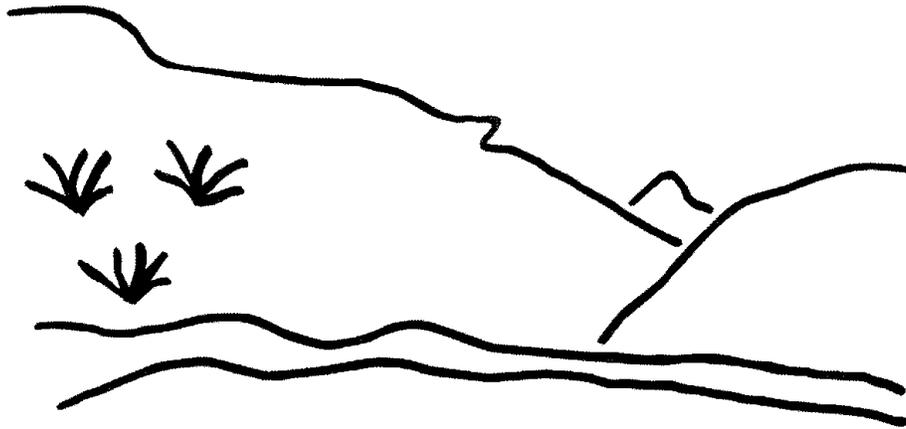


State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

Castle Gate Mine
Phase II Bond Release Hardscrabble
C007/004-BR02B
Technical Analysis
January 21, 2003

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TECHNICAL ANALYSIS

TECHNICAL ANALYSIS

The Division ensures compliance with the Surface Mining Control and Reclamation Act of 1977(SMCRA). When mines submit an application for bond release, the Division reviews the proposal for conformance to the R645-Coal Mining Rules. This Technical Analysis is such a review. Regardless of these analyses, the permittee must comply with the minimum regulatory requirements as established by SMCRA.

Readers of this document must be aware that the regulatory requirements are included by reference. A complete and current copy of these regulations and a copy of the Technical Analysis and Findings Review Guide can be found at <http://ogm.utah.gov/coal>

This Technical Analysis (TA) is written as part of the bond release review process. It documents the Findings that the Division has made to date regarding the application for bond release and is the basis for permitting decisions with regard to the application. The TA is broken down into logical section headings. Only those sections that pertain to Phase II bond release have been analyzed. Specific findings are provided which indicate whether or not the application is in compliance with the Regulations.

INTRODUCTION

INTRODUCTION

Earthwork at the Hardscrabble site was completed during the years 1984, 1985, and 1993 through 1999. Phase I bond release was approved for Goose Island (8.79 acres) in 1985. Phase I bond release was conditionally approved January 25, 2001 for Hardscrabble No. 3 and No. 4 Mine areas (29.9 acres) with final approval effective February 14, 2001. (The substation was reclaimed in 2002 and was not included in the Phase I bond release area.) The As-Built Reclamation Topography and Cross-section Location Map is Exhibit 3.3-19.

Castle Gate Holding Company applied for Phase II bond release for the Hardscrabble No. 3 and No.4 Mine areas of the Castle Gate Mine, less the 1.21 acre road and the 0.72 acre substation. There are 37.1 acres eligible for Phase II bond release. The submittal contains vegetation and sediment yield information. The Utah Regulations allow for Phase II bond release after successful revegetation is completed and erosion is controlled to prevent suspended solids to streamflow and prohibit runoff outside of the permit area (R645-301-880.320). The Permittee has met the minimum requirements of this regulation for Phase II bond release.

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GENERAL CONTENTS

IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

Analysis:

Castle Gate Holding Company has held the permit on the Castle Gate Mine since September 11, 1998. The Mining and Reclamation Plan has a complete discussion of the company's structure in Chapter 2.

Findings

The information provided is adequate for the purposes of Phase II bond release.

LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

Analysis:

The mine site is located in Hardscrabble Canyon approximately 4 miles northwest of Helper, Utah. The site is located on the Standardville, Utah, U.S. Geological Survey 7.5 minute quadrangle map and is described as follows:

Township 13 South, Range 9 East, SLB&M, Utah

Section 3: SE1/4 SW1/4

Section 10: NW1/4 NW1/4, NE1/4 NW1/4, SE1/4 NW1/4, NW1/4 NE1/4, SW1/4 NE1/4, SE1/4 NE1/4.

Findings:

The information provided is adequate for the purpose of Phase II bond release.

PUBLIC NOTICE AND COMMENT

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

Analysis:

Appendix 3 of the submittal includes a copy of the public notice. The advertisement contains all the information required by R645-301-880-120. An affidavit of publication has also been provided and is dated August 2002.

Appendix 4 of the application contains copies of notification letters sent to adjoining property owners: Mr. Gary Harwood, American Electric Power Service Corp., the Bureau of Land Management; and local governmental bodies: the County Commission, the Carbon County Road Department, Carbon County Planning and Zoning.

Findings:

The information provided meets the requirements of the Regulations.

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

Analysis:

All activities have been accomplished in accordance with the requirements of the Surface Mining and Control Act of 1977 as evidenced by the Division's approval of the As-Built drawings submitted with the Phase I bond release application, which was approved January 30, 1997. The Phase II bond release application contains a notarized C1C2 form certifying the truthfulness of the information submitted.

Findings:

The information provided in the bond release application meets the minimum certification requirements for Phase II bond release.

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GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

Phase II Bond Release may be granted after revegetation has been established in accordance with the approved reclamation plan so long as the lands to which the release is applicable are not contributing suspended solids to streamflow or runoff outside the permit area in excess of the requirements set by UCA 40-10-17(j) of the ACT and by R645-301-751. No permanent impoundments have been retained on this site.

The Division staff has reviewed the submittal for Phase II bond release with this guidance in mind.

Findings:

The information provided is adequate for the purposes of Phase II bond release.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The postmining land uses are wildlife habitat and grazing. The area contains critical elk winter range, so grasses, particularly tall grasses, are important for the postmining vegetation. Grasses are also important for grazing.

The permittee has met the Phase II bond release requirement for land use. The site is being used as wildlife habitat, but it has not yet been grazed. During site inspections, numerous deer and elk have been seen in the area. Although the vegetation cover is dominated by grasses, there is a good mix of forbs and shrubs included. The utility of these species for the postmining land uses is discussed in further detail in other sections of this analysis.

Findings:

Information provided in the application is adequate to meet the requirements of this section of the regulations.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR Sec. 817.97; R645-301-333, -301-342, -301-358.

Analysis:

The mining and reclamation plan says wildlife habitat enhancement will be created by development of micro-topographic features, such as swales and rises created during regrading; using the species in the seed mixes; creating snags and roosts where materials are available; and by making wetland areas wherever topography and hydrology lend themselves to their creation.

During the regrading process, numerous large rocks were uncovered, and many of these were used to make rock piles that are being used as habitat by birds and small mammals, particularly in No. 4 Mine canyon and the fan portal highwall areas. Materials for roosts and snags did not become available, but the operator was able to preserve several fully grown cottonwoods by realigning the channel from the position originally proposed. The canyon has a few seeps, but there is not enough water to create wetlands.

The site had been used for mining for many years, and some of the natural cliffs were buried under refuse or material that was sidecast to allow for building construction. During regrading, the operator was able to re-expose some of these cliffs. Other areas were graded to blend into and complement adjacent areas. These techniques have created a diverse landscape that is capable of supporting a varied assemblage of wildlife species.

In general, the plant species that have become established are more desirable for wildlife forage than the species in adjacent undisturbed areas. The dominant species in surrounding undisturbed areas are Salina wild rye and sagebrush, and while sagebrush is used extensively by big game, Salina wild rye is not palatable. By contrast, the dominant species in the reclaimed area are all rated as having fair or better palatability. One common species in the reclaimed area is basin wild rye, a tall grass that is very desirable for wintering elk.

Adjacent undisturbed areas have, in addition to those areas dominated by sagebrush and Salina wild rye, patches of oak, maple and conifers that provide good cover for wildlife. The reclaimed area has a line of mature cottonwoods along the channel and some small patches of oak that were saved from grading operations. Numerous shrubs and oaks have been plalong the

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channel and elsewhere, and while these have not yet matured to where they are providing wildlife cover, the Division anticipates this will eventually happen. The Division considers that the area has been enhanced as wildlife habitat.

Findings:

The Permittee has met the minimum requirements of this regulation for Phase II bond release.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

General

The Hardscrabble Canyon portion of the Castle Gate Mine was reclaimed in 1984 and 1985 and 1993 through 1999. The substation was reclaimed in 2002. The road through the disturbed area was altered but left in place for the postmining land use. given for the Goose Island refuse pile area in 1985. Conditional approval of Phase I bond release for 29.9 acres with final approval effective February 14, 2001.

On May 10, 2002, the Division received an application for Phase II bond release for 36.5 acres. The 36.5 acres was arrived at by summation of the Goose Island disturbance (8.8 acres), plus the No. 3 mine reclamation (7.3 acres), plus the No. 4 mine reclamation area including the road (20.4 acres).

The disturbed area boundary at the Hardscrabble complex encompasses 39.0 acres, of which 36.76 acres are actually disturbed and 2.24 acres comprise a buffer zone along the perimeter that was not disturbed. The Hardscrabble area eligible for Phase II bond release includes all the acreage within the 39 acre disturbed area boundary except the road (1.21 acres) and the recently reclaimed substation [0.76 acres at most recent count (email from J. Pappas2/20/2003)]. Therefore, 37.1 acres is eligible to receive Phase II bond release.

During the Phase I bond release inspection, the Division found that all backfilling and grading, topsoil placement and drainage construction were properly done. During the Phase II bond release inspection the Division determined that vegetation has been established in accordance with the approved mine plan.

No specific engineering requirements will be looked at during Phase II bond release. Should the Division find that slides or drainage failures have occurred the Division will require the Permittee to take appropriate action.

Findings:

The Permittee has met the minimum requirements for this section of the regulations.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Redistribution

Information concerning the redistribution of topsoil and subsoil was reviewed in the Division's Phase I Bond Release Decision Document dated November 29, 2000. According to the technical review, final soil placement depth averaged 24 inches. Coal debris, coal refuse and any acid- and/or toxic-forming material exposed or excavated during reclamation was covered with four feet of overburden material and substitute soils.

Findings:

The information provided meets the requirements for bond release.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

Retention

The road to be retained for the post mining land use is 1.21 acres.

Findings:

The information provided is adequate for the purposes of the Regulations.

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HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Groundwater Monitoring

Hardscrabble Canyon has no groundwater monitoring points or wells.

Surface Water Monitoring

Hardscrabble Canyon has two surface water monitoring points, one above the former disturbed area and one below that area. These points are monitored now and will continue to be monitored until final bond release. There are no wells in Hardscrabble Canyon.

Sediment control measures

A field visit was made to Hardscrabble Canyon on August 22, 2002. The reclamation there was implemented in phases over the last 6 years. It's apparent the more recent areas have not developed as much vegetation as the older areas. However, all areas are doing well. The plant diversity is good and the mounds and depressions continue to retain moisture and prevent runoff. In terms of sediment loss, the reclaimed area is at least as good, or better, than surrounding native areas. Although there is localized erosion and deposition (on the order of 20 feet), overall it's obvious no sediment has been lost from the site. No significant rills or gullies were found.

The reclamation methods have minimized disturbance to the hydrologic balance within the permit and adjacent areas and have prevented material damage outside the permit area. The area can now support the approved postmining land use. The roughening and seeding method has proven successful at many Utah coal mine reclamation projects and is working well at these sites. Thus, this reclamation is using the best technology currently available to prevent additional contributions of suspended solids to streamflow. There is no evidence of pollution of surface and subsurface waters, and it appears very unlikely there will be future occurrence of such pollution.

Findings:

Plant growth and the roughened ground are sufficient for Phase II Bond Release.

REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

Revegetation: Standards For Success

Standards

According to the mining and reclamation plan, revegetation success will be judged by comparing vegetation life forms in the reclaimed and reference areas using the Motyka index. The Motyka index is a similarity index, and the calculated similarity between the reclaimed area and the reference area must be at least 70 percent or the percent similarity calculated between samples in the reference area, whichever is less.

Other performance standards in the rules include erosion control, diversity, and utility for the postmining land use. The species must be native to the area and capable of regeneration and succession. Some of the revegetation success standards that would normally be applied, such as production, woody plant density, and cover, are not included as success standards because the site was previously disturbed. For this same reason, the reference area used is not an undisturbed area but is a site that was successfully reclaimed by the Utah Abandoned Mine Land Reclamation program.

Cover, Similarity, and Diversity

The calculated similarity between the reclaimed and reference areas is 70.21 percent. This meets the success standard. In addition, the applicant presents information showing that the cover in the reclaimed area is not statistically different from the cover in the reference area and that diversity in the reclaimed area is greater than the diversity in the reference area.

The mining and reclamation plan contains baseline vegetation cover data from 1981 for two undisturbed reference areas in Sowbelly Gulch that are no longer part of the success standards. Although a comparison of cover values between the reclaimed area and these undisturbed areas is not required by the plan, the reclaimed area has more cover (44.82%) than the Sowbelly grass-sage reference area (38.9%) and greater than 90 percent of the cover in the Sowbelly mixed brush reference area (47.7%). Therefore, even if this was a post-law site where topsoil had been salvaged and comparison to undisturbed areas was required, the reclaimed area would meet the bond release vegetation cover requirements.

Minimum sample sizes were 15 for the reclaimed area and 13 for the reference area, and the Permittee took 80 and 40 samples for these areas respectively.

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Species Composition

The section of this analysis titled “Protection of Fish, Wildlife and Related Environmental Values” discusses utility of the vegetation for the wildlife habitat postmining land use. The same principles of forage palatability discussed in that section apply to the grazing land use.

During the bond release inspection on August 22, 2002, one musk thistle plant, a noxious weed, was found on the site, and it was dug up. Some noxious weeds have been found in the reclaimed area in the past, but the Permittee has worked actively to eradicate them. The rules allow continued efforts to control these weeds through the entire period of extended responsibility for successful revegetation.

Although the vegetation study included with the application for bond release shows some species that are not native to the area, cover from these species was minor. Total cover from these species was 5.19 percent and relative cover 11.58 percent. The dominant vegetation is of species native to the area.

Erosion Control

During the bond release inspection, we found two small rills but no other signs of accelerated erosion. This is due to several factors including some of the reclamation practices the Permittee used. Most of the site was gouged, and this roughening technique has been very effective in preventing runoff, erosion, and sedimentation. In addition, the two dominant grasses (thickspike wheatgrass, *Elymus lanceolatus*, and western wheatgrass, *Elymus smithii*) and one dominant forb (pacific aster, *Aster chilensis*) are rhizomatous and very effective at controlling erosion (Table 2, Appendix 1).

Findings:

The Permittee has met the minimum revegetation requirements for Phase II bond release.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

The Division conducted an inspection of the site on August 22, 2002. During that inspection, the Division noted that the regrading and gouging performed in 1999 at Goose Island is controlling erosion. The presence of rills and gullies are very few, located on a gouged slope

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on the west side of the road between Mine No. 4 and Goose Island. The sediment from the rills is being washed into the roadside ditch, but is not leaving the site. The rills were photographed and can be seen in the images folder for the mine, dated 08222002.

Two problem areas were noted in the Technical Analysis of the Phase I bond release dated November 29, 2000. The first was the area near the old scalehouse used for equipment staging and screening soil for riprap. The area was noted as having poor vegetation re-establishment due to limited soil structure (compaction). On August 22, 2002, the Division noted that the area is still limited in vegetation cover, but gouges on the site are retaining all flow on the site and no erosion was noted. The area was photographed.

A second problem area noted during Phase I bond release is the area identified by soil sample HCRD-6. This area covers about 1000 square feet and is elevated on a bench above the canyon floor. The site is very steep with the soil at the angle of repose. There is some vegetation growing on the soils, but the site remains mostly uncovered by vegetation or litter. Despite the lack of cover, there are no rills or gullies on the area. All drainage appears to flow to the low point of the fill at the cliff's edge. Below the cliff, the sediments are captured in gouges.

Appendix 2 of the Application for Phase II Bond Release provides a comparison of the sediment yield in tons/acre/year for the reclaimed slopes under existing conditions to the reclaimed slope assuming reference area cover. The comparison was run using the Revised Universal Soil Loss Equation by EarthFax Engineering, Inc.

The assumptions built into the model are as follows:

- The soil erodibility factor (K) for the control (hypothetical undisturbed site) was based upon the association of 45% Pathead, 25 % Curecanti and 30% other soils described by the Soil Survey of the Carbon Area, 1988, UDSA, SCS (Appendix 3.3E) and was considered to be $K = 0.27$.
- The K factor for the reclaimed land was based upon the average texture of fifteen composite samples taken in 1996 from trenches prior to reclamation in 1996 (Appendix 3.3M) and was considered to be $K = 0.30$.
- The reclaimed soils were also assumed to have a moderate to rapid permeability, based upon the field notes in Appendix 3.3M.
- The very fine sand fraction is assumed to be 5%.
- The reclaimed soils were assumed to have 0% organic matter.
- Slope was assumed to be 30% (3.5 h : 1 v) for both the control and reclaimed conditions.

EarthFax found that sediment yield from the reclaimed site varied from 0.51 tons/ac/yr down to 0.16 tons/ac/yr depending upon the extent of gouging. EarthFax arrived at an average of 9.0 tons/yr sediment from the entire 36.5 acre site as compared to a projected 21.5 tons/yr for the

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control which is described as the same site with no gouging and a vegetation cover equivalent to that of the reference area.

Whether this model demonstrates erosion control depends upon the acceptable soil loss tolerance value for the soils of the site. The Natural Resources Conservation Service (formerly the Soil Conservation Service) identified the soil loss tolerance value for the Pathead and Curecanti soils as 1 ton/acre/year in Table 12 of the 1988 Soil Survey of Carbon Area. The consultant's prediction of 0.16 to 0.51 tons/acre/year falls below this soil loss tolerance value.

Findings:

The Permittee has adequately applied best management practices to control erosion and prevent sediments from leaving the site.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Bonded Area Map

The Division developed a technical directive to assist in phase bond release. The items that pertain to the bonded area include the following:

- Maps
 - The Permittee should supply the Division with a map at a scale of 1"=150' of the bonded area, see Exhibit 3.3-23.
 - Exhibit 3.3-23 shows the delineation of all disturbed areas.
 - The reclamation dates and acreages of all reclaimed areas are shown. The Permittee assumed that bond release associated with this amendment would be completed in 2002. Due to delays bond release will not occur until 2003. Plateau Mining Corp. has agreed to make the correction on final copy of Exhibit 3.3-23.
 - The operation or reclamation status of each area is shown on Exhibit 3.3-23. Those areas include the No. 4 Mine Canyon, the No. 3 Mine Canyon, Goose Island and the substation.

- A Summary Table:
 - The total disturbed area acreage for each area is shown in the legend of Exhibit 3.3-23.

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- The acreage, locations, dates for each phase of bond release is shown on the legend of Exhibit 3.3-23, although the Division may have to modify the dates.

Findings:

The information provided in the bond release application is considered adequate to meet the minimum maps, plans and cross-sections of the reclamation operations requirements of the regulations.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Analysis:

Determination of Bond Amount

Determination of bond amount

Table 1. Summary of bond amounts for the Castle Gate Mine.

	Sowbelly	Hardscrabble	Adit No. 1	Total
Acres	21	39	3	63
Current Bond Amount	\$369,946	572,000	\$129,054	\$1,071,000
Amount Proposed for Release	(\$136,946)	(\$253,900)		(\$390,846)
Bond remaining for Substation and road Reclamation	Included in Revegetation	\$83,100		
Revegetation Cost	233,000	\$235,000		
Bond Amount remaining	\$233,000	\$318,100	\$129,054	\$680,154

The Division calculated the revegetation costs for the Hardscrabble complex to be \$235,000 in 2012 dollars. That amount insures that the Division could reseed the site in the event of bond forfeiture.

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Findings:

The information provided in the bond release application meets the minimum bond and insurance sections the regulations.

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