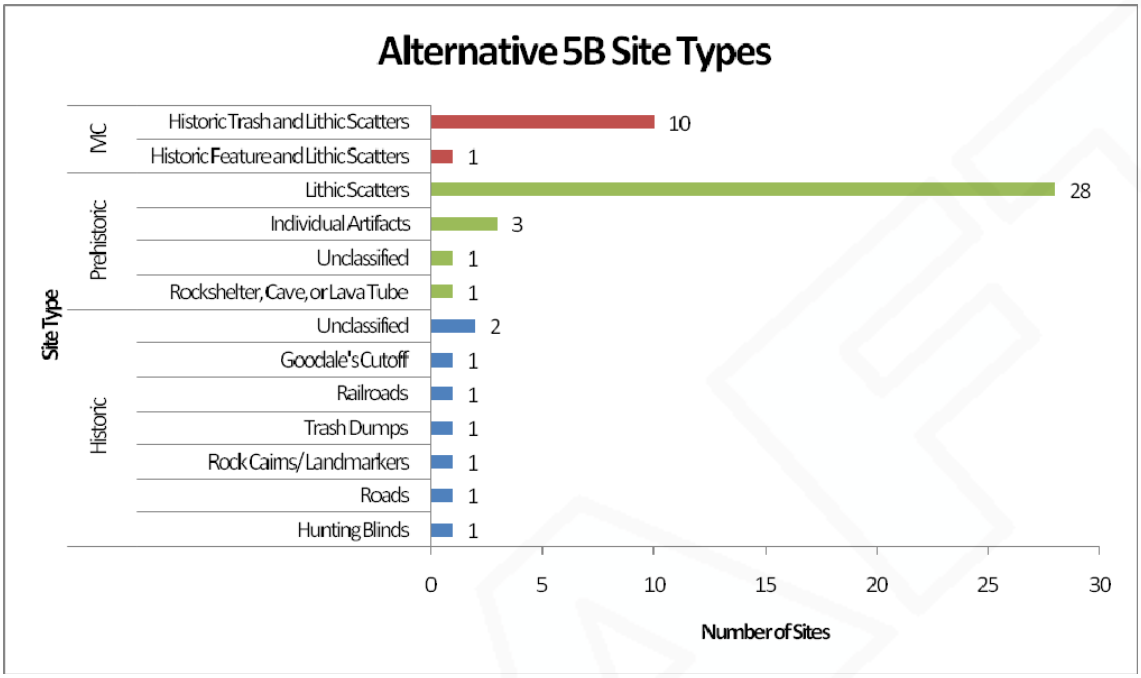

Figure 3.4-57. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 5B

Site Density Model

The site density model indicates that this alternative consists of 40 percent high site density areas and 60 percent medium site density areas. There are no low site density areas within Alternative 5B (Figure 3.4-58). This indicates that there is moderate to high probability of encountering undiscovered cultural resources along the alternative.

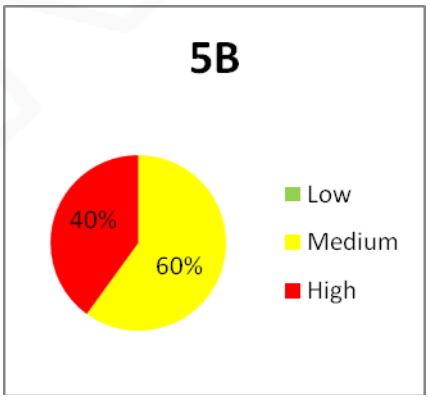

Figure 3.4-58. Alternative 5B Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Three agency identified cultural resources will be visible from Alternative 5B: the confidential TCP, Goodale's Cutoff, and the Wasden Site (Figure 3.4-59). The length of Alternative 5B that may impact each cultural resource is detailed below.

- Confidential TCP – 4.97 miles Middle Ground.
- Goodale's Cutoff – 0.37 mile Immediate Foreground, 2.03 miles Foreground, and 15.12 miles Middle Ground.
- Wasden Site – 6.53 miles Middle Ground.

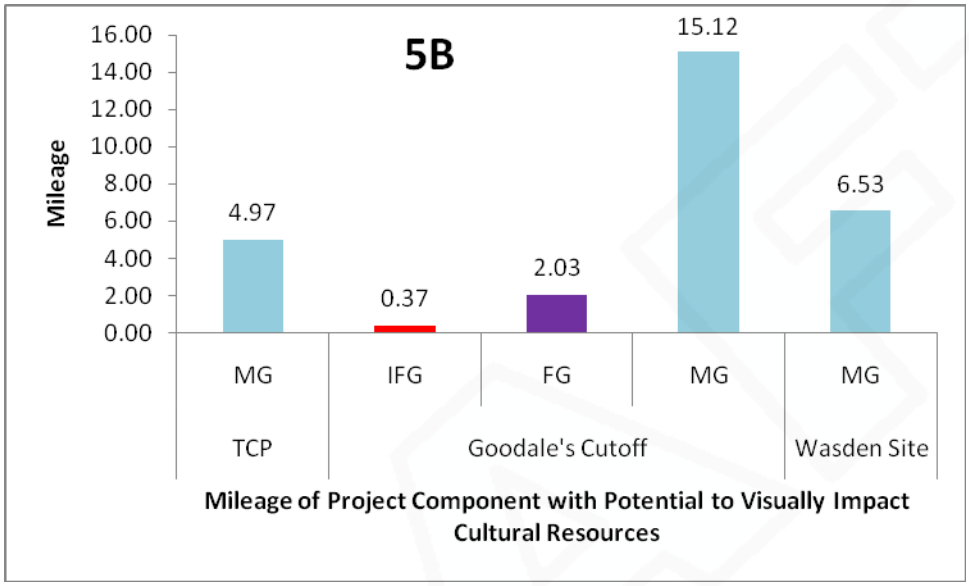

Figure 3.4-59. Project Component Visual Impact Analysis for Alternative 5B Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts.

Viewshed Analysis(inconsistent- sensitive visual impact analysis- sequential order)
Five agency identified sensitive point cultural resources will be impacted by Alternative 5B. These are Powerline Cave, Goodale's Cutoff, Twin Buttes Cave, St. James Episcopal Mission, and the Wasden Site (Figure 3.4-60). The length of Alternative 5B that will be visible from each site is detailed below.

- Powerline Cave – 0.98 mile Foreground and 5.86 miles Middle Ground.
- Goodale's Cutoff – 0.11 mile Immediate Foreground, 0.89 mile Foreground, and 7.12 miles Middle Ground.
- Twin Buttes Cave – 3.61 miles Middle Ground.
- St. James Episcopal Mission – 5.83 miles Middle Ground.
- Wasden Site – 6.53 miles Middle Ground.

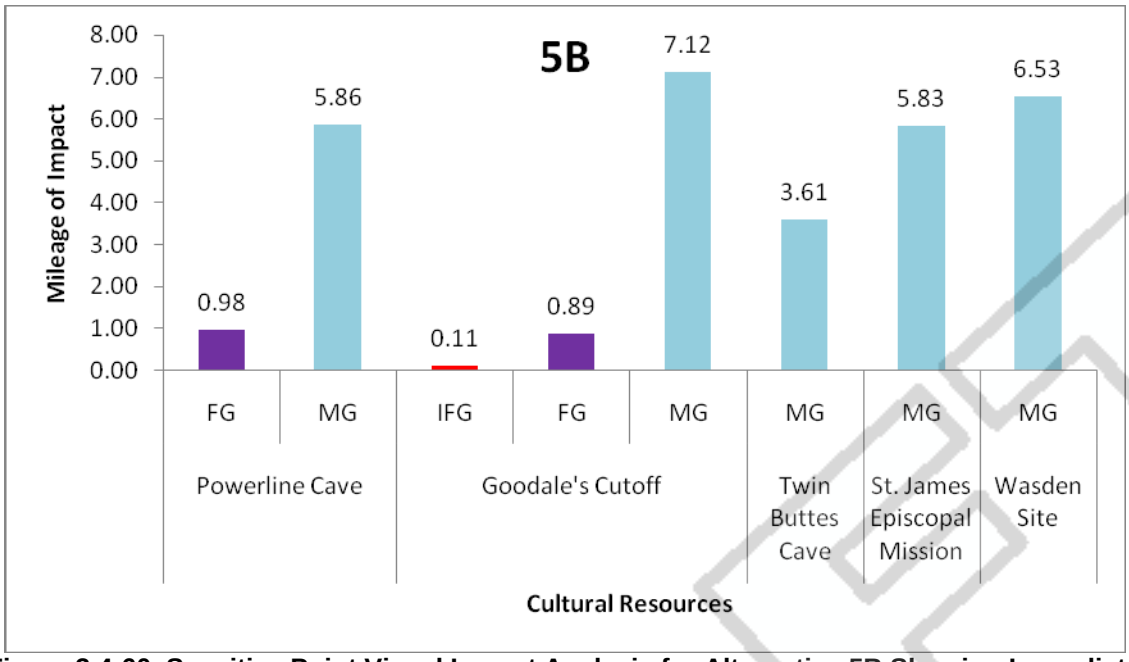

Figure 3.4-60. Sensitive Point Visual Impact Analysis for Alternative 5B Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts.

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, 16 would be within the visual study corridor of Alternative 5B.

Alternative 5C

Previously Identified Sites (inconsistent)

There are 40 previously recorded sites within Alternative 5C. Of these, 19 are prehistoric, 12 are historic, and nine are multicomponent (Figure 3.4-61). One historic site is listed in the NRHP and the remaining sites have unknown eligibilities. This alternative has one previously recorded site per 1,879 acres.

The 19 prehistoric sites consist of 15 lithic scatters, three individual artifacts, and a cave (Figure 3.4-61). All of these sites have unknown NRHP eligibilities. Two of the lithic scatters have known sizes. One of these is larger than the average lithic scatter size and the other is smaller. There are no prehistoric complex feature sites.

There are 12 historic sites including four historic transportation routes, one irrigation site, three buildings, one historic trash dump, and three unclassified historic sites (Figure 3.4-61). Goodale's Cutoff is listed in the NRHP and the remaining sites have unknown NRHP eligibilities. Goodale's Cutoff is a complex feature site.

The nine multicomponent sites consist of six historic trash dumps with associated lithic scatters and three historic features with associated lithic scatters (Figure 3.4-61). All nine have unknown NRHP eligibilities and none are complex feature sites.

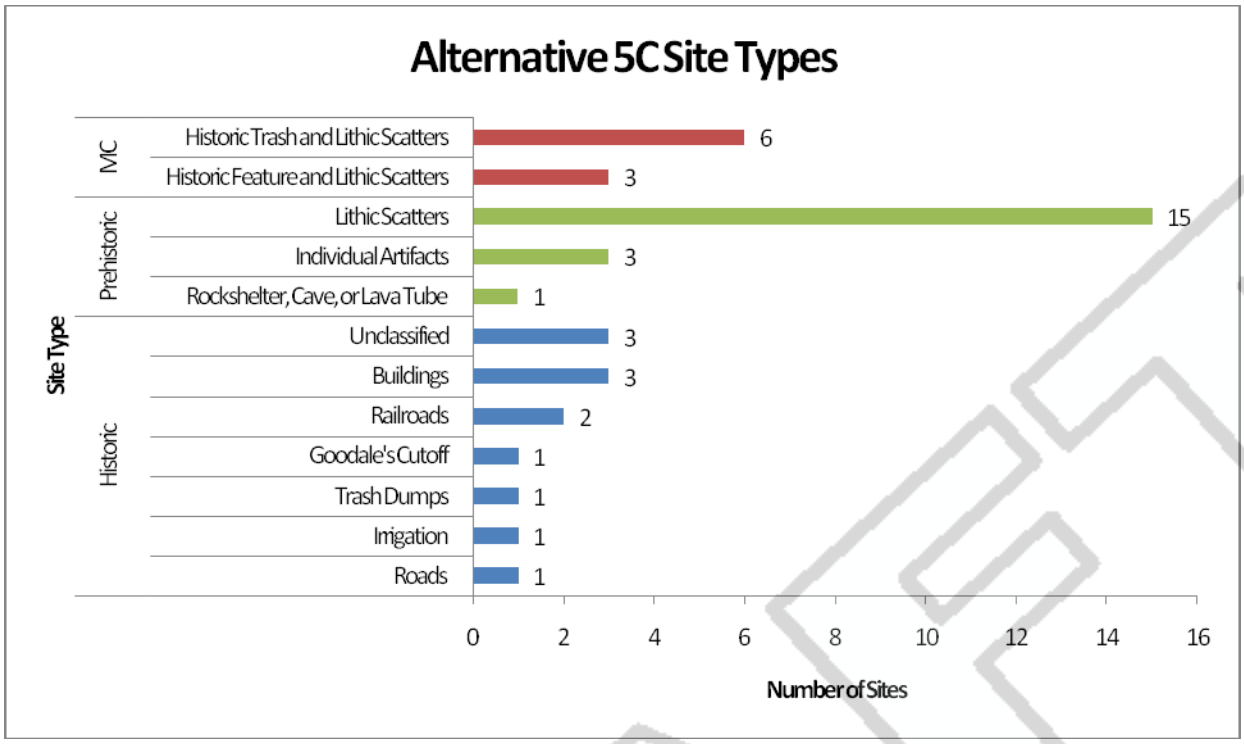

Figure 3.4-61. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 5C

Site Density Model

The site density model indicates that this alternative consists of 32 percent high site density areas and 68 percent medium site density areas, and there are no low site density areas (Figure 3.4-62). This indicates that there is moderate to high probability of encountering undiscovered cultural resources along the alternative.

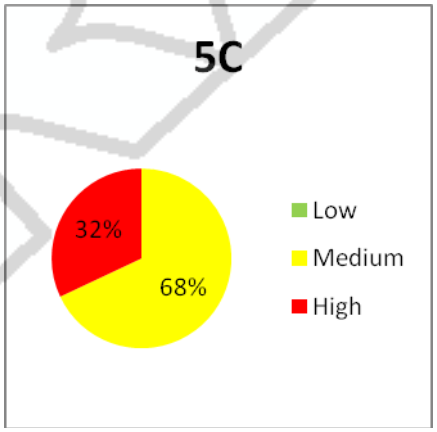

Figure 3.4-62. Alternative 5C Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

One agency identified cultural resource will be visible from Alternative 5C, Goodale's Cutoff (Figure 3.4-63). The length of Alternative 5C that may impact this cultural resource is detailed below.

- Goodale's Cutoff – 0.17 mile Immediate Foreground, 1.61 miles Foreground, and 9.21 miles Middle Ground.

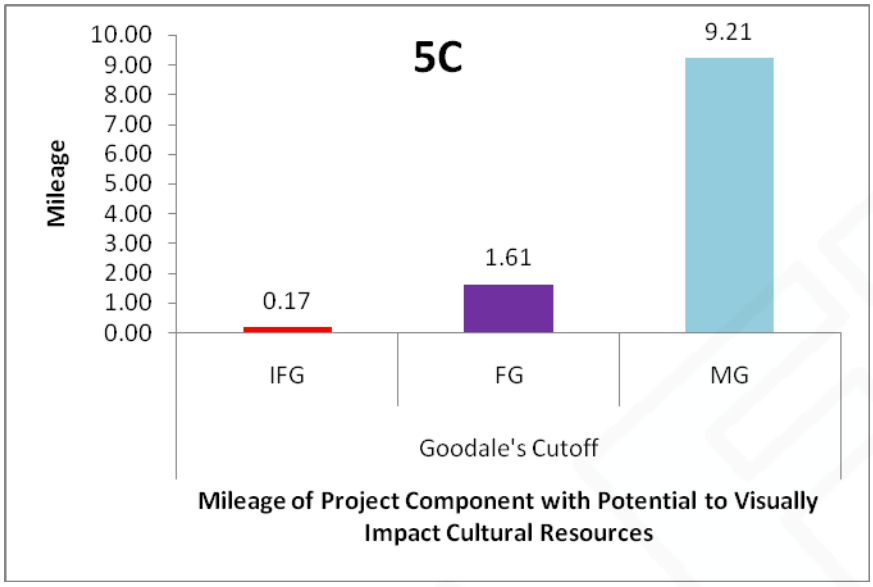

Figure 3.4-63. Project Component Visual Impact Analysis for Alternative 5C Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis
One agency identified sensitive point cultural resource will be impacted by Alternative 5C, the St. James Episcopal Mission (Figure 3.4-64). The length of Alternative 5C that will be visible from this site is detailed below.

- St. James Episcopal Mission – 5.83 miles Middle Ground.

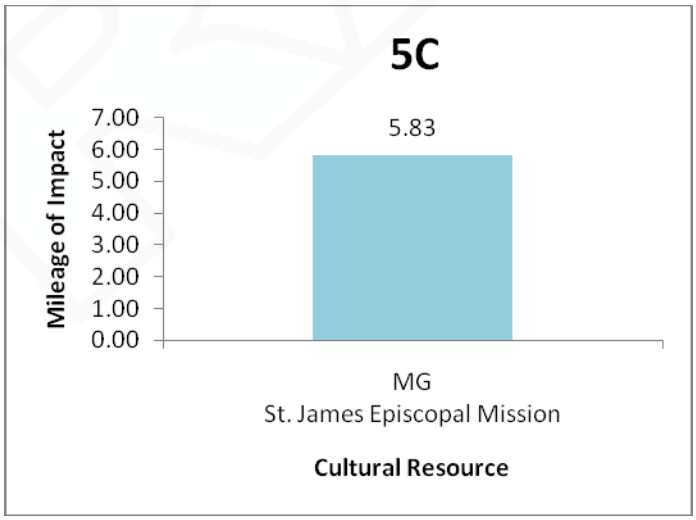

Figure 3.4-64. Sensitive Point Visual Impact Analysis for Alternative 5C Showing Middle Ground (MG) Impacts

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, seven would be within the visual study corridor of Alternative 5C.

Alternative 5D

Previously Identified Sites(inconsistent)

There are 42 sites associated with this alternative. They consist of 30 prehistoric sites, eight historic sites, and four multicomponent sites (Figure 3.4-65). One historic site is listed in the NRHP and one prehistoric site is recommended as eligible for inclusion in the NRHP. The remaining 40 sites have unknown NRHP eligibilities. In Alternative 5D there is one previously recorded site per 1,696 acres.

The 30 prehistoric sites consist of 24 lithic scatter sites, one cave site, four individual artifacts, and one unclassified prehistoric site (Figure 3.4-65). The Twin Buttes Cave has been recommended as eligible for inclusion in the NRHP. The remaining 29 sites have unknown NRHP eligibilities. Two of the lithic scatters have associated size information. One of these is larger than the average lithic scatter size and the other is smaller. The Twin Buttes Cave is a complex feature site.

The eight historic sites consist of Goodale's Cutoff, the A-2 Clark County Road, two buildings, a historic trash dump, a hunting blind, and two unclassified historic sites (Figure 3.4-65). Goodale's Cutoff is listed in the NRHP and the remaining seven sites have unknown NRHP eligibilities. Goodale's Cutoff is a complex feature site.

The four multicomponent sites consist of two historic trash dumps with associated lithic scatters and two historic features with associated lithic scatters (Figure 3.4-65). All four sites have unknown NRHP eligibilities and none are complex feature sites.

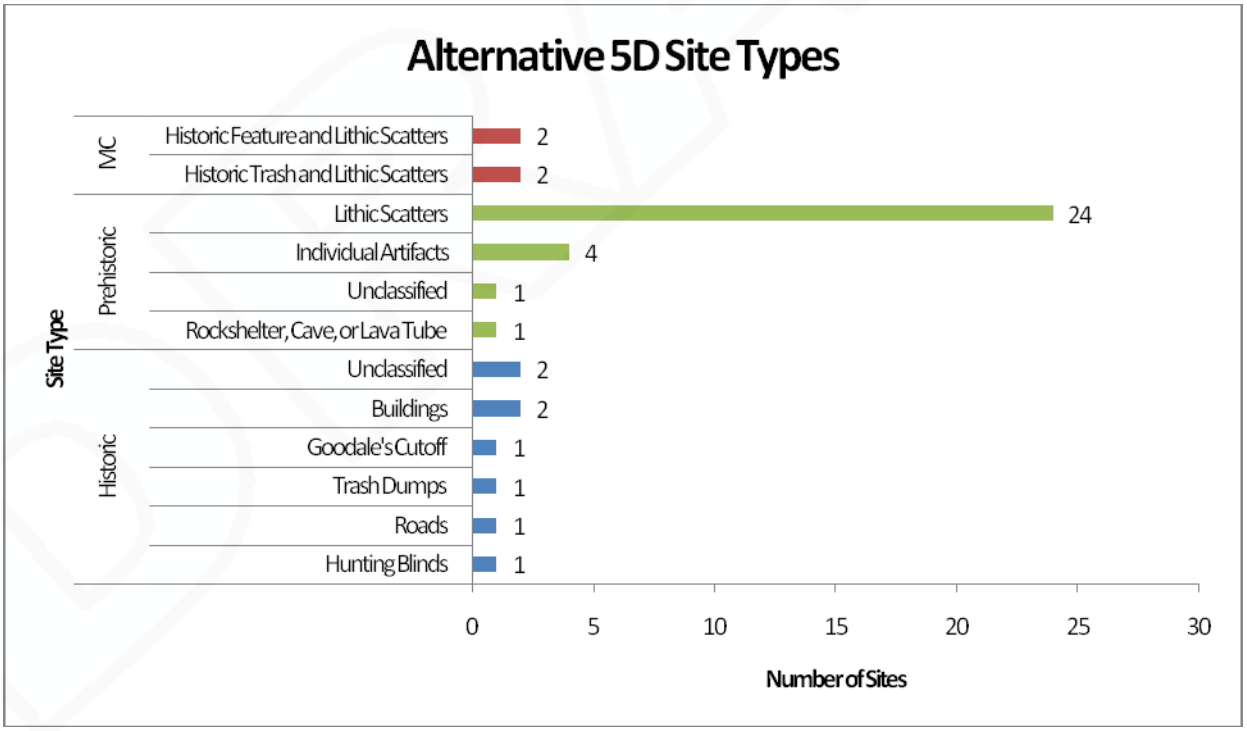

Figure 3.4-65. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 5D

Site Density Model

The site density model indicates that this alternative consists of 35 percent high site density areas and 65 percent medium site density areas. There are no low density areas within Alternative 5D (Figure 3.4-66). This indicates that there is a moderate probability of encountering undiscovered cultural resources along the alternative with interspersed high probability areas.

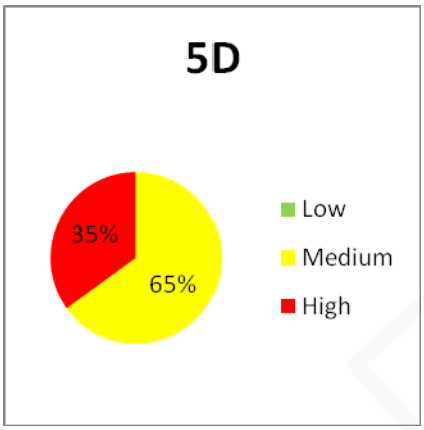

Figure 3.4-66. Alternative 5D Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Two agency identified cultural resources will be visible from Alternative 5D: Goodale's Cutoff and the Wasden Site (Figure 3.4-67Figure 3.4-). The length of Alternative 5D that may impact each cultural resource is detailed below.

- Goodale's Cutoff – 0.17 mile Immediate Foreground, 1.61 miles Foreground, and 12.98 miles Middle Ground.
- Wasden Site – 9.13 miles Middle Ground.

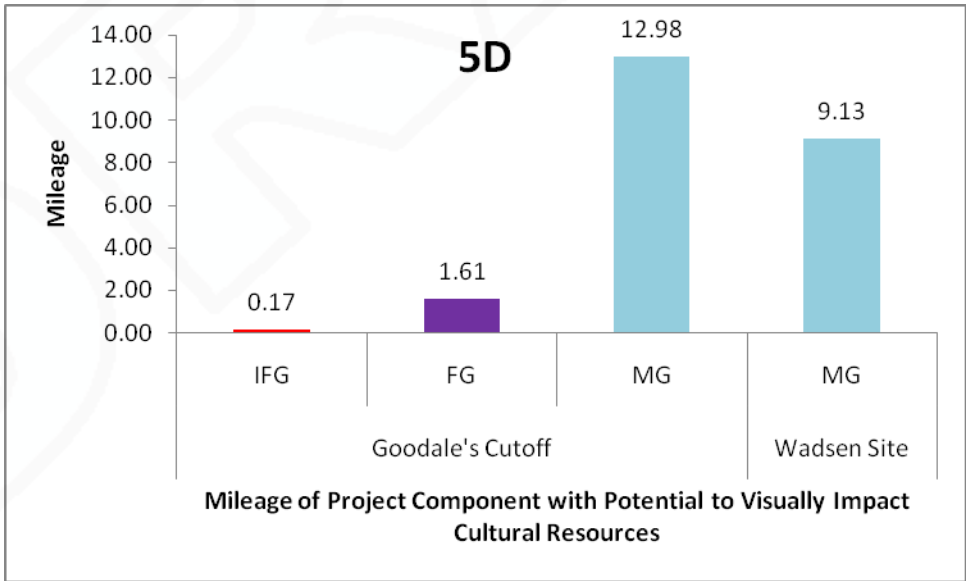

Figure 3.4-67. Project Component Visual Impact Analysis for Alternative 5D Showing Immediate Foreground (IFG), Foreground (FG), and Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis
Three agency identified sensitive point sites will be impacted by Alternative 5D. These are Twin Buttes Cave, St. James Episcopal Mission, and the Wasden Site (Figure 3.4-68). The length of Alternative 5D that will be visible from each site is detailed below.

- St. James Episcopal Mission – 5.83 miles Middle Ground.
- Wasden Site – 6.53 miles Middle Ground.
- Twin Buttes Cave – 0.83 mile Foreground and 5.33 miles Middle Ground.

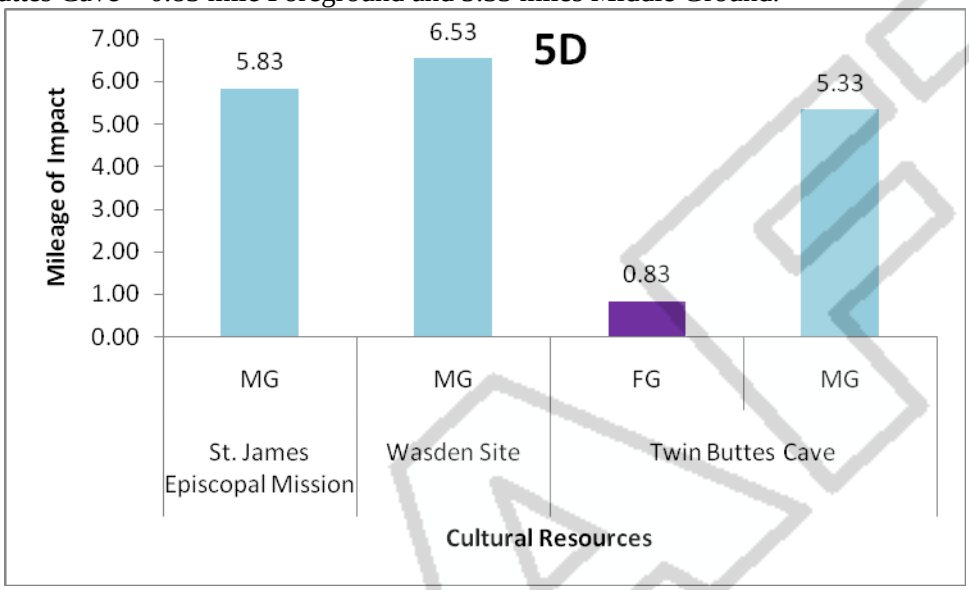

Figure 3.4-68. Sensitive Point Visual Impact Analysis for Alternative 5D Showing Foreground (FG) and Middle Ground (MG) Impacts

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, nine would be within the visual study corridor of Alternative 5D.

Zone 5 Summary

Alternative 5A has the most previously identified cultural resources and is the shortest alternative. It will impact one NRHP listed site and has the highest number of sites with unknown eligibility. The listed site, Goodale's Cutoffis the only historic complex feature site on the alternative. There are two prehistoric complex feature sites. Alternative 5A has the highest percentage of high site density areas, the lowest percentage of medium site density areas, and no low site density areas. The project component visual impact analysis shows the lowest potential impact of any alternative in the Immediate Foreground and Foreground, and the second lowest in the Middle Ground. This alternative will visually impact the confidential TCP. The sensitive point visual impact analysis shows no Immediate Foreground impact, the second highest Foreground impact and the third highest Middle Ground impact (Table 3.4-7). When compared to the other three alternatives, Alternative 5A has the highest impact on cultural resources.

Alternative 5B has the second highest number of previously recorded sites and is the second longest alternative. It impacts one NRHP listed site and has the second highest number of sites with unknown eligibility. It has one historic complex feature site, Goodale's Cutoff, the NRHP listed site. Alternative 5B has one prehistoric complex feature site. This alternative has the second highest percentage of high site

density areas, the third highest percentage of medium site density areas, and no low site density areas. The project component visual impact is the highest of all alternatives in all three categories. The sensitive point visual impact analysis shows the most impact of any alternative in all three categories (Table 3.4-7). Alternative 5B has the second highest impact on cultural resources.

Alternative 5C has the lowest number of previously recorded sites and is the longest of the alternatives. It impacts one NRHP listed site and has the lowest number of sites with unknown eligibility. It has one listed historic site with complex features, Goodale's Cutoff, and one complex prehistoric site. It has the lowest percentage of low site density areas, the highest percentage of medium site density areas, and has no low site density areas. The project component visual impact analysis for this alternative in the Immediate Foreground and Foreground is tied for second highest and the Middle Ground impact is the lowest of any alternative. The sensitive point visual impact analysis of this alternative has the lowest levels of potential visual impact in all categories (Table 3.4-7). Alternative 5C has the lowest impact on cultural resources.

Alternative 5D has a low number of previously recorded sites and is the third longest alternative. It impacts one listed site, one eligible site and has the third highest number of sites with unknown eligibility. It has one listed historic site with complex features, Goodale's cutoff, and one prehistoric site with complex features. This alternative has the third highest percentage of high site density areas and the second highest percentage of low site density areas. The project component visual impact analysis is tied for second highest impacts to the Immediate Foreground and Foreground and has the second highest impact in the Middle Ground. The sensitive point visual impact analysis shows no potential Immediate Foreground impact, the third highest Foreground impact and the second highest Middle Ground impact (Table 3.4-7). Alternative 5D has the Third highest impact on cultural resources.

All of the proposed Alternatives in Zone 5 would pass near the Nez Perce National Historic Trail near the Zone 4/5 border. The alternatives in this location are in the vicinity of Interstate 15 and therefore will not be intruding on the integrity of the trail in a remote location. However, the alternatives would be visible to visitors along the trail and therefore would have some substantial impact on the visual integrity of the site.

In summary of the four alternatives within Zone 5: Alternative 5A will likely have the highest impact on cultural resources (Table 3.4-7). This is due to its very high number of previously identified sites, medium to high predicted site densities, and overall high visual impacts identified by both the project component and sensitive point visual impact models. Alternative 5B will likely have the second highest impact on cultural resource due its length (third longest). A relatively high number of previously identified sites, medium to high predicted site densities, and high visual impacts identified by both the project component and sensitive point visual impact models. Alternative 5D will likely have the third highest impact on cultural resources. This is because of its length (second longest), medium to high predicted site densities, and high visual impacts identified by both the project component and sensitive point visual impact models. Although Alternative 5C is the longest, it will likely have the lowest impact on cultural resources, because of it has the lowest number of previously identified sites, the lowest predicted site densities, and the lowest visual impacts identified by both the project component and sensitive point visual impact models.

Table 3.4-7. Comparison of Alternatives in Zone 5

Zone 5					
Alternative Miles in Length		**5A 107 miles**	**5B 114 miles**	**5C 118 miles**	**5D 111 miles**
Previously Identified Sites NRHP Evaluations	Total	136	52	40	42
	Listed	1	1	1	1
	Eligible	0	0	0	0
	Unresolved	0	0	0	0
	Unknown	135	51	39	41
	Not Eligible	0	0	0	0
Site Density Model	High	42%	40%	32%	35%
	Med	58%	60%	68%	65%
	Low	0%	0%	0%	0%
Visual Impact Miles – Project Component	IFG	0.12	0.37	0.17	0.17
	FG	1.02	2.03	1.61	1.61
	MG	14.59	26.62	9.21	22.11
Visual Impact Miles – Sensitive Point	IFG	0	0.11	0	0
	FG	0.98	1.87	0	0.83
	MG	7.16	28.95	5.83	17.69
Sensitive Point Talley		11	16	7	9
Impact on Cultural Resources		Highest	Second Highest	Lowest	Third Highest

3.4.10.7 Impacts to Cultural Resources Within and Around Zone 6

Alternative 6A

Previously Identified Sites(inconsistent)

There are 96 previously recorded sites within Alternative 6A. Of these, 56 are prehistoric, 20 are historic, and 20 are multicomponent (Figure 3.4-69). All the sites have unknown NRHP eligibilities. This alternative has one site per 712 acres.

The 56 prehistoric sites consist of 43 lithic scatters, 11 individual artifacts, one rockshelter, and one rock alignment (Figure 3.4-69). All the prehistoric sites have unknown eligibilities. One of the 43 lithic scatters has size data and is almost double the average size of the lithic scatters analyzed. Both the rockshelter and rock alignment are complex feature sites.

The historic sites consist of one railroad, the Milner Gooding Canal, six cairns, three buildings, five historic trash dumps, and four unclassified historic sites (Figure 3.4-69). All the historic sites have unknown NRHP eligibilities and none are complex feature sites.

The 20 multicomponent sites consist of 18 historic trash dumps with associated lithic scatters, and two historic features with associated lithic scatters (Figure 3.4-69). All the multicomponent sites have unknown NRHP eligibilities and none are complex feature sites.

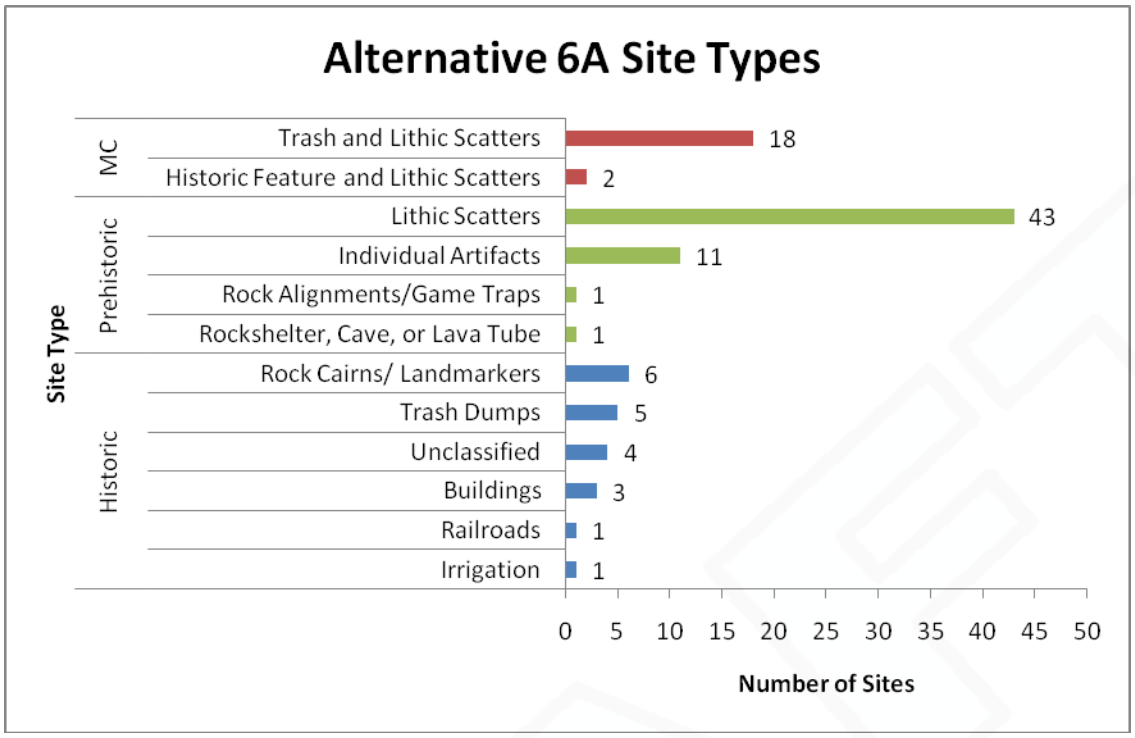

Figure 3.4-69. Previously Recorded Prehistoric, Historic, and Multicomponent (MC) Sites within Alternative 6A

Site Density Model

The site density model indicates that this alternative consists of 22 percent high site density areas and 78 percent medium site density areas. There are no low density areas within Alternative 6A (Figure 3.4-70). The preponderance of medium probability areas indicates that most of the study area will have a moderate probability of encountering undiscovered resources with smaller high probability areas interspersed.

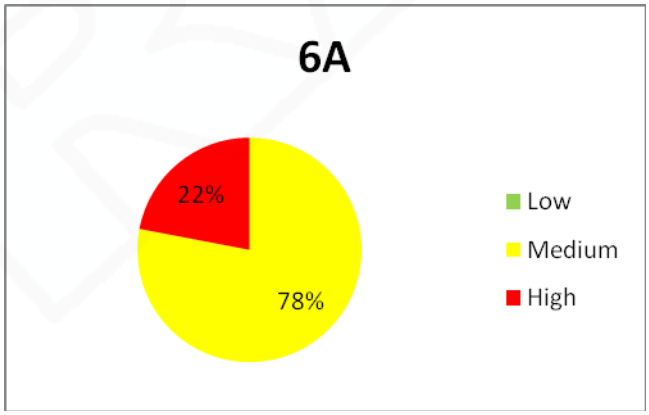

Figure 3.4-70. Alternative 6A Site Densities

Visual Impact Analysis Results

Project Component Visual Impact Analysis

Two agency identified cultural resources will be visible from Alternative 6A: Baker Cave III and Wilson Butte Cave (Figure 3.4-71Figure 3.4-). The length of Alternative 6A that may impact each cultural resource is detailed below.

- Baker Cave III – 9.09 miles Middle Ground.
- Wilson Butte Cave – 6.50 miles Middle Ground.

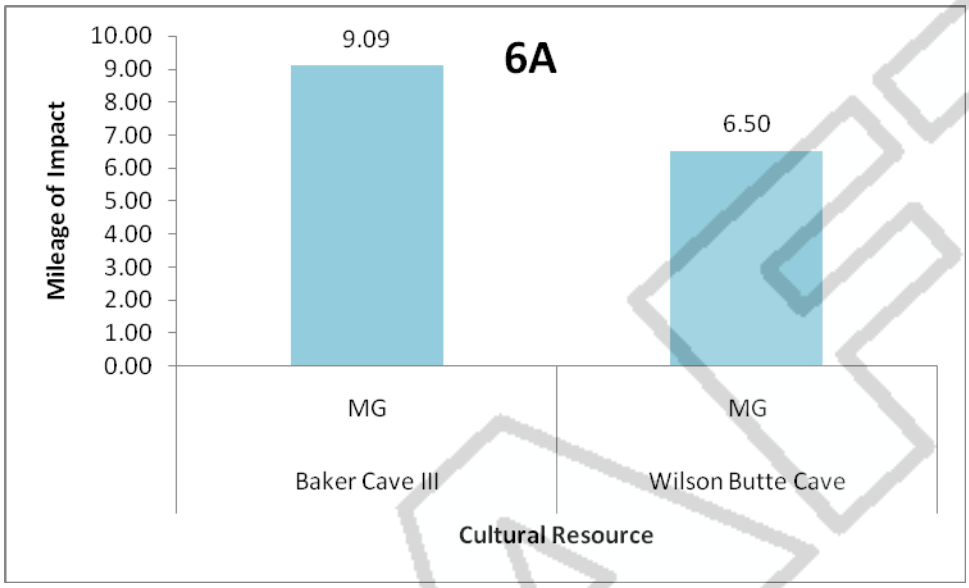

Figure 3.4-71. Project Component Visual Impact Analysis for Alternative 6A Showing Middle Ground (MG) Impacts

Sensitive Point Visual Impact Analysis

Three agency identified sensitive point cultural resources will be impacted by Alternative 6A. These are Baker Cave III, Wilson Butte Cave, and the Daniel A. Hunt House (Figure 3.4-72Figure 3.4-). The length of Alternative 6A that will be visible from each site is detailed below.

- Baker Cave III – 9.09 miles Middle Ground.
- Wilson Butte Cave – 6.50 miles Middle Ground.
- Daniel A. Hunt House – 4.39 miles Middle Ground.

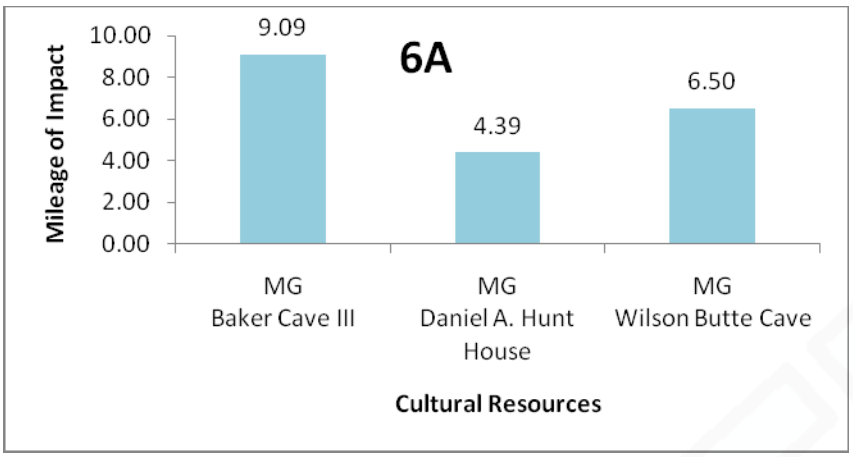

Figure 3.4-72. Sensitive Point Visual Impact Analysis for Alternative 6A Showing Middle Ground (MG) Impacts

Sensitive Point Tally

Of the 84 sensitive visual points that were included in the qualitative proximity analysis, six would be within the visual study corridor of Alternative 6A.

Zone 6 Summary

Alternative 6A is the only alternative in the zone and therefore has no comparable data. There are 96 sites with unknown NRHP eligibilities in this zone and two are complex feature sites. Alternative 6A has a moderate site density and high Middle Ground visual impacts in both the project component and sensitive point models (Table 3.4-8). Alternative 6A is the only alternative in Zone 6 and therefore will have the highest impact on cultural resources.

Table 3.4-8. Alternative 6A Summary

Zone 6			
Alternative Miles in Length			**6A 106.77 miles**
Previously Identified Sites NRHP Evaluations		Total	96
		Listed	0
		Eligible	0
		Unresolved	0
		Unknown	96
		Not Eligible	0
Site Density Model		High	0%
		Med	78%
		Low	22%
Visual Impact Miles	Project Component	IFG	0
		FG	0
		MG	15.59
	Sensitive Point	IFG	0
		FG	0
		MG	19.98
Sensitive Point Talley			6
Impact on Cultural Resources			Highest

3.4.11 Effects Summary

Table 3.4-9 shows the overall ranking of impact to cultural resources for the different alternatives within each zone.

Table 3.4-9 Cultural Resource Impact Ranking

	Zone 1 – Townsend to Mill Creek	**Zone 2 – Mill Creek to Glen**	**Zone 3 – Glen to Stateline**	**Zone 4 – Stateline to Sheep Station**	**Zone 5 – Sheep Station to Cedar Point**	**Zone 6 – Cedar Point to Midpoint**
Least Impact	1D	2E	3B	4A	5C	6A
⇩	1A	2D	3C		5D	
	1C	2B	3A		5B	
	1B	2A			5A	
Most Impact		2C				

The impacts to cultural resources from the Local Routing Options are detailed in Appendix C.4.14

In many ways, the impact to cultural resources is directly proportional to length of alternative. Other important factors that may influence the overall impact that each alternative may have on cultural resources are as follows:

- Proportion of areas associated with numerous previously identified sites through which each alternative passes.
- Proportion of areas associated with high site densities through which each alternative passes such as valley bottoms, near rivers, etc.
- Proximity to sites of more intense historical activity (e.g. mining districts).
- Proximity to sites that can be visually impacted.
- Proximity to linear sites that are listed in or eligible for inclusion in the NRHP such as National Historic Trails, eligible railroads, etc.
- Proximity to the Butte Anaconda National Historic Landmark District.

3.4.12 Climate Change

Climate change could indirectly impact cultural resources through changes in precipitation patterns that could lead to more or less erosive conditions that would affect the resources. An increase or decrease in surface water levels could result in the submergence or exposure of subsurface cultural resources .There will be no foreseeable impacts to significant cultural resources as a result of global climate change that is attributable to the proposed project.

3.4.13 Mitigation of Impacts to Cultural Resources

3.4.13.1 Mitigation Measures

Impacts to cultural resources during construction and operation of the proposed project would be mitigated through the implementation of the Programmatic Agreement when it is completed, and by requirements in the Agency Stipulations (Appendix B.4). These measures, taken in combination are expected to eliminate the likelihood of direct effects to cultural resources in such a manner as to achieve a finding of No Historic Properties Adversely Effected.

3.4.13.2 Mitigation Cost Estimates

As required by the PA and agency stipulations, the selected alternative would be subjected to an intensive pedestrian cultural resource inventory. In order to fulfill the MFSA application requirements, general cost estimates for this survey are provided per Alternative and LRO in Appendix C.4.15.

Additional References:

Idaho Museum of Natural History. ND. *Excavation at the Wasden site*. Digital Atlas of Idaho: Idaho's Natural History Online. Electronic document, http://imnh.isu.edu/DIGITALATLAS/arch/Prehist/Pre_Summ/SE_Snake/Wasden/3-1.htm. Accessed May 19, 2010.

Woods, Alan J., Omernik, James, M., Nesser, John A., Shelden, J., Comstock, J.A., Azevedo, Sandra H., 2002, Ecoregions of Montana, 2nd edition (color poster with map, descriptive text, summary tables, and photographs). Map scale 1:1,500,000.