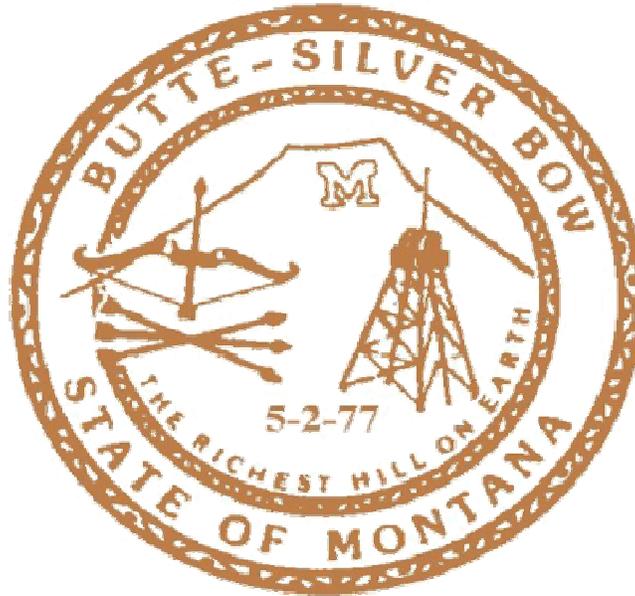


Exhibit A. Excavation and Dirt-Moving Protocols.



DRAFT

**Butte Silver Bow County
Excavation and Dirt-Moving Protocols**

Butte-Silver Bow County
Planning Department
155 West Granite Street
Butte, Montana 59701

May 2013

Introduction

Butte-Silver Bow's (BSB) **Excavation and Dirt-Moving Protocols** are applicable to all Residential, Commercial, Industrial and Recreation projects located in the **Excavation Control District**. All Applicants excavating or moving dirt must comply with these Protocols.

These protocols will help BSB and the **Applicant** properly identify and handle mine wastes in the Excavation Control District. The protocols are in place to protect human health and the environment from potential exposure to mine waste.

Excavation Control District

The **Excavation and Dirt-Moving Ordinance** is applicable in the Silver Bow Creek/Butte Area National Priorities List site (NPL Site) within Silver Bow County. A map of this district is available at the BSB Planning Department, the Clerk and Recorder's office, and attached to this document as Appendix A.

Butte Priority Soils Operable Unit (BPSOU) is an area of concentrated contamination within Excavation Control District and is subject to all applicable action level protocols unless soil sampling indicates excavated soils are below action levels. A map of this area is available at the BSB Planning Department, the Clerk and Recorder's office, and is attached to this document as Appendix B.

Definitions

For the purpose of this ordinance, the following terms, phrases, words and their derivatives shall have the meaning given herein, except where the context clearly indicates a different meaning:

Applicant means a property owner or applicant representing a property owner who has filed an application for an Excavation and Dirt-Moving Permit.

Action Level means:

- Residential - Exceeding 1,200 parts per million for Lead; Exceeding 250 parts per million for Arsenic; Exceeding 147 parts per million for Mercury
- Commercial and Industrial - Exceeding 2,300 parts per million for Lead; Exceeding 500 parts per million for Arsenic.
- Recreational and Open Space - Exceeding 2,300 parts per million for Lead; Exceeding 1,000 parts per million for Arsenic.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and education practices, maintenance procedures, and other management practices to prevent or reduce the migration of contamination from a site or as otherwise defined in the Montana Sediment Erosion Control Manual.

Butte Priority Soils Operable Unit (BPSOU) or BPSOU means historic mining areas within and near municipalities of Butte and Walkerville, surface water, and alluvial groundwater associated with Silver Bow Creek, as designated on the National Priority List of sites established by the Environmental Protection Agency (EPA) through the

Comprehensive Environmental Response Compensation and Liability Act, (CERCLA). Map attached as Appendix B.

Butte-Silver Bow or BSB means the local government of the City and County of Butte-Silver Bow, Montana.

Cap means an impervious or soil cover that minimizes the migration of contaminated soil.

Contaminants of Concern means Lead, Arsenic or Mercury exceeding EPA standards for clean-up action .

Contaminated Soils or contamination means soil containing contaminants of concern exceeding EPA action levels for residential, commercial, industrial or open space and recreation areas.

Excavation and Dirt-Moving Activity means any activity which changes the volume of dirt on the land surface. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity which exposes soil or rock.

Excavation Control District means the entirety of the Silver Bow Creek/Butte Area National Priority List site within Silver Bow County. Map attached as Appendix A.

Excavation and Dirt-Moving Permit means a Permit issued under the Excavation and Dirt-Moving Ordinance allowing an Applicant to proceed with an Excavation and Dirt-Moving Activity.

Excavation and Dirt-Moving Protocols means those protocols approved by EPA and MDEQ that set forth the protocols for management of excavated materials (soil, dirt, debris) in an ‘Excavation and Dirt-Moving Permit Area.’

Mine Waste means mining and mineral processing waste including waste rock, mill tailings, smelter slag, and other soil, dirt, sand or gravel mixed with any form of mine waste.

Mine Waste Repository means the designated area for disposal of contaminated soil and mine waste. Map attached as Appendix C.

Permit Area means the area described in the ‘Excavation and Dirt-Moving Permit Application.’

Butte-Silver Bow Landfill means the Class II Solid Waste Landfill owned and operated by Silver Bow County, located in Rocker, Montana, approximately 5 miles west of Butte. A map of the site and its haul route is attached as Appendix D.

Exemptions

The following activities are exempt from the provisions of these Protocols as provided in Section 08.28.210 of the Excavation and Dirt-Moving Ordinance. Exempt activities include:

- Excavations less than 1 cubic yard within the BPSOU;
- Excavations less than 3 cubic yards throughout the remaining ‘Excavation and Dirt-Moving Control District;’
- Remedial action in compliance with Superfund;

- Excavations related to bona fide agricultural properties as classified by The Montana Department of Revenue, Property Assessment Division;
- Excavations related to Timber Production; and
- Excavations related to utility or land management emergencies. For emergency excavations, an Applicant is required to obtain a permit as soon as is practical.

Permits Required

1. Proof of **Storm Water Management Permit**, if applicable.
2. Butte-Silver Bow **Excavation & Dirt Moving Permit Application**, attached as Appendix E, if:
 - a. Greater than 1 cubic yard within the Butte Priority Soils Operable Unit (BPSOU).
 - b. Greater than 3 cubic yards throughout the remaining Excavation and Dirt-Moving Control District.

Procedure

1. Submit **Excavation and Dirt-Moving Permit Application** to the Planning Department;
2. Allow 3 to 5 business days to process approval;
3. If necessary, BSB will conduct a site visit to inspect the site and sample excavated soils:
 - if soil sample analytics reveal soil contamination is above action levels follow Protocol A (Above Action Level).
 - if soil sample analytics reveal soil contamination is below action levels, follow Protocol B (Below Action Level).

Protocols

A. Above Action Levels

- This activity shall adhere to the **Stormwater Management Protocols** and Best Management Practices of the Montana Sediment Erosion Control Manual.
- Prior to digging, please **CALL 811 or 1.800.424.5555 BEFORE YOU DIG** to identify all underground utilities.

Managing Contaminated Soils

- Any disturbed soil shall be stockpiled within the permit area. Take the following precautions stockpiling:
 - i. Cover the stockpile with plastic sheeting or tarps to prevent dust generation and erosion;
 - ii. Prevent visible dust during excavation and placement operations. Implement dust control measures, such as spraying soil with water, during excavation or grading operations;
 - iii. Do not stockpile in or near storm drains, water courses or wetlands; and
 - iv. Install a berm, hay bales, and/or silt fences around stockpile to prevent runoff from leaving the area, where necessary.

Transporting Contaminated Soils for Disposal

- Minimize or eliminate the migration of potentially contaminated soils off-site during transportation to the **Mine Waste Repository**. Take the following precautions:

- i. Prevent visible dust during transportation by **securing a tarp over the contaminated soil** to prevent wind-blown dusts and particulates from leaving the truck;
- ii. **Line the truck bed** with a bed liner to prevent wet or muddy contaminated soils from leaking from the truck or utilize a sealed side-dump truck; and
- iii. When leaving permitted area **wash down transport vehicle** to keep contamination on site.

Returning Contaminated Soils to the Ground

- Excavated soils left on site must be properly **capped**. There are two types of “proper” caps:
 - i. **Hard Cover** such as asphalt, concrete or a structure; or
 - ii. **Soil Cover**
 - Surface slopes, if present, should be graded and contoured to slopes no steeper than 3 feet horizontal for every 1 foot vertical;
 - If soil has a pH of less than 5.5, the site must be capped with two-inches of limerock or a geotextile liner and 18 inches of EPA approved cover soil; and
 - Vegetated with grass sod or appropriate vegetation, as deemed acceptable by BSB staff.
- If an Excavation and Dirt-Moving Activity on a permitted area disturbs a previously reclaimed site and its engineered cap, the Applicant is responsible for reclaiming the site to EPA specifications. EPA specifications are attached as Appendix F, *Butte Hill Revegetation Specifications*.

B. Below Action Levels

- Excavation and Dirt Moving should follow conventional Excavation Management procedures.
- Activity shall adhere to the Stormwater Management protocols and Best Management Practices of the Montana Sediment Erosion Control Manual.
- Prior to digging, please **CALL 811 or 1.800.424.5555 BEFORE YOU DIG** to identify all underground utilities.

Managing Soils

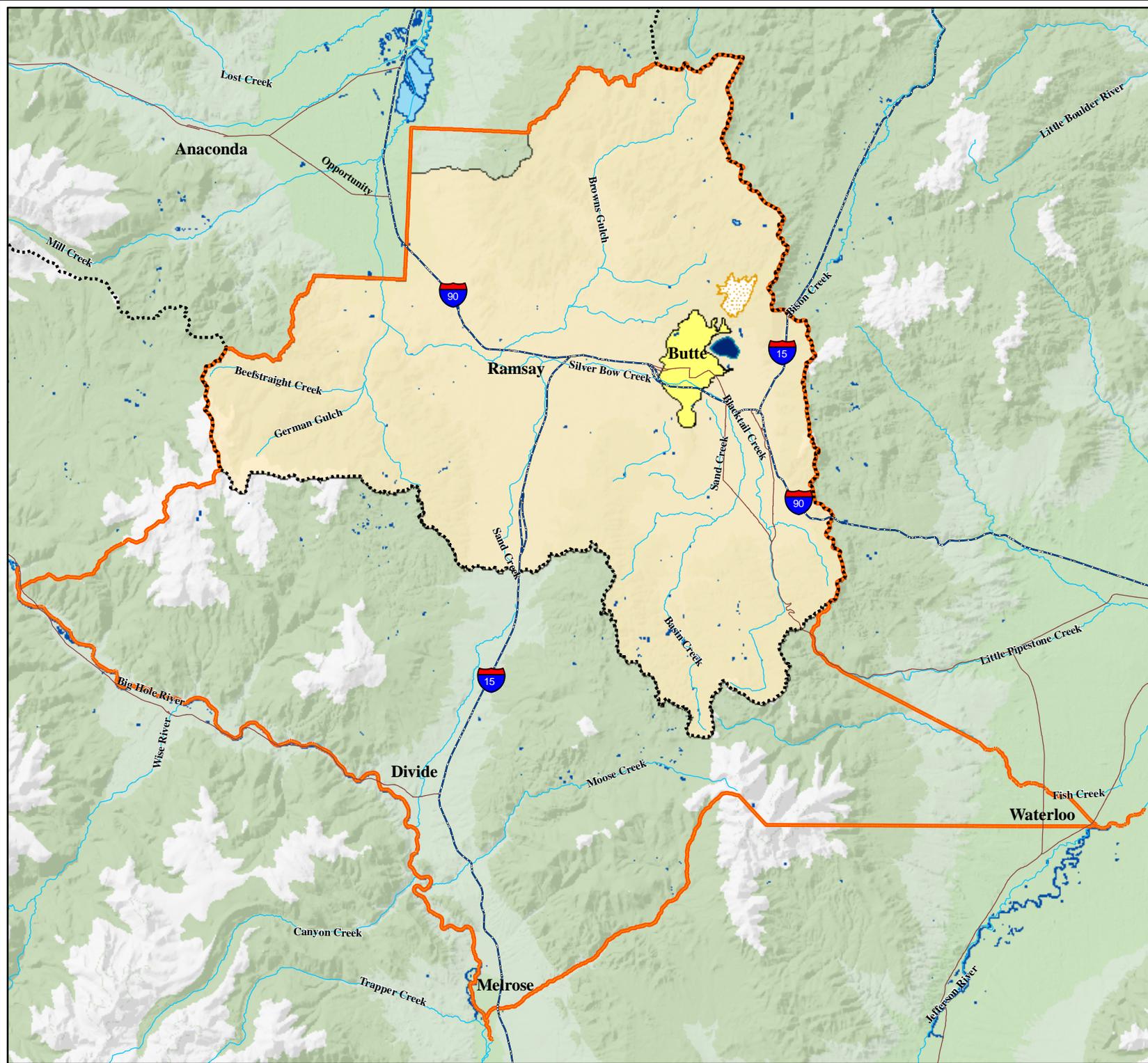
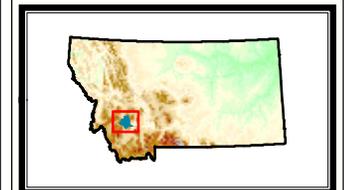
- Any disturbed soil shall be stockpiled within the permit area. Take the following precautions stockpiling:
 - i. Prevent visible dust during excavation and placement operations. Implement dust control measures, such as spraying soil with water, during excavation or grading operations; and
 - ii. Do not stockpile in or near storm drains, water courses or wetlands.

Transporting Soils for Disposal

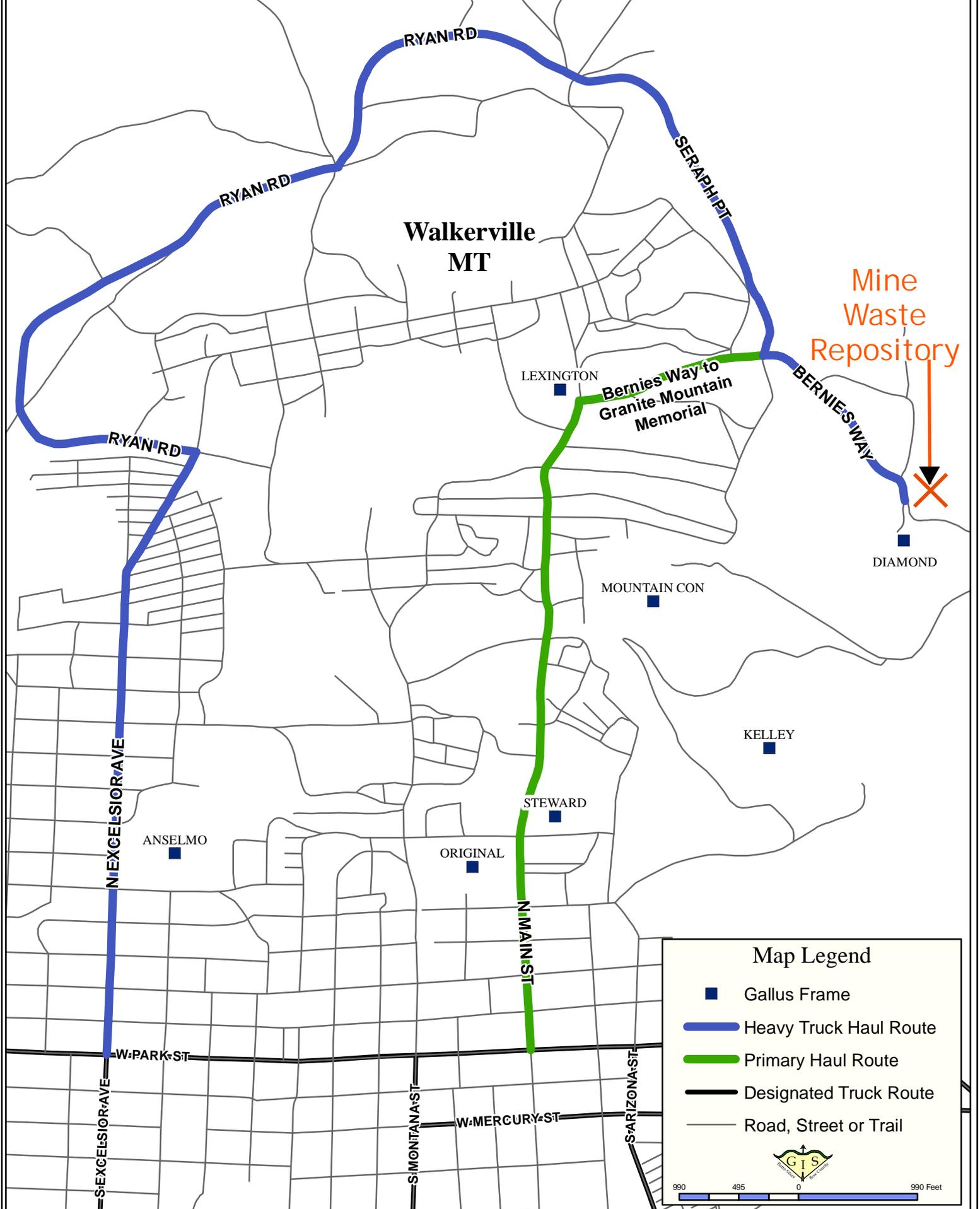
- Prevent visible dust during transportation by **securing a tarp over the soil** to prevent wind-blown dusts and particulates from leaving the truck
- Excess soil can be disposed of at the Butte-Silver Bow **Landfill** in Rocker Montana, map attached as Appendix D.

Appendix A:
Excavation Control District
City and County
of Butte-Silver Bow

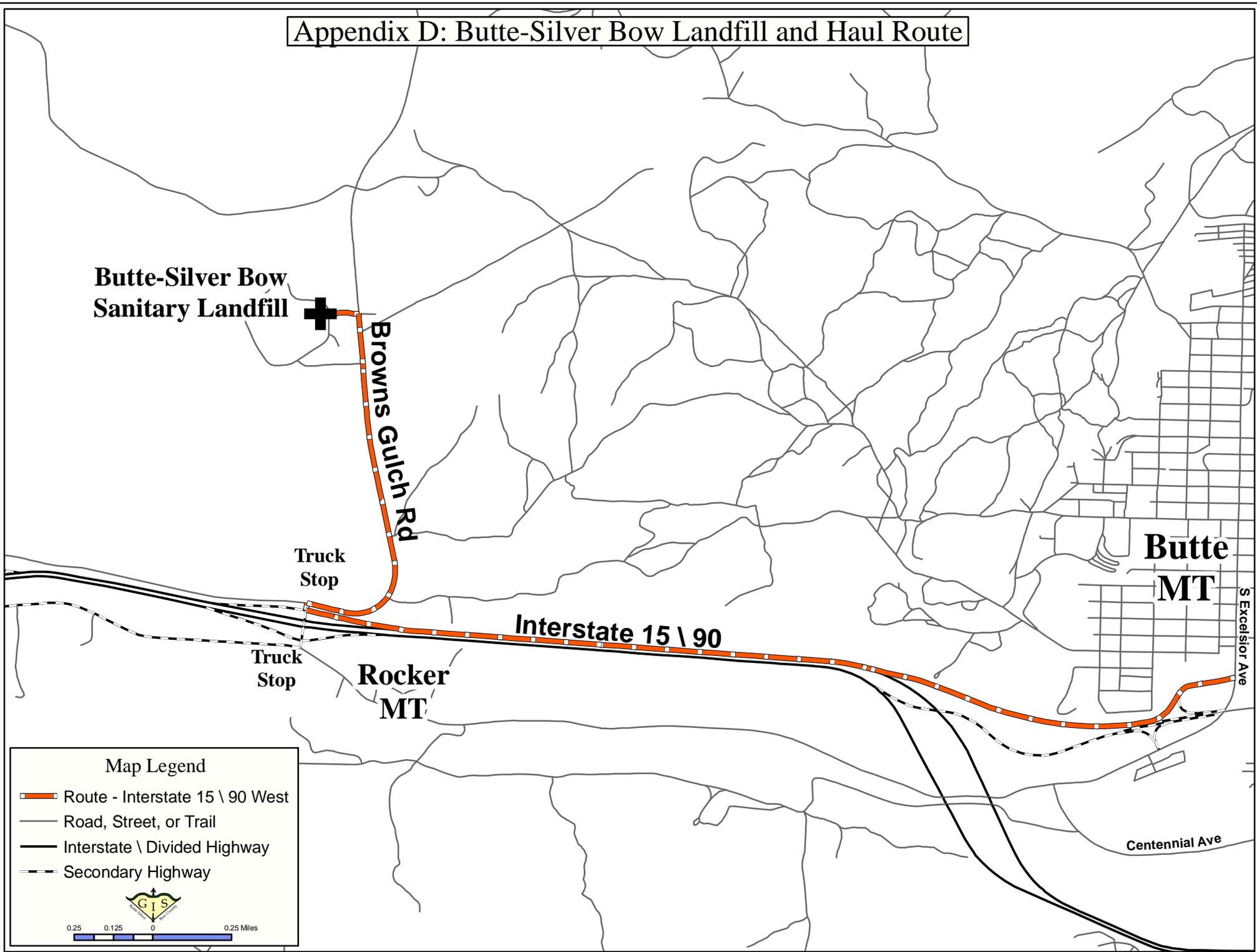
-  Interstate \ Divided Highway
-  State \ Secondary Highway
-  Continental Divide
-  County Boundary
-  Channel or Stream
-  Berkeley Pit
-  Lake or Impoundment
-  Mill Tailings
-  Butte Priority Soils Operable Unit (BPSOU) Boundary
-  National Priorities List (NPL) Superfund Site - Excavation Control District



Appendix C: Mine Waste Repository Site and Haul Routes



Appendix D: Butte-Silver Bow Landfill and Haul Route



**Appendix E.
Butte Silver Bow
Excavation & Dirt Moving
Permit Application**

Permit No: _____
Date Submitted: _____
Finalized: _____

**Butte Silver Bow Planning Department
155 W. Granite Street Butte, MT 59701
(406) 497 – 6250**

Note: Prior to submitting this 'Excavation and Dirt Moving Permit Application,' a Storm Water Management Permit must be approved, if applicable.

Property Owner Contact Information

Owner of Property: _____
Mailing Address: _____ City, State: _____ Zip: _____
Phone: _____ Mobile: _____ Email: _____
Physical Address of the Property: _____

Contractor/Developer/Person doing the work/Contact Information

Contractor or Owner: _____
Mailing Address: _____ City, State: _____ Zip: _____
Phone: _____ Mobile: _____ Email: _____
Physical Address of the Property: _____

Project Information

Project Location & Volume of Excavation:

- | | |
|--|---|
| <input type="checkbox"/> Excavation Control District | <input type="checkbox"/> Butte Priority Soils Operable Unit |
| <input type="checkbox"/> Less than 3 cubic yards | <input type="checkbox"/> Less than 1 cubic yard |
| <input type="checkbox"/> Greater than 3 cubic yards | <input type="checkbox"/> Greater than 1 cubic yard |

Property Type: Residential Commercial/Industrial Recreation/Open Space

Type of Excavation:

- | | | |
|--------------------------------------|--------------------------------------|--|
| <input type="checkbox"/> Footing | <input type="checkbox"/> Landscaping | <input type="checkbox"/> Fencing |
| <input type="checkbox"/> Foundation | <input type="checkbox"/> Sidewalk | <input type="checkbox"/> Utility Repairs/
Maintenance |
| <input type="checkbox"/> Posts/Poles | <input type="checkbox"/> Driveway | |

Project Schedule (estimated)

Start date: _____ Duration soil will be exposed: _____ Completion Date: _____

Site Plan & Project Details: Please complete Appendix A: Site Plan Drawing; and provide:

Dimensions of Surface Area to be disturbed: _____

Depth of excavation: _____

Estimated volume of soil needed for backfill: _____

Source of Backfill: _____

Volume of soil to be disposed of at the Mine Waste Repository: _____

Checklist:

- 1. Copy of Storm Water Permit, if applicable.
- 2. \$10 processing fee. No application is considered without payment.
- 3. Detailed site plan and project details.
- 4. Read and understand Excavation and Dirt Moving Protocols

Acknowledgement Certificate

I certify I am the Owner or Owner’s authorized agent. If acting as an authorized agent, I further certify I am authorized to act as the Owner’s agent regarding the property at the above-referenced address for the purpose of filing applications for decisions, permits, or review under the Butte-Silver Bow Excavation and Dirt Moving Ordinance and have full power and authority to perform on behalf of the Owners all acts required to enable the City to process and review such applications.

I certify the information on this application is true and correct and understand that I shall not start this project until this application is approved. I shall comply with the laws of the State of Montana and the ordinances of Butte-Silver Bow and that any excavation will be in full compliance with any and all protocols associated with this permit, including granting the city-county to enter the property to inspect the site, take samples of excavated materials and monitor excavation and back-filling activities.

Owner or Authorized Representative

Date

For Office Use Only

Application Processing

Application Received by: _____ Date: _____

Fee Paid: _____ Check No.: _____ Receipt No.: _____

Approved By: _____ Date: _____

Soil Inspection Completed by: _____

Soil Sampling Results

Sample System: XRF Analysis Lab Sample Internal Data

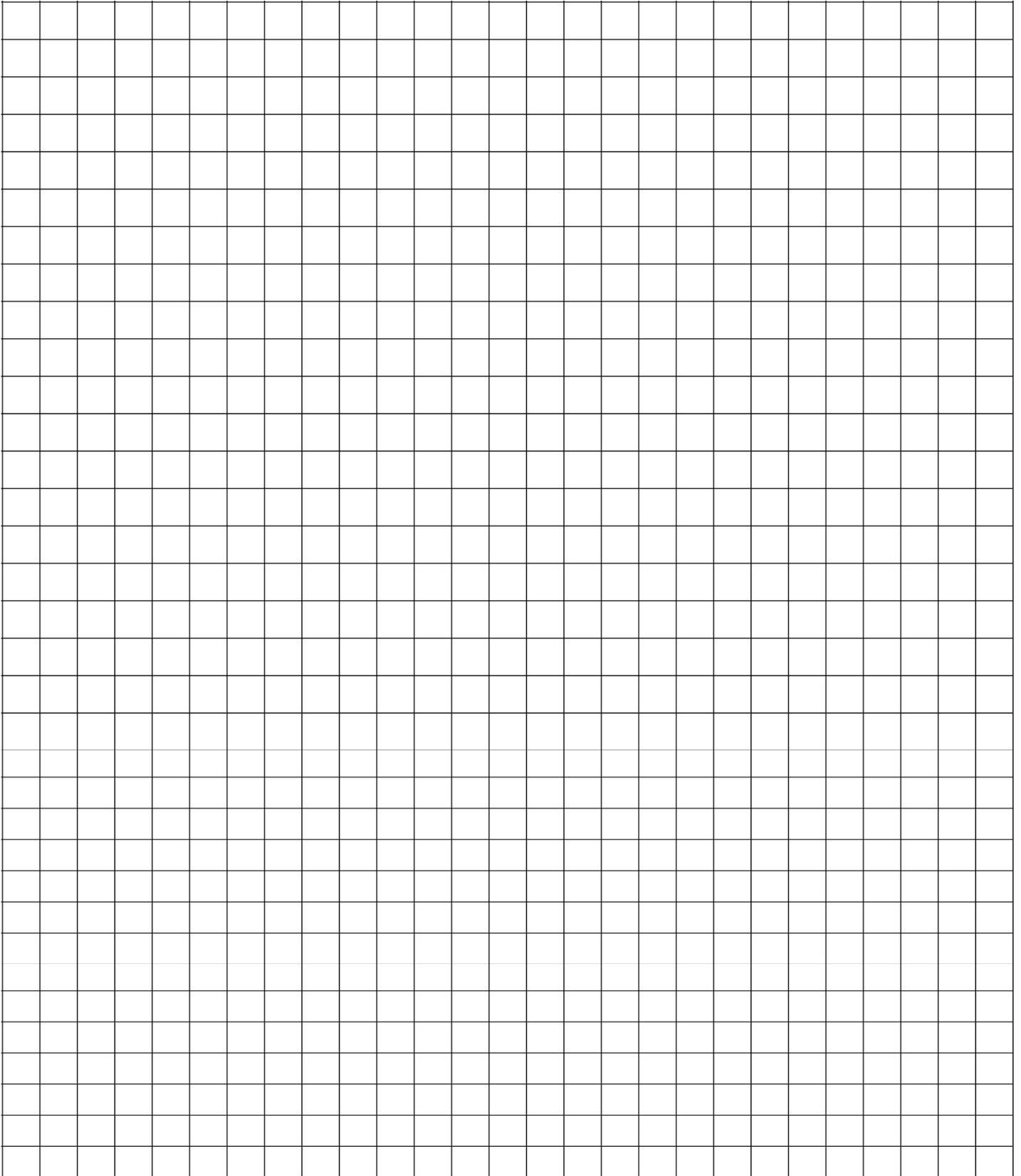
Results:

Lead: Above Action Levels Below Action Levels

Arsenic: Above Action Levels Below Action Levels

Mercury: Above Action Levels Below Action Levels

Site Plan



Appendix F. Butte Hill Revegetation Specifications

U.S. Environmental Protection Agency

**Silver Bow Creek /
Butte Area Superfund Site**

Butte Priority Soils Operable Unit (BPSOU)

BUTTE HILL REVEGETATION SPECIFICATIONS

as of March 1999

BUTTE HILL LIMESTONE STABILIZATION

GENERAL

Work described in this section shall consist of preparing the ground surface for limestone stabilization, hauling, placing, and spreading the limestone and fill on prepared areas in accordance with this Specification at the locations shown on the Drawings.

MATERIALS

Limestone sources will be approved by EPA. Limestone may be from any approved source and shall have a calcium carbonate equivalent content of not less than 65%. All limestone must be <1 inch in diameter and 50% (weight basis) must pass a 60 mesh (<0.25 mm) sieve.

CONSTRUCTION REQUIREMENTS

pH Testing of Subgrade

AERL shall test the subgrade soil pH of all areas to be revegetated. The frequency of testing shall not be less than one test per 40,000 square feet (approximately 200 x 200 foot grid). Limestone addition shall include areas to be revegetated where the subgrade soil has a pH of less than 5.5. Acid-base accounting (ABA) may be required by EPA under certain circumstances, such as the presence of acid-generating minerals, and the method used to determine ABA shall be as described in EPA-600/2-78-054. Documentation of this sampling effort, including a map showing sampling locations and sample results, shall be included in the final construction completion document(s) for the project.

Installation of Limestone

The surface of the subgrade in the area to be covered shall be brought to grade and finished smooth and uniform immediately prior to dumping and spreading the limestone. The limestone shall be placed prior to the placing of the cover soil. A minimum 350 tons/acre (approximately 2 inches) of limestone shall be placed on the low pH soil. Placement of the limestone layer on a site will be based on site-specific data and approved by EPA prior to placement of limestone.

Grades on the area to be covered shall be maintained in a true and even condition. Where grades have not been established, the areas shall be graded and sloped to drain. The surface shall be left smooth in an even and properly compacted condition to prevent, insofar as practical, the formation of low places or pockets where water will stand.

BUTTE HILL COVER SOIL

GENERAL

The work of this section covers all operations required for furnishing, excavating, hauling, stockpiling, spreading, and seedbed preparation of approved cover soil.

SUBMITTALS

Cover soil submittals will be provided in the Design Report or under separate cover and approved by EPA prior to use. The following submittals shall be provided to EPA for each cover soil source:

- The intended cover soil source site location, including details on the area and depth to be excavated at the source site location.
- For each cover soil source, AERL shall be required to secure at least 3 soil samples from the source area. EPA will be notified in advance of the sampling effort and the approximate location and depth where samples will be collected.
- Each of the above 3 soil samples shall be analyzed by an approved laboratory for the following parameters: texture class and particle size; pH; saturation percent; electrical conductivity (EC) in mmhos/cm; organic matter percent; NO₃ - nitrogen; available phosphorus (P); and available potassium (K). The above parameters shall be analyzed using USDA classification and test methods as described in ASA/SSSA Monograph No. 9, Methods of Soil Analysis, Parts 1-2, most recent edition or as described in EPA approved Clark Fork River Superfund Site Investigations documents. Also, each of the above 3 soil samples shall be analyzed by an approved laboratory for the following soil metals parameters: arsenic, cadmium, copper, lead, and zinc. Cover soil placement shall not begin until test results of the soil samples are known.

MATERIALS

Cover soil sources will be approved by EPA. Cover soil thickness shall be a minimum of 18 inches, unless otherwise approved by EPA in writing. Eighteen inches is considered the minimum thickness required for long-term vegetation success. Sufficient cover soil should be applied to account for settling, sloughing, and erosion. Cover soil material shall be reasonably free of any trash, rocks, lumps of soil, stumps, and brush. Rock content (i.e., particles >2.0 mm) must constitute <45% (by volume) of the cover soil and the maximum allowable rock size is 6 inches in diameter. To the extent possible, the cover soil source should be free of any noxious weeds.

Cover soil shall be a friable material and the <2.0 mm fraction characterized as loam, sandy loam, sandy clay loam, sandy clay, clay loam, silty clay, silty clay loam, silt loam, or silt in accordance with the USDA Soil Conservation Service textural classification provided below. Per approval of EPA, loamy sand may be acceptable from 6 to 18 inches in certain circumstances.

The soil pH shall be between 5.5 and 8.5. The soil SAR shall be <12. Soil saturation percent will be less than 85% and greater than 25%. The soil shall have an EC less than 4 mmhos/cm. NO₃, P, and K will be used by EPA and AERL to verify fertilizer rates.

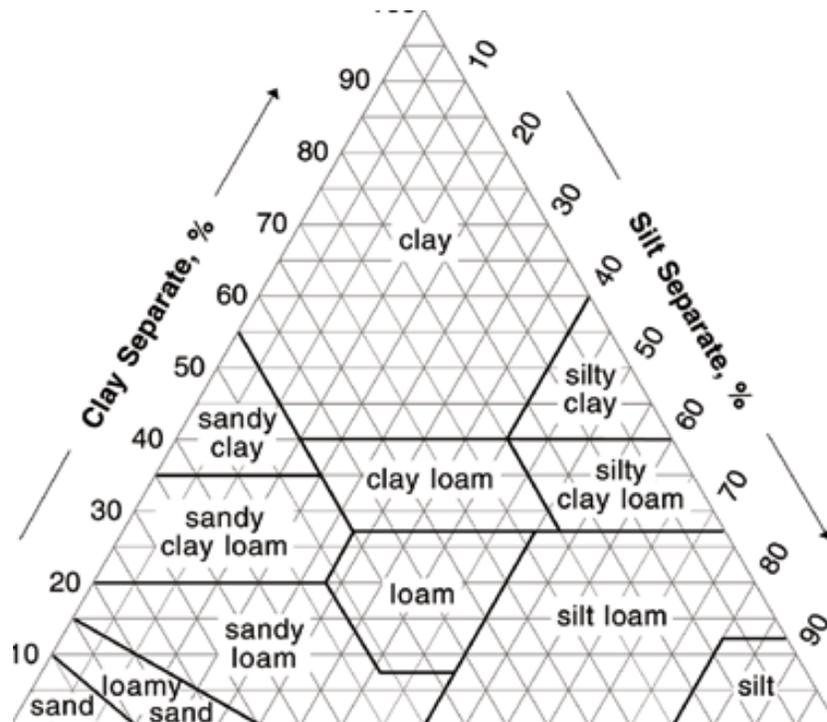


Figure 1. Graphic guide for textural classification of the less than 2 mm portion. (Source: USDA Soil Conservation Service)

The following chemical suitability criteria are general guidelines to be followed as screening standards:

As	<97 mg/kg
Cd	<4 mg/kg
Cu	<250 mg/kg
Pb	<100 mg/kg
Zn	<250 mg/kg

With the exception of zinc, these suitability criteria were established for parks, play areas, and residential yards in the Final Work Plan for Residential Areas, Butte Priority Soils Expedited Response Action prepared by ARCO dated May 1, 1995. These values were provided in a February 14, 1995, letter from Sara Weinstock (EPA) to Dave Sinkbeil (ARCO) providing final comments on the above work plan. The criterion for zinc was reduced to <250 mg/kg from <500 mg/kg to take into account potential phytotoxic effects noted at the higher level in the Final Baseline Ecological Risk Assessment, Anaconda Regional Water, Waste, and Soils Operable Unit, Anaconda Smelter NPL Site, Anaconda, Montana, prepared in October 1997 by CDM Federal Programs Corporation for EPA. The chemical suitability criteria listed above were established for the Butte Hill and may not be appropriate for use at other Clark Fork River Basin Superfund Sites.

It should be noted that some exceedances of the above criteria may still allow successful long-term vegetation. Therefore, if cover soil sampling shows a variance from the chemical suitability criteria, AERL will notify EPA and a plan to address the usability of that cover soil source will be discussed. EPA must approve in writing any cover soil sources which exceed the above suitability criteria.

CONSTRUCTION REQUIREMENTS

Visual inspection of excavated cover soil shall be a continuous process to carefully observe and recognize changes in source material characteristics. Visual inspection, in conjunction with hand-texturing of the <2.0 mm fraction, will be used to determine the adequacy of the borrow material ahead of excavation, to assure that current material meets textural criteria, and to identify areas to move to if material begins to fall out of specification. Each inspection shall record the location, test number for that day, date, time, estimated rock content percentage, and soil texture (<2.0 mm fraction). The frequency of inspection is dependent on the variability of the cover soil source material, but must be performed and recorded at least once daily during periods of source material excavation and transport. It is desirable to have the same person perform the inspections for the duration of excavation at a particular source area. In addition to the above visual inspections, textural analysis by laboratory hydrometer testing may be requested by EPA at a rate not to exceed one test for every 5,000 cubic yards of cover soil material excavated. These tests will be used for comparison and guidance for field testing and field observations. Copies of all inspection records and laboratory analyses shall be provided to EPA for review. Summaries of inspection records and analyses shall be included in the final construction completion documents for the project.

For revegetation purposes, slopes must not exceed a maximum of 3:1 (3 horizontal to 1 vertical)

unless previously agreed to by EPA and AERL because of site specific requirements. Cover soil shall not be placed until the areas to be covered have been properly prepared, the limestone layer appropriately applied (if required), all construction work in the area has been completed and approved by AERL, and EPA notified that all subgrade preparations have been completed.

After the cover soil has been spread, large clods, hard lumps, rocks, and large roots over 6 inches in diameter; litter; or other foreign material (exposed iron, timbers, etc.) shall be raked up, removed from the cover soil and disposed of properly. Further preparation of the cover soil for seeding is provided in the specifications for Seeding and Fertilizing.

AERL shall grade the source area borrow site(s) to existing contours at slopes not to exceed 3:1 (unless previously agreed to by EPA and AERL because of site specific requirements) and to provide positive drainage. AERL shall replace stockpiled topsoil to the borrow area. The borrow area shall be prepared for seeding, mulching, and fertilizing as are other areas receiving cover soil.

BUTTE HILL ORGANIC AMENDMENT APPLICATION

GENERAL

Organic amendment application shall consist of furnishing, applying, and incorporating soil amendments, such as manure and compost, at locations and rates designated on the Drawings.

SUBMITTALS

Organic amendment submittals will be provided in the Design Report or under separate cover and approved by EPA prior to use. The following submittals shall be provided to EPA for each organic amendment source:

- Location of Supplier;
- For each supplier, at least three organic amendment analyses, including gravimetric water content, rock and other fragment content, and organic matter content, as described further under Materials; and
- Proposed organic amendment application and incorporation methods and equipment.

MATERIALS

Analyses for organic amendments (such as manure, compost, etc.) shall include the gravimetric water content (% , dry weight), the percentage of rock and/or other fragments >2.0 mm fraction (% , dry weight), and organic matter content of the <2.0 mm fraction (% , dry weight). The organic matter content of the <2.0 mm fraction shall be determined in the laboratory using Walkley-Black procedure, ASA, Meth. Soil Anal., 1986, Method 29-3.5.2.

If manure is used as the organic amendment source, cattle manure shall be the preferred manure type. Straw bedding material mixed into the manure is acceptable, but it shall not constitute more than 20% of the dry weight.

Application Rate

The field application rate shall be calculated using 3% organic amendment on a dry weight basis in the upper 6 inches of cover soil. Upon approval or direction from EPA, the 3% application rate may be modified to account for site-specific conditions. Analyses for organic amendments shall be submitted for each Supplier on a regular basis to determine if adjustments to the field application rates are necessary. The water and rock and/or other fragment content shall be deducted in calculating the field organic amendment application rate. Documentation of the organic amendment application, including application rate calculations, shall be included in the final construction completion documents(s) for the project.

CONSTRUCTION REQUIREMENTS

Stockpiling Organic Amendment

Prior to stockpiling organic amendment on site, the Contractor shall develop an acceptable stockpiling plan for AERL review and approval. The plan shall include the location of the stockpile and adequate measures to prevent contamination of underlying and adjacent soils and prevent air or water pollution.

Site Grading

Prior to placement of the organic amendment, all areas shall be graded as necessary to approximately restore the design contours of the ground or to produce a contour that will blend with contours of adjacent areas. This shall include grading erosion channels in revegetated areas that are to receive organic amendment.

Organic Amendment Application

Organic Amendment shall be applied with agricultural manure spreaders or other approved application equipment that enables spreading a uniformly regulated amount of material.

For a specified application rate, the Contractor shall apply the organic amendment in a uniform manner across the landscape. Localized organic amendment application thicker than 6 inches is unacceptable.

Contractor shall calibrate the organic amendment spreader prior to each use of the equipment unless site conditions have not changed and equipment settings have not been altered since previous calibration. Calibration records shall be furnished to AERL. Upon request, copies of equipment calibration shall be provided to EPA for review. All calibration records shall be included in the final construction completion document(s) for the project.

Under no circumstances shall the Contractor apply the organic amendment during wind conditions strong enough to displace material onto adjacent sites.

Organic Amendment Incorporation

Following organic amendment application, the soil shall be ripped to a 6-inch depth at 12-inch centers. The soil shall then be tilled to a depth of 6 inches with a disc, rototiller, moldboard plow, or chisel plow. An agricultural disc with a disc diameter of approximately 20 inches having cone-shaped discs at a spacing width of 6-8 inches is recommended. Multiple tilling equipment passes may be required to achieve adequate incorporation. Adequate incorporation will be a complete and uniform mixing of the manure and soil to a depth of 6 inches. All tillage procedures shall be completed as soon as practicable after amendment application.

BUTTE HILL SEEDING AND FERTILIZING

GENERAL

Revegetation work described in this section includes fertilization, seeding, and mulching on all project designated and disturbed areas upon completion of construction work. These areas include finished embankment slopes, borrow areas, areas to be revegetated, and disturbed areas.

MATERIALS

Seed

Hand collected native species and some of the special wetland species collected cannot meet the following requirements. All seed shall comply with, and be labeled in accordance with, the Montana Seed Law. Montana Code Annotated (MCA) 80-5-104 (2) states ... Indigenous seeds, as defined in 80-5-101, in amounts of one pound or more, whether in packages or bulk, must be labeled with the following information:

1. The statement “Labeled only for reclamation purposes”;
2. Lot number or other distinguishing mark;
3. The common name, genus, species, and subspecies, when applicable, including the name of each kind of seed present in excess of 5 percent. When two or more kinds of seed are named on the label, the label shall specify the percentage of each. When only one kind of seed is present in excess of 5 percent and no variety name or type designation is shown, the percentage must apply to seed of the kind named. If the name of the variety is given, the name may be associated with the name of the kind. The percentage in this case may be shown as shown as pure “live seed” and must apply only to the seed of the variety named;
4. State or county of origin;
5. The approximate percentage of viable seed, together with the date of test. When labeling mixtures, the percentage viability of each kind shall be stated;
6. The approximate percentage, by weight, of pure seed, meaning the freedom of seed from inert matter and from other seeds;
7. The approximate percentage, by weight, of sand, dirt, broken seeds, sticks, chaff, and other inert matter;
8. The approximate total percentage, by weight, of other seeds;
9. The name and approximate number of each kind of species of prohibited and restricted noxious weed seeds occurring per pound of seed; and

10. The full name and address of person, firm, or corporation selling the seed.

As listed in the Montana Seed Law, seed shall contain no “PROHIBITED” noxious weed seed. The seed shall contain no “RESTRICTED” noxious weed seed in excess of the maximum numbers per pound, as specified by MCA 80-5-105, or as specified by the appropriate BSB County Weed Board, whichever is more stringent.

As defined by MCA 80-5-101(4), indigenous seeds include the seeds of those plants that are naturally adapted to an area where the intended use is for revegetation of disturbed sites. These species include grasses, forbs, shrubs, and legumes.

The Contractor must supply AERL with all seed bag tags and certification from the supplier stating that the seed complies with the Federal Seed Act and the Montana Seed Laws (MCA 80-5-101- through 305). Upon request, copies of said tags shall be submitted to EPA for review. Copies of seed bag tags and certification shall be included in the final construction completion documentation the project.

When legumes are seeded as the predominant mixture, the seed supplier shall include inoculants (rhizobia) and provide documentation as specified in the Seed Certification. Seed Certifications shall be submitted to AERL prior to any seeding. The Contractor shall also submit a copy of the bill or other documentation from the seed supplier showing actual bulk weights of the individual seed types combined in the mix an verification of legume inoculation. The required certifications and documentation shall be provided to AERL at least three days prior to the seeding.

Fertilizer

Fertilizer shall be delivered in standard-size bags of the manufacturer showing weight analysis and manufacturer’s name, or in bulk quantities accompanied with written certifications from the manufacturer stating that the fertilizer supplied complies with applicable Specifications.

Fertilizer shall be soluble commercial carrier of available plant food element or combination thereof. The fertilizer to be used on the project shall supply the quantities of available chemical elements stipulated below. The fertilizer shall be of uniform composition and in good condition for application by suitable equipment. It shall be labeled with the manufacturer’s guaranteed analysis, as governed by applicable fertilizer laws. Any fertilizer that becomes contaminated or damaged, making it unsuitable for use, shall not be accepted. All required fertilizer certificates shall be provided to AERL a minimum of three days prior to fertilizing. The certification shall include the guaranteed analysis of the fertilizers stated in the terms of the percentages of nitrogen, and available phosphorous, potash, and boron, in that order.

Mulch

Vegetative mulch shall be either grass hay or straw. Grass hay material shall be composed primarily of perennial grasses. The grass hay mulch shall contain greater than 70 percent grass by weight and shall not contain more than 10 percent alfalfa, crested wheatgrass or yellow sweet clover. Grass hay shall be relatively free of noxious weeds and other undesirable species.

Straw mulch material shall be clean grain straw, shall be relatively free of noxious weeds and other undesirable species, and shall not contain greater than 5 percent cereal seed by weight, i.e., seed heads. Wheat straw will be used whenever possible. Harvesting will be performed with modern combines, which leave less grain in the straw. Written approval of straw and hay sources from the supervisor of the BSB County weed board shall be obtained.

Chopped or ground material is not acceptable. The mulch material is not acceptable if it is damaged by rotting, molding, etc. to seriously limit its use for mulch. It shall be relatively free of stones, dirt, roots, stumps, or other foreign material.

Application rates shall be 3,000 lbs/acre on flat non-critical erosion and potential dust generating areas and 4,000 lbs/acre on all critical runoff and potential dust generating areas. Exact application rates will be adjusted in the field to accommodate differences in mulch material and seedbed conditions.

CONSTRUCTION REQUIREMENTS

Seedbed Preparation

Prior to executing the seeding, fertilizing and mulching work items, the seed bed at all sites shall be prepared so these items can most efficiently be completed, with the areas resulting in reasonable conformity to specified line and grade. The fertilizing, seeding, and mulching work items shall be executed only after the seedbed condition has been approved by AERL. The cover soil shall be prepared as described in the Cover Soil specifications.

The seedbed surface must be in a condition that does not preclude growth at the time of application of seed. Conditions that may preclude growth include, but are not limited to: large clumps, clods, and impervious crusts of dirt; areas too tightly compacted to allow seed growth; and areas of loose soils which could possibly become too compacted during the seed applications to allow growth. The decisions on the conditions of the seedbed shall be made by AERL. If AERL determines the seedbed is inadequate for seeding, the Contractor shall treat the inadequate areas, as directed by AERL, to attain as nearly as practicable the adequate condition at no additional cost to AERL.

Excessively tight or compacted soils shall be loosened to the minimum depth of 6 inches. Disking, chiseling, or tilling of the soils shall be done at right angles to the natural flow of water on the slopes, unless otherwise directed or approved by AERL. Compaction of the soil, when required, shall be performed by equipment that shall produce a uniform rough-textured surface ready for seeding and mulching.

Existing structures and facilities shall be adequately protected and any damage done by the Contractor shall be repaired or adjusted to the satisfaction of AERL.

Seed Application

General

Slopes and areas finished during the period of October 15 through June 15 may be permanently seeded within this time period. The Contractor must obtain AERL permission to commence

seeding operations. Slopes and areas finished during the period June 16 through October 14 shall receive an annual cover crop from the straw mulch seed to protect the in-place cover soils during this period. The control of noxious weeds and other undesirable species will also be addressed during this period. The perennial seed mix shall then be applied to the areas after October 15. EPA shall be notified prior to commencement of seeding activities.

Specifications of each type of seed mix are outlined below. The seeding of steep slopes, narrow medians, or small areas that are impractical to seed by drill may be performed by using the hydraulic seeding methods, when approved by AERL. The hydraulic seeding methods shall be used when the seedbed surface is too wet or swampy to permit seeding by drill. Hydraulic seeding methods shall not be used during adverse weather, as determined by AERL.

The applied seed, regardless of the method of application, shall not be covered by a soil thickness greater than 1 inch in depth.

Seed Application Equipment

Drill Seeding

Seeding equipment used for applying grass/forb seed must be designed, modified or equipped to regulate the application rate and planting depth of the seed mixture. Seed must be uniformly distributed in the drill hopper during the drilling operation. Acceptable drills are: custom seeders, furrow drills, disc drills or other drills approved by AERL. All seeding equipment shall be operated perpendicular to the slope. Contractor shall calibrate the drill seeder prior to each use of the equipment unless site conditions have not changed and equipment settings have not been altered since previous calibration. Calibration records shall be furnished to AERL. Upon request, copies of equipment calibration shall be provided to EPA for review. A summary of all calibration records shall be included in the final construction completion document(s) for the project.

Planting depth shall be regulated by depth bands or coulters. The drill box shall be partitioned by dividers no more than 24 inches apart, in order to provide for more even distribution on sloping areas. The rows or planted seed shall be a maximum of 8 inches apart. Drilling depth shall be from 1/4 to 1 inch.

Broadcast Seeding

Seeding by hand or mechanical broadcasting shall be permitted on areas inaccessible to drills or impractical to seed by other prescribed methods. The broadcast seeding rate shall not be less than twice the drill seeding rate. Following the seeding, the soil shall be hand-raked to cover the seed. Broadcast seeding requires the prior approval of AERL.

Hydraulic Seeding

The Contractor must provide one pound of wood fiber mulch per each 3 gallons water in the hydraulic seeder as a cushion against seed damage. The mulch used as a cushion may be part of the total required mulch with the remainder applied after the seed is in place. The Contractor may be required to use extension hoses to reach the extremities of slopes.

When using vegetative mulch, the Contractor may mix the seed with the fertilizer if his hydraulic seed equipment is capable of uniformly mixing water, fertilizer, and seed, in that order, and power blowing or spraying the mixture uniformly over the seedbed. After blending, the slurry shall be applied to the seedbed within 45 minutes after the seed has been added to the water-fertilizer mixture. If the slurry cannot be applied within the specified time, it shall be fortified, at no cost to AERL, with the correct ratio of seed to the remaining slurry and a new 45-minute time frame established for applying the fortified mixture. At no time shall seed and fertilizer remain in a slurry for more than 45 minutes.

Seed Application Areas/Rates - The revegetation mixes include:

**Butte Hill 1997 Primary Seed Mixture
Revegetation Mix**

Seed Mixture	Rate, #PLS/Acre
Slender Wheatgrass	3.0
Thickspike Wheatgrass	2.0
Sheep Fescue	2.0
Crested Wheatgrass	1.0
Ladak Alfalfa	1.0
Red Clover	2.0
Canada Bluegrass	1.0
Birdsfoot Trefoil	1.0
Total	13.0

Butte Hill

Alternate Seed Mixture No. 1 - Gentle Sloped Areas (Less than 10:1) Revegetation Mix

Seed Mixture	Rate, #PLS/Acre	Planting
Bozoisky Russian Wildrye	5.0	Initial seeding, drill seeded on 15-18 inch centers.
Ladak Alfalfa	2.0	Interseeded during following years as determined by vegetation monitoring.
Total	7.0	

Butte Hill

Alternate Seed Mixture No. 2 B Grass-lined Ditches

Seed Mixture	Rate, #PLS/Acre
Smooth Broughm	5.0
Birdsfoot Trefoil	1.0
Red Clover	0.5

Pure live seed application rates shall be as specified in the tables.

The 1997 primary seed mixture was proposed by BSB County and is based upon their monitoring results for successful revegetation within the Butte area and has been reviewed and approved by BSB County, EPA and the State for use in upland areas of the Butte Priority Soils Operable Unit. The Alternate Seed Mixture No. 1 will only be used in areas with slopes of <10:1 that are particularly susceptible to weed infestation. Additional optimal conditions for use of the alternative seed mix include locations with high moisture holding capacity and shelter from strong wind conditions. The Alternate Seed Mixture No. 2 has been proposed by BSB County and is an option for hand seeding grass-lined ditches and detention basins.

Calculations of pure “live seed” may be made on the basis of either a germination test or a tetrazolium test in addition to the purity analysis. Seed shall be applied on a pure “live seed” basis. The quantity of pure “live seed” in a 100-lb. container shall be determined by the formula: 100 multiplied by germination percentage, and this product multiplied by the purity percentage. For example, if the seed is 85 percent pure and test 90 percent germination, then a 100-lb. container would contain 76.5 pounds of pure “live seed”.

Fertilizer Application

If surface soil nutrient availability data are not available, fertilizer will be applied at a rate to achieve soil concentrations of 60 lbs. of nitrogen (N) per acre, 80 lbs. of P₂O₅ per acre, and 150 lbs. of K₂O per acre. Mechanical or hydraulic methods of application are allowed, providing a uniform application at the specified rate is accomplished. The application method is subject to approval by AERL. When scheduling and soil conditions permit, the fertilizer shall be incorporated into the soil by disking, raking, or shallow plowing to the full depth of the topsoil or to a maximum depth of six inches, whichever is less.

Fertilizer shall be applied to the prepared seedbed prior to seeding or mulching and shall be blended with the top layer of soil or concurrently with the seed (as “no-till” drills allow). Upon EPA approval, fertilizer may be applied subsequent to seeding and mulching. Refertilization following seedling establishment will not require incorporation. In no instance shall subsoil be incorporated into the seedbed as a result of the fertilization operation.

Mulch Application

Mulch is usually applied during the summer and early fall and drill seeded after October 15th. The mulch shall be applied in a uniform manner by a mulch spreader at rates varying from 2,000 to 4,000 lbs. per acre. The actual rate utilized shall depend upon site conditions (i.e., slope, erosion potential, etc.) and shall be approved by AERL and EPA prior to application. The mulch spreader shall be designed specifically for this type of work. The vegetative material shall

be fed in the mechanical spreader at an even, uniform rate.

The mulch shall be anchored into the seedbed by using a mulch tiller (crimper). Straw or hay shall be clean grain straw and shall be pliable.

Mulch tillers shall have round, flat, notched blades of these approximate dimensions: 0.25-inch thick by 18 inches in diameter and spaced 8 inches apart. The tiller shall have sufficient weight to force the vegetative mulch a minimum of 3 inches into the soil and shall be equipped with disc scrapers. Mulch tilling shall be done on all slopes capable of being safely traversed by a tracked vehicle. All mulch tilling shall be done perpendicular of the flow-line of the slope.

Mulch, where required, will be applied to seeded areas as close as possible to the completion of seeding operations for the area. Mulch shall not be applied in the presence of free surface water, but may be applied upon damp ground.

Mulch shall not be applied to areas having a substantial vegetative growth, such as grasses, weeds, and grains. Areas not to be mulched shall be determined by AERL. Mulching shall not be done during adverse weather conditions or when wind prevents uniform distribution. Application shall be in a manner to not seriously disturb the seedbed surface.