BEST COAL, INC.
JAGGER MINE / P-3932
REVISION R-1

ADDENDUM TO PARTS II-E THROUGH II-H

This Addendum to Parts II-E through II-H is submitted to the Regulatory Authority with the additional baseline information needed to adequately describe the lithology, orientation, structure, and geochemistry of additional intervals added as a result of Revision R-1. In addition, baseline information for potentially affected adjacent surface and groundwater resources will also be submitted and additional impact from this operation to surrounding surface and groundwater resources, if any, will be assessed. The nature of Revision R-1 for the above referenced mine site consists of: 1) Add 69.0 new acres mining area, 1.0 new acre for a portion of Primary Road 5P, and 7.0 New Acres Basins 053P, 054P, 055P, 056P, 079P, 081P, and drainage course to Increment No. 1, 2) Add 35.0 new acres mining area, 6.0 new acres Basins 049P, 051P, 052P, 057P, 080P, drainage courses, and 1.0 new acre access roads to Increment No. 2, 3) Add 36.0 new acres mining area and drainage course, and 1.0 new acre for a portion of Primary Road 7P to Increment No. 3, 4) Add 44.0 new acres mining area, and 1.0 new acre Basin 077P to Increment No. 4, 5) Add 11.0 new acres for Primary Road 4P, a portion of Primary Road 5P, and Primary Road 6P, 9.0 new acres Basins 045P, 047P, 048P, Drainage Courses,

2.0 new acres access roads, and 38.0 new acres excess spoil disposal area No. 1 to Increment No. 5, 6) Add 6.0 new acres for a portion of Primary Road 7P, Primary Road 8P, and Primary Road 9P, 2.0 new acres for Basins 035P, 037P, and drainage courses, 1.0 new acres access roads, and 128.0 new acres for Excess Spoil Disposal Area No. 2 to Increment No. 6, 7) Transfer 15.0 acres mining area and 1.0 acre Basins 012P and 013P from Increment No. 2 to Increment No. 1. Re-assess Basin 012P and 013P as mining area, 8) Transfer 2.0 acres mining area from Increment No. 3 to Increment No. 1. Re-assess 1.0 acre mining area as a portion of Primary Road 5P, 9) Re-assess 1.0 acre Basin 019P and a drainage course, 10 Transfer 28.0 acres mining area from Increment No. 3 to Increment No. 2, 11) Transfer 2.0 acres Basins 010P and 011P from Increment No. 5 to Increment No. 2. Re-assess Basins 010P and 011P as mining area, 12) Transfer 10.0 acres mining area from Increment No. 4 to Increment No. 2, 13) Transfer 13.0 acres mining area and 1.0 acre Basin 018P from Increment No. 2 to Increment No. 3. Re-assess Basin 018P as mining area, 14) Transfer 37.0 acres mining area from Increment No. 4 to Increment No. 3, 15) Transfer 1.0 acre Basin 009P from Increment No. 5 to Increment No. 3. Re-assess Basin 009P as mining area, 16) Transfer 11.0 acres mining area from Increment No. 3 to Increment No. 4, 17) Transfer 4.0 acres Basins 020P, part of 021P, 024P, and 025P from Increment No. 5 to Increment No. 4. Re-assess Basins 020P, part of 021P, 024P, and 025P as mining area, 18) Transfer 1.0 acre mining area from Increment No. 2 to

Increment No. 1. Re-assess 1.0 acre mining area a portion of Primary Road 5P, 19) Re-assess 1.0 Acre mining area in Increment No. 3 as a portion of Primary Road 7P, 20) Transfer 9.0 acres for Primary Roads 1P, 2P, and 3P and 1.0 acre Coal Stockpile, Equipment Storage Area, and office from Increment No. 6 to Increment No. 1, 21) Re-locate Basins 022P and 023P. Transfer 1.0 acre Basin 022P and part of Basin 021P from Increment No. 5 to Increment No. 3. Transfer 1.0 acre Basin 023P from Increment No. 5 to Increment No. 4. Re-assess part of Basin 021P as mining area, 22) Transfer 1.0 acre drainage courses and access from Increment No. 5 to Increment No. 4. Re-assess drainage courses and access as mining area, 23) Transfer 1.0 acres mining area from Increment No. 4 to Increment No. 3. Re-assess mining area as a drainage course, 24) Extend the topsoil variance to include all mining and Excess Spoil Area within the Post Revision R-1 Permit Area, 25) Update the Operations Plan, 26) Update the Hydrologic Monitoring Plan to delete Basins 009P, 010P, 011P, 012P, 013P, 018P, 019P, 020P, 021P, 024P, and 025P and to add Basins 035P, 037P, 045P, 047P, 048P, 049P, 051P, 052P, 053P, 054P, 055P, 056P, 057P, 077P, 079P, 080P and 081P, 28) Submit Detailed Design Plans for Basins 047P, 053P, 054P, 055P, 056P, and 081P, 29) Submit Detailed Design Plans for Primary Road 4P, and 30) Submit Detailed Design Plans for Excess Spoil Area No. 1. A total of 378 permitted acres are added as a result of this Revision. The area added is shown on the attached map and is located in part of Sections 13, 14, 15, 22, 23, & 24, Township 15

South, Range 4 West, Jefferson County Alabama as seen from the Brookside, Alabama USGS 7.5 minute quadrangle.

The Best Coal, Inc. - Jagger Mine is a surface mining facility and all coal within the revision R-1 area will be recovered similar to coal recovery within the rest of the permit area (by the Dozer - Loader method). This revision includes mining 3 additional deeper coal seams (the Lick Creek, Jefferson, and Black Creek) underlying the mining area added by Revision R-1 as well as underlying the area originally contained within the pre-revision R-1 Jagger Mine.

Baseline information collected for this addendum includes:

1) Drill Holes BCJMOB-9 and BCJMOB10 drilled by personnel of Walker Drilling Service in late October and early November of 2011. The drill used to drill the above sites was a Gardner-Denver GD1500 air rotary drill, utilizing 4 and 3/4 and a 7 and 7/8 inch drill bit. Their locations are shown on the attached Mine Site Location Map. These sites were drilled specifically for baseline information for this proposed revision area to describe the composition, orientation, and geochemistry of strata both above and below the Lick Creek, Jefferson, and Black Creek coal seams.

2) Groundwater Monitoring sites BCJMMW-6 and BCJMMW-7 were also drilled

by personnel of Walker Drilling Service in late October and early November of 2011. The drill used to drill the above sites was also the Gardner-Denver GD1500 air rotary drill, utilizing 4 and 3/4 and a 7 and 7/8 inch drill bit. Groundwater Monitoring site BCJMMW-6 was cased by qualified personnel of Walker Drilling Service as shown in the attached 'Casing Specifications'. Groundwater Monitoring site BCJMMW-6 monitors the aquifer below the Black Creek Seam. Groundwater Monitoring site BCJMMW-7 was cased by qualified personnel of PERC Engineering Co., Inc. as shown in the attached 'Casing Specifications'. Groundwater Monitoring site BCJMMW-7 monitors the aquifer above the Black Creek Seam. Their locations are shown on the attached Mine Site Location Map. These sites were also drilled specifically for baseline information for this proposed revision area to describe the composition, orientation, and geochemistry of strata both above and below the Lick Creek, Jefferson, and Black Creek coal seams AND to describe local groundwater quality and elevations.

3) Groundwater Monitoring site BCJMMW-8 was also drilled by personnel of Walker Drilling Service in early November of 2011. The drill used was also the Gardner-Denver GD1500 air rotary drill, utilizing 4 and 3/4 and a 7 and 7/8 inch drill bit. Groundwater Monitoring site BCJMMW-8 was cased by qualified personnel of Walker Drilling Service as shown in the attached 'Casing Specifications'. No well inventory update was conducted in this rural area as a

result of this revision, however, Groundwater Monitoring site BCJMMW-8 was drilled and cased specifically to monitor groundwater quality both east of the fault shown on the Mine Site Location Map and between the proposed mine site and the existing groundwater users adjacent to the mine site. BCJMMW-8 mimics a local domestic well in that it is cased against surficial contamination and intersects several intervals which contribute to the wells' static groundwater level.

4) Geochemical analysis conducted on samples collected from Drill Holes BCJMOB-9 and BCJMOB10 and Groundwater Monitoring sites BCJMMW-6 and BCJMMW-7. Samples were collected every five ft. or change in lithology by qualified personnel of PERC Engineering Co., Inc. and analyzed for pH & neutralization potential by the PERC Engineering Laboratory according to ASTM Standards. Sulfur analysis was conducted by Energy Technical Services, LLC.. This analysis was performed specifically for baseline information for the proposed revision area with respect to geochemical quality of the strata to be disturbed as a result of the revision. An analysis of this information is discussed below. The lithology of the above sites was described by a qualified Geologist from PERC Engineering Co., Inc.. See attached analysis.

5) Groundwater analysis from Groundwater Monitoring Sites BCJMMW-6, BCJMMW-7, and BCJMMW-8. Groundwater Monitoring Sites BCJMMW-6,

BCJMMW-7, and BCJMMW-8 have been sampled on 3 occasions by the PERC Engineering laboratory between the dates 11-17-2011 and 01-03-2012. These sites were sampled specifically for baseline information for the proposed revision area with respect to local groundwater quality for the aquifers to be disturbed as a result of the revision. Samples were taken with either a hand bailer or a submersible pump after development. Water level is measured prior to development. Practices employed by PERC Engineering concerning the volume of groundwater extracted at groundwater monitoring sites prior to sampling is outlined as follows: Where recharge of groundwater is sufficient, three well volumes of groundwater (measured from the static depth) are pumped prior to sampling so the sample obtained is from recharge. Where recharge is slow, and three well volumes cannot be obtained within the monitoring cycle (usually monthly), only one well volume will be pumped. The well will then be allowed to recharge and a sample will be obtained after a volume equal to the volume of the pump line has been discharged. In infrequent instances where recharge is very limited, and the volume of water in the well is too small to be pumped to the surface, a 'bottom sampler' is employed to bail as much water as possible from the well. The well will then be allowed to recharge and the bottom sampler will again be used to obtain a sample when ample groundwater is present to be collected. Depth to water, and pH, are measured in the field, and the sample is split into two separate containers: a 473 ml plastic bottle is acidified and utilized for metals analysis, and a one quart plastic bottle is utilized

for all other analysis. Both are stored in an ice chest for transport to the PERC Engineering Laboratory. Samples collected by PERC are taken to the PERC Engineering Laboratory and are analyzed according to ASTM specifications. Parameters tested include pH, iron, manganese, conductivity, sulfates, acidity, and alkalinity. See attached analysis.

6) Surface water analysis of existing downstream Surface Water Monitoring Site BCJMSW-3 and upstream Surface Water Monitoring Site BCJMSW-4 on the Locust Fork of the Black Warrior River and Surface Water Monitoring Site BCNMSW-3 on Trouble Creek. The locations of these sites are shown on the attached Mine Site Location Map. Surface Water Monitoring Site BCJMSW-3 and BCJMSW-4 were originally sampled on 15 occasions by the PERC Engineering Laboratory between 11-15-07 and 03-12-07, and were also sampled for this revision on 2 occasions by the PERC Engineering Laboratory between 11-15-07 and 03-12-07. Surface Water Monitoring Site BCNMSW-3 was sampled on 11 occasions by the PERC Engineering Laboratory between 01-15-07 and 08-11-09 and are supplemented by samples taken at Surface Water Monitoring Sites BCJMSW-5 and BCJMSW-6, which were sampled for this revision on 2 occasions by the PERC Engineering Laboratory between 11-15-07 and 03-12-07. Parameters tested on all occasions include flowrate, pH, total iron, total manganese, total suspended solids, specific conductance, sulfates, acidity, and alkalinity. See attached results of analysis. All surface water

samples collected by the PERC Engineering Laboratory were taken by the 'grab' method. Flowrate measurements collected by the PERC Engineering Laboratory were taken according to ASTM D3858 "Standard Practice for Open Channel Flow Measurement of Water by Velocity - Area Method" or other equally valid methods. All samples analyzed by the PERC Engineering Laboratory are according to ASTM standards.

According to the 'Depositional Settings of the Pottsville Formation in the Black Warrior Basin', the area added by Revision R-1 is structurally located within the Warrior Coal Basin. The strata which underlies and outcrops in this region is similar to the original permit area and is of the Pottsville Formation of the Pennsylvanian Age. The Warrior Basin is the southern most of a series of Pennsylvanian basins of the Appalachian Plateau. The Pottsville Formation in this area consists of thin to thick bedded sandstones, siltstones, shales, clays, and coal seams. Structurally, the Warrior Basin is formed by a large gentle syncline that extends from north-central Mississippi in the west to north-central Alabama in the east. The syncline is tilted southwestward with a regional dip of 30 to 200 feet per mile. Toward the interior of the Warrior Basin, the regional southwest dip of Pottsville strata is modified by a series of three synclines and two anticlines. Of these, the major structures are the Warrior and Coalburg synclines, and the Sequatchie anticline. The fold axes are parallel to the Appalachian system in a northeast-southwest direction and plunge to the

southwest with the regional dip.

Locally, the strata which outcrops in the immediate vicinity of the Revision R-1 Area includes shales, sandstones, underclays, and coal seams associated with the Black Creek Coal Group. According to 'Depositional Settings of the Pottsville Formation in the Black Warrior Basin', the Black Creek Coal lies approximately 100 to 300 feet above the 'J' Group and from 40 to 130 feet below the Mary Lee Group. This reference also states that the Black Creek Coal Group exists in a stratigraphic interval from 45 to 160 feet thick.

The additional target seams proposed to be recovered as a result of this revision includes the Lick Creek, Jefferson, and Black Creek Seams of the Black Creek Coal Group. None of the above coal seam outcrop within the proposed Revision R-1 Area. As stated above, two excess spoil disposal areas are proposed to be added through this revision to accommodate the 'box' cuts needed to attain an adequate amount of spoil room.

The Black Creek Seam occurs between approximately 130 and 240 ft. MSL within the proposed revision area and averages approximately 22 inches thick. At this site, the Jefferson Seam is split into an Upper and Lower Bench. The Lower Bench of the Jefferson coal bed is located an average of 33 feet above the Black Creek Seam and averages approximately 16 inches thick. The Upper

Bench of the Jefferson coal bed is located an average of 8.1 feet above the Lower Bench and averages approximately 13 inches thick. The Lick Creek Seam is located an average of 45 feet above the Upper Bench of the Jefferson coal bed and averages approximately 8 inches thick. Finally, the Lick Creek Seam is located an average of 83 feet below the Ream Seam permitted under the original Jagger Mine. All of the above coal information was taken from site specific drill data.

This site is located on an intermediate plateau whose surface topography has been highly dissected by erosion. Surface elevations of this plateau within the proposed revision area range from approximately 300 to 420 ft. MSL. The surrounding ridges are approximately 140 feet higher than the highest elevation of this plateau and its highest elevation is approximately 140 feet above the adjacent Locust Fork of the Black Warrior River.

The overburden above the Black Creek Seam reaches a maximum thickness of approximately 225 ft. within the revision area and consists of, in descending order, unconsolidated surface material approximately 5 ft. thick, followed by an interval of weathered and non-weathered sandstone approximately 15 ft. thick, followed by an interval of interbedded shale and sandstone approximately 10 feet thick, followed by an interval of medium hard gray shale approximately 17 ft. thick, followed by the Ream Seam which is approximately 6 inches thick,

followed by an interval of medium hard gray shale approximately 17 ft. thick, followed by an interval of sandy shale approximately 15 ft. thick, followed by an interval of medium hard gray shale approximately 10 ft. thick, followed by an interval of interbedded shale and sandstone approximately 10 feet thick, followed by an interval of medium hard gray shale approximately 30 ft. thick, followed by the Lick Creek Seam, which is approximately 6 inches thick. The Lick Creek Seam is followed by an interval of medium hard, fine to medium grained sandstone approximately 47 ft. thick, followed by the Upper Bench of the Jefferson Coal Seam, which is approximately 12 inches thick. The Upper Bench of the Jefferson Coal Seam is followed by an interval of sandstone and shale approximately 9 ft. thick, followed by the Lower Bench of the Jefferson Coal Seam, which is approximately 23 inches thick. The Lower Bench of the Jefferson Coal Seam is followed by an interval shale approximately 27 ft. thick, followed by the Black Creek Coal Seam, which is approximately 23 inches thick. The Black Creek Seam is underlain by an interval of interbedded shale and sandstone a minimum of 7 feet thick. The above description is a result of site-specific drilling within the proposed revision area but is typical in nature and the intervals described above may vary in thickness or content depending upon their location within the Revision R-1 Area.

The total sulfur content of the Lick Creek Seam within the Revision R-1 Area was analyzed as 2.34 percent. The total sulfur content of the Upper Bench of

the Jefferson Seam within the Revision R-1 Area was analyzed as 1.74 percent. The total sulfur content of the Lower Bench of the Jefferson Seam within the Revision R-1 Area was analyzed as 0.36 percent. The total sulfur content of the Black Creek Seam within the Revision R-1 Area was analyzed as 0.34 percent. As stated above, sulfur analysis was conducted by Energy Technical Services, LLC..

Geochemical analysis conducted on the drill holes/ monitoring wells mentioned above reveal that these following intervals were tested as being potentially acid-forming (other than the target coal seams): In BCJMMW-6 intervals 53.5 - 55 and 40-45. In BCJMMW-7 intervals 40-45, 45-50, 57.5-60, 80-85, and 102-107.5. In BCJMOB-9 no interval was tested as being potentially acid-forming. In BCJMOB10 interval 48.5 - 50. As shown on the attached lithologies, all of the above intervals are adjacent to the target coal seams and as such were most likely contaminated by these seams during sample collection. Due to the fact that all overburden at this site does not occupy similar areas, intervals shown in the overburden analyses which are located in the upper portions of the drill logs occupy a smaller volume than intervals which are located closer to the bottom, consequently, their acid-base accounts do not contribute as substantially to the overall chemistry of the overburden. In an attempt to more accurately describe the acid-base potential of the overburden at the Jagger revision R-1 mine area, a spreadsheet which was developed at the Pennsylvania

Dept. of Environmental Resources, Bureau of Mining and Reclamation was employed. This spreadsheet not only takes into account the volume occupied by each interval tested, but also the amount of coal lost into the spoil. The results of this method from Drill Holes BCJMOB-9 and BCJMOB10 and Monitoring sites BCJMMW-6 and BCJMMW-7 (as shown in the attached Volumetric Overburden Calculation Sheets) are favorable: overburden at the Revision R-1 Area of the Jagger Mine contains an average of 10.21 (tons CaCO3/1000 tons overburden) excess neutralization potential. This excess neutralization potential should be adequate to neutralize any potentially acid forming layers present in the overburden. As evidence of this statement, the adjacent Drummond - Knob Mine No. 2 recovered the same seams as proposed in this revision and the overburden was of sufficient quality as to warrant Bond Release by the Regulatory Authority.

Geochemical sites BCJMOB-9 and BCJMOB10 and Monitoring sites BCJMMW-6 and BCJMMW-7 were utilized along with drill information taken from drill holes 150417, 150419, 150420, 150423, 150426, 150427, 150437, 150438, 150439, 150455, and 150465 from the adjacent Drummond Coal - Knob No. 2 Mine to construct the attached Structure-Contour Map for the Black Creek Seam.

The surface elevation of drill holes BCN3MW-2, BCN3MW-4, BCN3MW-6,

BCN3MW-8, and BCN3DH-1 were determined by survey by qualified personnel of PERC Engineering Co., Inc.. The surface elevation of drill holes 150417, 150419, 150420, 150423, 150426, 150427, 150437, 150438, 150439, 150455, and 150465 were determined by survey by Drummond Company Inc..

The strike of the Black Creek Seam ranges from approximately N 59° E to N 80° W and the strata dips to the Southeast at approximately 7°. The strike and dip was determined by utilizing the Structure Contour Map for the Black Creek Seam.

The Brookside quadrangle, lithologic logs from drill hole BCJNOB-7 (from the original Jagger permit), geochemical sites BCJMOB-9, BCJMOB10, and Groundwater Monitoring Site BCJMMW-7, and structure contour lines for the Black Creek Seam were utilized to construct Cross-Sections A - A' and B - B'.

The following descriptions of regional groundwater and aquifer characteristics are based on information contained in the 'Hydrology Reports' for Areas 21, 22, 23, & 24 by the U.S. Geological Survey and also information contained in various hydrogeological evaluations submitted to, and approved by, the Alabama Surface Mining Commission.

Groundwater in the Warrior Basin occurs chiefly in openings along fractures and

bedding planes within Pottsville Formation strata. The most productive water-bearing openings generally occur in sandstone beds within 250 to 350 ft. of the surface. Well yields in the Pottsville depend on the number and size of water-bearing openings present. The number and size of the openings normally varies from one point to another depending upon the degree of fracturing present in the rocks. Regionally, the primary source of recharge to groundwater is rainfall which infiltrates through the overlying soils, past the root zone of plants, and into strata such as sandstone where it will sit (perch) upon an interval, such as shale, which limits the downward progress of the groundwater. Groundwater may also encounter fault and fracture zones, which will transmit the groundwater past the bedding planes of shale, or other aquitards, to deeper aquifers. Where aquifers are overlain by less permeable strata, these aquifer may become confined due to the pressure exerted by groundwater in up-dip strata. Groundwater movement in the Warrior Basin is generally from areas of higher elevation, along bedding planes, toward stream channels. Where the static groundwater level intersects the surface, seeps or springs may occur. Where the static groundwater level intersects stream channels, groundwater discharges into the stream and contributes to surface runoff as baseflow.

Groundwater occurring above and below the Black Creek Coal Seam of the Black Creek Coal Group within the proposed Revision R-1 Area exists in Pottsville Formation strata. According to 'Depositional Settings of the

Pottsville Formation in the Black Warrior Basin', the Lick Creek Seam is overlain by the Bremen Sandstone Member in Cullman and Walker Counties, however in this area, it is absent. As shown in Cross-Section B-B' the interval separating the Lick Creek and Ream Seams in this area consists primarily of shale.

In the absence of faults and fracture zones, groundwater occurring in strata overlying the Black Creek Seam within and adjacent to the proposed revision area is found primarily in two intervals of sandstone. One located between the Lick Creek Seam and the Upper Bench of the Jefferson Coal bed and the other overlying the Lick Creek Seam. Collectively, these sandstone intervals range from approximately 39 feet to over 66 feet thick. Other small sandstone and interbedded sandstone and shale intervals exist in the strata overlying the Black Creek Seam but they are secondary with respect to groundwater holding and conducting capability. Due to the fact that both sandstone intervals are overlain by laterally persistent intervals of shale and clay, the dominant source of recharge for these intervals is groundwater from up-dip areas. It is also highly likely that at least one of these sandstone intervals receive recharge from the Locust Fork of the Black Warrior River due to the fact that 1) the Locust Fork is located adjacent to the proposed revision area on the up-dip (north and west) boundary and 2) the strata overlying the Black Creek Seam dips towards the southeast, or away from Locust Fork. Groundwater elevations at BCJMMW-7 average 22.27 feet below the surface, which is close to the top of the

sandstone unit overlying the Lick Creek Seam and further indicates that one or both sandstone intervals are receive recharge from Locust Fork. Based on local topography and the dip direction and magnitude, the recharge area for this interval may extend several thousand feet towards the north and west, however a significant portion of this interval in up-dip areas has been previously disturbed by coal related activities. This aquifer would be considered a reliable source of domestic groundwater based solely on quantity.

As shown from BCJMMW-6, the strata underlying the Black Creek Seam consists mainly of shale with only a small amount of interbedded shale and sandstone. In the absence of fault and/or fracture zones, shale conducts and stores little groundwater. Groundwater elevations at this site average 60.37 feet below the surface, which 39.63 feet above the shale interval underlying the Black Creek Seam. This information indicates that this interval is either hydraulically connected to a sandstone interval overlying the Black Creek Seam, or is experiencing an elevated groundwater level caused by pressure from adjacent up-dip groundwater in the same interval. Based on the shale interval underlying the Black Creek Seam being 12 feet thick at the BCJMMW-7 location, it seems unlikely that the interbedded shale and sandstone strata underlying Black Creek Seam is hydraulically connected to a sandstone interval overlying the Black Creek Seam. It is also possible that this interval obtains recharged from the Locust Fork of the Black Warrior River. Even though the

groundwater in this interval is elevated, it is unlikely this interval is a reliable source of domestic groundwater based solely on quantity. The reasons for this statement are that 1) the lithology is not favorable and 2) based on water level measurements in the baseline data, it took over two weeks for the water level to increase from 99 feet to current levels, indicating a slow migration rate. Averages for selected parameters from groundwater samples taken at monitoring wells measuring chemical quality in groundwater associated with strata above, within, and below the Black Creek Coal Group are shown below:

Monitoring Site:	pH* (S.U.):	FeT (mg/l):	SpC (umhos):	SO4 (mg/l):
BCJMMW-6 (below Black Creek)	7.67	5.72	853	54.0
BCJMMW-7 (above Black Creek)	6.63	2.96	307	69.0

* median

Groundwater quality in the Pottsville Formation was described by Thomas J. Hill in "Hydrologic Assessment, Eastern Coal Province Area 23, Alabama" on page 59. The following is an excerpt from his findings:

Parameter:	Max:	Min:	Ave:
Fet (mg/l)	7.40	0.10	0.89
pH (s.u.)	9.40	6.40	8.40*
SpC (umhos)	1760	37	504
SO4 (mg/l)	37.0	0.20	11.0

*median

A comparison between averages shown for groundwater above and below the Black Creek Coal Group at the Jagger Mine vs. Pottsville Formation averages show that the local groundwater is of lower pH, higher mineralization, higher or lower specific conductivity, and much higher sulfate concentrations than the Pottsville averages shown above. This says that, on average, local groundwater is of lower quality than the Pottsville averages and as such is probably not reliable as a domestic source from a quality standpoint. Based on the sulfate concentrations and conductivity value exhibited in the baseline data, the groundwater at this site has been affected by previous coal related disturbance.

No well inventory was conducted as a result of this revision.

As stated above in the nature of revision R-1, this revision proposes to add Basins 035P, 037P, 045P, 047P, 048P, 049P, 051P, 052P, 053P, 054P, 055P, 056P, 057P, 077P, 079P, 080P, and 081P. These sediment basins are permitted under ADEM NPDES Permit Number AL0075752. Sediment basins 051P, 052P, 053P, 054P, 055P, 056P, 057P, and 081P will drain into the Locust Fork of the Black Warrior River, while sediment basins 035P, 037P, 045P, 047P, 048P, 049P, and 080P will drain into Trouble Creek. All basins are proposed as permanent water impoundments (fish and wildlife habitats). The locations of all added sediment basins are shown on the attached Mine Site Location Map.

A description of the receiving streams were submitted during the original permit and no significant changes to the watersheds are known to have taken place during the interim

All analytes measured from Surface Water Monitoring Site BCJMSW-3 mentioned above was plotted vs. stream flow (in CFSM) to characterize water quality in Locust Fork at different flowrates prior to mining by Best Coal, Inc. Within the proposed revision area. Baseline conditions at the 7Q2, Average, and 2 yr. flowrates are given in the Determination of the Probable Hydrologic Consequences (Attachment II-H). See results of regression plots attached.

Values for the 7Q2, average, and 2-year flowrates for the Locust Fork of the Black Warrior River at Surface Water Monitoring Site BCJMSW-3 were calculated during the original hydrogeologic evaluation. See original report.

Surface water quality values for baseline conditions at these specific flowrates for Surface Water Monitoring Site BCJMSW-3 are shown on the attached 'Water Quality & Quantity Projections' pages. Notice that no parameter exceeds EPA effluent limitations at any flowrate calculated even though previous disturbance has occurred in this watershed (as evidenced by elevated sulfate values).

Comparisons should also be made between baseline surface water quality in the receiving streams and effluent limitations specified by the Alabama Dept. of Environmental Management for the receiving streams' use classification, which is 'Fish and Wildlife', as referenced by Chapter 335-6-11-.02 in their Water Quality Program, and mentioned previously in this report. As referenced from Chapter 335-6-10 in the Water Quality Program of the Alabama Dept. of Environmental Management, the best usage of the 'Fish and Wildlife' classification for the Locust Fork is fishing, the propagation of fish, aquatic life, and wildlife, and any other usage except utilization as a supply for drinking or food processing, or for swimming and water contact sports. According to the same reference, the following water quality restrictions are imposed by ADEM for this use classification: Wastes shall not cause the pH to deviate more than one unit from the normal pH, nor be less than 6.0 or greater than 8.5. The temperature shall not exceed 90 degrees Fahrenheit. Dissolved oxygen concentrations will not be less than 5 mg/l. Only such amounts of toxic substances or taste, odor, and color producing substances will be allowed which will not exhibit acute or chronic toxicity. Fecal coliform will not exceed a geometric mean of 1,000/100ml on a monthly average. Radioactive materials will not exceed the requirements of the State Dept. of Public Health and there shall be no turbidity of other than natural origin that will cause substantial visible contrast with the natural appearance of the waters or interfere with any beneficial uses which they serve. Officials from ADEM were contacted and

asked what parameter concentrations would degrade this use classification for parameters not listed in Chapter 335-6-10. They responded that if the parameter is not specifically listed in the above referenced Chapter, baseline quality of the body of water would be used to determine whether or not degradation is taking place. As shown on the attached 'Water Quality & Quantity Projections' pages, no parameter exceeds the effluent limitations listed in Chapter 335-6-10 for the 'Fish and Wildlife' classification, even with the additional impact from mining deeper seams in a larger permitted area.

'During Mining' water quality estimates for Locust Fork is also given on the attached 'Water Quality & Quantity Projections' pages. All estimates for quality and quantity of the receiving stream during the mining of the proposed Revision R-1 area is based on: 1) baseline surface water quality, 2) the size of the proposed permit area (after revision approval) within its respective watershed, 3) the drainage area of the watershed of the receiving stream at the respective monitoring site, 4) the anticipated discharge quality of the sediment basins, and 5) the amount of previous disturbance within the watershed. During the development of "During Mining" surface water quality projections it was assumed that surface water leaving the post Revision R-1 mine site will meet EPA and ADEM effluent limitations but will be of the lowest quality, ie, will have a pH of 6 s.u., a FeT of 3 mg/l, a MnT of 2 mg/l, a TSS of 35 mg/l, and a SpC of 2000. As shown on the attached 'Water Quality & Quantity Projections'

page, no parameter exceeded EPA effluent limitations and little change to the quality of Locust Fork is shown. These changes in surface water quality should not have a significant affect on the use-classification of the receiving stream if the operator complies with state and federal water quality guidelines.

Sediment delivered to the Locust Fork of the Black Warrior River from the post Revision R-1 mine site, as estimated by a computer program developed at PERC Engineering Co., Inc. utilizing the Universal Soil Loss Equation (USLE), and modified using conservative values for sediment basin trapping efficiencies and sediment delivery ratios for the receiving stream, should average 789 tons per year before mining begins, 1,071 tons per year during the first year of mining, 1,033 tons per year during the second year of mining, 908 tons per year during the third year of mining, 766 tons per year during the fourth year of mining, 621 tons per year during the fifth year of mining, 283 tons per year in the first year after active mining, 60 tons per year in the second year after active mining, 37 tons per year in the third year after active mining but before 100% release of bonds, and 32 tons per year after release of the performance bonds. Results of this program are attached. It may seem odd that the post mining erosion is modeled to be less than the pre-mining condition, however this model assumes 152 acres of pre-law disturbance will be routed through a sediment basin during mining, and the basins at this site are proposed as being permanent, and will continue to treat discharge from the proposed permit area, even after bond

release.

Sediment levels in surface runoff will be controlled by sediment basins as designed in Part III-B of this application. Timely planting, fertilization, liming, and mulching of revegetation as outlined in Part IV of this application will enhance post mining vegetative cover, which in turn will decrease erosion, and prevent conditions which may result in low quality surface water runoff.

The long term effects of mining by Best Coal, Inc. on surface water quality in Locust Fork is also shown on the attached 'Water Quality & Quantity Projections' pages. Post mining estimates are based on: 1) baseline surface water quality, 2) estimated impact during mining, 3) the size of the post Revision R-1 permit area, 4) the size of the watershed, and 5) the amount of previous disturbance within that watershed. Post mining surface water quality in the receiving stream will be of generally lower quality as compared to baseline values but this difference will be minimal due mainly to previous disturbance in the watershed and the very small size of the proposed permit area as compared to this large watershed.

Changes in water quantity within the permit area were estimated in the original hydrologic evaluation.

In general, the intervals above the Black Creek within the post Revision R-1 permit area (and the original permit area where the Black Creek Seam will also be mined) will be significantly affected during the mining process. The most noticeable affect to these intervals are that they will store and transmit more groundwater. As stated above, groundwater occurring in strata overlying the Black Creek Seam within the original permit area and the proposed revision area is found primarily in two intervals of sandstone. One located between the Lick Creek Seam and the Upper Bench of the Jefferson Coal bed and the other overlying the Lick Creek Seam. The groundwater in these two intervals (pre-mine) are supported by underlying shale (or other lower-permeable strata) which will be fractured during the mining process. The result will be one large post mining spoil aquifer which will have much lower groundwater elevations as compared to pre mine conditions and this aquifer will store and transmit a much greater quantity of groundwater. In addition, the direction of post mining groundwater migration will be controlled/dominated by the dip of the strata, which as stated above is towards the southeast. Groundwater quality within these intervals within the proposed permit area and immediately down dip from the mine site should decrease due to increased conductivities, mineralization, sulfate levels, and decreased pH's. As stated above, this interval is already affected by previous mining up dip from the proposed mine site / Revision R-1 Area. Any off-site groundwater which is located East of the proposed permit area is separated from affected groundwater by a fault which was discussed in

the original hydrogeologic report and is shown on the attached Mine Site Location Map. Affected groundwater from the proposed permit/revision area would either have to migrate through undisturbed strata, or move along the fault towards the Southeast (towards previously disturbed areas) or the Northwest (away from adjacent strata). Based on this information, off-site groundwater in this interval should not be greatly affected by mining at the Jagger Mine.

Not much impact is anticipated with respect to on and off-site groundwater quality for the aquifer located below the Black Creek Coal Seam as a result of mining under Revision R-1 at this facility. As shown above, baseline data from Groundwater Monitoring Site BCJMMW-6 (the well which monitors the aquifer below the Black Creek Seam) reveals that this groundwater is high in mineralization, conductivity, and sulfates. Based on this analysis, the aquifer underlying the Black Creek Seam is already affected from coal related disturbance up-dip from the mine site and as such changes in groundwater quality in this interval is expected to be negligible. No changes to groundwater quantity is expected to the aquifer below the Black Creek Seam located on-site.

The original well inventory conducted by PERC Engineering Co., Inc. in May of 2009 for the original Jagger Mine revealed that there are only three residences within a ½ mile radius of the proposed site. The area added by Revision R-1 is no closer to these residences than the original permit. All three utilize local

groundwater as their only domestic source. There is no developed municipal water supply available in this rural area. The locations of the inventoried residences are shown in the original hydrogeologic evaluation. All three wells are separated from the post Revision R-1 mine site by the fault located on the east end of the proposed permit/revision area and enjoy its influence to decrease or eliminate the migration of affected groundwater to these wells. As stated above, Groundwater Monitoring Site BCJMMW-8 was located, drilled, and cased specifically to monitor any impact to the intervals disturbed by this revision.

In the event that it is shown that mining by Best Coal, Inc. has diminished the quality or quantity of any surrounding wells, one of the following methods of replacing the resident's domestic supply will be implemented: 1) an alternative source of groundwater for either shallow groundwater wells or wells with inadequate casing would involve drilling a new well in which the casing would penetrate an aquitard, such as shale below the lowest target coal seam, and the well would also terminate below the aquitard in water-producing strata, such as sandstone, or 2) other methods which replace the groundwater users supply and is agreeable to both the user and the operator will be considered an alternative. No alteration of the drainage area of the receiving streams are anticipated as a result of this revision.

PHC FINDINGS:

The findings of the preceding Determination of the Probable Hydrologic Consequences for Best Coal, Inc. at their Jagger Mine under Revision R-1 is as follows:

A) Acid or toxic-forming materials:

Geochemical analysis conducted on the drill holes/ monitoring wells mentioned above reveal that these following intervals were tested as being potentially acid-forming (other than the target coal seams): In BCJMMW-6 intervals 53.5 - 55 and 40-45. In BCJMMW-7 intervals 40-45, 45-50, 57.5-60, 80-85, and 102-107.5. In BCJMOB-9 no interval was tested as being potentially acid-forming. In BCJMOB10 interval 48.5 - 50. As shown on the attached lithologies, all of the above intervals are adjacent to the target coal seams and as such were most likely contaminated by these seams during sample collection. Due to the fact that all overburden at this site does not occupy similar areas, intervals shown in the overburden analyses which are located in the upper portions of the drill logs occupy a smaller volume than intervals which are located closer to the bottom, consequently, their acid-base accounts do not contribute as substantially to the overall chemistry of the overburden. In an attempt to more accurately describe the acid-base

potential of the overburden at the Jagger revision R-1 mine area, a spreadsheet which was developed at the Pennsylvania Dept. of Environmental Resources, Bureau of Mining and Reclamation was employed. This spreadsheet not only takes into account the volume occupied by each interval tested, but also the amount of coal lost into the spoil. The results of this method from Drill Holes BCJMOB-9 and BCJMOB10 and Monitoring sites BCJMMW-6 and BCJMMW-7 (as shown in the attached Volumetric Overburden Calculation Sheets) are favorable: overburden at the Revision R-1 Area of the Jagger Mine contains an average of 10.21 (tons CaCO3/1000 tons overburden) excess neutralization potential. This excess neutralization potential should be adequate to neutralize any potentially acid forming layers present in the overburden. As evidence of this statement, the adjacent Drummond - Knob Mine No. 2 recovered the same seams as proposed in this revision and the overburden was of sufficient quality as to warrant Bond Release by the Regulatory Authority.

B) Adverse impacts to the hydrologic balance:

As stated in the PHC, changes in water quantity within the permit area due to the affects of mining have been estimated using "Procedures For Predictive Analysis Of Selected Hydrologic Impacts Of Surface Mining" by David B. McWhorter. Values for precipitation, temperature, and solar

radiation were obtained from the National Weather Service and NOAA. Runoff curve numbers were taken from "Applied Hydrology and Sedimentology for Disturbed Areas" by Barfield, Warner, and Haan. Water use coefficients were taken from "Water Requirements for Stabilization of Spent Shale" by Wymore. Effective rooting depth values were taken from "Agronomy Journal, Volume 52". Available Water Capacity values for soils and B Horizon mined areas were taken from the Soil Conservation Service's Soil Survey. Available Water Capacity values for A Horizon mined areas were taken from an average of over 40 site-specific studies conducted in Jefferson, Tuscaloosa, Walker, and Winston counties by Tim Thomas of PERC Engineering Co., Inc. utilizing "A Method of Comparing Soil Materials for Plant Available Water" by Sam Lyle. These changes were originally determined in the original hydrogeologic report for this permit. Changes in flowrates are shown on the attached 'Water Quality & Quantity Projections' pages.

C) Contamination, diminution, and interruption of underground or surface source of water used for legitimate purpose on site and adjacent areas:

Surface Water: 'During Mining' water quality estimates for Locust Fork is also given on the attached 'Water Quality & Quantity Projections' pages. All estimates for quality and quantity of the receiving stream

during the mining of the proposed Revision R-1 area is based on: 1) baseline surface water quality, 2) the size of the proposed permit area (after revision approval) within its respective watershed, 3) the drainage area of the watershed of the receiving stream at the respective monitoring site, 4) the anticipated discharge quality of the sediment basins, and 5) the amount of previous disturbance within the watershed. During the development of "During Mining" surface water quality projections it was assumed that surface water leaving the post Revision R-1 mine site will meet EPA and ADEM effluent limitations but will be of the lowest quality, ie, will have a pH of 6 s.u., a FeT of 3 mg/l, a MnT of 2 mg/l, a TSS of 35 mg/l, and a SpC of 2000. As shown on the attached 'Water Quality & Quantity Projections' page, no parameter exceeded EPA effluent limitations and little change to the quality of Locust Fork is shown. These changes in surface water quality should not have a significant affect on the use-classification of the receiving stream if the operator complies with state and federal water quality guidelines.

Groundwater: In general, the intervals above the Black Creek within the post Revision R-1 permit area (and the original permit area where the Black Creek Seam will also be mined) will be significantly affected during the mining process. The most noticeable affect to these intervals are that they will store and transmit more groundwater. As stated above, groundwater occurring in strata overlying the Black Creek Seam within

the original permit area and the proposed revision area is found primarily in two intervals of sandstone. One located between the Lick Creek Seam and the Upper Bench of the Jefferson Coal bed and the other overlying the Lick Creek Seam. The groundwater in these two intervals (pre-mine) are supported by underlying shale (or other lower-permeable strata) which will be fractured during the mining process. The result will be one large post mining spoil aquifer which will have much lower groundwater elevations as compared to pre mine conditions and this aquifer will store and transmit a much greater quantity of groundwater. In addition, the direction of post mining groundwater migration will be controlled/dominated by the dip of the strata, which as stated above is towards the southeast. Groundwater quality within these intervals within the proposed permit area and immediately down dip from the mine site should decrease due to increased conductivities, mineralization, sulfate levels, and decreased pH's. As stated above, this interval is already affected by previous mining up dip from the proposed mine site / Revision R-1 Area. Any off-site groundwater which is located East of the proposed permit area is separated from affected groundwater by a fault which was discussed in the original hydrogeologic report and is shown on the attached Mine Site Location Map. Affected groundwater from the proposed permit/revision area would either have to migrate through undisturbed strata, or move along the fault towards the Southeast

(towards previously disturbed areas) or the Northwest (away from adjacent strata). Based on this information, off-site groundwater in this interval should not be greatly affected by mining at the Jagger Mine. Not much impact is anticipated with respect to on and off-site groundwater quality for the aquifer located below the Black Creek Coal Seam as a result of mining under Revision R-1 at this facility. As shown above, baseline data from Groundwater Monitoring Site BCJMMW-6 (the well which monitors the aquifer below the Black Creek Seam) reveals that this groundwater is high in mineralization, conductivity, and sulfates. Based on this analysis, the aquifer underlying the Black Creek Seam is already affected from coal related disturbance up-dip from the mine site and as such changes in groundwater quality in this interval is expected to be negligible. No changes to groundwater quantity is expected to the aquifer below the Black Creek Seam located on-site.

D) Sediment yield from disturbed areas:

Sediment delivered to the Locust Fork of the Black Warrior River from the post Revision R-1 mine site, as estimated by a computer program developed at PERC Engineering Co., Inc. utilizing the Universal Soil Loss Equation (USLE), and modified using conservative values for sediment basin trapping efficiencies and sediment delivery ratios for the receiving stream, should average 789 tons per year before mining begins, 1,071

tons per year during the first year of mining, 1,033 tons per year during the second year of mining, 908 tons per year during the third year of mining, 766 tons per year during the fourth year of mining, 621 tons per year during the fifth year of mining, 283 tons per year in the first year after active mining, 60 tons per year in the second year after active mining, 37 tons per year in the third year after active mining but before 100% release of bonds, and 32 tons per year after release of the performance bonds. Results of this program are attached. It may seem odd that the post mining erosion is modeled to be less than the pre-mining condition, however this model assumes 152 acres of pre-law disturbance will be routed through a sediment basin during mining, and the basins at this site are proposed as being permanent, and will continue to treat discharge from the proposed permit area, even after bond release.

E) Acidity, TSS, TDS, Fe, Mn, pH, other:

The long term effects of mining by Best Coal, Inc. on surface water quality in Locust Fork is also shown on the attached 'Water Quality & Quantity Projections' pages. Post mining estimates are based on: 1) baseline surface water quality, 2) estimated impact during mining, 3) the size of the post Revision R-1 permit area, 4) the size of the watershed, and 5) the amount of previous disturbance within that watershed. Post

mining surface water quality in the receiving stream will be of generally lower quality as compared to baseline values but this difference will be minimal due mainly to previous disturbance in the watershed and the very small size of the proposed permit area as compared to this large watershed.

F) Flooding or Streamflow Alterations:

None anticipated at this site.

G) Groundwater and Surface Water Availability:

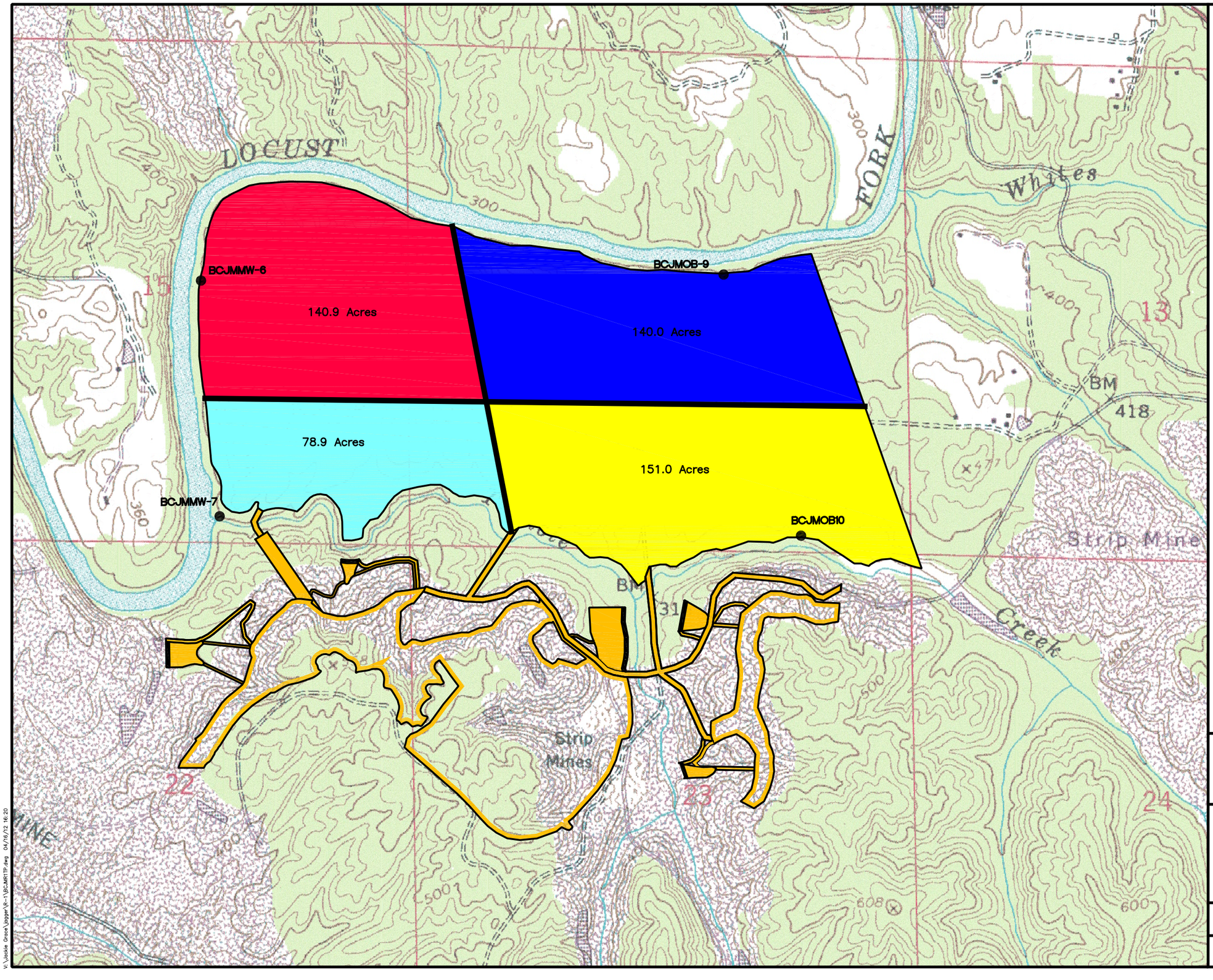
Due to the fracturing of low permeability strata, groundwater availability within the permit area will increase dramatically over baseline levels. Also, due to the fact that this fracturing will create voids in the overburden, this will increase the gravitational affects on the groundwater while decreasing capillary affects on the groundwater, which will result in on-site post mine groundwater levels in this interval will be much lower. As stated previously (in Part II-F), very little groundwater exists in this interval. Increased porosity and the resulting increased hydraulic conductivity of the fractured overburden will result in the increased post mine base flows discussed above.

H) Other:

No other impacts are anticipated at this site.

I) Supplemental Information:

None required for this mine site.



LEGEND

- Revision R–1 Boundary
- BCJMOB-9 — Geochemical Analysis Site
- Area representing BCJMMW–6
- Area representing BCJMMW–7
- Area representing BCJMOB–9
- Area representing BCJMOB10
- Excess Spoil Area

Scale: 1" = 1000'

N

NOTES:
BASE MAP TAKEN FROM THE BROOKSIDE U.S.G.S QUADRANGLE.
T15S, R4W, PART OF SECTIONS 13, 14, 15, 22, 23, & 24.

PERC
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P.O. Box 1712 Jasper, Alabama 35502
(205) 384-5553 Office (205) 295-3114 Fax

Best Coal, Inc.
Jagger Mine
P-3932 / Revision R-1
Theissen Polygon Map

DRAWN BY: JNG	DATE: 4–16–12
DWG. NAME: BCJMR1TP	
APPROVED BY: TST	SCALE: 1"=1000'

N:\Jackie Grace\Jagger\R-1\BCJMR1TP.dwg 04/16/12 16:20

CERTIFICATION STATEMENT:

All information including surface water modeling, groundwater interpretations, and estimates of surface and groundwater impact estimated in Parts II-H was prepared for Best Coal, Inc. at the Jagger Mine / Revision R-1 Area by a qualified professional and I hereby certify that it is true and correct to the best of my knowledge or belief.

Date: 02-14-2012

TIMOTHY S. THOMAS

PROFESSIONAL ENGINEER

REGISTRATION NO. 18830