August 17, 2004
ASARCO BLACK PINE MINE
2004/2005 INTERIM RECLAMATION PLAN FOR THE COMBINATION MINE AREA AND FINAL RECLAMATION PLAN FOR THE BLACK PINE MINE
DRAFT CHECKLIST ENVIRONMENTAL ASSESSMENT

COMPANY NAME: ASARCO **OPERATING PERMIT NO. 00063**
PROJECT: Black Pine Mine
LOCATION: T8N, R14W, Sections 7, 8, 9, 16, 17, 18, 19, and 21
COUNTY: Granite
PROPERTY OWNERSHIP: [X] Federal [ ] State [X] Private

TYPE AND PURPOSE OF ACTION: Reclamation of ASARCO's Combination Mine portion of the Black Pine Mine is necessary to reduce on-going water quality impacts caused primarily by snowmelt leaching through the waste rock dump and seeping out through the toe of the waste rock dump. The leachate has flowed downhill across the permit boundary, and the acid and high copper content have killed the vegetation in the path of these annual short-term flows. In 2001, ASARCO was ordered to construct surface diversions around the toe of the waste rock dump and to construct a lined storm water capture pond and a seepage collection system to capture the leachate and other springs in the area. This water is pumped into the underground mine workings. The capture and pumpback of storm water and several springs influenced by the leachate through the waste rock dump have reduced the water quality impacts to a large extent. The best means of further reducing the ongoing impact would be to prevent the infiltration of snowmelt and precipitation through the waste rock dump.

ASARCO submitted a revised reclamation plan for the entire Black Pine Mine complex (see Exhibit 1 in Attachment 1) to the Montana Department of Environmental Quality (DEQ) and the Beaverhead-Deerlodge National Forest, Pintler Ranger District (USFS) (ASARCO 2002). ASARCO received $190,000 from its Environmental Protection Agency (EPA)-managed trust fund to begin reclamation of the Combination Mine area in 2003. The portion of the plan for the Combination Mine area was accomplished with that funding.

This environmental assessment (EA) addresses the portion of the interim reclamation that ASARCO proposes to accomplish during 2004 and 2005 as well as final reclamation for the entire Black Pine Mine complex.

Combination Mine:

Existing Plan: The existing Combination Mine consists of an access road through the site, scales, several mine and mill buildings, two mine portals, waste rock dump, water tank, storm water diversions, vent raise, and a seepage collection and pumpback system below the waste rock waste rock dump. The buildings and mine portal are located on the top of the waste rock dump, which had a surface area prior to regrading of about 3.5 acres. The waste rock dump angle of repose slope had a surface area of 4.5 acres.

Reclamation of the Combination Mine was originally approved with a standard 1970's plan which included regrading the waste rock dump slope from angle of repose to a 2:1 slope and covering it with salvaged soil materials. Contour trenching of the slope would have been implemented if necessary. Reclamation of the portal area included backfilling the portal with waste rock and recontouring the portal pad. No special measures were approved as acid or toxic drainage was not anticipated. The reclamation of the roads was not specified and they were to be either left intact to provide access for recreational uses or recontoured and seeded according to USFS and State of Montana specifications and recommendations. The option to

be selected would depend upon whether or not the roads would be needed after abandonment of the property.

The following current permitted conditions represent the No-Action Alternative in this draft EA for the entire Black Pine Mine including all components covered by this permit amendment:

CURRENT PERMIT CONDITIONS

Permit Boundary:	1,049.00 acres
Permitted Disturbance:	28.67 acres
Current Disturbance (as of the date of the last annual report):	28.67 acres
Current Bonded Acres:	28.67 acres
Current Bond:	$1,370,000
Obligated Balance:	$1,370,000
Unobligated Balance:	$ 0

Proposed Plan: Interim reclamation at the Combination Mine would continue through 2004 (Chris Pfahl 2004). Initial interim reclamation was analyzed, approved and implemented in 2003. Final reclamation would begin when ASARCO decided to permanently close the mine.

Interim Reclamation: The mill building housing the heavy media separation plant, which runs east-west on the waste rock dump top (see Figure 2-1 in Attachment 2), was removed prior to regrading in 2003. All other buildings would remain in place until ASARCO determined that mining was completed. The buildings would be fitted with gutters and downspouts to divert runoff water from the building roofs to a collection runoff diversion. Upon mine closure, the plant site buildings and foundations would be removed.

ASARCO obtained $190,000 from the trust fund administered by EPA for beginning reclamation of the Combination Mine portion of the Black Pine Mine complex during 2003. Additional funding has been approved for interim reclamation in 2004. More funding will be requested for 2005. The 2003 part of the plan for the Combination Mine area called for completing the following items with field approval by DEQ and USFS personnel. These items have been completed.

1) Relocating USFS Road 448 downhill from its current location at the base of the waste rock dump;
2) Relocating some of the components of and improving the seepage collection and pumpback systems below the waste rock dump(see Figure 6-1 in Attachment 3);
3) Salvaging uncontaminated soils adjacent to the waste rock dump;
4) Salvaging the contaminated soils below the USFS road on ASARCO property,
5) Placing the contaminated soils on top of the waste rock dump,
6) Disturbing a borrow area for road bed construction materials; and
7) Regrading the waste rock dump from angle of repose to a 3:1 slope.

ASARCO also implemented several items (Hydrometrics 2003b) that had been included in the agency alternative and that were field approved by DEQ and USFS staff (see Drawing 3-1 and Figure 3-2 in Attachments 4 and 5 respectively):

1) Constructing a new collection pond below the relocated road to collect waste rock dump runoff and installing a culvert to route that water into the pond,
2) Installing a diversion to route runoff from native ground away from the contaminated soils area, and
3) Installing slash filter windrows and silt fences for erosion control.

ASARCO proposes to complete interim reclamation at the Combination Mine waste rock dump in 2004 and 2005 (see Drawing 1 in Attachment 6). The waste rock dump slope would be covered with a composite soil cover consisting of two feet of cover soil/growth medium (6 inches of topsoil over 18 inches of subsoil) and an underlying drainage layer (see Table 1) placed over a 6- to12- inch layer of compacted low permeability soil. The low permeability soil layer for the slope cap would be comprised of local silty subsoil

material identified during the borrow soil investigation (Hydrometrics 2003a,). A cushion or filter layer, if needed, would be comprised of sandy gravel to prevent piping of the low permeability soils into the waste rock dump fill. The drainage layer would be constructed of relatively high permeability earthen material (such as coarse sand and/or gravel) obtained from the local borrow source or imported onto the site. The resultant cap over the waste rock dump slope would be between 3 and 3.5 feet thick.

Downgradient (east) of the Combination Mine waste rock dump was an area of contaminated soils, called the Combination Soils. During reclamation activities in 2003, the contaminated Combination Soils on ASARCO property were removed and stockpiled on the waste rock dump top. In 2004, the Combination Soils removed in 2003 would be screened and used as a cushion between the coarse subgrade and a 40-mil polyvinylchloride (PVC) liner (or other DEQ approved liner) to be installed in 2004 (see Table 1). If additional soil material is needed for the cushion material to fill in low spots, the silty subsoil from a local borrow source (BPB-4) on ASARCO property (see Exhibit 1 in Attachment 1) would be used. The liner would be covered with a 6-inch cushion/drain layer, which would in turn be covered with 18 inches of subsoil and 6 inches of topsoil for a total cap thickness of at least 2 feet (Hydrometrics 2003a). The liner would be sealed against the building foundations by sloping the subgrade away from the buildings, trenching around the foundations, folding the liner into the trenches, and backfilling with compacted low permeability soil.

A 25-foot roadway would traverse the plant site from south to north to provide vehicular access (see Drawing 1 in Attachment 6). The roadway would be constructed in the same fashion as the rest of the plant site with the exception that the top 6 inches would be comprised of road base material, which would be placed over the subsoil (Hydrometrics 2003a, pg 2-9).

Table1. GENERAL PROFILE OF PROPOSED COMBINATION WASTE ROCK DUMP PLANT SITE AND SLOPE CAPS

SLOPE CAP	PLANT SITE CAP	PLANT SITE ROADWAY
6” topsoil	6” topsoil	6” road base (replaced with topsoil at mine closure)
18” subsoil	18” subsoil	18” subsoil
6” drainage layer (target $k=10^{-2}$ cm/sec).	6” cushion/drain layer	6” cushion/drain layer
6” to 12” low permeability soil layer (target $k=10^{-4}$ cm/sec).	40 mil PVC liner	40 mil PVC liner
Optional filter layer	Cushion layer (possibly excavated Combination Soils)	Cushion layer (possibly excavated Combination Soils)
Mine waste (fill)	Mine waste (fill)	Mine waste (fill)

Note: Table taken from Hydrometrics 2003a, pg 2-5

The subsoil and topsoil/growth medium for both the waste rock dump slope and plant site caps described above would be obtained from a borrow area (BPB-4) located north of the Combination Mine mill and portal area (see Exhibit 1 in Attachment 1). Topsoil would be stockpiled to reclaim the borrow area. If additional borrow material were required because the Combination Soils were determined to be unsuitable for use, borrow areas BPB-2 or BPB-8 could provide additional soils (Hydrometrics 2003a). Based on the rocky nature of these materials, some of the subsoil may require screening to obtain the quality of material needed for the cap drainage system and cushion layer components.

Following soil placement, the waste rock dump slope and surface would be seeded in accordance with the DEQ and USFS seed mixture guidelines as approved for the Black Pine Mine. The seed mix includes a combination of native grasses, forbs and shrubs, and would be hydraulically applied over the site. Wood fiber mulch and tackifier would be used with the application.

Several measures are also proposed to improve storm water management at the Combination Mine site (Hydrometrics, 2003a, see Drawing 3-1 in Attachment 4). Temporary measures would include installation of silt fence along the toe of the reclaimed waste rock dump and the application of the mulch tackifier when the site is seeded. The erosion control plan detailing proposed erosion control measures was submitted to DEQ in 2003 (Hydrometrics 2003b).

Another storm water diversion measure would consist of the runoff collection channel that would collect and divert runoff water from the capped plant site and waste rock dump top. The diversion would be located along the cut slope on the west edge of the plant site. The PVC-lined diversion would drain at a 2 percent slope to the south. The diversion would be designed to handle the estimated 25-year, 24-hour peak flow of 3.24 cubic feet per second (cfs). The diversion would convey water through a new culvert to a storm water retention/infiltration basin to be located south of the plant site on the east side of the access road. The basin would be equipped with an emergency overflow spillway and outlet channel to prevent breaching during an extreme precipitation event.

In the event that capping the waste rock dump would not eliminate the poor quality seepage, more permanent long-term water management measures might be required. These measures may include construction of a lined water collection pond downhill of the Combination Mine, and possible water treatment. Conceptual water treatment methods considered include pumpback and treatment of seepage water within the underground mine workings, pumpback and treatment at the plant site, or treatment through gravity drainage to a small biotreatment cell that would be located downhill (east) of the Combination Mine. Results of additional bench scale water treatment testing will be summarized in additional reports by ASARCO upon completion of testing. The need for additional water management measures would be based on the quality of the Combination Mine seepage water after capping the waste rock dump. Final water management plans would be addressed in a subsequent environmental analysis.

Final Reclamation: The existing gate at the portal would be maintained until mine closure and final reclamation. Once ASARCO decided that mining was completed, both Combination Mine adits (portal and vent raise) would be permanently closed to prevent future access. Closure would be achieved through backfilling the adit with coarse non-reactive fill and then covering the backfill with clean soil fill from BPB-4. Grade would not exceed 2.5:1 in slope.

All buildings remaining on top of the waste rock dump would stay in place until ASARCO determined that mining was completed. The former building areas would be graded to tie in with the surrounding subgrade (see Drawing 4 in Attachment 7). Those areas would be prepared for placement of the PVC liner, which would be joined with the surrounding PVC liner, and capped in the same fashion as the rest of the plant site as described below. The road base material would be removed and replaced with topsoil and seeded for final reclamation after mining ceases (See Table 1).

The north and south access roads would be partially reclaimed as two-track roads to allow access to the property after closure. The road surfaces would be ripped to an approximate depth of 12 inches to reduce surface compaction. Loose, unconsolidated material available in road berms or along roadsides would be pulled down or dozed onto the road surface and used to partially backfill the cut slope. If necessary, cover soil would be placed over excessively rocky areas where revegetation may otherwise be limited. The road surface would be outsloped (1 to 2 percent) and water bars incorporated to reduce the flow length of storm water runoff. The prepared road surface would be seeded with the approved seeding mix.

The following conditions represent the Proposed Action in this draft EA for the entire Black Pine Mine including all components covered by this permit amendment:

PROPOSED PERMIT CONDITIONS

Permit Boundary:		1,049.00 acres
Permitted Disturbance:		28.67 acres
Current Disturbance (as of the date of the last annual report):		28.67 acres
Proposed New Permitted Disturbance (estimated):		24.19 acres
BPB-4 (max. area available)	6 acres	
BPB-8 (max. area available)	8 acres	
BPB-10	5 acres	
Combination Soil Salvage area	3.66 acres	
Increase in Combination Dump	0.7 acres	
USFS Road 448 relocation	0.83 acres	
Total Bonded Acres:		52.86 acres
Current Bond:		$1,370,000
Obligated Balance:		$1,370,000
Unobligated Balance:		$ 0

Tim Smith Mine (Tim Smith #1):

Existing Plan: The Tim Smith #1 adit portal and waste rock dump are located in Section 17, T8N, R14W on the other side of the mountain from the Combination Mine and include a total disturbance of 5.4 acres (see Exhibit 1 in Attachment 1). The current waste rock dump covers approximately 1.9 acres including a relatively flat pad area and the steep waste rock dump face. The waste rock dump is elongated and lies on a moderate south-facing slope. Much of the waste rock dump toe lies near an ephemeral drainage. There has been no mining at this site since 1993.

The adit would be backfilled with coarse rock and support facilities (buildings) would be removed. The vent raise would be filled in and the fence removed. The waste rock dump would be recontoured to conform as nearly as possible with existing topography. Salvaged topsoil would be spread on the waste rock dump and where possible the slope at a thickness of approximately 6 inches. The site would be fertilized and seeded with the agencies' recommended seed mix. No planting of trees was ever proposed or approved for this site.

The access and egress roads would be closed in a manner to effectively stabilize the roadbeds and reduce erosion hazards. The culverts would be removed and the roads regraded to conform with the surrounding topography. The roadbeds would be scarified, covered with salvaged topsoil, fertilized and prepared for revegetation, and seeded with the agencies' recommended seed mixture for the area. Any waste rock used in road construction would be left in place. The powerline would be removed.

Proposed Action: Reclamation of the Tim Smith #1 mine would not change much from what was originally proposed in 1982, however, little detail was provided at that time. The proposed reclamation plan incorporates more detail on how the reclamation would be accomplished.

Reclamation at the Tim Smith #1 would be accomplished in two phases. Interim reclamation would include regrading and capping the waste rock dump, incorporation of storm water controls, and seeding the waste rock dump. Final reclamation to be done at mine closure would include removing two small structures, closure of the Tim Smith adit, and restoration of the haul/access road to a two-track road. See Drawing 6 in Attachment 8.

Interim Reclamation: The waste rock dump would be regraded to provide a more stable configuration and to control storm water runoff. The relatively flat pad area would be leveled and backsloped at approximately 2 percent away from the waste rock dump crest. Excess material, including the piles of

waste rock currently at the west end of the pad, would be pushed to the west extending the waste rock dump in that direction. The slope of the waste rock dump face would be reduced from its current grade to a uniform 2.5:1 grade. Due to the proximity of the waste rock dump toe to the ephemeral drainage on the eastern half of the waste rock dump, that portion of the waste rock dump would remain in its current position and the waste rock dump crest cut back to obtain the desired 2.5:1 grade. The cut material would be hauled and placed at the west end of the waste rock dump. The total cut-and-fill volumes would be approximately 7,500 cubic yards each.

The borrow soils for the Tim Smith #1 soil cap would be obtained from borrow area BPB-10 (see Exhibit 1 in Attachment 1). BPB-10 is approximately 5 acres in size. A minimum 2-foot thick soil cap would be placed over the entire regraded waste rock dump. The cap would be comprised of 18 inches of subsoil (4,600 cubic yards) overlain by 6 inches of topsoil/growth medium (1,500 cubic yards). ASARCO determined that approximately 20,000 cubic yards of subsoil was available at this site for reclamation purposes. The remaining 15,400 cubic yards of subsoil could be used to reclaim the borrow area or for use at other sites. At least half of the available topsoil would be used to reclaim the borrow area; the remaining 5,000 cubic yards of topsoil could be used to reclaim the waste rock dump.

Following soil placement, the waste rock dump slope and surface would be seeded in accordance with the DEQ and USFS seed mixture guidelines as approved for the Black Pine Mine. The seed mix includes a combination of native grasses, forbs and shrubs, and would be hydraulically applied over the site. Wood fiber mulch and tackifier would be used with the application.

Temporary erosion control measures according to the existing storm water discharge permit would include the installation of silt fence along the toe of the reclaimed waste rock dump and the use of tackifier when the slopes are planted. Other storm water controls would be incorporated into the grading and reclamation plan. All diversion channels would be sized to handle the 25-year, 24-hour storm event. A runon diversion would be constructed upslope of the Tim Smith #1 waste rock dump and would be designed to handle 18.7 cubic feet per second. Settling basins would be located at both ends of the diversion with some form of discharge structure (i.e. level spreaders) to reduce the velocity and dissipate the water onto native slopes.

Runoff collection diversions would be constructed along the waste rock dump to collect and divert storm water runoff from the capped waste rock dump slope. One diversion would be located along the west side of the waste rock dump and the second located along the western two-thirds of the south waste rock dump toe. No diversion would be installed along the eastern third of the waste rock dump toe due to its short slope length although silt fence would be installed there. The runoff collection diversions would discharge water into a sediment trap/settling basin near the toe of the southwest corner of the reclaimed waste rock dump. The settling basin overflow would discharge to the native ground via level spreaders or some other appropriate discharge structure designed to dissipate the storm water flow and energy.

Final Reclamation: At mine closure all buildings at the Tim Smith #1 site would be dismantled and removed from the site to an appropriate disposal site.

The Tim Smith #1 adit would be permanently closed by placing earthen fill in the portal to prevent future access. Timbers and other combustible materials would be removed from the site for proper disposal. Clean soil fill would be placed over the backfilled slope and graded to approximate the surrounding grade but would not exceed 2.5:1. The slope would then be seeded as described above for the waste rock dump.

The Tim Smith #1 access road would be partially reclaimed as a two-track road to allow access to the property after closure. The road would be reclaimed as described above for the Combination Mine access roads.

Tim Smith #2

Existing Plan: The Tim Smith #2 area, located in Section 17, T8N, R14W, consists of a partially collapsed decline adit, a waste rock dump located below the portal and a 1,000-foot long access road (see Exhibit 1 in Attachment 1). The original amendment proposed a total disturbance of 2.02 acres. This adit was never fully constructed and does not connect with the main Tim Smith workings. Reclamation of the access road and this adit would not occur until the Tim Smith #1 is closed, as the adit, if completed as planned, could be used as a ventilation/escape route should mining resume.

Once hauling of ore ceased from the Tim Smith #2 adit, the waste rock dump would be recontoured to conform as nearly as possible with existing topography. Salvaged topsoil would be spread on the waste rock dump and where possible the slope. The site would be fertilized and seeded with the agencies' recommended seed mix. No planting of trees was ever proposed or approved for this site. Any support facilities such as the water tank would also be removed at that time. The adit, to be used for ventilation and as an escape route once the two Tim Smith adits connected, would continue to be maintained until the mine closed and would then be backfilled with coarse waste rock.

At mine closure, the access road would be closed in such a manner as to effectively stabilize the roadbeds and reduce erosion hazards. The culverts would be removed and the roads regraded to conform with the surrounding topography. The roadbeds would be regraded, covered with salvaged topsoil, fertilized and prepared for revegetation, and seeded with the agencies' recommended seed mixture for the area.

Proposed Action: The Tim Smith #2 would also be reclaimed in two stages.

Interim Reclamation: The waste rock dump would be regraded to a 2.5:1 slope and covered with 12 inches of growth medium/soil. The soil for reclaiming the waste rock dump would be obtained from proposed borrow area BPB-8 located immediately east of the waste rock dump (see Exhibit 1 in Attachment 1).

Storm water controls would include a runon diversion located uphill of the portal and waste rock dump and silt fence placed along the waste rock dump toe. A riprapped outfall would be constructed at either end of the diversion to dissipate the flow and prevent erosion of the native slope.

Final Reclamation: The adit would be backfilled with coarse waste rock to seal the entrance. The portal area would be regraded to match the existing topography and a 12-inch thick layer of growth medium/soil would be placed over the backfill material. The area would be seeded with the approved seeding mixture.

The Tim Smith #2 access road would be fully reclaimed at closure, as it would not be necessary for post-closure access. The roadbed would be ripped and regraded to restore original drainage patterns. The entire road area would be outsloped to approximate natural drainage patterns and to prevent accumulation of stagnant water. If necessary, cover soil would be dozed or pulled from the area immediately adjacent to the road to provide adequate soil for successful revegetation. The area would be seeded with the approved seed mixture. Woody material (slash) disturbed during reopening of the road would be placed over the seeded surface to discourage post-reclamation use and reduce the erosion potential.

Lewis Shaft Area

Existing Plan: The Lewis Shaft is a ventilation shaft located in the northeast corner of Section 17, T8N and R15W (see Exhibit 1 in Attachment 1). Site features include a metal headframe or hoist house, a fan support facility, a metal warehouse, and access roads and staging area. The shaft was driven in the 1910's but the metal headframe was constructed in the 1970's. The shaft area is currently enclosed by a chain link fence and includes a disturbance area of approximately 0.13 acres. The site would be reclaimed in accordance with the previously approved reclamation plan. Since the Lewis Shaft would be used in any future mining activities, it would not be reclaimed until the Tim Smith and Combination Mines are both closed.

Reclamation efforts would conform to those previously approved by the State of Montana. At the cessation of mining, the buildings would be removed, the disturbed areas stabilized, and ground cover vegetation re-established to return the area as nearly as possible to the state in which it existed prior to commencement of operations. No additional reclamation detail is provided in the 1985 amendment to Operating Permit 00063.

Proposed Action: After the Combination and Tim Smith mines are closed, all structures at the Lewis Shaft would be removed and all metal features would be cut into manageable sized pieces for salvage or disposal. Non-salvageable materials would either be disposed of at an approved offsite facility or onsite if the materials and site conditions warrant. All fencing timbers, asphalt or concrete curbing or surfacing, piping, and other debris or trash would be removed from the site for appropriate disposal.

Following demolition of the headframe, a concrete and earthen plug and soil cap would be placed in the shaft to prevent future access, and to prevent direct recharge to the mine workings from surface runoff. Due to the depth of water below the ground surface, hydraulic sealing of the shaft would not be necessary. Eighteen inches of growth medium would be placed over the backfill in the shaft and the area reseeded with the approved seeding mix.

Disturbed areas around the shaft would be ripped to a depth of 12 inches and regraded to approximate the premining drainage patterns and grade. If the ripped soils were not suitable for revegetation, 6 to 12 inches of growth medium would be placed over all or a portion of the site to promote revegetation. Suitable growth medium would either be obtained from adjacent areas or one of the local borrow areas.

The soil for reclaiming the waste rock dump would be obtained from proposed borrow area BPB-8 located west of the shaft (see Exhibit 1 in Attachment 1).

Agency-Mitigated Alternative: Under this alternative, ASARCO would also be required to incorporate several mitigations into its reclamation plan for the various components of the Black Pine Mine. Those mitigations and stipulations are listed in Section 25 below.

CHECKLIST ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL CHECKLIST LEGEND

Y = Impacts may occur (explained under Potential Impacts)
N = Not present or no impact would occur
NA = Not applicable

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
1. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE: Are soils present which are fragile, erosive, susceptible to compaction, or unstable? Are there unusual or unstable geologic features? Are there special reclamation considerations?	**[Y]** **GEOLOGY** Combination Mine *Existing Condition:* The waste rock dump consists primarily of the quartzites and argillites of the Spokane Formation including ore vein material. Pyrite, iron staining, and copper bearing minerals can be seen on the surface of the waste rock dump and copper staining from mobilization of copper minerals can be seen on rocks, bones, and other debris on the surface of the waste rock dump. The material is crushed mine-run waste material (from 1/2" to less than 6 inches) in size. The waste rock dump top covered approximately 3.5 acres and the waste rock dump slope

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	covered about 4.5 acres. No vegetation was growing on the waste rock dump surface before regrading in 2003 indicating its acid rock characteristics as well as a lack of soil, fine material, or organics. *Existing Plan:* Given that the site has acid rock drainage problems, the lack of detail in the existing plan would result in reclamation of the site that would not adequately address these concerns. The lack of details for final reclamation also makes it difficult to ascertain how successful reclamation and stability of the site would be after closure. *Proposed Action:* <u>Interim Reclamation</u>: Portions of the proposed reclamation plan improvements completed in 2003 should decrease the potential acid rock drainage from the waste rock dump, but the regrading would also increase the potential for more contaminants to be mobilized in the seepage until interim reclamation of the waste rock dump can be completed in 2004. The runoff would be collected and pumped back into the mine workings. This would be a temporary measure until interim reclamation of the waste rock dump is completed in 2004. The cap proposed by ASARCO is complex and would require an intense quality control program to achieve the textures and depths proposed. The contaminated soils on ASARCO property were removed from the Combination Soils area in 2003 and were stockpiled on top of the waste rock dump. These soils would be screened in 2004 to provide a portion of the cushion material beneath a proposed PVC liner to be installed during the next phase of interim reclamation in 2004. The regraded waste rock dump and contaminated soils were not isolated from contact with storm water runoff and infiltration after regrading for at least one year. This resulted in some potential for recontamination of the reconstructed road and the excavated trenches in the Combination Soils area over the winter 2003-2004. They would be isolated when a cap would be placed on the waste rock dump and interim reclamation of the waste rock dump was completed in 2004. The regrading of the waste rock dump to a 3:1 slope would create a more stable landform. The cap, to be installed in 2004, on the long slope of the waste rock dump would be susceptible to erosion. Dozer tracking perpendicular to the slope, on the cap layers, would leave cleat indentations parallel to the slope contour. While the cleat indentations would help to reduce surface erosion and improve infiltration of water into the cover soil, it may not be the best method to keep the cap from potentially slumping along the cap-waste rock interface. As the slope has been graded to 3:1 or less and no liner is proposed to be under the slope cap, chances of slumping would not be great.

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	Minor regrading would be necessary during 2004 to construct an infiltration pond east of the waste rock dump below the south access road and to construct a diversion along the west backside of the waste rock dump to drain south into that pond. This basin would have a capacity of approximately 93,500 gallons, but could contain larger flows as water infiltrates through the bottom of the basin. ASARCO estimates that infiltration could be as high as 400 gallons per minute or 635,000 gallons per day. The basin would be equipped with an emergency overflow spillway and diversion to prevent breaching during an extreme precipitation event. <u>Final Reclamation</u>: When the mine is completely closed, the adit would be backfilled with a minimum of 30 feet of rock and then clean soil material would be backfilled against the cut face and the adit at a 2.5:1 slope and seeded. ASARCO did not specify reclaiming the infiltration pond and diversion, so it is assumed that they would remain in place after closure. The access roads would be reclaimed as two-track roads to the edge of the waste rock dump. The road surfaces would be ripped to an approximate depth of 12 inches. Sufficient material, available in berms or along roadsides, would be pulled onto the road surface and used to partially backfill cut slopes. Water bars would be installed to reduce erosion potential. These measures are sufficient to reduce compaction along the road and fill in cut slopes. This reclamation plan for these roads may not comply with USFS specifications for a two-track road. *Agency Mitigated Plan:* <u>Interim Reclamation</u>: The cap proposed by ASARCO is complex and would require an intense quality control program to achieve the textures and depths proposed. Complex caps take more time and equipment to construct. DEQ investigated a simpler cap for the waste rock dump, which would involve basically two lifts of borrow materials with the last lift containing 35 to 50 percent rock fragments. A geomembrane would have been installed under the cap on the waste rock dump top. The total cap would have been 4 feet thick. As ASARCO's proposed cap would work to reduce infiltration into the waste rock dump, this alternate cap will not be included as a stipulation. A second PVC liner would be attached all around each building to help shed water away from the building. This liner, placed about 18 inches above the cap liner, would slope away from the building. This second liner would be covered with at least 1-foot of rocky non-erosive soil material to protect the liner from exposure to sunlight and the weather. This would provide better

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	control of seepage through the cap around the building-cap interface and eliminate the need for gutters that would not function with the snow load at the site. <u>Final Reclamation</u>: ASARCO would obtain USFS specifications for road reclamation and closure in effect at that the time of closure and reclamation of the access roads to the Combination Mine. At a minimum, 6 inches of rocky soil[1] would be placed on the ripped and regraded roadbed to facilitate revegetation and reduce erosion potential. This mitigation would also be required for reclaiming the access roads to Tim Smith #1 and Tim Smith #2. <u>Tim Smith Mine (Tim Smith #1)</u> *Existing Condition:* The rock in the area of the Tim Smith #1 is similar to that at the Combination Mine. The rock in the Tim Smith #1 ore differs from the Combination Mine ore in that it is reddish quartzite, but not sulfidic vein material. The Tim Smith quartzite does not have the acid generating capabilities of the Combination Mine waste rock. Its actual capacity for acid generation has not been assessed. The current waste rock dump covers approximately 1.9 acres including a relatively flat top and a steep waste rock dump slope (1.5:1 to 2:1 grade). The waste rock dump lies in an east-west direction and is on a moderate south-facing slope. It is 650 feet long and 130 feet wide at its widest point. Much of the waste rock dump toe lies near an ephemeral drainage, which is a tributary to South Fork Lower Willow Creek. There is a large rock pile on the west end of the waste rock dump top. *Existing Plan:* The approved reclamation plan for the Tim Smith #1 site is fairly generic and requires that buildings be removed, and the waste rock dump regraded. The adit would be backfilled with coarse fill at closure. The road would also be regraded and reclaimed at mine closure. The regrading would be done to reshape the site to conform with adjacent topography. No specific details are provided so it is difficult to ascertain if the plan would fully accomplish the reclamation required by law. *Proposed Plan:* The Tim Smith #1 would be reclaimed in two stages. The waste rock dump would be regraded and reclaimed during interim reclamation in 2005. Final reclamation of the rest of the site would not be done until ASARCO decided to permanently close the Black Pine Mine.

[1] Rocky soil is considered to have 35 to 50 percent coarse fragments, which are necessary to reduce erosion potential on steep slopes.

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	Interim Reclamation: The waste rock dump would be regraded to provide a more stable configuration and to control storm water runoff. The relatively flat pad area would be leveled and backsloped at approximately 2 percent away from the waste rock dump crest. Excess material, including the piles of waste rock currently at the west end of the pad, would be pushed to the west extending the waste rock dump in that direction. The slope of the waste rock dump face would be reduced from its current grade to a uniform 2.5:1 grade. Due to the proximity of the waste rock dump toe to the ephemeral drainage on the eastern half of the waste rock dump, that portion of the waste rock dump would remain in its current position and the waste rock dump crest cut back to obtain the desired 2.5:1 grade. The cut material would be hauled and placed at the west end of the waste rock dump. The total cut-and-fill volumes would be approximately 7,500 cubic yards each. Given the problems that have occurred with the Combination Mine waste rock dump drainage, there is some concern that that potential may exist with the waste rock dump at Tim Smith #1. No measures were proposed to analyze the rock to determine if the potential for acid rock drainage exists nor were mitigations identified to handle any potential acid rock drainage. A runon and a runoff diversion would be constructed to divert storm water until final reclamation is completed. Final Reclamation: At closure, all buildings would be removed and minor grading may be necessary to blend with the topography of the adjoining lands. The adit would be cleared of loose soil, timbers, and debris. The adit would be backfilled with non-reactive coarse rock. Cover soil would be placed over the fill and graded to a 2.5:1 slope. Since this mine adit would not discharge mine water, this adit closure plan is adequate for Tim Smith #1 The access road would be reclaimed as a two-track road. The road surface would be ripped to an approximate depth of 12 inches. Sufficient material, available in berms or along roadsides, would be pulled onto the road surface and used to partially backfill cut slopes. Water bars would be installed to reduce erosion potential. These measures are sufficient to reduce compaction along the road and fill in cut slopes. This reclamation plan for the road may not comply with USFS specifications for a two-track road. *Agency Modified Alternative:* Whole rock geochemical analysis of the waste rock dump materials must be provided by ASARCO to ensure that acid rock drainage would not be a concern as it is at the Combination Mine. If the data indicates a potential problem, then measures to reduce the problem must be developed and

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	analyzed prior to reclaiming the waste rock dump. A contingency plan would include capping the waste rock dump in a similar fashion as the Combination Mine waste rock dump until ASARCO provided revised plans for agency review and approval. This stipulation would also be required for Tim Smith #2. <u>Final Reclamation</u>: ASARCO would obtain USFS specifications for road reclamation and closure in effect at that the time of closure. At a minimum, 6 inches of rocky soil would be placed on the ripped and regraded roadbed to facilitate revegetation and reduce erosion potential. This mitigation would also be required for reclaiming the access roads to the Combination Mine and Tim Smith #2. <u>Tim Smith #2</u> *Existing Condition:* The waste rock in the area of the Tim Smith #2 waste rock dump is similar to that at the Combination Mine. Tim Smith #2 ore, like that at the Tim Smith #1, would differ from the Combination Mine ore in that it would be reddish quartzite, but would not be sulfidic vein material. The Tim Smith #2 adit was never completed and never reached the ore vein. The Tim Smith quartzite does not have the acid generating capabilities of the Combination Mine material. Its actual capacity for acid generation has not been assessed. The waste rock pile is comprised predominantly of coarse rock. The footprint measures approximately 200 by 150 feet at its widest point, and is approximately 45 feet high at the waste rock dump face. Based on these dimensions, the waste rock dump volume is approximately 8,000 cubic yards. The waste rock dump face currently stands at angle of repose and supports scattered lodgepole pine. *Existing Plan:* The approved reclamation plan is fairly generic and requires that buildings be removed, and the waste rock dump regraded once the two Tim Smith adits connected and waste rock and ore ceased to be hauled from the Tim Smith #2 adit. The adit would be backfilled with coarse fill at closure. The road would also be regraded and reclaimed at mine closure. The regrading would be done to reshape the site to conform with adjacent topography. No specific details are provided so it is difficult to ascertain if the plan would fully accomplish the reclamation required by law. *Proposed Plan:* <u>Interim Reclamation</u>: The proposed plan contains details to support and expand the generic plan approved in 1985. The waste rock dump would be regraded to a 2.5:1 slope by pushing material down the slope and slightly increasing the footprint and leaving the cut slope exposed. The waste rock dump would then

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	be covered with 12 inches of growth medium/soil from BPB-8. The area would be seeded with the approved seeding mixture. Given the problems that have occurred with the Combination Mine waste rock dump drainage, there is some concern that that potential may exist with the waste rock dump at Tim Smith #2. No measures were proposed to analyze the rock to determine if the potential for acid rock drainage exists nor were mitigations identified to handle any potential acid rock drainage. Final Reclamation: At closure, the adit would be backfilled with coarse waste rock to seal the entrance. The portal area would be regraded to match the existing topography and a 12-in thick layer of growth medium/soil would be placed over the backfill material. The area would be seeded with the approved seeding mixture. The Tim Smith #2 access road would be fully reclaimed at closure, as it would not be necessary for post-closure access. The roadbed would be ripped and regraded to restore original drainage patterns. The entire road area would be outsloped to approximate natural drainage patterns and to prevent accumulation of stagnant water. The proposed reclamation plan for the road may not comply with USFS requirements in effect at the time the road was reclaimed. *Agency Modified Alternative:* Whole rock geochemical analyses of the waste rock dump materials must be provided to ensure that acid rock drainage would not be a concern as it is at the Combination Mine. If the data indicates a potential problem, then measures to reduce the problem must be developed and analyzed prior to reclaiming the waste rock dump. A contingency plan would include capping the waste rock dump in a similar fashion as the Combination Mine waste rock dump until ASARCO provided revised plans for agency review and approval. This mitigation is combined with the same requirement for Tim Smith #1. The Tim Smith #2 waste rock dump would be pulled back into the cut slope to backfill against it rather than just regrading away from the cut slope. This would not increase the footprint of the waste rock dump and would reclaim the cut face. Final Reclamation: ASARCO would obtain USFS specifications for road reclamation and closure in effect at that the time of closure. At a minimum, 6 inches of rocky soil would be placed on the ripped and regraded roadbed to facilitate revegetation and reduce erosion potential. This mitigation would also be required for reclaiming the access roads to the Combination Mine and Tim Smith #2. Lewis Shaft

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	Existing Condition: The rock in the area of the Lewis Shaft has not been assessed geochemically, but may be similar to that at the Tim Smith #1 and #2 areas given its proximity to both sites. Excluding the haul and access roads that are covered above by both Tim Smith facilities, the disturbed area associated with the Lewis Shaft is less than 0.25 acres. The disturbance consists of bare ground around the shaft and is similar in nature to the adjacent road surface. Site features include a metal headframe, a fan support facility, a metal warehouse, access roads, and a staging area. A chain link fence encloses the shaft area. *Existing Plan:* The approved reclamation plan is fairly generic and states that upon permanent cessation of the mine, the site would be reclaimed. After the buildings had been removed the disturbed areas would be stabilized and ground cover re-established to return the area as nearly as possible to the state in which it existed prior to commencement of operations. Reclamation efforts would conform to those previously approved by the state at the time Amendment 4 was approved in 1985. No further detail was provided, making analysis of this alternative difficult. *Proposed Plan:* <u>Interim reclamation</u>: The proposed plan contains details to support and expand the generic plan approved in 1985. At closure, reclamation would begin with the removal of all structures including the headframe and hoist house structure, the fan support facility, a metal warehouse, and any other structures, which may be present. All current structures are metal construction and would be cut to manageable sized pieces for salvage or disposal. Non-salvageable material would either be disposed of at an approved offsite facility, or onsite if the materials and site conditions warrant. Disposal methods, whether onsite or offsite, would meet applicable rules and regulations. In addition to the site structures, all fencing, timbers, asphalt or concrete curbing or surfacing, piping, and other debris or trash would be removed from the site for appropriate disposal. Disposal options and requirements would be the same as those described above for the demolished structures. Following demolition of the headframe, a concrete and earthen plug and soil cap would be placed in the shaft. Objectives of the plug are to mitigate safety issues associated with an open shaft, prevent direct recharge to the mine workings from surface runoff, and allow for post-mining land usage. Since groundwater levels are a few hundred feet below the shaft collar, hydraulic sealing of the shaft would not be necessary.

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	Following site preparation, an approved backfill material would be placed in the shaft to serve as the earthen plug. The plugged zone would extend down to competent bedrock to eliminate the potential for sloughing of overburden material below the plug. Due to the considerable shaft length (425 feet), backfilling the entire shaft would not be attempted. Instead, a support structure or bulkhead would be constructed and tied into the bedrock walls to support the backfill material. The shaft would be backfilled to approximately six inches below surrounding grade and 18 inches of growth medium placed over the backfill. This would create a slight mound over the backfilled shaft, which will promote surface runoff and reduce potential infiltration through the plug and to the mine workings. The area would then be seeded in accordance with the USFS specified seed mix. A settlement monument would be placed on the surface of the plug to allow subsequent monitoring for potential settlement. The reclamation plan for the Lewis shaft is reasonable and would result in successful reclamation of the site to comparable stability and utility as required by law. *Agency Modified Alternative:* No changes are proposed to ASARCO proposed reclamation plan with regard to geology and regrading of mining-related features. **<u>SOIL</u>** <u>Combination Mine</u> *Existing Condition:* It is most likely that any soils salvaged from the mine and waste rock dump areas would be fine silty sands with 25 to 50 percent coarse fragments similar to what is at the borrow areas identified by ASARCO. Topsoil in the mine area has about one percent organic matter and an average sodium adsorption ratio of 0.25. The soil is relatively low in nitrogen and potassium, but these soils currently support vegetation on undisturbed native sites. Minimal soil was salvaged by the previous mine operator. Some soil may be located adjacent to the scales. ASARCO has some stockpiled organic material on the Combination Dump for use in reclamation. Downgradient (east) of the Combination Mine waste rock dump is an area of contaminated soils referred to as the Combination Soils (referred to as barren sections in Figure 3-2 in Attachment 5). These soils occurred as two relatively long, narrow strips of land devoid of vegetation and extending from the toe of the waste

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	rock dump eastward for a distance of at least 1,000 feet. The eastern lateral extent of the affected soils downgradient of spring CPS-1 is not fully determined and additional sampling is needed to identify all affected soils in that area. Soil sampling by ASARCO has shown the Combination Soils to contain elevated concentrations of some metals, including copper, zinc, lead, and manganese, as compared to peripheral soils outside the contaminated area. The source of the metals is runoff and seepage from the waste rock dump as the barren area corresponds to the path of runoff flows. Based on limited data, ASARCO believed the high metals concentrations were primarily in the top 6 inches in most of the barren area. USFS Road 448 crossed through these materials just below the waste rock dump. The slopes of the road fill materials were also contaminated. ASARCO identified one primary soil borrow area for use on the Combination Mine portal area and waste rock dump. Borrow area BPB-4 is located approximately 500 feet north of the mine on the west side of the north access road on ASARCO property. The topsoil in BPB-4 ranges in depth from 1 to 3 feet and averages 2 feet thick across the site. The topsoil is generally a brown to dark brown silty fine sand with approximately 25 percent coarse rock fragments (gravel to cobbles). The subsoil ranges from 2.5 to 8 feet thick and averages 5.5 feet. The subsoil is generally light to reddish or orange brown fine silty sand with 50 percent coarse fragments (angular gravels to cobbles); a minor clay component is present in some of the subsoils. The soils at this site are slightly acidic with a soil pH averaging about 5.4 – 5.6 with the subsoils being slightly less acidic. The soil in this borrow area is chemically and physically suitable for reclamation. If a second borrow area is needed for reclaiming the Combination Mine area, a second site, BPB-2, is located about 1000 feet northeast of BPB-4 (see Exhibit 1 in Attachment 1). Topsoil at BPB-2 is approximately 1 foot thick. The topsoil is generally brown to dark brown, silty fine sand to silty sand with less than 10 percent gravel-sized coarse fragments. The subsoil ranges from 7 to 9 feet thick and averages 6 feet. The top 4 feet of the subsoil is generally light brown fine silty sand with 50 percent coarse fragments (angular gravels to cobbles). Subsoils below 5 feet are orange brown sandy clay to light orange brown fine sandy clay with 50 percent coarse fragments (angular gravels to cobbles). The soils at this site are slightly acidic with a soil pH averaging between 5.1 and 5.4 with the subsoils being slightly less acidic. The soil in this borrow area is chemically and physically suitable for reclamation. *Existing Plan:* Soil salvaged from the waste rock dump area was to have been placed below the waste rock dump area. At least 1 foot was to have been salvaged from the portion of the waste rock dump on USFS lands and soil was to have been salvaged

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	and stockpiled where practical, and stored on private land whenever possible. Any soil material that may have been placed at the toe of the waste rock dump has been contaminated by the acid rock drainage from the waste rock dump and cannot be used for reclamation purposes. Reclamation was proposed to be accomplished in three phases. Cut slopes would have been reclaimed during the first phase but no soil was proposed or approved to be used. No soil was proposed for the fill slopes of the waste rock dump, which were to be reseeded during phase 2 as the waste rock dump areas were completed. During phase 3, the complete reclamation of the portal area would be accomplished to return the site to its original vegetative cover. Revegetation and soil distribution would have been done as recommended at closure by the State of Montana and the Soil Conservation Service (now Natural Resources Conservation Service). The lack of detail in the approved reclamation plan does not assure that reclamation and revegetation of the site would result in comparable stability and utility to surrounding lands. It is also unlikely reclamation would be successful given the acid rock drainage problem and the lack of suitable salvaged soil. The existing approved plan provides no measures to address the soil contamination problem below the waste rock dump caused by acid rock drainage. *Proposed Action:* <u>Interim Reclamation</u>: Soil to the north (0.35 acre) and south (0.4 acre) of the waste rock dump area were salvaged before the waste rock dump slopes were regraded in 2003 and were stockpiled for use in interim reclamation of the waste rock dump in 2004. ASARCO proposes to salvage and use half of the volume of soil from BPB-4 for interim and final reclamation at the mine and waste rock dump and the other half for reclaiming the borrow area. In 2003, material to construct the relocated roadbed was taken from this borrow area. A total of 6 acres within borrow area BPB-4 could be disturbed to provide the approximately 7,000 cubic yards of topsoil/growth medium and 21,000 cubic yards of subsoil required for the 2-foot thick cover soil layers. Up to 10,000 cubic yards of topsoil would be stockpiled to reclaim the borrow area. ASARCO estimates that up to 9,500 cubic yards of topsoil and 53,000 cubic yards of subsoil would be available for cap construction. ASARCO would have to protect the borrow area using Best Management Practices (BMPs) to prevent erosion and loss of soil material until interim reclamation could be completed in 2005.

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	DEQ believes that the soil borrow area, BPB-4, may not contain the volumes of soil estimated by ASARCO. Area soils can be variable and typically shallow and rocky with thin organic horizons or topsoil layers. If the estimates of soil materials are low, there may be insufficient soil at BPB-4 to complete interim reclamation of the entire Combination Mine waste rock dump and soil areas in 2005. BPB-2 and BPB-8 are mentioned as possible additional sources of borrow material. No mention is made of the amount of material available for the Combination Mine area, as some of the soil in BPB-8 would be used for reclaiming the Tim Smith #1 Mine area and possibly the Lewis Shaft. In 2003, ASARCO resloped the top of the waste rock dump to a grade of 1 to 2 percent away from the crest of the waste rock dump toward the cut face behind the mine and mill buildings. ASARCO also reduced the slope of the waste rock dump from the angle of repose to a 3:1 slope. The uninterrupted waste rock dump slope has increased the erosion potential of fine materials exposed during regrading. Without a liner or a cap, storm water carried some fine sediment down to the base of the waste rock dump and perhaps farther onto the reconstructed roadbed and diversion. This may have contaminated some of the new roadbed before installation of the waste rock dump cap is completed in 2004 and the Combination Soils area is completed in 2005. This means that any roadbed and soils that were contaminated would need to be tested to determine the level of contamination. If needed the contaminated material and soils would need to be removed. If left in place the contaminated material and soils could limit successful revegetation. The waste rock dump is 125 feet high. The slope is 3:1 or less and the slope length is almost 400 feet long. The long uninterrupted slopes on the waste rock dump would be more susceptible to erosion of the cap cover material than slopes periodically broken by benches. The dozer cleat indentations in the slope cap would help somewhat to reduce erosion and increase infiltration into the cover soil for use by vegetation, but they do not help reduce slope length and control erosion like benches would. It is not possible to install benches across the regraded waste rock dump. Installing benches would expand the footprint of the waste rock dump, and there is insufficient room to do so between the regraded waste rock dump slope and the new roadbed. The potential for erosion on the waste rock dump slope would be similarly decreased if benches are constructed or if soils with suitable coarse fragment contents are used to reclaim the dump. ASARCO did not specify the texture of soils to be used on the top versus the slope of the waste rock dump. If fine sandy soils with little coarse fragment content were placed on the slope, they would be susceptible to erosion. ASARCO has specified that

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	topsoil would have a maximum of 20 percent of material greater than 2 inches in size and subsoil would have no more than 20 percent of material greater than 4 inches in size (ASARCO 2004). This specification could result in some material be classified as unsuitable topsoil or subsoil reducing the amount of soil available for reclamation. All soils to be used on the waste rock dump slope should contain 35 to 50 percent coarse fragments. This would help reduce erosion potential on the slopes. Less rocky fine textured soils would be suitable for flatter slopes on the waste rock dump top. Without this distinction and with the 400 foot long uninterrupted slope, the cap, especially the topsoil lift, would be susceptible to erosion during precipitation events and spring snowmelt. The top 6 inches of the cover soil material used in the caps on the Combination Mine waste rock dump would consist of topsoil taken either from BPB-4 or soil stockpiles created prior to regrading activities in 2003. ASARCO has not planned to incorporate additional organic material into the topsoil, but did specify that topsoil must have 1 to 20 percent organic material (ASARCO 2004). Organic matter increases the water holding capacity and fertility of the topsoil and provides the basis for a microbial community to reestablish in the soil. Lack of adequate organic matter would slow down revegetation success. ASARCO proposed a cutoff of 300 ppm copper as a guideline to direct cleanup of the Combination Soils. Soils left in place at 300 ppm copper would exceed background levels and may also contain elevated levels of other metals. No method was suggested by ASARCO on how to evaluate that level in the field. The agencies reviewed background soils information and found levels to be less than 50 ppm. The agencies assume that if copper levels are below 50 ppm then other metals of concern will be reduced as well. Removing the existing roadbed materials and the Combination Soils on ASARCO property in 2003 eliminated most of this contaminated material during the first year of interim reclamation work. The lack of field verification of the extent and depth of contamination may have resulted in some contaminated soil remaining in place as ASARCO only proposed removing six to 24 inches of contaminated materials at different sections of the contaminated area. Field inspection by the agencies in 2003 revealed that ASARCO removed Combination Soils on ASARCO property to a depth of 3 feet. ASARCO tested the materials left and found copper levels still were above 300 ppm in some of the removal areas (Chris Pfahl 2004). No contaminated soils were removed from USFS property in 2003. The USFS has approved the removal of the soils in 2004 (USFS 2004), but none of the soils would be removed in 2004

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	because of a lack of funding. ASARCO plans to remove the contaminated soils on USFS property in 2005. The entire Combination Soils area on ASARCO and USFS property would be reclaimed in 2005 by regrading the excavated trenches into two swales to blend in with surrounding topography. The swales would be deepest on the upgradient (west) ends and tapering to meet the existing ground surface at the eastern end. ASARCO believes that excavation of soils adjacent to the swales may provide sufficient and suitable soil cover material if the post-excavation surfaces were not suitable for direct revegetation. If testing of the surface and adjacent materials indicates that they are unsuitable as a growth medium, the soils would be imported or in-place soils amended. Due to the anticipated shallow depth of removal, ASARCO did not propose to backfill excavated areas unless required to provide a suitable growth medium. ASARCO did not provide an updated plan as to how they would modify this plan for the 3-foot deep trenches excavated in 2003 and how to address the elevated levels of copper below the three-foot depth. Once the Combination Soils area was stabilized and vegetation established, the temporary diversion north of the waste rock waste rock dump would be removed. Topsoil removed and stockpiled nearby during the construction of the diversion in 2003 would be used to backfill the diversion. The topsoil would then be seeded with an approved seed mix. Other temporary diversions would be likewise reclaimed. The runon diversions above the mine would remain in place. Storm water runoff from the waste rock dump top was not routed into the mine to minimize the risk of contaminating undisturbed off-site area between the regrading done in 2003 and the completion of interim reclamation on the waste rock dump in 2004. Given the permeability of the waste rock dump, it was likely that most water would infiltrate into the waste rock dump top. It might be possible that much of the storm water runoff during a rain-on-snow event would flow off the waste rock dump top when the surface was frozen. ASARCO's Erosion Control Plan for 2003 Construction Activities (Hydrometrics 2003b) provided for capturing any runoff in the diversion below the waste rock dump and routing it to a new lined collection pond east of the reconstructed road to be pumped back into the mine. As mentioned above some runoff did leave the waste rock dump surface in the spring of 2004 and may have contaminated some additional soils or roadbed materials. ASARCO installed three new culverts under the relocated road. The first one was installed just above and south of the Combination Soils area; the second culvert was installed approximately 250 feet downgradient of the relocated portion of the road. These two culverts along with a temporary diversion

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	constructed above the road northeast of the waste rock dump were necessary in order to route storm water from undisturbed areas to avoid the Combination Soils area until interim reclamation of this area is completed in 2005. A third culvert, that had been included in the Agency Mitigated Alternative in the draft 2003 EA and was later incorporated into the Erosion Control Plan for 2003 Construction Activities (Hydrometrics 2003b), was installed at the north branch of the Combination Soils area to drain surface water runoff from the waste rock dump collected in the permanent diversion constructed below the waste rock dump and above the road to a lined pond. These features would limit runoff from the waste rock dump contaminating the roadbed material and the excavated drainages where the contaminated Combination Soils were removed in 2003. They also would help prevent erosion of newly topsoiled and seeded portions of the Combination Soils area in 2005 until vegetation was established. Without all of these measures, it was possible that seepage through and runoff from the waste rock dump from spring snowmelt or a rain-on-snow event could flow across the reconstructed roadbed or down the road diversion to downgradient culverts onto native soils. Either situation would result in mine-related waters contaminating the new roadbed or undisturbed soils, or increasing the contamination of the remaining Combination Soils. These soils would then need to be removed and replaced a second time during the completion of interim reclamation in 2005. These features along with the effectiveness of the improved seepage collection system and/or the lack of a large snowmelt runoff in late winter 2004 allowed most runoff from the waste rock dump to be captured in the lined pond below the road. The temporary diversion northeast of the waste rock dump would be removed after the cap was installed and seeded and the Combination Soils area stabilized and vegetation established. The remaining storm water control features would remain in place after all interim reclamation associated with the Combination Mine, the Combination Soils area, and BPB-4 was completed in 2005. The collection pond and pumpback system components would not be removed until it had been determined that the cap was effective in reducing or eliminating the acid rock drainage from the waste rock dump. <u>Final Reclamation</u>: When the mine is permanently closed, the remaining buildings would be torn down and removed from the site. Additional liner would be installed where the buildings had been and connected to the liner installed during interim reclamation. The cap in those areas would be constructed in the same fashion as it was for the rest of the top during interim reclamation. The new cap material would be reseeded with ASARCO's seed mix. The road base material would be removed

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	from the road across the waste rock dump and replaced with 6 inches of topsoil from BPB-4, or BPB-2 and BPB-8 if necessary, and reseeded. At closure, both adits would be permanently closed to prevent future access. The adit would be cleared out and backfilled with coarse non-reactive rock. Cover soil would be placed over the backfill and graded to a 2.5:1 slope. The fill would be compacted and seeded with the approved seed mix. Again, the lack of organic material in the cover soil could hinder revegetation efforts and the lack of topsoil with adequate coarse fragments could result in erosion of that material reducing the potential for successful revegetation. The north and south access roads would be partially reclaimed as two-track roads. The roadbeds would be ripped to a depth of 12 inches to reduce surface compaction and regraded. Loose soil material available in roadside berms or adjacent areas would be pulled or dozed onto the road surface. If necessary, cover soil would be placed on rocky areas where revegetation might otherwise be limited. No source of cover soil was specified, but as BPB-4 would be the source of soil materials for the Combination Mine that would most likely be the source. No depth of cover soil was specified. Water bars would be placed every 250 feet on grades greater than five percent and every 500 feet on grades less than five percent. The prepared road surfaces would be seeded with ASARCO's proposed seed mix. These measures should allow vegetation to become established on the roadbed depending upon a couple of factors. Without specifying the depth of potential cover soil applications on the roadbed, there may be areas where the soil is too shallow or droughty to sustain vegetation. If there is much traffic after planting or during the first couple of years, revegetation efforts may not be successful and reseeding may be required. While the water bars would help route storm water off the reclaimed road and reduce erosion potential on the road, the cover soil may be more easily eroded if fine textured soils with few rock fragments are used on steeper slopes. The use of soils with 35 to 50 percent coarse fragments on steeper slopes would help to minimize the erosion potential. *Agency Modified Alternative:* <u>Interim Reclamation</u>: After interim reclamation is completed in 2005, ASARCO would need to submit an as-built map showing reclaimed topography, and the location of water collection facilities and all soils stockpiles to be used for final reclamation of the waste rock dump top and the borrow area(s). The volumes of soil in those stockpiles must be indicated. As-built maps and

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	drawings are required so that DEQ has documentation of the reclamation, water collection system and soil stockpiles before final reclamation at the Combination Mine area. If there were insufficient material for final reclamation at BPB-4, then ASARCO would use BPB-2 (see Exhibit 1 in Attachment 1). BPB-2 is closer to the Combination Mine and would not be used for reclaiming other areas of the Black Pine Mine. All soil stockpiles could be temporarily seeded with ASARCO's seed mix or a DEQ approved seed mix. The disturbed area within BPB-4 and BPB-2, if used, would be seeded in 2005 with a seed mix approved by DEQ, to reduce the potential for erosion and loss of soil materials. The seeding rate would also be approved by DEQ if drill seeding or hydroseeding were to be used. All slopes 3:1 or less should be drill seeded unless other factors prohibited access by a drill. To further reduce the erosion potential on the waste rock dump slope and other steep grades, rocky topsoil would be used on the waste rock dump slopes. Any soils used on the last lift for the waste rock dump slope for the cap would contain 35 to 50 percent coarse fragments. This would help to keep the soil in place during precipitation events and snowmelt runoff. Finer textured soils would only be used on the waste rock dump top and flatter slopes. Additionally, the last lift of the cap on the waste rock dump *slope* would be 12 inches deep of this rocky topsoil rather than the 6 inches of soil with only 20 percent coarse fragments proposed by ASARCO. The thicker soil depth would facilitate revegetation success by minimizing erosion and increasing the rooting depth for vegetation. Twelve inches of soil is recommended but not required for the last lift of the waste rock dump *top* cap to improve revegetation success. Organic material, such as composted wood chips would be incorporated into the top 2 inches of all topsoil placed on the waste rock dump if the organic matter content is less than one percent. This would help improve the establishment of the microbial community in the soil, fertility and water holding capacity of the topsoil and therefore, improving the potential for successful revegetation of the cap. ASARCO has a stockpile of composted organic material located just east of the south access road. An x-ray fluorescence analyzer (XRF analyzer) would be used in the field in 2005 to verify that sufficient contaminated Combination Soils had been removed. Any roadbed material and soils that were affected by runoff and sediment in 2003 and 2004 must also be sampled. The agencies have specified that soils would be removed based on limits developed from background levels of 50 ppm copper in uncontaminated soils in adjoining areas. Agencies assume that if copper levels were below 50 ppm that other metals of concern would be reduced as well. The XRF

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	would be used to check contamination levels at the base of existing trenches and soils adjacent to the trenches and downgradient to the wetlands on USFS property. There would be no need to excavate more than 3 feet of material from the Combination Soils area in all areas where the copper concentration was between 50 and 300 ppm at the base of the trench. The trench would be backfilled with 3 feet of clean soil material from one of the borrow areas. If the contamination was greater than 300 ppm copper at the base of a 3-foot trench, then ASARCO would remove an addition foot of contaminated material and backfill the trench with 4 feet of clean soil material from one of the borrow areas. Excavation of contaminated soils would not extend into the downgradient wetlands on USFS property. All trenches would be filled with clean material to original grade. The top 6-12 inches of soil material would consist of rocky topsoil with 35-50 percent coarse fragments to reduce erosion potential in these drainages. The clean material would be planted with a DEQ approved seed mix and seeding rates for the method of seeding. All slopes 3:1 or less should be drill seeded unless other factors prohibit access by a drill. If any additional contaminated soils were identified as described above or any new areas were recontaminated over the winters of 2003-2004 and 2004-2005, they would be removed and placed in a DEQ field approved location in BPB-4. A PVC liner would be placed on top of these contaminated soils materials and a cap like that constructed for the waste rock dump would be installed over the liner. The cap would be planted with an approved seed mix. This will protect ground water beneath the contaminated materials. If the soils are placed on a slope, a diversion must be constructed around the contaminated soil dump to prevent seepage from contaminating the material from underneath. <u>Final Reclamation</u>: At final reclamation the road base material would be removed from the roadway on the waste rock dump top as proposed by ASARCO. These areas would be ripped to a depth of 12 inches to reduce compaction as ASARCO has proposed for completely reclaiming the access road to Tim Smith #2. Then at least 6 inches of topsoil from BPB-4 or BPB-2 would be placed in those areas as well as the last lift of the cap installed where the buildings had been removed. Organic material would be incorporated into the top 2 inches of the soil placed on the reclaimed roads and backfilled adit if the organic matter content in the soil was less than 1 percent. Then these new areas would be seeded with a DEQ approved reclamation seed mix. The ripping of the traffic areas would reduce compaction from traffic across the waste rock dump between interim and final reclamation. The ripping and increased soil depth would increase the depth of the root zone enhancing reclamation success on these portions of the reclaimed waste rock dump top.

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	A minimum of 6 inches of rocky topsoil from BPB-4 or BPB-2 would be placed on the access roads after the existing surface is ripped. Soils used on steeper slopes would contain 35 to 50 percent coarse fragments. This would help to keep the soil in place during precipitation events and snowmelt runoff. It would also enhance the potential for reclamation success. If DEQ and the USFS determine during field inspection that organic matter is needed to further enhance reclamation success, ASARCO would incorporate organic material into top 2 inches of the soil over the road surface. <u>Tim Smith Mine (Tim Smith #1)</u> *Existing Condition:* The topsoil in BPB-10 is classified as fine silty sand to silty loam with approximately 25 percent coarse rock fragments Subsoils were similarly classified but contained approximately 50 percent coarse rock fragments greater than 3 inches. There is no information regarding soil characteristics at the Tim Smith #1 although they are most likely similar to BPB-10, which is near by. No soil stockpiles are located at the site. *Existing Plan:* Salvaged soil would be replaced on the regraded waste rock dump top and slope, if possible, to a depth of 6 inches. Salvaged soil along the road would be replaced after the road was scarified and regraded. All regraded and resoiled areas would be fertilized and planted with the agencies' seed mixture for the area. No quantities of soil were otherwise specified in the original amendment for this site. No alternate sources were provided should additional soil be required. No soils were salvaged and stockpiled at the mine portal area or along the access road when the Tim Smith #1 mine portal was being constructed. Without the stockpiled soil, the reclamation plan could not be implemented and the Tim Smith #1 site could not be properly reclaimed. Successful revegetation would be very difficult to achieve. *Proposed Plan:* <u>Interim Reclamation</u>: Half of the topsoil (5,000 cubic yards) in BPB-10 would be retained to reclaim the borrow area at closure; only 1,500 cubic yards would be required to reclaim the waste rock dump along with 4,600 cubic yards of subsoil. A total of 20,000 cubic yards of subsoil are available for use. The cap would consist of 18 inches of subsoil overlain by 6 inches of topsoil placed on the waste rock dump in separate lifts. Dozer tracking of each lift perpendicular to the slope would help decrease water velocity down the reclaimed slope.

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	ASARCO has proposed a seed mixture of native grasses, forbs, and shrubs that would be hydraulically applied over the waste rock dump surface. Wood fiber mulch would be included at a rate of 1,000 pounds per acre during seeding and at a second application for a total of 2,000 pounds per acre. A mulch tackifier would be applied with the second mulch application to assist in reducing erosion of the topsoil and loss of seed. <u>Final Reclamation</u>: Clean soil would be placed over the backfill in the adit and graded to approximate the surrounding grade. The soil would be compacted and seeded with the proposed seed mixture. The Tim Smith #1 access road would be partially reclaimed as a two-track road at mine closure. After the roadbed is ripped to a depth of 12 inches and regraded, cover soil would be placed on rocky areas where revegetation might otherwise be limited. Water bars would be placed every 250 feet on grades greater than five percent and every 500 feet on grades less than five percent. The prepared road surfaces would be seeded with ASARCO's proposed seed mix. These measures should allow vegetation to become established on the roadbed depending upon a couple of factors. Without specifying the depth of potential cover soil applications on the roadbed, there may be areas where the soil is too shallow or droughty to sustain vegetation. If there is much traffic after planting or during the first couple of years, revegetation efforts may not be successful and reseeding may be required. While the water bars would help route storm water off the reclaimed road and reduce erosion potential on the road, the cover soil may be more easily eroded if fine textured soils with few rock fragments are used on steeper slopes. The use of soils with 35 to 50 percent coarse fragments on the slopes would help to minimize that potential. *Agency Modified Alternative:* <u>Final Reclamation</u>: The Tim Smith #1 access road would not be reclaimed until after the buildings were removed and the mine portal and the waste rock dump were reclaimed. This road would be reclaimed to USFS specifications at closure. At a minimum, 6 inches of rocky soils containing 35 to 50 percent coarse fragments would be placed on the ripped and regraded road. This would help to keep the soil in place during precipitation events and snowmelt runoff and help reduce compaction of the road whenever it was used after the access road was reclaimed. The deeper soils would enhance reclamation potential. If DEQ and the USFS determine during field inspection that organic matter is needed to further enhance reclamation success, ASARCO would incorporate organic material into top 2 inches of the soil over the road surface to raise the organic matter content

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	to one percent. <u>Tim Smith #2</u> *Existing Condition:* BPB-8 is the closest borrow area to the Tim Smith #2 area, although it was not included in the approved plan in 1985. The topsoil is approximately 1 foot thick and the subsoil is about 2 feet thick. The entire profile is classified as a silt loam with 22-25 percent coarse fragments in the topsoil and 50 percent coarse fragments in the subsoil. There is no information regarding soil characteristics at the Tim Smith #2 although they are most likely similar to BPB-8, which is nearby. No soil stockpiles are located at the site. *Existing Plan:* Salvageable topsoil should have been stripped and stockpiled from areas covered by the waste rock dump and road. These soils were to be used to reclaim the site after closure. Salvaged topsoil would be placed on the regraded waste rock dump surface and, where possible, the slope. The soil would be prepared for seeding and planted to provide a stable and permanent vegetative cover in compliance with the best available technology at that time and in accordance with recommendations by the State of Montana. The access road would not be reclaimed until closure of the mine. At that time, it would be closed in a manner to effectively stabilize the roadbed and reduce erosion hazards. It would be graded, covered with salvaged topsoil, fertilized, and prepared for revegetation with the recommended seed mixture. No soils were salvaged and stockpiled at the mine portal area or along the access road when construction began at Time Smith #2. Without the stockpiled soil, the reclamation plan could not be implemented and the Tim Smith #2 site could not be properly reclaimed. Successful revegetation would be very difficult to achieve. *Proposed Plan:* <u>Interim Reclamation</u>: The waste rock dump would be regraded to a 2.5 to 1 slope and covered with 12 inches of growth medium soil. The soil would be obtained from proposed soil borrow area, BPB-8, located immediately east of the waste rock dump (see Exhibit 1 in Attachment 1). Approximately 6,400 cubic yards of topsoil would be available from BPB-8 for reclaiming the Lewis Shaft area and Tim Smith #2 as well as up to 25,800 cubic yards of additional subsoil. <u>Final Reclamation</u>: The adit would be backfilled with coarse waste rock to effectively seal the entrance. The portal area would then be regraded to match the existing topography and a 12-inch

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	thick cover soil layer placed over the backfill material. The regraded waste rock dump and portal area would then be seeded in accordance with the proposed seed mix and application rates. At closure, the access road would be completely reclaimed. The roadbed would be ripped and the area regraded to restore original drainage patterns. Loose unconsolidated material in the fill shoulder and the ripped roadbed would be dozed or pulled into the cut slope to reduce its grade. The entire area would be outsloped to approximate original drainage patterns and to prevent accumulation of stagnant water. If necessary, cover soils from areas adjacent to the road would be used to provide sufficient soil for revegetation. The regraded road area would be seeded with the approved seed mix. Woody material (slash) disturbed during reopening and then regrading the road would be placed over the seeded surface to discourage post-reclamation use and reduce erosion potential. ASARCO did not specify the depth of ripping, the amount of cover soil that would be placed, or the criteria that would trigger the need for the cover soil. It is assumed that the road would be ripped to 12 inches prior to regrading, as that is the depth mentioned in the rest of the application. Depending on how much regrading needs to be done, some areas may require additional ripping to reduce compaction in the root zone prior to placement of cover soil. Without specifying the depth of potential cover soil applications on the roadbed, there may be areas where the soil is too shallow or droughty to sustain vegetation. The cover soil may be easily eroded if fine textured soils with few rock fragments are used on steep slopes. The use of soils with 35 to 50 percent coarse fragments on steeper slopes would help to minimize that potential. *Agency Modified Alternative:* <u>Final Reclamation</u>: The access road would be reclaimed to USFS specifications at closure. After regrading and before placement of any cover soil and seeding, the regraded area would be ripped again to 12 inches to ensure that the root zone would not be compacted. Unless otherwise specified by USFS, there would be a minimum of 6 inches of suitable growth medium on top of the regraded road area. The additional ripping and soil or growth medium depth would enhance potential for reclamation success. Any cover soil needed would be taken from BPB-8. Soils used on the road would contain 35 to 50 percent coarse fragments. These rocky soils would help to keep the soil in place during precipitation events and snowmelt runoff. The ripping and soil would provide a better site for establishing vegetation and would not increase the area of disturbance to obtain soil adjacent to the road. If DEQ and the USFS determine during field inspection that organic matter is needed to further enhance reclamation success, ASARCO would incorporate organic material into top 2 inches of

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	the soil over the road surface to raise the organic matter content to one percent. <u>Lewis Shaft</u> *Existing Condition:* BPB-8 is the closest borrow area to the Lewis shaft, although it was not included in the approved 1985 plan. The topsoil is approximately 1 foot thick and the subsoil is about 2 feet thick. The entire profile is classified as a silt loam with 22-25 percent coarse fragments in the topsoil and 50 percent coarse fragments in the subsoil. There is no information regarding soil characteristics at the Lewis Shaft although they are most likely similar to BPB-8, which is nearby. No soil stockpiles are located at the site. *Existing Plan:* Upon permanent closure of the mine, the site would be reclaimed. No mention was made of salvaging soil at this site or using it to reclaim the disturbed areas. There are no soil stockpiles in the Lewis Shaft area. After the buildings had been removed, the disturbed areas would be stabilized and ground cover re-established to return the area as nearly as possible to the state in which it existed prior to commencement of operations. Reclamation efforts would conform to those previously approved by the state at the time Amendment 4 was approved in 1985. No further detail was provided making analysis of this alternative difficult. *Proposed Plan:* Approximately 6,400 cubic yards of topsoil would be available from BPB-8 for reclaiming the shaft area and Tim Smith #2 as well as up to 25,800 cubic yards of subsoil. Eighteen inches of growth medium or subsoil would be placed over the backfill in the shaft as part of the reclamation of the shaft. Reclamation of other disturbed areas around the shaft would involve ripping the bare surface to a depth of 12 inches, regrading to approximate the pre-mining drainage patterns and grade, and seeding in accordance with the USFS specified seed mix. If the ripped soils were not suitable for revegetation, 6 to 12 inches of growth medium would be placed over all or portions of the site to promote revegetation. Growth medium would be salvaged from the surrounding area, or obtained from one of the local borrow areas identified by ASARCO pending approval by the regulatory agencies. *Agency Modified Alternative:* No changes are proposed to ASARCO proposed reclamation plan.
2. WATER QUALITY, QUANTITY AND DISTRIBUTION: Are important surface or ground water resources present? Is there potential for violation of ambient	**[Y]** <u>Combination Mine</u> *Existing Condition:* There are no perennial streams within the Black Pine Mine permit area. The nearest perennial stream is Smart Creek located about 1.25 miles southeast of the toe of the

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
water quality standards, drinking water maximum contaminant levels, or degradation of water quality?	Combination Mine waste rock dump and USFS Road 448. Smart Creek drains into Flint Creek, which flows through the Philipsburg Valley several miles away. Several ephemeral springs and one perennial spring, CPS-1, have been located either adjacent to or beneath the waste rock dump and downslope from the waste rock dump in or adjacent to the Combination Soils areas. Communication with a former USFS employee who cruised the timber in the current waste rock dump area prior to its construction has indicated that there were in fact springs and spruce trees present on the site. This would indicate the potential for water coming up through the base of the waste rock dump and interacting with the waste rock. A former ASARCO employee who developed the mine and waste rock dump claims there were no springs in the area under the waste rock dump. This differs from what the USFS employee stated. Once the waste rock dump is capped, the presence or lack of water flowing into the seepage capture system would verify the presence or lack of springs under the waste rock dump. The local springs drain into ephemeral drainages that flow into Smart Creek. These springs are acidic (pH ranging between 2.6 and 4.7) and are high in sulfates, copper, zinc, iron and cadmium. These seeps and springs tend to flow during and after snowmelt and large precipitation events although one, CPS-1, is perennial. Monitoring and sampling done in 2000 generally indicated a possible connection between the Combination Mine pool and CPS-1 but that there were other factors contributing to the poor water quality of the spring than just the mine water (Hydrometrics 2001). Elevated levels of copper also showed possible influence of the acid seepage from the waste rock dump. The water quality of the ephemeral springs and seeps indicated contamination by the acid seepage from the waste rock dump was occurring through either surface flows or shallow ground water flows between the waste rock dump and the springs and seeps. The snowmelt and storm water from the top of the waste rock dump do not directly drain off the surface but primarily infiltrate into the waste rock dump and exit via these downslope springs and seeps. The water tends to pond in depressions until it either seeps into the waste rock dump or evaporates. Very little water flows off the surface onto the adjoining land except from the toe of the waste rock dump. The overland flows were generally of short duration and occurred primarily during snowmelt each spring. The bulk of the flows were channeled through the culverts under USFS Road 448, but the pattern of the contaminated areas shows that some water flowed over the road as well. It is estimated that snowmelt in an average year would result in as much as 11 to13 inches of precipitation (MWH 2002) or about 2 million gallons of runoff that would leave the site within a 2 week

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	period which is equivalent to about 100 gallons per minute (gpm) or 0.25 cubic feet per second (cfs). A rain-on-snow event or a 24-hour/25-year storm event could result in the movement of as much as 5.46 cfs of water off the site within a couple of days. ASARCO added sodium hydroxide into the mine pool in 2001 to test whether the mine pool was affecting the perennial spring, CPS-1, and other springs in the area. The agencies were also concerned that by pumping back the contaminated water from CPS-1 and the contaminated storm water from the waste rock dump, the rising mine pool might be affecting both water quality and quantity in the springs. An analysis of the mine pool water and the spring water revealed that the water in the CPS-1 is the same as that from the waste rock dump seeps. The sodium hydroxide has not been detected in local springs, so there is no documented connection between the mine pool and local springs. *Existing Plan:* Under the original 1974 reclamation plan, all drainage from the area would be diverted to existing natural drainage channels, and water from the development and mining activities would be contained underground in the workings. It is not specified if storm water and snowmelt from the portal area and the waste rock dump top would be drained into the mine workings or if the water was to be diverted off site into the natural channels after reclamation. Given that snowmelt and storm water infiltrate into the waste rock dump and that no means had been approved to ensure water would drain off the waste rock dump without infiltrating, the original plan is inadequate to protect storm water and possibly downgradient streams and wetlands from the effects of acid drainage. The agencies approved and ASARCO constructed a seepage collection system in 2001 to control offsite migration of acidic waters associated with the mine facilities. The seepage collection system includes a network of seepage collection trenches designed to intercept shallow subsurface water migration. The trenches are of variable depths depending upon the soils and the location of the seepage water in 2001, but are generally 3 to 5 feet deep. The trenches were backfilled with washed gravel (1.5 inches maximum) to approximately 1 foot below the ground surface and then covered with native material to grade. The captured seepage water is collected in 2-inch diameter perforated PVC pipe located near the bottom of each trench. The intercepted water gravity drains to one of two pump stations, one above USFS Road 448 and one located approximately 600 feet downhill (east) of the road. The pump stations can pump a maximum of 210 gallons per minute (gpm). The water is pumped back into the Combination Mine underground workings for containment.

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	A shallow trench along the edge of the waste rock dump intercepted storm water off the face of the waste rock dump and shallow seepage, and drained it into a temporary storm water capture pond. The water in this pond was also pumped to the upper pump station for return to the underground mine workings. This system had limited effectiveness under high runoff conditions as some water was found bypassing this system under the lined storm water pond and in the CPS-1 and CPS-10 area. There were numerous problems with power outages and plumbing problems limiting pumpback of the contaminated water. ASARCO made improvements to the system in 2002 and most of the plumbing problems were resolved. There was still some seepage bypassing the capture system. The collection system was redesigned in 2003 before the waste rock dump was resloped. Capture efficiency has increased and plumbing problems have been resolved. *Proposed Action:* Interim reclamation would be completed at the Combination Mine during summer 2004. Final reclamation would be done once ASARCO decided to permanently close the mine. <u>Interim Reclamation</u>: As mentioned above, ASARCO made two changes to the existing seepage collection system in 2003 prior to any regrading of the waste rock dump slope. Two additional trenches were installed to capture water that bypassed the trenches beneath spring CPS-1 and a small series of seeps east of monitoring well SMW-4 (see Figure 6-1 in Attachment 3). The upper pump station was relocated just across the road in 2003 to ensure gravity drainage into it from the seeps at the base of the waste rock dump. This allowed the regrading of the waste rock dump in 2003 to cover up the existing capture system and pond below the toe of the existing waste rock dump yet allow seepage to be captured and pumped back to the mine workings. All lines to the existing upper pump station were relocated to connect with the new pump station. These modifications to the seepage collection system would further help to reduce the impacts from any seepage that was generated by water getting into the waste rock dump. Given that the waste rock dump was not capped during the first year of interim reclamation, it was likely that storm water and spring snowmelt waters infiltrated through the waste rock dump and were captured by the expanded system. It was possible that some waters could bypass the system and contaminate the materials placed between the regraded waste rock dump and the relocated roadbed, as the system did not extend all the way to bedrock. Additionally the storm water capture pond at the toe of the waste rock dump was removed prior to regrading the waste rock dump.

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	ASARCO's original plan, analyzed in the 2003 draft EA, did not provide for a replacement pond on the downgradient side of the road or a way for contaminated runoff from the waste rock dump to get to a temporary storage area to be pumped back to the mine during the year between regrading in 2003 and completion of interim reclamation in 2005. Potentially this water could have flowed down the diversion along the reconstructed relocated roadbed contaminating the diversion, the roadbed, and areas downgradient of the new culvert installed by ASARCO in 2003 about 250 feet beyond the end of the reconstructed roadway. There had been some concern that water might also flow over the roadbed and continue downslope, allowing contamination of the Combination Soils to continue. Since regrading the waste rock dump exposed new surfaces to weathering it was possible that the water quality in the seepage and storm water runoff would be of worse quality than what currently seeps through the waste rock dump. Three changes included in the Erosion Control Plan for 2003 Construction Activities (Hydrometrics 2003b, see Drawing 3-1 in Attachment 4) and field approved by DEQ and USFS helped to resolve the collection pond and diversion issues. ASARCO constructed a lined water management pond downhill (east) of the lower seeps. Two other changes directed storm water runoff during major storm events to the pond. Runoff from the waste rock dump would be captured in the road ditch below the regraded waste rock dump. A culvert was installed above the pond to carry the runoff into the pond. The culvert was sized to handle a 100-year storm event to comply with INFIS[2]. Secondly, the road ditch was blocked just below the culvert to prevent runoff from flowing downgradient to another culvert ASARCO installed and onto native ground (see Drawing 3-1 in Attachment 4). The pond would be used primarily to store water collected by the seepage collection system prior to pumping it back to the mine and/or treating it prior to discharge if water treatment became necessary. A toe diversion, also referred to as the runoff collection ditch, would be constructed on the uphill side of the road below the waste rock dump alongside the reconstructed road. It would be lined with PVC and covered with ¾-inch borrow material. The diversion would handle the 25-year, 24-peak flow of 5.46 cfs. The diversion would be 6 feet wide with 2:1 side slopes and average and maximum slopes of 2.5 and 9 percent respectively. The liner in the diversion would reduce seepage into the ground at the toe of the waste rock dump and help reduce the amount of seepage to be captured and pumped back to the mine. The 2003

[2] INFIS is the acronym for Inland Native Fish Strategy, a program implemented by the USFS in 1995 to protect important fisheries habitat.

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	erosion control plan included a liner in the toe diversion that was constructed in 2003, but no liner was installed. Without the liner, there is some potential for water to seep into the ground and add to the seepage being captured by the seepage collection and pumpback system. ASARCO's original proposed plan did not contain descriptions or adequate measures to handle the continued seepage of possibly worse quality water between the first and second years of interim reclamation. The erosion control plan (Hydrometrics 2003b) and the agency's field-approved changes to the original plan largely resolved this problem. Some runoff did reach the Combination Soils area and run downstream during a rain event in the spring of 2004. This area would need to be cleaned up in 2005, but neither ASARCO's permit amendment application nor the erosion control plan contains commitments to accomplish that. The combination of these changes to the plan along with the expansion of the seepage capture system has largely handled seepage and runoff. The modified plan should continue to adequately handle storm water runoff and seepage through the waste rock dump especially after the waste rock dump is capped in 2004 and while vegetation is becoming established. The erosion control plan (Hydrometrics 2003b) included the construction of settling basins at the lower end of the trenches in the Combination Soils area in 2003 (see Figure 3-2 in Attachment 5). These basins would be sized to handle a 5-year, 24-hour storm event and would be required until the Combination Soils area was revegetated and stabilized. These basins would have trapped sediment and slowed down any storm water flowing off the Combination Soils area. These basins were not constructed and it is possible that some storm water may have flowed onto USFS property downgradient from ASARCO's property. ASARCO's bid package (ASARCO 2004) did not contain information indicating that these basins would be installed in 2004. In the spring of 2004 some slash filter windrows rather than straw bales were placed at intervals along the main trenches excavated in 2003. These windrows helped reduce runoff water velocity and erosion potential, but do not totally compensate for the lack of the basins. The runon diversion located on the hillside above the plant site was regraded and extended approximately 250 feet to the south and north to completely bypass the plant site (see Drawing 3-1 in Attachment 4). New culverts were installed at either end of the runon diversions and runon water was discharged onto native slopes downgradient of the access roads. ASARCO did not provide any conceptual design specifications for outlet structures necessary to spread out the flow of water across native ground.

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	ASARCO proposed interim regrading and reclamation of the waste rock dump to reduce the potential for snowmelt and storm water to infiltrate through the waste rock dump and generate acidic water that reaches the seeps and springs. The waste rock dump top was regraded to slope toward a diversion located between the buildings and the cut face of the slope on the west side of the site. The runoff diversion would be constructed in 2004 to route water off the capped waste rock dump. This diversion would be 1 foot deep, 8 feet wide, and 920 feet long triangular channel with 4:1 side slopes. The diversion was designed to convey the 25-year, 24-hour peak flow of 3.24 cfs and would be lined with PVC. The storm water retention/infiltration basin south of the plant site on the east side of the access road would be constructed during 2004 after the cap had been installed. The basin would capture water flowing in the diversion across the waste rock dump top toward the roadside diversion and through a downgradient culvert. The culvert would be located approximately 100 feet south of the plant site. The infiltration basin would be approximately 200 feet long, an average of 25 feet wide, and 4 feet deep. The basin would have a capacity of approximately 93,500 gallons roughly equivalent to the 25-year storm event. The basin would be equipped with an emergency overflow spillway and diversion to prevent breaching during an extreme event. The extended runon diversions modified in 2003 and the infiltration basin and culvert to be installed in 2004 would help to keep most of the storm water from the waste rock dump top separated from the uncontaminated runon water from undisturbed areas above the mine. The emergency overflow diversion would route water back into the roadside diversion and down to the culvert and then out onto undisturbed native soils. Since the waste rock dump top would be capped and reclaimed in 2004, these measures would adequately handle spring runoff when flows would be high. During the rest of the year, precipitation would primarily infiltrate into the cap and be used by vegetation or flow along the top of the PVC and into the collection diversion. The cap above the PVC liner would be constructed of uncontaminated soils, so the primary pollutant would be a high level of suspended solids. Once the vegetation was established on the waste rock dump top the level of suspended solids would decrease. Most of the sediment would settle out in the infiltration pond allowing clean water to infiltrate into the ground beneath the pond or overflow into the roadside diversion. Once the vegetation on the waste rock dump has become established the runoff diversion directing water from uncontaminated areas north of the mine to the diversion below

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	the culvert directing runoff from the waste rock dump into the capture pond would be removed and reclaimed. Other storm water control features such as the temporary culvert routing runoff into the capture pond would be reclaimed once the source areas are stabilized. ASARCO would submit a Notice of Termination to DEQ that construction activities had ceased, the area was stabilized, and temporary storm water control features were being removed. No backup pumps or electrical power generation system have been proposed. The failure of pumps or loss of electrical power could result in the acid water from the intercepted springs and seeps flowing onto the Combination Soils area east of the road. This would allow the existing impact to these areas to continue. <u>Final Reclamation</u>: There are no specific features to be installed at final reclamation to handle storm water runoff differently than during interim reclamation. The diversion at the west side of the waste rock dump and its associated infiltration basin south of the waste rock dump would likely remain at final reclamation as ASARCO did not specify that those features would be removed at closure. This would continue to provide adequate storm water management for spring runoff from the waste rock dump top after the mine is closed. ASARCO has done preliminary testing and planning of various water treatment options in the event water treatment is determined to be necessary. These included continued collection and pumping of seepage beneath the waste rock dump and treating the water in the underground workings, at the plant site, or in a small biotreatment cell down hill from the Combination Mine. ASARCO does not anticipate the need for long-term water treatment, but would evaluate the need and type of treatment after the quantity and quality of the seepage collected beneath the waste rock dump is known after the cap has been installed, revegetated, and stabilized. *Agency Modified Alternative:* <u>Interim Reclamation</u>: Before any regrading could done in 2004 and 2005, the land to be regraded must be cleared of vegetation before soils could be salvaged. Since the slash material can be used during the reclamation process, slash generated by land clearing activities prior to soil salvage, regrading, etc. would be salvaged and used for slash filter windrows to help minimize erosion. The agencies had recommended three storm water management measures that were to be implemented in the Combination Soils area. ASARCO included all three in its erosion control plan for the 2003 regrading activities (Hydrometrics 2003b). Those mitigations are addressed above.

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	ASARCO would need to construct the three sediment basins at the end of the trenches excavated in the Combination Soils area that were supposed to be constructed in 2003 according to its erosion control plan (Hydrometrics 2003b). This must be accomplished as soon as possible to provide needed storm water and sediment control. ASARCO would need to install outlet energy dissipating structures to the downslope ends of the culverts under the access roads and USFS Road 448 to dissipate runoff water flowing out of the culverts. This would spread out the volume of water hitting the ground below the culvert, reducing erosion. The toe diversion below the waste rock dump and along the reconstructed road needs to be lined as ASARCO proposed in its application and water management plan for 2003 (Hydrometrics 2003b). This is necessary to reduce seepage potential for runoff from the waste rock dump into the seepage collection system. ASARCO would install rock check dams along the interface between the regraded waste rock dump and undisturbed soils on both sides of the waste rock dump. The location of the check dams would be field approved by DEQ. The check dams would reduce the erosion potential in the drainages created by the waste rock dump interface with undisturbed soils. Until vegetation gets established, backup electrical power generation for the seepage collection system would be installed to ensure the system would be operable whenever the pumps needed to pump back collected seepage and waste rock dump runoff water. This modification in conjunction with the modifications to the seepage collection system proposed by ASARCO would further reduce the impacts from any seepage that was generated by water getting into and running off the reclaimed waste rock dump until vegetation gets established. Long-term water treatment studies must continue. This is necessary to ensure that the means for water treatment at the Combination Mine are clearly identified and the preliminary plans for implementing the preferred method would be available for use should water monitoring indicate a need for water treatment. Should monitoring indicate that treatment would be necessary, the preferred plan would be developed by ASARCO and analyzed in a supplemental environmental document prior to approval and implementation. Additionally, CPS-1 would be monitored quarterly to document how well the capping and reclamation of the waste rock dump works to control acid rock drainage. Full parameter testing must occur annually.

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	Spring and seep monitoring for quality and flow would occur at least annually during peak ground water periods (late June/early July) to determine whether leakage from mine pool waters might be impacting peripheral surface environments on either side of Black Pine Ridge. Field parameters of specific conductivity, pH, and temperature would be collected, flow would be measured, and water quality samples must be collected for laboratory analysis. Final Reclamation: The seepage collection and capture system could not be removed at or before final reclamation unless all sampling data confirm that the waste rock dump cap is adequately controlling the seepage through the waste rock dump. Once that was confirmed, the pumps, storage pond and pipelines to the mine can be removed and the areas revegetated and reclaimed. If water treatment were necessary, pumping of the collected seepage into the mine would be continued until environmental review of treatment alternatives was completed. Tim Smith Mine (Tim Smith #1) *Existing Condition:* Much of the waste rock dump toe lies near an ephemeral drainage, which flows into the South Fork Lower Willow Creek. South Fork Lower Willow Creek only flows during snowmelt and after large storm events. *Existing Plan:* No storm water control plans were included in the original reclamation plan for this site. The site, including the access road, would be regraded to conform with the existing topography. The lack of plans means that the site would be at greater risk of erosion from storm water runon and runoff. Large storm events could erode replaced topsoil into the ephemeral drainage and further downstream with each storm event. *Proposed Plan:* Interim Reclamation: ASARCO has proposed several storm water control measures to be implemented during reclamation of this site. The toe of the waste rock dump closest to the ephemeral drainage would not be regraded by pushing the slope down but by reducing the waste rock dump crest and placing the material on the west side of the waste rock dump. This would allow the slope to be flattened somewhat and made less susceptible to the risk of erosion and reduce the potential for sediment to reach the stream. Silt fencing would be installed along the toe of the reclaimed waste rock dump and a mulch tackifier would be used during the seeding process. Runoff collection diversions would divert water

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	from above the site away from the capped waste rock dump slopes. All diverted water would be collected in a sediment trap/settling basin near the toe of the southwest corner of the waste rock dump toe. Level spreaders or some other discharge structure would dissipate storm water flow onto native ground. These measures would provide appropriate means of reducing the risk of erosion and sediment reaching the ephemeral drainage. A specific design for the outfall structures was not provided. <u>Final Reclamation</u>: No removal of storm water control structures at the Tim Smith #1 has been proposed by ASARCO. The adit would be plugged with backfill and reclaimed, as no ground water would discharge from the adit. Some runoff from the waste rock dump top might seep into the adit through the plug and into the mine waters, but no impacts are anticipated. *Agency Modified Alternative:* One agency mitigation is proposed for the Tim Smith #1 specifically with regard to water quality and quantity. DEQ would need to field approve the design of the sediment basin outfall structures. <u>Tim Smith #2</u> *Existing Condition:* There are no defined perennial or ephemeral streams in the vicinity of the Tim Smith #2. The site is located on a moderate north-facing timbered slope. *Existing Plan:* The partially driven adit is a decline and no discharge of water from the adit is anticipated. No storm water controls were specified in the 1985 amendment. *Proposed Plan:* <u>Interim Reclamation</u>: Storm water controls would include a runon diversion located uphill of the portal and waste rock dump, and a silt fence placed along the waste rock dump toe. The runon diversion would intercept storm water run-off from the area uphill (south) of the adit and waste rock dump for diversion around the reclaimed area. The diversion has been designed to handle peak flows resulting from the 25-year/24-hour precipitation event, and would include a six-foot wide, 1.5-foot deep, triangular channel with 2:1 side slopes. A riprapped outfall would be constructed at either end of the diversion to dissipate the flow and prevent erosion of the native slope. The silt fence would serve as a temporary storm water control to prevent offsite sediment transport until the vegetative cover is fully established. Silt fence would be installed along the toe of the reclaimed waste rock pile to prevent sediment transport from the site and decrease the runoff water velocity. The silt fence would be installed within a six-inch deep trench, which would then be

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	backfilled with native material to anchor the fence. Silt fence would be supported by wooden or metal stakes spaced at a maximum interval of six feet, with wire mesh support fence stapled to the upslope side of the stakes prior to attaching the fabric. <u>Final Reclamation</u>: No removal of storm water control structures at the Tim Smith #2 has been proposed by ASARCO. The adit would be plugged with backfill and reclaimed, as no ground water would discharge from the adit. Some runoff from the waste rock dump top might seep into the adit through the plug and into the mine adit and possibly mine waters if the adit was ever completed, but no impacts are anticipated. *Agency Modified Alternative:* No changes are proposed related to water quality and quantity. <u>Lewis Shaft</u> *Existing Condition and Plan:* The water level in the shaft is far below the surface and would not discharge from the shaft. *Proposed Plan:* At mine closure, ASARCO would create a slight mound over the backfilled shaft to promote surface runoff and reduce potential infiltration through the plug and to the mine workings. This plan would adequately provide to minimize the potential for water to drain through the plug and into mine waters. No impacts are anticipated from any surface water reaching the mine pool. *Agency Modified Alternative:* No changes are proposed related to water quality and quantity.
3. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?	**[N]** <u>All locations</u> It is possible that dust could be increased from the 2004/2005 reclamation activities at the Combination Mine, interim reclamation at the Tim Smith #1, Tim Smith #2, and final reclamation at the three mentioned sites and at the Lewis Shaft. None of the increases would be significant. Any increases in dust would be a short-term impact on air quality until vegetation gets established. There would be no change in the air quality in the permit area from implementing final reclamation at the Black Pine Mine facilities.
4. VEGETATION COVER, QUANTITY AND QUALITY: Will vegetative communities be significantly impacted? Are any rare plants or cover types present?	**[N]** <u>Combination Mine</u> *Existing Condition:* There was no vegetation growing on the Combination Mine waste rock dump before it was regraded in 2003. The undisturbed areas surrounding the waste rock dump consist of up to 15-year-old lodgepole pine trees with an understory of grasses, low shrubs (huckleberry, kinnikinnik,

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	snowberry) and wild flowers, except for contaminated areas to the east in the Combination Soils area. There are standing burned snags left from the Combination Fire of 1988. There are also scattered individual trees and clumps of aspen and willows on the hillsides below the mine. No rare plants or cover types have been identified in the project area including the proposed soil borrow areas. *Existing Plan:* Revegetation would have been done as recommended at closure by the State of Montana and the Soil Conservation Service (now Natural Resources Conservation Service). The lack of detail in the approved reclamation plan does not ensure that reclamation and revegetation of the site would result in comparable stability and utility to surrounding lands. *Proposed Plan:* <u>Interim Reclamation</u>: Areas around the waste rock dump and USFS Road 448 disturbed during reclamation activities in 2003 totaled 2-3 acres. Salvage of borrow soils for road borrow material in 2003 and for capping and reclaiming the waste rock dump in 2004 and reclaiming the Combination Soils area in 2005 would disturb vegetation in another 6 acres at site BPB-4 located about 500 feet north of the mine and waste rock dump site. Fertilizer and possibly lime would be applied prior to seeding. The rates were to be specified in a Special Provisions section of the bid package but that section was not submitted to DEQ (ASARCO 2004). It is, therefore, impossible to determine if the rates are reasonable and if they would be effective. Planting of vegetation is proposed for completion of interim reclamation of the waste rock dump in 2004 and the borrow area, and the Combination Soils area in 2005. Interim and final reclamation includes seeding of a mixture of native grasses and forbs. The seed mix proposed by ASARCO for interim and final reclamation contains a listing of species from which ASARCO would make a selection based on availability of local seed. The seed mix would contain at least seven of the native grasses and five of the native forbs in the list if broadcast seeded; drill seeding and hydroseeding rates were not specified. Only a total pounds of seed per acre is indicated and not a recommended rate of pure live seed per acre (pls/acre) for each species. Without knowing the proportion of each species that could be included in the mix, it is difficult to determine if each species would successfully establish on the topsoiled surfaces at the mine. ASARCO has specified that all plant seed would be grown above 41 degrees north latitude so that the seed and species would be adapted to Montana conditions.

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	Seed would be planted by drill seeding to a depth of ½ inches in rows 8 inches apart (Hydrometrics 2003b). Broadcast seeding by hand or mechanical means would be used in areas inaccessible to drills or impractical by other means. ASARCO indicated that seed might be applied by hydroseeding. The locations of areas to be hydroseeded were to have been shown in the Special Provisions Section of the 2004 bid package (Hydrometrics 2003b). That section was not submitted to DEQ and the locations cannot be identified. ASARCO did specify that it might be done on slopes greater than 2:1. The slopes are gentle enough (3:1 or less) that drill seeding would be a better way to plant the seed on those areas rather than broadcast seeding or hydroseeding. Drill seeding puts the seed into the ground rather than laying it on the surface, which enhances germination success. Seed applied hydraulically would be applied with wood-fiber mulch. The mulch would be applied at a rate of 1 pound of wood fiber per 3 gallons of water (Hydrometrics 2003b); ASARCO's revision application specified 1000 pounds per acre. ASARCO 's application also specified that a second application of mulch at the same rate would be applied along with a mulch tackifier after the seeding was done, but that was not specified in the 2004 bid package. The mulch would help to protect the seed and seedlings and reduce erosion potential on the site. Mulching of drill or broadcast seeded areas was not discussed by ASARCO's revision application. The resulting vegetation composition would be different than that in the surrounding landscape, but it is likely that plants and seeds from the adjacent undisturbed areas would gradually colonize both sites. Eventually, the site would be dominated by lodgepole pine, which is the dominant vegetation on the surrounding areas. ASARCO did not propose to plant lodgepole seedlings. The lack of planted seedlings would limit establishment of trees to wind blown and animal deposited seeds. The shallow soil layer on the trenches in the Combination Soils area could limit plant growth if the soil in the bottom of the trench still contained high levels of copper. As described in the soils section, the removal of additional contaminated soils and deeper soil replacement would improve revegetation potential in this area. <u>Final Reclamation</u>: Final reclamation would begin when ASARCO determined to permanently close the Combination Mine. After the buildings were removed and liner and cap were installed in building locations, the new portions of the cap would be revegetated with the same seed mix used for interim reclamation. The backfill plugging both adits would be covered with clean soil fill from BPB-4 and seeded with the approved seed mix.

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	The road across the waste rock dump would be reclaimed by removing the road base material and replacing it with 6 inches of topsoil from BPB-4. Without ripping the soil cap beneath the road base, it is possible that the root zone would be compacted from traffic across the waste rock dump after interim reclamation was done and the root zone limited to the top 6 inches of replacement soil. The area would then be seeded with the approved seed mix. The north and south access roads would be reclaimed as two-track roads to allow access to the site after closure. After the roadbeds had been ripped, regraded and partially topsoiled in rocky areas, the surface would be reseeded with the approved seed mix. If after regrading the roadbed, the root zone is still compacted because the loose ripped material had be graded away or if insufficient soil is placed on the roadbed, then vegetation might have some difficulty in becoming established in the roadway area. If those conditions do not occur, ASARCO's plan should provide the means for vegetation to successfully establish on the reclaimed roadbed. Use of the access roads before the vegetation gets established would compact the soil and potentially destroy the vegetation making the road appear more appealing for people traveling through the area. *Agency Modified Alternative:* <u>Interim Reclamation</u>: All areas disturbed between 2003 and 2005 would be seeded with a DEQ approved seed mix. The borrow area would be reseeded using a DEQ final reclamation seed mix. The seed mix, seeding rate, and fertilizer rates must be submitted to DEQ prior to use for review and approval. Tubling lodgepole pine trees would be planted in 2005 to provide for long-term water uptake. The revegetation goal would be to obtain 400 trees/acre. This would speed up the establishment rate of lodgepole pine trees on the waste rock dump. The removal of additional contaminated soils and deeper replacement of soils in the trenches in the Combination Soils area would improve revegetation potential for this area. The criteria for soil removal and replacement are discussed in the soils subsection in Section 1 above. The resulting vegetation composition at these sites would be different than that in the surrounding landscape, but it is likely that plants and seeds from the adjacent undisturbed areas would gradually colonize the site. Eventually, the site would be dominated by lodgepole pine, which is the dominant vegetation on the surrounding areas. The gates prohibiting traffic across the waste rock dump should remain in place to discourage public traffic on the reclaimed

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	access roads and across the waste rock dump and allow successful revegetation of the waste rock dump surface and roadway. ASARCO may decide to remove the gates once vegetation is permanently established on the site after final reclamation is completed. <u>Tim Smith Mine (Tim Smith #1)</u> *Existing Condition:* The vegetation around the Tim Smith #1 site is similar to that adjacent to the Combination Mine. Limited vegetation is growing on the waste rock dump. *Existing Plan:* After salvaged topsoil was spread on the regraded waste rock dump, and where possible the slope, to a depth of 6 inches the site would be fertilized and seeded with the agencies' approved seed mix. No trees were proposed. The regraded roadbeds would be scarified, covered with salvaged topsoil, fertilized, and seeded with the agencies' recommended seed mix. No topsoil was salvaged and stockpiled at either the mine portal area or along the access road. No alternate source of soil material was approved. Without a soil layer on top of the waste rock dump it is unlikely that revegetation efforts would succeed because of the lack of fines, poor water holding capacity, and low fertility. Vegetation may be more likely to gradually become established in the road corridor after regrading because the road bed medium is not as barren and coarse a medium as the waste rock and the narrowness of the corridor would facilitate invasion by pioneer species and seedling trees. *Proposed Plan:* A 2-foot thick soil cap would be placed on the waste rock dump: 18 inches of subsoil and 6 inches of topsoil. The soil would come from borrow area BPB-10. After soil placement the site would be seeded as described for the Combination Mine area. Seed would be applied hydraulically along with wood fiber mulch and tackifier. These measures would greatly improve the potential for reclamation success at the Time Smith #1 compared with the existing plan. As described for the Combination Mine, the seed mix needs to be better defined for site conditions and should be drill seeded on all slopes 3:1 or flatter. Hydroseeding would be used on steeper slopes. No mention is made of using mulch as was proposed for the Combination Mine. The road would not be completely reclaimed but partially reclaimed to a two-track road like the access roads on the Combination Dump. This would facilitate revegetation of the roadway while still allowing access to the site and would be subject to the same concerns about potential impacts. *Agency Modified Alternative:* During interim reclamation at the Tim Smith #1, ASARCO would plant the entire waste rock dump

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	top and face and storm water control diversions and basins with a seed mix of grasses and forbs approved by DEQ. Drill seeding would be used on slopes at or less than 3:1, as it would be more effective than hydroseeding. DEQ would have to approve drill seeding rates and any fertilizer rates proposed by ASARCO prior to application. Hydroseeding as proposed by ASARCO would be used on steeper slopes. Mulch and a mulch tackifier would be applied after seeding to all surfaces regardless of seeding method at 1000 pounds of mulch per acre. The resulting vegetation composition at these sites would be different than that in the surrounding landscape, but it is likely that plants and seeds from the adjacent undisturbed areas would gradually colonize the site. Eventually, the site would be dominated by lodgepole pine, which is the dominant vegetation on the surrounding areas. <u>Tim Smith #2</u> *Existing Condition:* The vegetation around the Tim Smith #2 site is similar to that adjacent to the Combination Mine. Vegetation is growing on the waste rock dump including some small lodgepole pine trees. *Existing Plan:* Reclamation of the Tim Smith #2 adit and access road would not occur until the Tim Smith #1 was closed. After regrading and spreading of salvaged topsoil on the waste rock dump, and where possible on the slope, the area would be fertilized and seeded with the recommended seed mix. The access road would be permanently reclaimed and access to the site would cease. After removing culverts and regrading the roadbed, it would be ripped, covered with salvaged topsoil, fertilized, and seeded with the approved seed mix. No soil was salvaged and stockpiled at Tim Smith #2 making it impossible to implement the existing plan. No alternate source of soil material was identified. Without the soil, it would be very difficult to establish vegetation on the waste rock dump because of its lack of fines, poor water holding capacity, and low fertility. Vegetation may be more likely to gradually become established in the road corridor after regrading because the road bed medium is not as barren and coarse a medium as the waste rock and the narrowness of the corridor would facilitate invasion by pioneer species and trees. *Proposed Plan:* <u>Interim Reclamation</u>: The regraded waste rock dump would be covered with 12 inches of soil from BPB-8 located east of the waste rock dump. The backfill of the adit would also be covered with a 12-inch thick layer of cover soil. The portal area would then be reseeded with the approved seed mix. Seed would be

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	applied hydraulically. The plan proposed by ASARCO would improve the potential for reclamation success at the Tim Smith #2 compared with the existing plan. As described for the Combination Mine, the seed mix needs to be better defined for site conditions and should be drill seeded on all slopes 3:1 or flatter to improve the potential for successful revegetation. Final Reclamation: The road would be completely reclaimed, as access to the site would not be needed after closure. The roadbed would be ripped to an approximate depth of 12 inches and loose unconsolidated material in the fill shoulder would be dozed or pulled into the cut slope. If necessary cover soil would be dozed or pulled from adjacent areas to the road to provide adequate cover for revegetation. Although this could provide an addition seed source for plants on the road, it would increase the area of disturbance at the Tim Smith #2 site. After soil placement the roadway would be seeded. Seed would be applied hydraulically. The plan proposed by ASARCO would improve the potential for reclamation success at the Tim Smith #2 compared with the existing plan. As described for the Combination Mine, the seed mix needs to be better defined for site conditions and should be drill seeded on all slopes 3:1 or flatter to improve the potential for successful revegetation. ASARCO did not propose to plant lodgepole tublings. The lack of planted tublings would limit establishment of trees to wind blown and animal deposited seeds, but trees should begin to invade the relatively small site in short period of time. Woody material (slash) disturbed during reopening of the road would be placed over the seeded surface to discourage post-reclamation road use. These measures would enhance revegetation success at both the portal area and the roadway. Pulling soil from adjacent areas to the road would increase disturbance at the site, increasing the area to be reclaimed. There is no commitment to a specific depth of cover soil on the roadway and if insufficient soil material is provided, then revegetation efforts could be slower and less successful than desired. *Agency Modified Alternative:* Interim Reclamation: During interim reclamation at the Tim Smith #2 ASARCO would plant the entire waste rock dump top and face and storm water control diversions and basins with a seed mix of grasses and forbs to be approved by DEQ prior to use. DEQ would also need to approve the seeding and fertilizer rates prior to application. Drill seeding would be used, as it would be more effective than hydroseeding on slopes at or less than 3:1. Mulch and a mulch tackifier would be applied after seeding to all surfaces regardless of seeding method at 1000 pounds of mulch

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RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	per acre. The resulting vegetation composition at these sites would be different than that in the surrounding landscape, but it is likely that plants and seeds from the adjacent undisturbed areas would gradually colonize the site. Eventually, the site would be dominated by lodgepole pine, which is the dominant vegetation on the surrounding areas. <u>Final Reclamation</u>: Final reclamation would be completed in the same manner as interim reclamation. <u>Lewis Shaft</u> *Existing Condition:* The vegetation around the Lewis Shaft is similar to that adjacent to the Combination Mine. Vegetation is sparse around the buildings and structures at the site. *Existing Plan:* The reclamation plan for the Lewis Shaft was very generic and stated the site would be reclaimed in accordance with the previously approved reclamation plan. In general, the site would be stabilized and vegetation re-established to return the area as nearly as possible to pre-mine conditions. Without more detail, it is impossible to determine how successful revegetation of the Lewis Shaft area would be. No sources of soil material or replacement depths were specified. Without sufficient cover soil, successful reclamation of the Lewis Shaft would be very slow. *Proposed Plan:* <u>Final Reclamation</u>: The shaft would be backfilled to approximately 6 inches below the surrounding grade and covered with 18 inches of growth medium mounded over the backfill. The area around the shaft would be ripped to a depth of 12 inches, regraded, and seeded with a USFS approved seed mix. If the ripped soils were not suitable for revegetation then the area would be covered with 6 to 12 inches of growth medium. If the growth medium were taken from the surrounding area it would increase the area to be reclaimed. Alternatively, ASARCO also indicated that growth medium could be obtained from one of the borrow areas but did not specify which one would be used. These measures should provide the means to successfully revegetate the Lewis Shaft area although 6 inches of growth medium is less than ideal. Seed would be applied hydraulically. The plan proposed by ASARCO would improve the potential for reclamation success at the Lewis Shaft compared with the existing plan, but some aspects of revegetation are not defined. No mention is made of using mulch as was proposed for the Combination Mine. The lack of mulch on hydroseeded areas would reduce the

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	revegetation potential of the site, as those areas would be susceptible to erosion and wind blown loss of seed and soil. The access road to the Lewis Shaft is the same access road to Time Smith #1 and is addressed above. *Agency Modified Alternative:* <u>Final Reclamation</u>: BPB-8 is close to the Lewis Shaft. There should be sufficient cover soil available for use at the Lewis Shaft after fill and soil material for Tim Smith #1 were removed. Therefore, cover soil needed for the Lewis Shaft would be obtained from BPB-8. The site should have at least a 12-inch deep layer of suitable growing medium. This would not increase the area of disturbance at the Lewis Shaft and would ensure that a suitable depth of growth medium was placed at the site. At final reclamation at the Lewis Shaft, ASARCO would plant the entire disturbed area with seed mix of grasses and forbs. DEQ would need to approve seed mix and seeding and fertilizer rates prior to application. Drill seeding would be used as it would be more effective than hydroseeding. Hydroseeding as proposed by ASARCO would not be used as the site is relatively flat. Mulch and a mulch tackifier would be applied after seeding to all surfaces regardless of seeding method at 1000 pounds of mulch per acre.
5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish?	**[N]** Black bear, moose, elk, and mule deer occur in the area. Game birds include blue grouse and Franklin's grouse. Other small mammals and songbirds also use the surrounding undisturbed landscapes. Reclamation activities at any of the four sites associated with the Black Pine Mine site under any action alternative would temporarily disturb and possibly displace wildlife during these activities. These activities would be short term and use of the surrounding area would return to similar levels of use after regrading and interim reclamation of the waste rock dump was completed. There is no fisheries habitat located within the proposed project area, although Smart Creek and Flint Creek, downstream of the Combination Mine, do support fish populations. There would be no impact to fisheries habitat in Smart Creek or South Fork Lower Willow Creek from implementing the Proposed Plan or the Agency-Modified Alternative.
6. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES: Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Species of special concern?	**[Y]** The bald eagle, gray wolf, grizzly bear, and Canada lynx are the only known threatened or endangered species to occur within the project area. The peregrine falcon had previously been listed as a threatened species, but has since been removed from listing as a result of nationwide recovery efforts. Where suitable habitat exists, the peregrine falcon will be considered a sensitive species. The project area does not contain any suitable critical habitat for these four currently listed and one previously listed species

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	(USDA Forest Service 2001b), and no impacts are anticipated to these species or their habitats from the implementation of any of the action alternatives. Other animal species of special concern in the area include northern goshawk, black-backed woodpecker, western big-eared bat, boreal toad, and northern leopard frog. Although there may be suitable prey in the area for the raptor and bat species, interim reclamation of the site would not adversely affect prey species or their habitats or any other suitable habitat for the raptors and bats. There is some potential for individual boreal toads and northern leopard frogs to be impacted by the changes being made to the seepage capture system at the springs, but there would be little potential to cause a trend toward listing these species. No federally listed plant species or plant species of special concern have been identified in the project area (USFS 2001a). A population of westslope cutthroat trout, a USFS sensitive species, exists in Smart Creek, and bull trout, an ESA (Endangered Species Act) listed "threatened species," is found in Flint Creek in Section 6. While these species are not found in the immediate vicinity of the Combination Mine, they are located downstream from the site. Neither the Proposed Plan nor the Agency Modified Alternative would have an impact on downstream fisheries in Smart Creek or South Fork Lower Willow Creek.
7. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?	**[N]** No historical or archeological sites have been identified in the permit area. If any sites were located during interim and final reclamation, ASARCO would be required under the Agency Modified Alternative to notify DEQ, the State Historic Preservation Office, and the USFS. What actions would be required would depend upon the nature of the sites and whether or not the sites were on private or USFS lands.
8. AESTHETICS: Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Will there be excessive noise or light?	**[Y]** <u>All Locations</u> The mine, waste rock dumps and access roads are visible from other USFS Roads and from across the valleys. Reclamation of the disturbances under either the Proposed or the Agency Modified Alternative would not greatly increase or decrease the visibility of the sites. Disturbances resulting from installing or reconstructing diversions at all sites, building the new USFS road segment below the Combination Mine waste rock dump in 2003, and salvaging soil material at all sites may be somewhat visible until the slopes were seeded in 2004 and 2005 and vegetation became established over the next couple of years. The buildings and structures at the Lewis Shaft are visible from USFS Road 678 leading past this site to the historic Combination Mill to the northwest and from the USFS Road leading to Tim Smith #1. Removing the buildings, plugging the shaft and grading the area around the shaft would not greatly increase or decrease the

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
	visibility of the site under either the Proposed or the Agency Modified Alternative The completion of interim reclamation activities in 2005 and final reclamation work after ASARCO decided to permanently close the mine would be primarily done during daylight hours so lighting is not an issue. The only impacts from noise would be to wildlife and cattle in the area and persons driving through on USFS roads in the area. This would be a short-term but unavoidable impact and would have no lasting effects.
9. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY: Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project?	**[N]**
10. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES: Are there other activities nearby that will affect the project?	**[N]**

IMPACTS ON THE HUMAN POPULATION	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
11. HUMAN HEALTH AND SAFETY: Will this project add to health and safety risks in the area?	**[N]** The use of heavy equipment to reclaim the sites has some inherent safety risks to personnel but equipment should be operated properly. Access by ASARCO and agency staff would be maintained during interim reclamation at the Combination Mine, and Tim Smith #1 and #2, but the roads through these sites would not be open to the public. Completion of the interim and final reclamation would help to enhance public health and safety at all four sites comprising the Black Pine Mine.
12. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities?	**[N]** There are cattle grazing on USFS lands surrounding the project area. There may be short-term and temporary disturbances to grazing animals.
13. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so, estimated number.	**[N]** There would be a short-term increase in employment to work the equipment to reclaim the sites, install diversions and culverts, and reclaim access roads. There would be no permanent positions created during interim reclamation of the site.
14. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax	**[N]**

IMPACTS ON THE HUMAN POPULATION	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
revenue?	
15. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be needed?	**[N]** DEQ and the USFS would continue to inspect the site to ensure compliance with permit conditions and stipulations.
16. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?	**[Y]** A portion of the waste rock dump and lands east of USFS Road 448 and south of the Combination Mine waste rock dump and mine area had been USFS lands subject to requirements of the 1987 Deerlodge National Forest Management Plan prior to acquisition by ASARCO in 2003. Nevertheless, there are USFS lands in the vicinity of the other three sites that make up the rest of the Black Pine Mine. The Agency Modified Alternative would comply with the USFS Plan. The reclamation of access roads on USFS lands would comply with USFS reclamation standards at the time of mine closure.
17. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract?	**[Y]** USFS Road 448 provides access to USFS lands and private inholdings in the vicinity of the permit area. Interim reclamation of the Combination Mine site under any action alternative would not affect that access. There is some recreational potential for hunting on the mine site and within the permit area for people authorized by ASARCO to enter these private lands. At final reclamation, the road across the Combination Dump would be completely reclaimed, but the north and south access road segments would be reclaimed to a two-track road. The access road past the Lewis Shaft and accessing Tim Smith #1 would also be reclaimed to a two-track road to maintain public access to public lands and private inholdings in the area. The access road to Tim Smith #2 would be completely reclaimed and measures would be taken to discourage public use of the reclaimed road way to ASARCO's privately owned lands there.
18. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: Will the project add to the population and require additional housing?	**[N]**
19. SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible?	**[N]**
20. CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area?	**[N]**

IMPACTS ON THE HUMAN POPULATION	
RESOURCE	**[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES**
21. PRIVATE PROPERTY IMPACTS: Are we regulating the use of private property under a regulatory statute adopted pursuant to the police power of the state? (Property management, grants of financial assistance, and the exercise of the power of eminent domain are not within this category.) If not, no further analysis is required.	**[Y]** DEQ regulates the use of private property used for mining under the Metal Mine Reclamation Act (MMRA). The MMRA requires compliance with the state's air and water quality acts. The required modifications are necessary to comply with the MMRA and the state's air and water quality acts
22. PRIVATE PROPERTY IMPACTS: Does the proposed regulatory action restrict the use of the regulated person's private property? If not, no further analysis is required.	**[Y]** DEQ's modifications to ASARCO's proposed interim reclamation plans for each of the four sites comprising the Black Pine Mine would restrict the amount and to some extent the method of implementing interim and final reclamation measures at those sites. The goal of interim reclamation would be achieved under both action alternatives. Interim reclamation would have a better chance of succeeding under the Agency Mitigated Alternative.
23. PRIVATE PROPERTY IMPACTS: Does the agency have legal discretion to impose or not impose the proposed restriction or discretion as to how the restriction will be imposed? If not, no further analysis is required. If so, the agency must determine if there are alternatives that would reduce, minimize or eliminate the restriction on the use of private property, and analyze such alternatives.	**[Y]** DEQ has the authority to require the modifications in order to protect the ground and surface water resources being adversely affected by acid rock drainage at the Combination Mine site and to prevent if from occurring at the other three sites. The agencies' mitigations are necessary to minimize the risk for continued harm to the lands and waters downslope and downgradient from the Combination Mine and the waste rock dump. Changes to the regrading, resoiling, and revegetation components of the reclamation plans for the four sites would be made under the Agency Mitigated Alternative. These changes are necessary to ensure the sites are reclaimed to comparable stability and utility as required by MMRA.
24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:	**[N]**

25. Alternatives Considered:

No Action Alternative: The existing reclamation plan for the Black Pine Mine Combination waste rock dump is basic and typical of plans approved in the 1970's. Currently, ASARCO pumps back seepage water from CPS-1 into the mine pool and collects storm water and seepage runoff from the waste rock dump in a pond installed south of USFS Road 448 in 2003 to replace in part the pond that had been located just below the waste rock dump prior to regrading. This would continue until and possibly after final reclamation plan was implemented because of the lack of detail and mitigations needed to deal with contaminated water and soils. The approved reclamation plans for the other three sites are general as well and might result in less than acceptable reclamation, stability, and utility of those sites.

Proposed Action: ASARCO's proposal contains the remaining components necessary for completion of interim reclamation at the Combination Mine, Tim Smith #1 and #2, in 2004 and 2005 and final reclamation of all four sites after ASARCO decides to permanently close the Black Pine Mine. More details on these reclamation plans can be found at the beginning of this EA and in ASARCO's permit revision application and associated documents. A brief summary is included below.

The Combination Mine

ASARCO's proposed interim reclamation plan for 2004 for the Combination waste rock dump would cover the top of the waste rock dump with a PVC liner. A complex soil cap would be placed over the entire waste rock dump in 2004. An infiltration pond would be constructed below the access road south of the waste rock dump and a drainage diversion along the cut face would capture water off the top of the capped waste rock dump and direct it into the pond. Gutters would be placed on the remaining buildings to direct runoff to the diversion. Any soil or borrow material needed for interim and final reclamation would be obtained from BPB-4 and any soil stockpiles created during regrading activities in 2003. All disturbed areas at the Combination Mine waste rock dump would be seeded and mulched in 2004. The Combination Soils area would be reclaimed in 2005.

At final reclamation, the remaining buildings on the waste rock dump would be dismantled and removed. PVC liner would be installed where the buildings had been located and connected to the liner installed in 2004 on the rest of the waste rock dump top. A reclamation cap would be constructed on new liner. The adit would be backfilled and cover material placed over the fill. All newly reclaimed areas would be seeded with ASARCO's seed mix.

Tim Smith #1 Mine

Interim reclamation at the Tim Smith #1 would consist of regrading the waste rock dump, putting cover soil on the waste rock dump, and seeding it with ASARCO's seed mix in 2005. Storm water control structures would be installed and stabilized by reseeding any disturbances created when constructing these features. Any cover soil or borrow material needed for interim reclamation would be taken from BPB-10.

Final reclamation would include backfilling the adit and topsoiling and seeding the material over the adit backfill and partially reclaiming the access road to a two-track road.

Tim Smith #2

Interim reclamation at the Tim Smith #2 would consist of regrading the waste rock dump, putting cover soil on the waste rock dump, and seeding it with ASARCO's seed mix in 2005. Storm water control structures would be installed and stabilized by reseeding any disturbances created when constructing these features. Any cover soil or borrow material needed for interim reclamation would be taken from BPB-8.

Final reclamation would include backfilling the adit and topsoiling and seeding the material over the adit backfill and completely obliterating the access road.

Lewis Shaft

Final reclamation would include removing all buildings and structures, plugging the shaft and backfilling, topsoiling and seeding the material over the shaft plug and revegetating the disturbed area around the shaft. No interim reclamation work was identified. Final reclamation would begin once ASARCO has decided to permanently close the Black Pine Mine. Any cover soil would come from adjacent areas to the shaft, but no borrow areas were identified.

Agency-Modified Alternative: The agencies have analyzed the activities necessary to implement the remaining components of the interim reclamation plan proposed for the Black Pine Mine area. The interim reclamation plan proposed by ASARCO must be modified to address several agency concerns caused by

implementing interim reclamation. Modifications are also needed for the final reclamation plan for the Combination Mine waste rock dump as well as the Lewis Shaft, and the Tim Smith #1 and #2 areas. The agencies have identified 23 modifications to the permit amendment request. Four of those modifications apply across the entire permit area. Those modifications are 2, 4, 6, and 7. Modifications 12, 13, and 15 apply to all areas except Lewis Shaft.

The Combination Mine

The reclamation plan for the Combination Waste Rock Dump proposed by ASARCO requires some changes to address several agency concerns. DEQ has identified 20 modifications to the permit amendment request relative to the Combination Mine. The modifications have been grouped according to the primary issue they address.

Reclamation and Revegetation

Modification 1: The agencies have some concern over the volume of soil materials available at BPB-4 after material was used to reconstruct the relocated USFS Road 448 in 2003. Information in the application does not indicate whether or not there would be sufficient material to complete interim reclamation of the waste rock dump area with a greater volume of soils to be replaced in the trenches at the Combination Soils area and the additional 6 inches of topsoil to be added to the waste rock dump slope and access roads. Additional soils from borrow site BPB-2 would be used if there were insufficient material at BPB-4. DEQ and the USFS would field approve the location of BPB-2 prior to disturbance of the site.

> Stipulation 1: ASARCO would use additional soil material from BPB-2 if there were insufficient material in BPB-4 to complete both interim and final reclamation of the Combination Mine waste rock dump, access roads, and the Combination Soils area. The siting of the additional borrow site must be field approved by the agencies before the site was used.

Modification 2: All reclamation features including soil stockpiles located at BPB-4, BPB-2 or around the waste rock dump that would be used for final reclamation are to be indicated on an as-built map documenting the condition of the Combination Mine area after interim reclamation is completed in 2005. A second as-built map must be submitted after final reclamation work is completed. Similar maps are to be provided for interim and final reclamation at Tim Smith #1 and Tim Smith #2, and after final reclamation for the Lewis Shaft and their associated soil borrow areas when those areas are reclaimed by ASARCO. The volume of each soil stockpile in the borrow areas must be provided with the as-built maps.

> Stipulation 2: ASARCO must provide as-built maps showing the location of all reclamation features including soil stockpiles at BPB-4, BPB-2, and the waste rock dump area for the Combination Mine area after the interim reclamation work is completed for agency review. Similar as-built maps must be provided after interim and final reclamation of Tim Smith #1, Tim Smith #2, and the Lewis Shaft and their associated soil borrow areas to the agencies. The volume of each soil stockpile in the borrow areas must be provided with the as-built maps.

Modification 3: Lodgepole pine seedlings would be planted on the Combination Mine waste rock dump slope in 2005 to provide long-term water uptake on the waste rock dump slope and enhance reclamation success. Tubling seedlings would provide more rapid establishment of lodgepole pine than bare-root stock. No tree seedlings would be planted on the waste rock dump top as tree roots might possibly penetrate the liner.

> Stipulation 3: ASARCO would plant tubling lodgepole pine trees on the Combination Mine waste rock dump slope in 2005. The revegetation goal would be to achieve 400 trees/acre.

Modification 4: Several components that relate to seed mixes, fertilizer rates, and mulch applications have been combined into one modification.

a. ASARCO's seeding plan, based on the weight of seed rather than pounds of pure live seed/acre (pls/acre), does not provide for long-lived perennial plant rhizomatous species. A specific seed mix and seeding rates must be proposed, reviewed and approved by agency staff prior to use. This modification would apply to all seed mixes to be used at all sites that comprise the Black Pine Mine. ASARCO's seed mix is acceptable for temporarily stabilizing soil stockpiles.
b. Drill seeding would be used on all slopes 3:1 or less unless some other factor prevents access by a drill. Broadcast or hydroseeding would be used on steeper slopes as proposed by ASARCO.
c. ASARCO must submit the proposed fertilizer and lime rates for use at all sites that comprise the Black Pine Mine to DEQ for review and approval prior to use. References to rates were included in ASARCO's bid package for 2004 reclamation activities, but the section containing that information was not included in the material sent to DEQ.
d. All sites would be mulched w/1,000 pounds of weed free mulch after seeding to discourage scavenging by rodents and to provide shade and help trap moisture for emerging seedlings.

Stipulation 4:

a. The planting mix to be used at all sites that comprise the Black Pine Mine would be revised to include at least one long-lived perennial rhizomatous plant species. The mixture must be based on pounds of pls/acre for each species rather than weight of the seed to ensure sufficient germination. Prior to use, the agencies would review and approve the seed mix and seeding rates. ASARCO may use its proposed seed mix for temporarily stabilizing soil stockpiles.
b. ASARCO would use drill seeding on all slopes 3:1 or less unless some other factor prevents access by a drill. Broadcast or hydroseeding would be used on steeper slopes as proposed by ASARCO.
c. ASARCO must submit the proposed fertilizer and lime application rates to DEQ for review and approval prior to application.
d. ASARCO would mulch all seeded areas after seeding w/ 1,000 pounds of weed free mulch.

Modification 5: The gates prohibiting traffic across the waste rock dump should remain in place to discourage public traffic on the reclaimed access roads and across the Combination Mine waste rock dump. This would improve the potential for successful revegetation of the waste rock dump surface and roadway. ASARCO may decide to remove the gates once vegetation is permanently established on the site after final reclamation is completed.

Stipulation 5: ASARCO would retain and maintain the gates prohibiting public traffic across the Combination waste rock dump until the vegetation is established. The gate may not be removed until after final reclamation is complete.

Modification 6: All road beds would be ripped to 12 inches before topsoil is installed to ensure an uncompacted rooting zone. Ripping had not been specified for the roadway over the Combination Mine waste rock dump. Ripping was proposed by ASARCO prior to regrading, but should also be done after regrading to ensure a sufficient and uncompacted rooting zone.

Stipulation 6: ASARCO would rip all regraded roadbeds to 12 inches prior to topsoil placement. If ASARCO can demonstrate that there was a minimum of 12 inches of uncompacted subsoil after regrading, then the verified roadbed need not be ripped again prior to soil placement.

Modification 7: If soil organic matter contents are less than one percent, organic material would be incorporated into the top 2 inches of the last lift of soil material in the cap on the waste rock dump top and slope to increase the fertility, water holding capacity and establishment of microbial communities in the soil. A stockpile of organic material is located just east of the south access road, near the location for the infiltration pond. DEQ would determine during field inspections if ASARCO needed to add organic matter to the soils used for reclaiming roads and other areas such as Tim Smith #1, Tim Smith #2, and the Lewis Shaft.

Stipulation 7: If soil organic matter levels are less than one percent, ASARCO would incorporate organic material, such as the organic material stored on the site, into the surface layer of soil on the entire waste rock dump cap to increase the organic matter content to one percent in the top 2 inches of the soil. DEQ would determine during field inspections if ASARCO needed to add organic matter to the soils used for reclaiming roads and other areas such as Tim Smith #1, Tim Smith #2, and the Lewis Shaft.

Combination Soils

Modification 8: The soil below the waste rock dump was contaminated with acid seepage from the waste rock dump. The contaminated soil on ASARCO property was removed in 2003. Testing with the XRF analyzer is necessary to determine if the extent of the contamination has been completely identified and that sufficient material has been removed to meet the agencies' cleanup limit of 50 ppm copper in the soil within the plant rooting zone.

Stipulation 8: ASARCO must use a XRF analyzer in the field to completely identify the extent of any remaining contaminated Combination Soils material before reclaiming the Combination Soils area and installing the cap on the top of the contaminated soil repository in BPB-4 (see Stipulation 9). This is necessary to ensure that all contaminated areas have been excavated to a minimum depth of 3 feet (see Stipulation 9) needed to comply with the agencies' limit for copper. The cleanup goal would be 50 ppm copper within the plant rooting zone.

Modification 9: It would not be practicable to require excavation to excessive depths in the Combination Soils area. If the copper concentration at the bottom of the 3-foot trench dug to remove contaminated Combination Soils ranged between 50 and 300 ppm, then no additional contaminated soil would need to be removed as few plant roots reach deeper than 3 feet. ASARCO would then place 3 feet of soil material from the borrow area in the excavated trench. If the copper concentration at the bottom of the 3-foot trench dug to remove contaminated Combination Soils exceeded 300 ppm, an additional foot of contaminated material would be removed from the trench before the trench was backfilled with 4 feet of clean soil material. This would provide an additional buffer against upward migration of copper into the rooting zone. The top 12 inches would be rocky topsoil as defined in Modification 11. This would provide sufficient soil depth such that most plant roots would not come in contact with the contaminated soils. Removal of soils would not extend into the downslope wetland areas unless otherwise approved by USFS staff.

Stipulation 9: If the copper concentration in the contaminated Combination Soils area were greater than 300 ppm at 3 feet, then ASARCO would excavate an addition foot of contaminated soils. Three or 4 feet of clean growth medium would be replaced in the trench depending on how deep the trench was excavated according to these limits. The top 12 inches of soil would be comprised of rocky topsoil as per Stipulation 12c, below.

Modification 10: The field review of the Combination Soils area in 2005 (Modifications 8 and 9) may indicate that additional soil needs to be removed to meet the agencies' copper criterion. The cap on the waste rock dump top would have to be removed and replaced to place this material with the contaminated material excavated in 2003. Therefore, those additional contaminated soils would be placed in a field-located and agency-approved repository site in BPB-4. The deposit of contaminated soils excavated in 2005 would be capped per the agency-modified Combination Mine waste rock dump top cover system.

Stipulation 10: Any additional contaminated Combination Soils identified and removed in 2005 below the waste rock dump per Stipulations 8 and 9 would be placed in BPB-4 and capped and reclaimed in the same fashion as the agency-modified Combination Mine waste rock dump cap. The location of this deposit of contaminated soils would be field located and approved by DEQ and USFS staff.

Storm Water Management and Erosion Control Measures

Modification 11: The installation of gutters on the buildings provides a focused discharge point at the base of the gutters. The force of water draining at these points could erode the cap beneath the downspout. In addition, the amount of snow pack at the site that collects on the roof could rip off or damage the gutters. The gutters would be eliminated. The connection of the PVC liner to the buildings needs to be modified to reduce the potential for water to seep between the building and the liner into the waste rock beneath and to reduce the potential for erosion from the gutter downspouts by allowing the snow to just slide off the roof and melt on the reclaimed and lined surface.

Stipulation 11: ASARCO would eliminate the gutters on the buildings. At the buildings, the adjacent diversion in which the edge of the PVC liner was placed would be filled in with a layer of clean soil material and covered with another liner attached to the building like a shingle to overlap the PVC liner for the cap and slope away from the buildings. The second liner would be covered with at least 1 foot of rocky, non-erosive soil material to prevent damage from sunlight.

Modification 12: Finer textured soils are more susceptible to erosion than coarser soils. Therefore, coarser soils with 35 to 50 percent coarse fragments need to be placed on steeper reclaimed slopes, and finer textured soils could be placed on flatter slopes.

a. Rocky topsoil would be placed as the last lift of soil material on the Combination Mine waste rock dump slope and this lift would be 12 inches thick rather than the 6 inches proposed by ASARCO. This is especially important because there no benches were constructed across the Combination Mine waste rock dump face in 2003 to slow down surface runoff and soil erosion. The deeper topsoil depth would help facilitate revegetation by providing a deeper rooting zone. This modification will also apply to the Tim Smith #1 waste rock dump.
b. Coarser topsoil should be placed as the last lift of soil placed in the Combination Soils area trenches to help reduce the flow of storm water down these drainages and reduce erosion potential. This lift would be 12 inches thick.
c. Coarser soils need to be placed on all access roads to be reclaimed throughout the Black Pine Mine to aid in reducing erosion potential and compaction by vehicular use on roads reclaimed as two-track roads. At a minimum, these rocky soils should be placed on steeper slopes on all other reclaimed roads in the permit area. USFS standards would take precedence if they are more stringent.

Stipulation 12:

a. ASARCO would deposit a 1-foot layer of clean topsoil with 35 to 50 percent rock fragments as the last lift for the cap on waste rock dump slopes. This is 6 inches more topsoil than proposed by ASARCO for the last lift of the Combination Mine waste rock dump cap. This stipulation will also apply to Tim Smith #1.
b. ASARCO would deposit a 1-foot layer of clean topsoil with 35 to 50 percent rock fragments as the last lift of fill to be placed in the Combination Soils area trenches.
c. ASARCO would deposit a minimum 6 inches of rocky soil material with 35 to 50 percent rock fragments as the final layer on all reclaimed access roadbeds. If USFS standards at the time of reclamation were more stringent, then those standards would be used instead.

Modification 13: Slash generated by land clearing activities prior to soil salvage, regrading, etc. would be salvaged and use for slash filter windrows to help minimize erosion.

Stipulation 13: ASARCO would salvage slash generated during land clearing and regrading activities and place it at the base of the waste rock dumps and along reclaimed roads in slash filter windrows. This stipulation also would apply to both Tim Smith #1 and #2.

Modification 14: Water draining off the sides of the waste rock dump and on the native slopes adjacent to the waste rock dump could collect in the drainage created between the waste rock dump and the undisturbed ground. The construction of rock check dams along this interface would help contain runoff

and reduce the potential for erosion along the drainage. Locations of the check dams would be field approved by DEQ and USFS staff. Sufficient rock should be available in the borrow area after material has been screened for the different layers of waste rock dump cap.

> Stipulation 14: ASARCO would construct rock check dams along the drainage created by the interface of the waste rock dump and the native ground to the north and south to help contain runoff and reduce the potential for erosion along the drainage. Rock would be obtained from the borrow area. Field review with DEQ and USFS staff prior to cap construction would be used to identify where the check dams should be constructed.

Modification 15: ASARCO has specified it would install a variety of culvert and basin storm water energy dissipation structures but has not provided any designs. ASARCO must provide designs for basin and culvert outlet energy dissipation structures for DEQ approval prior to installation for all sites within the Black Pine Mine permit area.

> Stipulation 15: ASARCO must provide designs for basin and culvert outlet energy dissipation structures for DEQ approval prior to installation for all sites within the Black Pine Mine permit area.

Modification 16: Several items specified in ASARCO's Erosion Control Plan for 2003 were not implemented. Those items need to be completed in order to achieve the level of erosion control needed at the Combination Mine.

a. The toe diversion below the waste rock would be lined with PVC as was specified by ASARCO in its Erosion Control Plan for 2003 and was not done. Lining of this diversion along the roadside would reduce the amount of water reaching the underground seepage collection system.
b. The sediment basins at the lower end of the trenches dug to remove contaminated soils in the Combination Soils area need to be constructed to trap water and sediment and prevent them from reaching wetlands on USFS lands. The basins would be located on ASARCO property adjacent to the USFS boundary.

> Stipulation 16: ASARCO would implement two items specified in its Erosion Control Plan for 2003 Reclamation Activities (Hydrometrics 2003b).
>
> a. ASARCO would line the toe diversion also referred to as the runoff collection or roadside ditch below the waste rock dump with PVC as described in its Erosion Control Plan for 2003 Construction Activities (Hydrometrics 2003b).
> b. ASARCO would construct the sediment basins at the end of the reclaimed trenches in the Combination Soils area in 2005.

Modification 17: Existing collection system components, liners and pumps for the collection pond below USFS Road 448 would be maintained until monitoring indicated and the agencies concurred that collection and pumpback of seepage water was no longer required.

> Stipulation 17: ASARCO would maintain the existing collection system components, liners and collection pond pumps until monitoring of pumpback return water indicated that that the quality of seepage water was of good enough quality that it no longer needed to be pumped back into the mine.

Modification 18: The seepage collection system is an important component in controlling the spread of the acid drainage from the waste rock dump until it was determined that interim reclamation was adequately controlling acid rock drainage. The remoteness of the site makes it important to have a backup power source on site should the electrical supply to the site be disconnected.

> Stipulation 18: Until vegetation gets established, backup electrical power generation for the seepage collection system must be installed by October 1, 2004. Backup electrical power

generation shall be retained until monitoring shows that acid rock drainage production has ceased or has reached an agency approved water quality level.

Water Treatment, Sampling, and Monitoring

Modification 19: Long-term water treatment may be a requirement under interim and final reclamation. Therefore, it is important that long-term water treatment studies continue so that the most suitable method can be selected after interim reclamation and prior to final reclamation of the site.

Stipulation 19: ASARCO must continue with its study of long-term water treatment methods and submit the results of that study to the agencies for consideration within 2 years after all interim reclamation work was completed and prior to final reclamation.

Modification 20: CPS-1 is an important monitoring site that is useful in determining success of reclamation on the waste rock dump. It must be sampled on a more regular basis and for a wider range of parameters than is currently being done. Monitoring of other springs and seeps is also needed to better determine whether or not water from the mine pool has any influence on peripheral surface waters.

Stipulation 20: ASARCO must monitor CPS-1 on an annual basis as well as other springs and seeps during peak ground water periods (late June or until July 15). Field parameters of specific conductivity, pH, and temperature must be collected, flow must be measured and a water quality sample of the other springs and seeps must be collected for laboratory analyses. Since CPS-1 is a perennial spring, water quality samples must be taken each year and tested for a range of parameters identified by the agencies.

Tim Smith #1 Mine

The reclamation plan for the Tim Smith #1 Mine, proposed by ASARCO, requires some changes to address agency concerns. DEQ has identified 2 modifications to the permit amendment request for this site. Modifications 2, 4, 6, 7, 12a, 12c, 13, and 15 also pertain to Tim Smith #1.

Modification 21: Whole rock geochemical analyses of the waste rock dump materials must be provided to ensure that acid rock drainage would not be a concern as it is at the Combination Mine. If the data indicate a potential problem, then measures to reduce the problem must be developed and analyzed prior to reclaiming the waste rock dump. A contingency plan would include capping the waste rock dump in a similar fashion as the Combination Mine waste rock dump until ASARCO provides revised plans to handle the potential problem. This mitigation is also applicable to Tim Smith #2.

Stipulation 21: ASARCO must collect samples of the waste rock and have the samples analyzed for metals and acid producing potential. If the laboratory analysis indicates a potential for the waste rock dumps to develop acid rock drainage, then the waste rock dumps must be capped in a similar fashion as the Combination Mine waste rock dump. ASARCO may submit a revised plan to handle the potential problem; that plan would be evaluated in a separate environmental document at that time. This stipulation applies to Tim Smith #1 and #2.

Tim Smith #2

The reclamation plan for the Tim Smith #2, proposed by ASARCO, requires some changes to address agency concerns. DEQ has identified 1 additional modification to the permit amendment request for this site. Modifications 2, 4, 6, 7, 12a, 12 c, 13, 15, and 21, also pertain to Tim Smith #2.

Modification 22: The Tim Smith #2 waste rock dump should be pulled back into the cut slope. The slope would be resoiled afterwards if ASARCO and the agencies determine the waste rock dump materials are too rocky or have insufficient fines to retain moisture necessary for plant growth. If the waste rock dump

materials were adequate for plant growth, then additional soil/growth medium would not be required. If the waste rock dump materials were inadequate for plant growth then 12 inches of soil would be obtained from BPB-8.

Stipulation 22: ASARCO would regrade the Tim Smith #2 waste rock dump by pulling material from the waste rock dump slope and crest back into the cut face to reduce the slope and reclaim the cut face. ASARCO would test the waste rock dump material as to its suitability as a plant growth medium. The agencies would determine if it was suitable or not. If not, ASARCO would obtain 12 inches of soil material from BPB-8.

Lewis Shaft

The reclamation plan for the Lewis Shaft, proposed by ASARCO, requires some changes to address agency concerns. DEQ has identified 1 additional modification to the proposed permit amendment for this site. Modifications 2, 4, 6, and 7 also pertain to the Lewis Shaft area.

Modification 23: Rather than obtain any necessary soil adjacent to the Lewis Shaft area, soil would be obtained from BPB-8 near Tim Smith #2. This would keep disturbances at the shaft area to a minimum.

Stipulation 23: ASARCO would obtain any necessary soil materials needed for interim and final reclamation of the Lewis Shaft area from BPB-8.

26. Public Involvement: The notice of application of the revised reclamation plan was published in the Philipsburg Mail on February 16, 2001. One comment was received. This EA will be sent to all parties on the Black Pine mailing list used to collect public comment in 2003.

27. Other Governmental Agencies with Jurisdiction: USDA Forest Service, Beaverhead-Deerlodge National Forest.

28. Magnitude and Significance of Potential Impacts:

Combination Mine: If interim reclamation of the waste rock dump is not accomplished, the potential impact is to allow snowmelt and storm water to continue to infiltrate into the Combination Mine waste rock dump and generate acid seepage that drains out through the bottom and toe of the waste rock dump. There is potential for the seepage to contaminate the roadbed, overwhelm the seepage collection system and continue to impact the downslope soils and vegetation and downgradient springs and seeps.

Under the Proposed Plan, the regrading of the waste rock dump in 2003 increased the area of disturbance and could potentially increase the level of contaminants in the seepage water before interim reclamation is completed in 2004 and 2005. Since no cap was installed during the first year, regrading the waste rock dump allowed the generation of acid rock seepage to continue until the cap on the waste rock dump could be installed in 2004. The original proposed plan did not contain measures to capture the continued seepage and prevent contamination of clean fill in the relocated roadway or prevent contaminated water from leaving the site without containment during the year after regrading. Field approvals by DEQ and USFS staff of a storm water management plan for 2003 reclamation activities resulted in implementation of several agency mitigations to resolve those potential problems. Storm water controls installed in 2003 were sufficient to handle most of the spring runoff at the Combination Mine in the spring of 2004. It is likely that the collection system would continue to be adequate while vegetation on the cap that would be installed in 2004 became established and stabilized the waste rock dump cap, and after the Combination Soils area is reclaimed in 2005. Any areas recontaminated over the winter and spring of 2004 would be removed before the end of 2005 and placed in the repository in BPB-4.

The cap proposed by ASARCO for the waste rock dump is costly, complex, and would require intense QA/QC to ensure that the material met specifications and was installed at the required depths. A simplified cap design could simplify those problems, but ASARCO's proposed cap would provide sufficient protection.

There is some concern that BPB-4 may contain insufficient soil for interim reclamation of the waste rock dump and the Combination Soils area, and final reclamation of the access roads, the building and road areas on the top of the waste rock dump at closure, and the borrow area itself. ASARCO indicated that BPB-2 or BPB-8 could be used but did not specify which one would be used. One site is closer (BPB-2) and is preferred by DEQ as BPB-8 would be used for reclaiming Tim Smith #2 and the Lewis Shaft.

There may still be areas in the Combination Soils area where copper exceeds the agencies recommended level of 300 ppm. ASARCO only salvaged soil 3 feet deep without measuring the concentration at the bottom of the trench. ASARCO proposed pulling soil from the edges of the trenches and the loose material in the bottom of the trench as growth medium. If contaminated soils remain in place so close to the surface of the growth medium or are used as growth medium in the trenches, then revegetation success in the Combination Soils area would be compromised. Any runoff flowing down the regraded drainages could carry the contamination further downslope.

Without backup electrical power during establishment of vegetation on the Combination Mine area, there is some potential for the failure of the seepage collection system, which would result in the downslope and downgradient flow of acidic seepage waters.

Under the Agency Modified Alternative, BPB-2 would be the backup borrow site if insufficient soil material is available at BPB-4. The use of rocky soils (35 to 50 percent coarse fragment) on the waste rock dump slope would help to reduce erosion potential of the cap surface. Changes in the seeding mix and planting of lodgepole pine tublings would further enhance revegetation success. One permit-wide stipulation pertains to the location and volumes of stockpiled soil materials to be available for final reclamation and submittal of as-built maps and reports after interim reclamation is completed in 2005. This requirement would help ensure that sufficient reclamation materials would be available for final reclamation and provides documentation as to exactly what work was accomplished during interim reclamation.

Reclamation of the Combination Soils area is further defined to ensure that soils with high copper levels were removed to 3 or 4 feet according the copper concentration levels at the bottom of a 3 foot trench in 2005. All trenches would be filled in with clean soil material obtained from the borrow area. Any contaminated Combination Soils removed in 2005 would be stockpiled in the borrow area and covered with a cap like that proposed for the Combination Mine waste rock dump. Maintenance of backup pumps and the seepage collection system and installation of backup electrical power generation system would help ensure the functioning of the seepage collection system and minimize the potential for the acid seepage to reach the Combination Soils area and downgradient springs and seeps. Water monitoring requirements have been expanded and long-term water treatment studies would continue so that protection of water quality is maintained over the short and long term.

Tim Smith #1: Under the Proposed Plan, ASARCO proposes to reclaim the Tim Smith Mine #1 in two phases. Interim reclamation would result in reclamation and stabilization of the waste rock dump. Under final reclamation the mine adit and access road would be reclaimed. Provided that the waste rock in the waste rock dump does not have any potential to produce acid rock drainage, ASARCO's plan is mostly adequate to reclaim and stabilize the site. No commitment was made to reclaim access roads to USFS standards where USFS roads existed. This could result in reclaimed roads that did not comply with those standards and were not suitable for eliminating post-mine use of those roads.

Under the Agency-Mitigated Alternative, geochemical testing of the waste rock dump would identify whether the material had any acid drainage generation potential. If the potential exists, then the waste rock dump would need to be reclaimed in a similar fashion as the Combination Mine waste rock dump. If not, then other than some site-wide mitigations for the use of rocky soils on slopes and modifications to the seed mix, ASARCO's reclamation plan would be adequate to reclaim the site to suitable stability and utility. The reclamation of access roads must comply with USFS standards to ensure the roads are adequately reclaimed and closed to public use.

One permit-wide stipulation pertains to the identification of reclamation features including soil stockpiles in the borrow pits to be used for final reclamation and submittal on as-built maps submitted to DEQ after interim reclamation is completed in 2005. A second as-built map would be submitted after final reclamation. This requirement would help ensure that sufficient reclamation materials would be available for final reclamation and provides documentation as to exactly what work was accomplished during interim and final reclamation. It also documents what features are in place that DEQ might have to reclaim, if ASARCO should abandon the site without completing reclamation.

Tim Smith #2: Under the Proposed Plan, ASARCO proposes to reclaim the Tim Smith Mine #2 in two phases. Interim reclamation would result in reclamation and stabilization of the waste rock dump. Under final reclamation the mine adit and access road would be reclaimed. Provided that the waste rock in the waste rock dump does not have any potential to produce acid drainage, ASARCO's plan is mostly adequate to reclaim and stabilize the site. No commitment was made to reclaim access roads to USFS standards where USFS roads existed. This could result in reclaimed roads that did not comply with those standards and were not suitable for eliminating post-mine use of those roads. Additionally, the waste rock dump would be regraded by pushing the material downslope increasing the footprint of the waste rock dump and leaving an unreclaimed cut face.

Under the Agency-Mitigated Alternative, geochemical testing of the waste rock dump would identify whether the material had any acid drainage generation potential. If the potential exists, then the waste rock dump would need to be reclaimed in a similar fashion as the Combination Mine waste rock dump. If not, then other than some site-wide mitigations for the use of rocky soils on slopes and modifications to the seed mix, ASARCO's reclamation plan would be adequate to reclaim the site to suitable stability and utility. The reclamation of access roads must comply with USFS standards to ensure the roads are adequately reclaimed and closed to public use. Regrading of the waste rock dump would be accomplished by pulling the material up the slope and against the cut face to reclaim the face and reduce the slope of the waste rock dump.

One permit-wide stipulation pertains to the identification of stockpiled soil materials to be available for final reclamation and submittal of as-built maps after interim reclamation is completed in 2005. A second as-built map would be submitted after final reclamation. This requirement would help ensure that sufficient reclamation materials would be available for final reclamation and provides documentation as to exactly what work was accomplished during interim and final reclamation.

Lewis Shaft: Under the Proposed Plan, no interim reclamation is proposed for the Lewis Shaft area. The site would be reclaimed once ASARCO decided to permanently close the mine. Under final reclamation the mineshaft, area around the shaft, and the access road would be reclaimed. ASARCO did not specify a borrow site for reclaiming the Lewis Shaft area. Using material immediately adjacent to the area would expand the disturbance around the shaft and could result in insufficient soil to reclaim the shaft area and the adjacent areas where the soil was obtained. Insufficient soil would slow down or impede revegetation efforts and result in a less stable and usable site. Any soil needed to reclaim the Lewis Shaft would be obtained from BPB-8.

One permit-wide stipulation pertains to the identification of reclamation features including soil stockpiles to be available for use at final reclamation and submittal on as-built maps and reports after interim reclamation is completed. Since no interim reclamation would be done at the Lewis

Shaft, only an as-built map would be required after final reclamation was completed. This requirement would provide documentation as to exactly what work was accomplished during final reclamation.

29. Cumulative Effects: No cumulative effects with the interim and final reclamation plans for all four sites comprising the Black Pine Mine have been identified. No other actions in the area would add to the cumulative impacts from the mine area.

30. References:

ASARCO Inc. 2004. Memo from J. Chris Pfahl, ASARCO Inc., to Pat Plantenberg, DEQ, containing the bid specifications for the 2004 reclamation work at the Black Pine Mine. May 18.

Hydrometrics, Inc. 2001. Draft of the Preliminary Groundwater Monitoring Report for the Black Pine Mine, Granite County, Montana, Prepared for ASARCO Incorporated. January.

_____. 2003a. Revised Reclamation Plan and Water Management Plan for the Black Pine Mine, Granite County, Montana, Operating Permit #00063. Prepared for ASARCO Incorporated. January.

_____. 2003b. Erosion Control Plan for 2003 Construction Activities at the Black Pine Mine Site, Granite County, Montana. Prepared for ASARCO Incorporated. August.

Montana Department of Environmental Quality 2004. Adoption of Draft EA as the Final EA, Finding of No Significant Impact, and Approval of Amendment 005 to Operating Permit No. 00063, Regarding 2003 Reclamation Plan for the ASARCO Black Pine Mine, Combination Mine Area. February 23.

Montgomery, Watson, and Harza. 2002. Black Pine Mine Soil Cover Modeling Technical Memorandum. June.

Pfahl, J. Chris 2004. Personal conversations with Patrick Plantenberg, DEQ, concerning the revised schedule for interim reclamation in 2004 and 2005. June.

USDA Forest Service. 2001a. Biological Evaluation for Plants, Black Pine Mine Reclamation, by John W. Joy, Forest Ecologist, Beaverhead-Deerlodge National Forest. May 11.

_____. 2001b. Biological Evaluation [for Animals], Black Pine Mine Reclamation, by Joel S. Harper, Wildlife Biologist, Beaverhead-Deerlodge National Forest. May 29.

_____. 2004. Letter from Charlie Hester, Acting District Ranger, Pintler Ranger District, to Chris Pfahl, ASARCO Inc. containing a copy of the Decision Memo approving removal of contaminated soils from Forest Service lands and replacement with clean topsoil. June 2.

31. Recommendation for Further Environmental Analysis:

[ ] EIS [ ] More Detailed EA [X] No Further Analysis

32. EA Checklist Prepared By:

Kathleen Johnson, Environmental Impact Specialist, DEQ
Patrick Plantenberg, DEQ Operating Permit Section Supervisor
George Furniss, Hydrogeologist, DEQ
Charles D. Freshman, Mining Engineer, DEQ

Steve Kelley, USFS, Pintler Ranger District

EA Reviewed by:

Warren McCullough, Chief, Environmental Management Bureau, DEQ

33. Approved By:

_____	December 15, 2008
Signature	Date

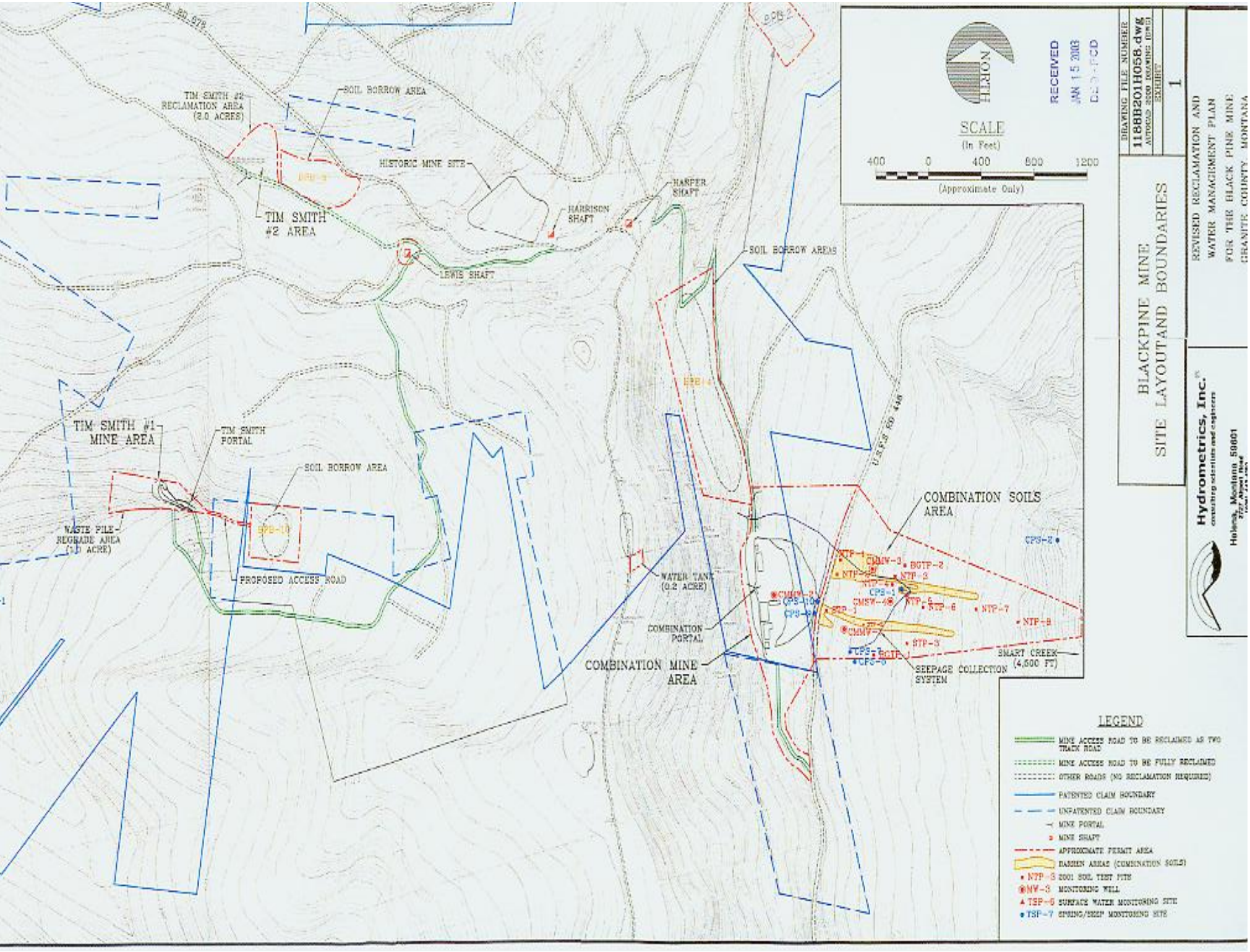
Warren McCullough, Chief
Environmental Management Bureau
Montana Department of Environmental Quality

File 00063.70
G:\EMB\OP\MEPA\EA\Black_Pine\Blackpine2004EA81604.doc

Attachment 1

Site Map

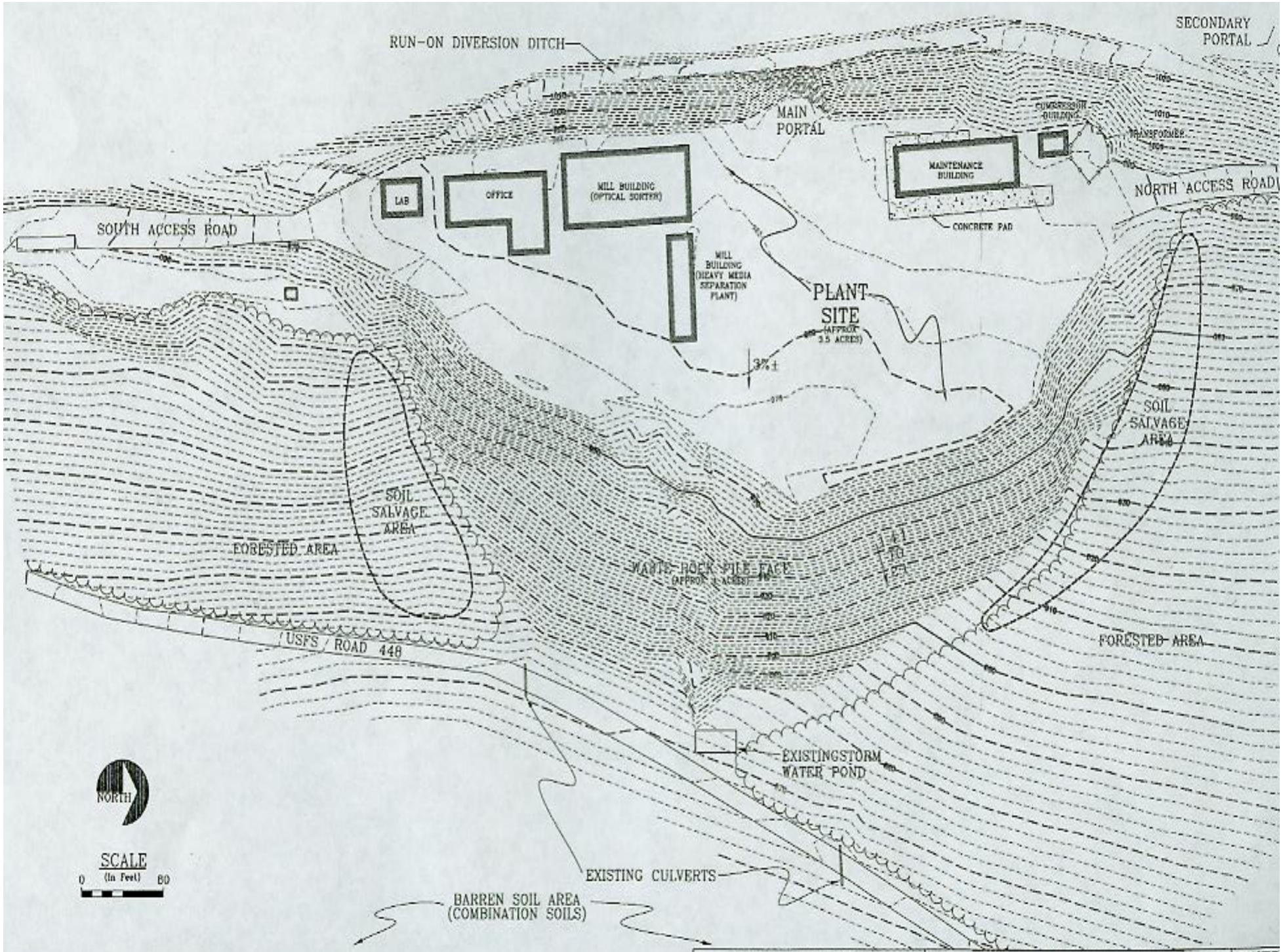
Exhibit 1


TIM SMITH #2
RECLAMATION AREA
(2.0 ACRES)
SOIL BORROW AREA
HISTORIC MINE SITE
TIM SMITH
#2 AREA
HARPER
SHAFT
HARRISON
SHAFT
LEWIS SHAFT
SOIL BORROW AREAS
TIM SMITH #1
MINE AREA
TIM SMITH
PORTAL
SOIL BORROW AREA
WASTE PILE-
REGRADE AREA
(1.0 ACRE)
PROPOSED ACCESS ROAD
WATER TANK
(0.2 ACRE)
COMBINATION
PORTAL
COMBINATION MINE
AREA
COMBINATION SOILS
AREA
SEEPAGE COLLECTION
SYSTEM
SMART CREEK
(4,600 FT)
NORTH
SCALE
(In Feet)
400 0 400 800 1200
(Approximate Only)
RECEIVED
JAN 15 2003
DRAWING FILE NUMBER
118882011H058.dwg
EXHIBIT
1
BLACKPINE MINE
SITE LAYOUT AND BOUNDARIES
REVISED RECLAMATION AND
WATER MANAGEMENT PLAN
FOR THE BLACK PINE MINE
GRANITE COUNTY, MONTANA
Hydrometrics, Inc.
Helena, Montana 59601
LEGEND
MINE ACCESS ROAD TO BE RECLAIMED AS TWO TRACK ROAD
MINE ACCESS ROAD TO BE FULLY RECLAIMED
OTHER ROADS (NO RECLAMATION REQUIRED)
PATENTED CLAIM BOUNDARY
UNPATENTED CLAIM BOUNDARY
MINE PORTAL
MINE SHAFT
APPROXIMATE PERMIT AREA
BARREN AREAS (COMBINATION SOILS)
NTP-3 2001 SOIL TEST PITS
MW-3 MONITORING WELL
TSP-6 SURFACE WATER MONITORING SITE
TSP-7 SPRING/SEEP MONITORING SITE

Attachment 2

Existing (Original) Combination Mine Waste Rock Dump Configuration

Figure 2-1



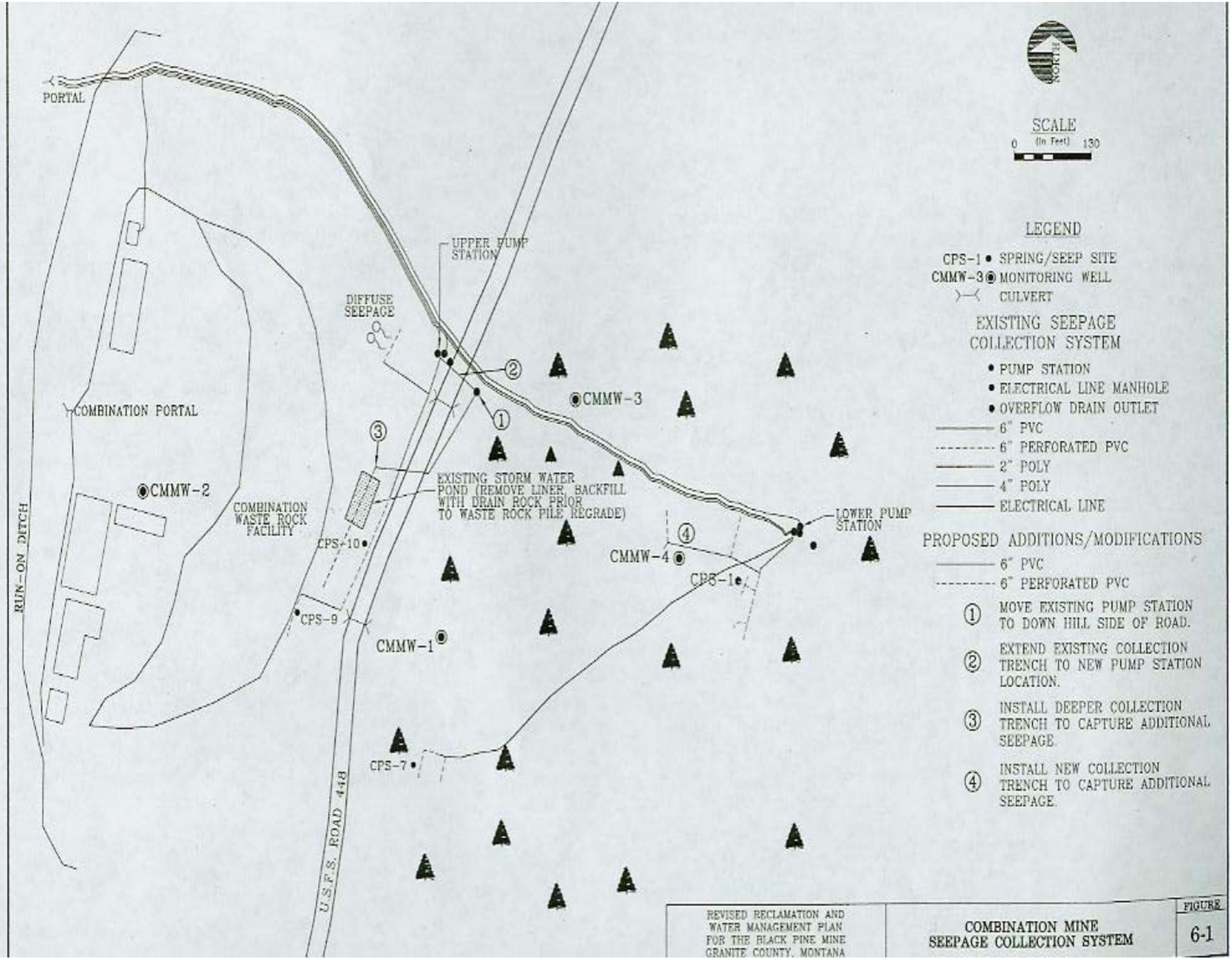
NOTE.
ELEVATIONS REFERENCED TO LOCAL DATUM.

REVISED RECLAMATION AND WATER MANAGEMENT PLAN FOR THE BLACK PINE MINE GRANITE COUNTY, MONTANA	EXISTING COMBINATION MINE WASTE ROCK PILE CONFIGURATION	FIGURE 2-1

Attachment 3

Combination Mine
Seepage Collection System

Figure 6-1



REVISED RECLAMATION AND WATER MANAGEMENT PLAN FOR THE BLACK PINE MINE GRANITE COUNTY, MONTANA

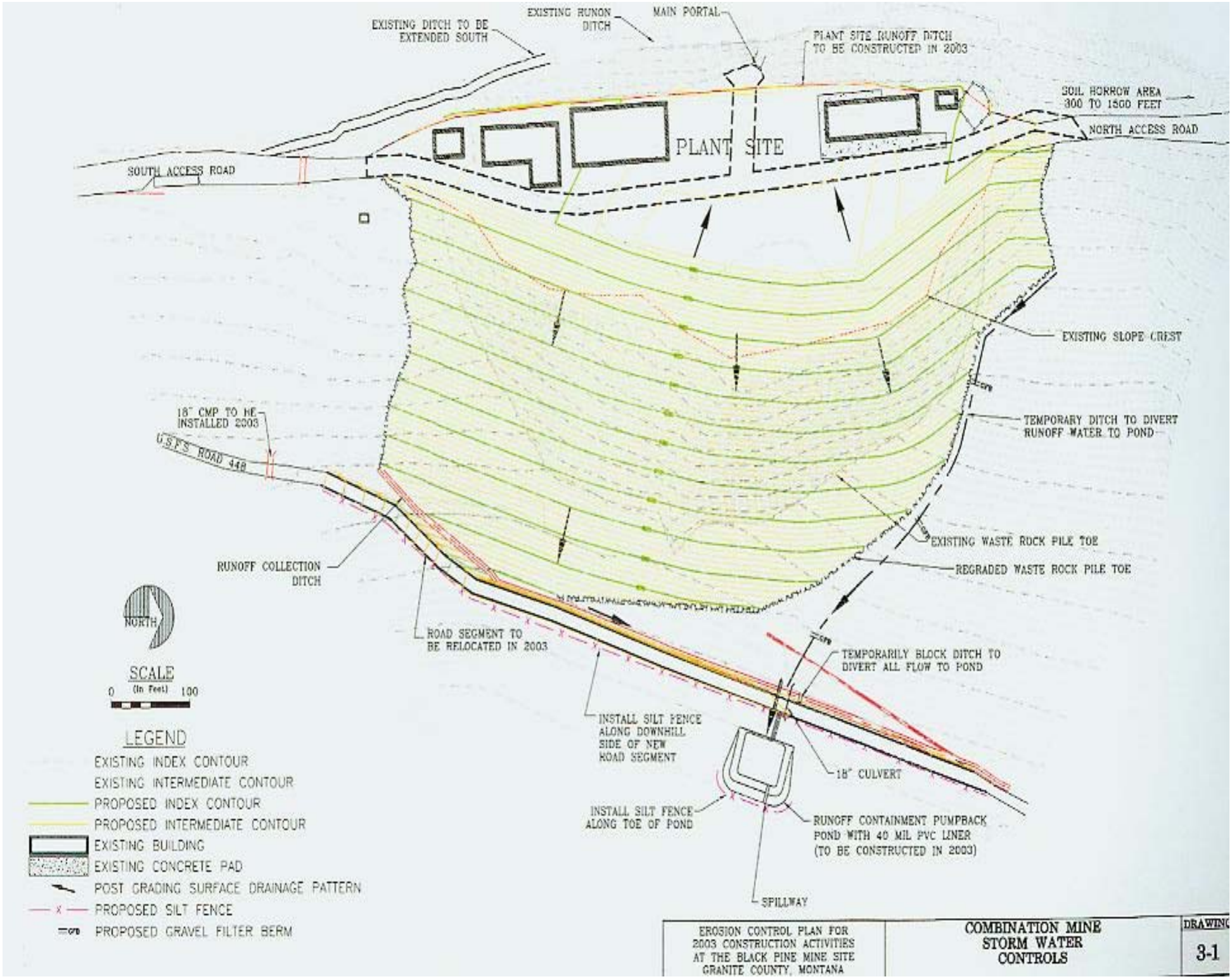
COMBINATION MINE SEEPAGE COLLECTION SYSTEM

FIGURE 6-1

Attachment 4

Combination Mine
Storm Water Controls

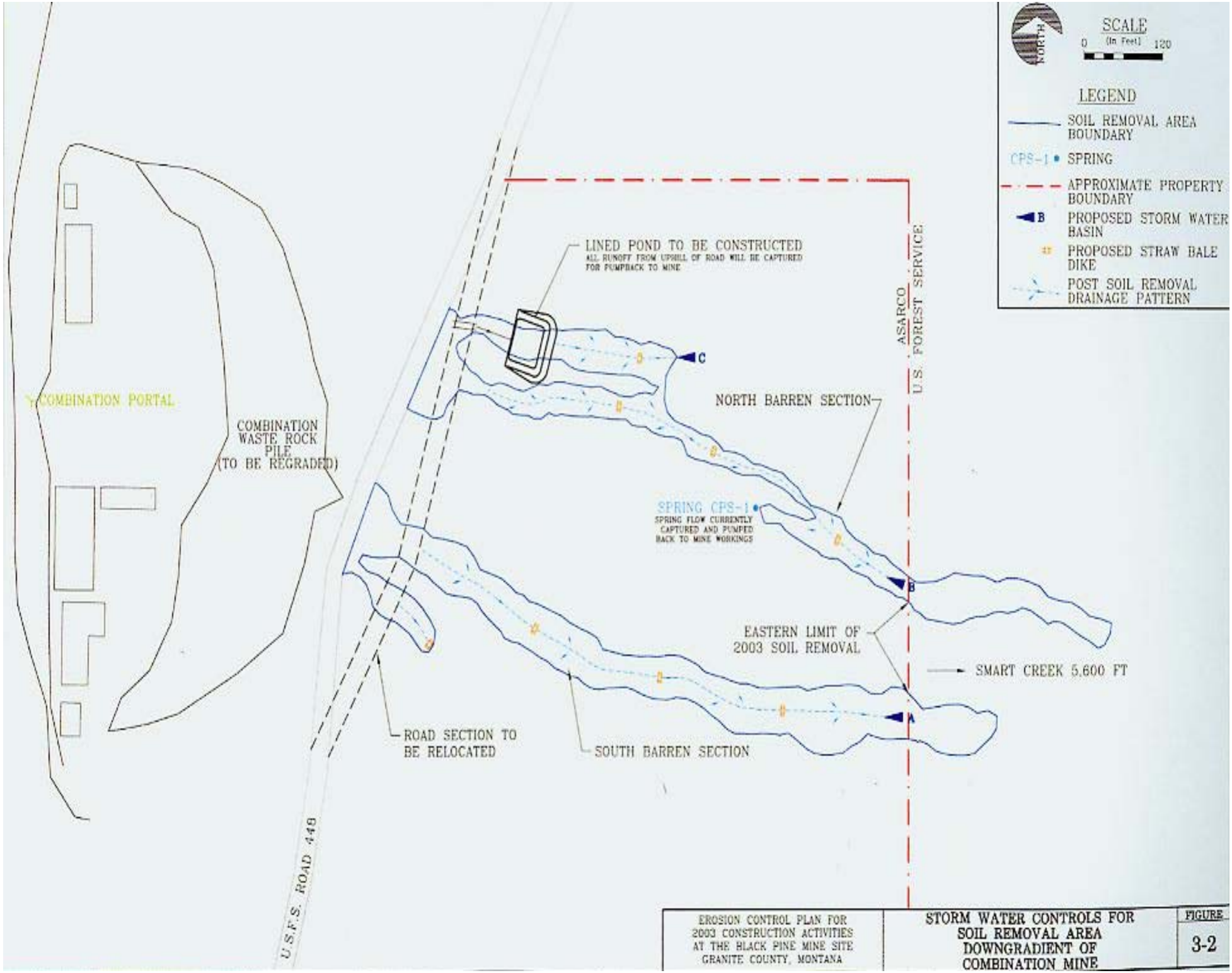
Drawing 3-1


EXISTING DITCH TO BE EXTENDED SOUTH
EXISTING RUNON DITCH
MAIN PORTAL
PLANT SITE RUNOFF DITCH TO BE CONSTRUCTED IN 2003
SOIL BORROW AREA 300 TO 1500 FEET
NORTH ACCESS ROAD
PLANT SITE
SOUTH ACCESS ROAD
EXISTING SLOPE CREST
18" CMP TO BE INSTALLED 2003
U.S.F.S. ROAD 448
TEMPORARY DITCH TO DIVERT RUNOFF WATER TO POND
EXISTING WASTE ROCK PILE TOE
REGRADED WASTE ROCK PILE TOE
RUNOFF COLLECTION DITCH
NORTH
ROAD SEGMENT TO BE RELOCATED IN 2003
TEMPORARILY BLOCK DITCH TO DIVERT ALL FLOW TO POND
SCALE
0 (In Feet) 100
INSTALL SILT FENCE ALONG DOWNHILL SIDE OF NEW ROAD SEGMENT
18" CULVERT
LEGEND
EXISTING INDEX CONTOUR
EXISTING INTERMEDIATE CONTOUR
PROPOSED INDEX CONTOUR
PROPOSED INTERMEDIATE CONTOUR
EXISTING BUILDING
EXISTING CONCRETE PAD
POST GRADING SURFACE DRAINAGE PATTERN
PROPOSED SILT FENCE
PROPOSED GRAVEL FILTER BERM
INSTALL SILT FENCE ALONG TOE OF POND
RUNOFF CONTAINMENT PUMPBACK POND WITH 40 MIL PVC LINER (TO BE CONSTRUCTED IN 2003)
SPILLWAY
EROSION CONTROL PLAN FOR 2003 CONSTRUCTION ACTIVITIES AT THE BLACK PINE MINE SITE GRANITE COUNTY, MONTANA
COMBINATION MINE STORM WATER CONTROLS
DRAWING
3-1

Attachment 5

Storm Water Controls for Soil Removal Area Downgradient of Combination Mine

Figure 3-2



EROSION CONTROL PLAN FOR 2003 CONSTRUCTION ACTIVITIES AT THE BLACK PINE MINE SITE GRANITE COUNTY, MONTANA

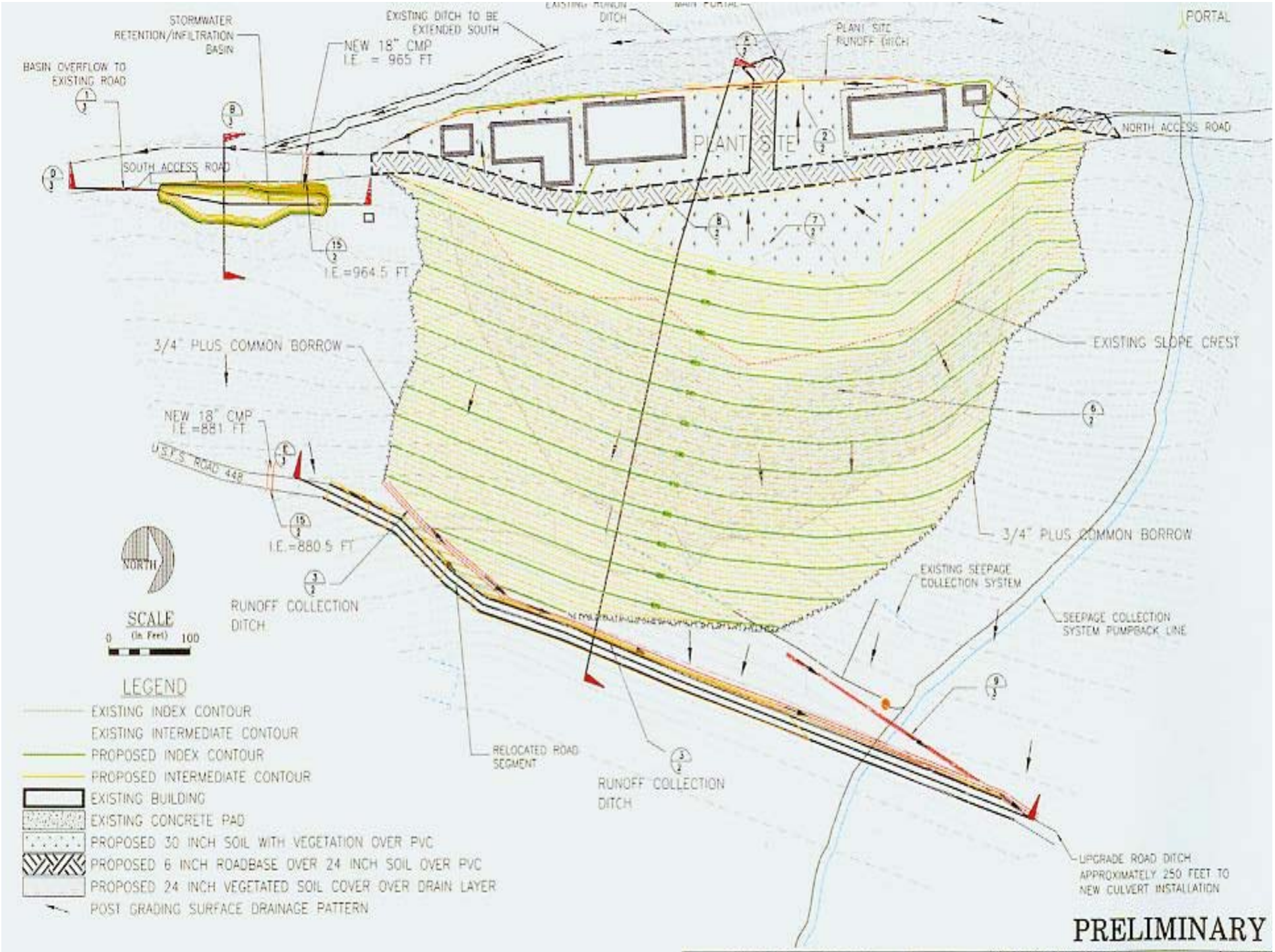
STORM WATER CONTROLS FOR SOIL REMOVAL AREA DOWNGRADIENT OF COMBINATION MINE

FIGURE 3-2

Attachment 6

Combination Mine Site
Interim Reclamation Plan Map

Drawing 1



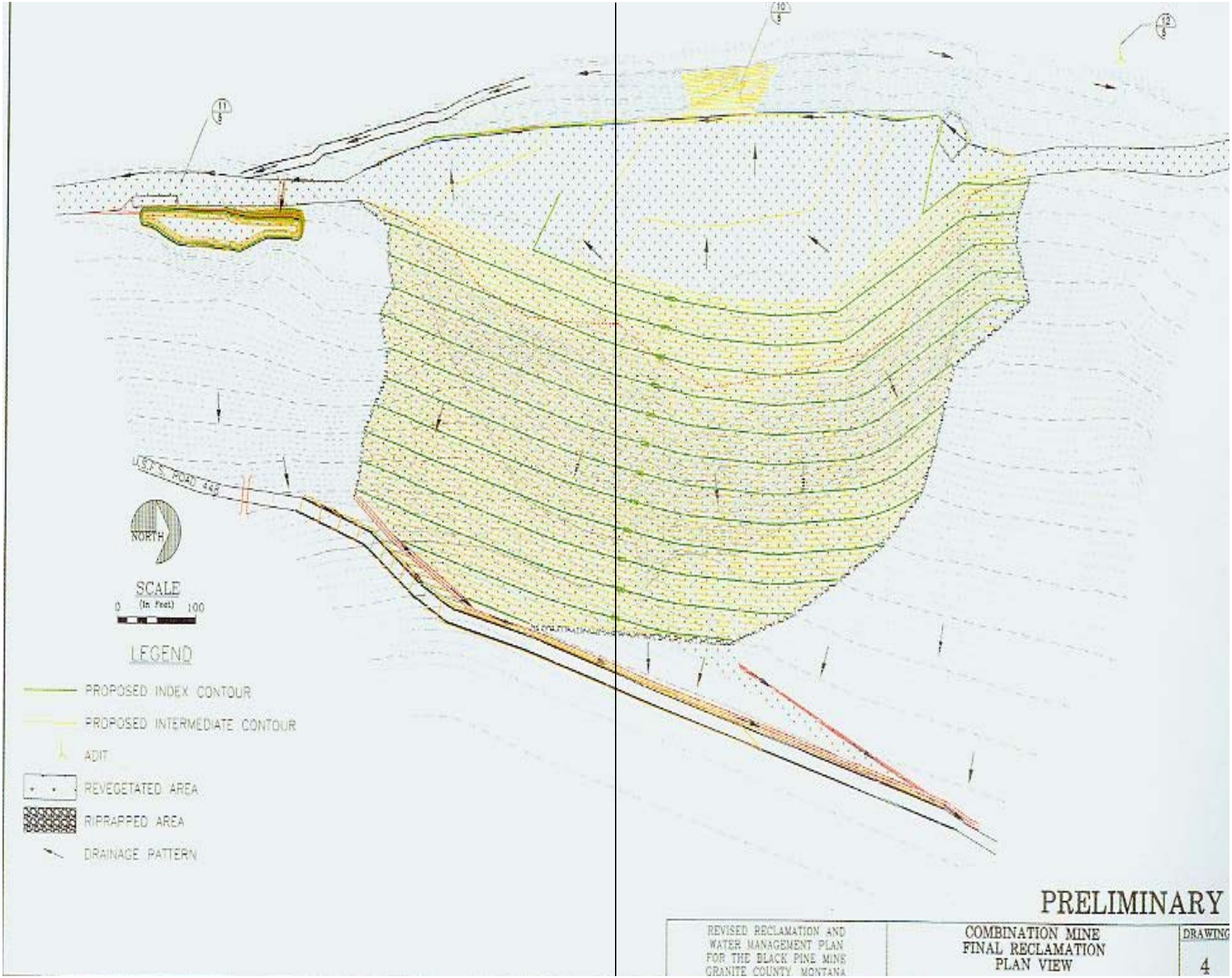
PRELIMINARY

REVISED RECLAMATION AND WATER MANAGEMENT PLAN FOR THE BLACK PINE MINE GRANITE COUNTY, MONTANA	COMBINATION MINE SITE RECLAMATION PLAN VIEW	DRAWING 1

Attachment 7

Combination Mine Site
Final Reclamation Plan Map

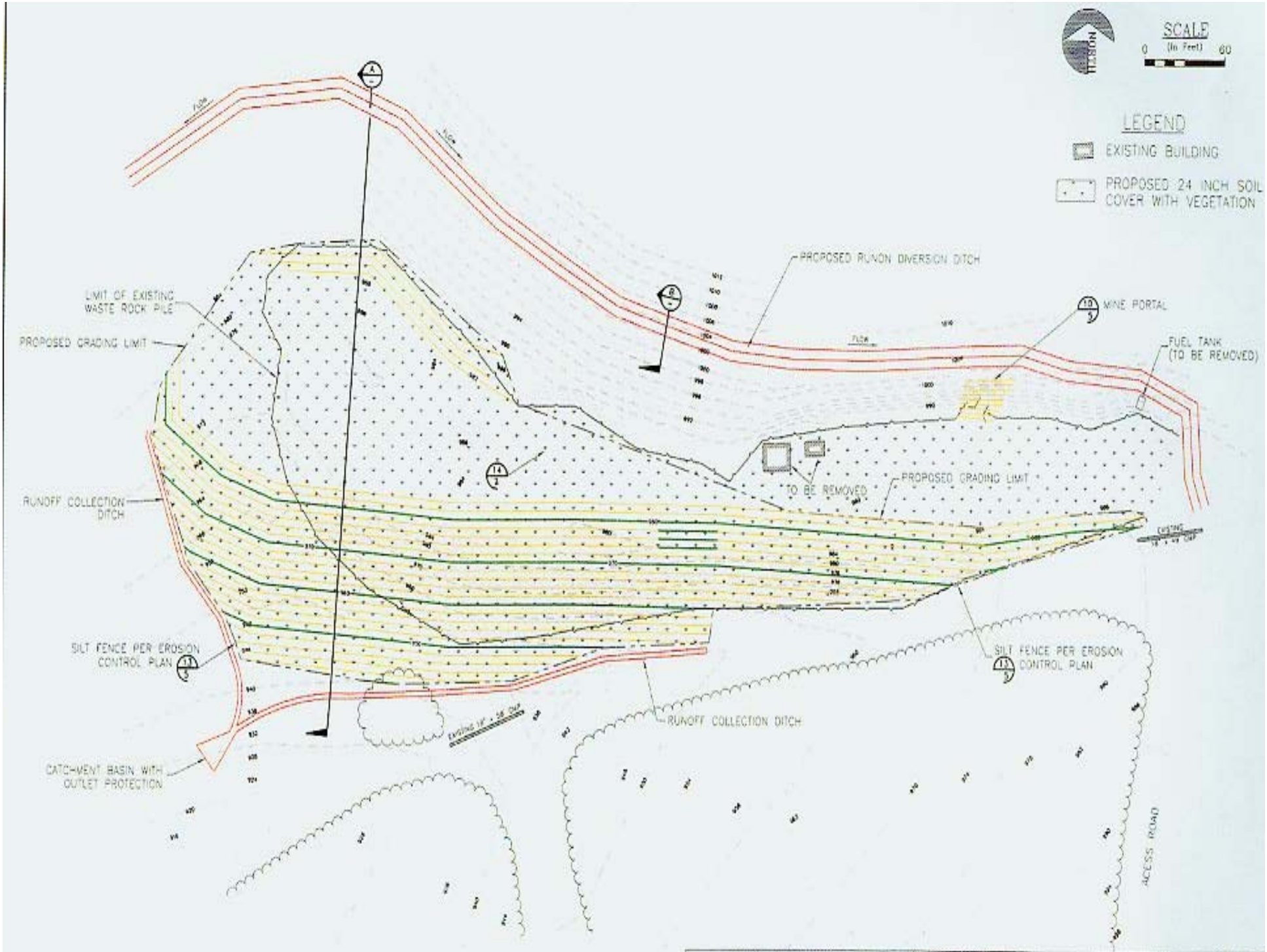
Drawing 4


10
9
12
9
11
9
U.S.F.S. ROAD 443
NORTH
SCALE
(In Feet)
0
100
LEGEND
PROPOSED INDEX CONTOUR
PROPOSED INTERMEDIATE CONTOUR
ADIT
REVEGETATED AREA
RIPRAPPED AREA
DRAINAGE PATTERN
PRELIMINARY
REVISED RECLAMATION AND
WATER MANAGEMENT PLAN
FOR THE BLACK PINE MINE
GRANITE COUNTY, MONTANA
COMBINATION MINE
FINAL RECLAMATION
PLAN VIEW
DRAWING
4

Attachment 8

Tim Smith #1
Reclamation Plan Map

Drawing 6



REVISED RECLAMATION AND WATER MANAGEMENT PLAN FOR THE BLACK PINE MINE GRANITE COUNTY, MONTANA	TIM SMITH MINE RECLAMATION PLAN	DRAWING 6