STATE OF ALABAMA

SURFACE MINING COMMISSION

P.O. BOX 2390 - JASPER, ALABAMA 35502-2390
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MEMORANDUM

TO: Sherry Wilson
Office of Surface Mining

Mr. Jeff Kitchens
Department of Environmental Management

Mr. Frank White
Alabama Historic Preservation Officer

The District Engineer
U.S. Corps of Engineers

Alabama Department of Industrial Relations
Division of Safety & Inspection

BLM - District Office

State of Alabama
Abandoned Mine Land Reclamation

Shelby County Commission

U.S. Fish & Wildlife Service

Mr. Keith Guyse, Fish & Game Division

Mr. Mitch Reid - Alabama Rivers Alliance

FROM: JOHNATHAN E. HALL, DIRECTOR

RE: **PERMANENT PROGRAM PERMIT FOR:**

Permit P-3985-58-21-S (Murry Creek Mine)

Pursuant to the Alabama Surface Mining Commission Regulation 880-X-8K-.12(2), we are hereby notifying you of the issuance of the above permit.

You may also view a copy of this permit at our web address of:

http://surface-mining.alabama.gov/PermitDecisions.html

Enclosed for your information and file is a copy of the permit which shows the legal description of the mine site.

JEH/ml

STATE OF ALABAMA
SURFACE MINING COMMISSION

Permit Number:P- 3985 -58-21-S

License Number:L- 828

PERMIT TO ENGAGE IN SURFACE COAL MINING OPERATIONS

Pursuant to **The Alabama Surface Mining Control and Reclamation Act of 1981**, as amended, **ALA. Code** Section 9-16-70 et. seq. (1975) a permit to engage in Surface Coal Mining Operations in the State of Alabama is hereby granted to:

Jesse Creek Mining, LLC
1615 Kent Dairy Road
Alabaster, AL 35007
(Murry Creek Mine)

Such operations are restricted to 199 acres as defined on the permit map and located in:

SE/SW, SW/SW of Section 13; SE/SE, SW/SE, SE/SW, SW/SW, NW/SW, NE/SW of Section 14; NE/SE, SE/SE of Section 15; NE/NE, SE/NE of Section 22; NW/NW, NE/NW, NW/NE, NE/NE, of Section 23; NW/NW of Section 24; all in Township 21 South, Range 4 West, Shelby County, Alabama.

This permit is subject to suspension or revocation upon violation of any of the following conditions:

1. The permittee shall conduct Surface Coal Mining and Reclamation Operations in accordance with the plans, provisions and schedules in the permit application.

2. The permittee shall conduct operations in a manner to prevent damage or harm to the environment and public health and safety and shall notify ASMC and the public in accordance with ASMC Rule 880-X-8K-.16 of any condition which threatens the environment or public health and safety.

3. Surface coal mining operations are restricted to those areas for which sufficient bond has been posted with ASMC. On the date of issuance of this permit, bond was posted only for increment(s) **1** consisting of **109** acres as defined on the permit map.

4. No mining disturbance is to occur on any part of the permit on which legal "right of entry" has not been obtained. When such rights are "pending" the applicant shall submit acceptable evidence, to the Director, that such rights have been obtained according to ASMC Regulation 880-X-8D-.07.

5. No disturbance is to occur on any properties on which land use comments from legal owners of record are "pending" prior to the applicant providing acceptable comments.

6. No disturbance is to occur in the 300' setback area to any occupied dwelling prior to the applicant providing acceptable evidence to ASMC of its having secured a waiver of each subject area signed by the owner of the dwelling.

7. No mining disturbance shall occur within the 100' setback of any public road or the relocation of any public road prior to the applicant providing acceptable evidence, to the Director, of its having secured approval for a waiver from the appropriate jurisdictional authority and specific written waiver from ASMC.

8. The permittee shall notify the ASMC and seek consultation with the US Fish and Wildlife Service if:

   a. The permit is modified in any way that causes an effect on species or Critical Habitat listed under the Endangered Species Act of 1973.
   b. New information reveals the operation may affect Federally protected species or designated Critical Habitat in a manner or extent not previously considered or
   c. A new species is listed or Critical Habitat is designated under the Endangered Species Act that may be affected by the operation.

9. The permittee shall contact the ASMC and consult with the Alabama Historic Preservation Officer if the permit is modified or if previously unknown archaeological or historic resources are discovered on the permit area. Upon discovery of previously unknown artifacts or archaeological features the permittee shall cease operations until the Alabama Historic Preservation Officer approves resumption of operations.

10. In accordance with the approved Topsoil Variance, if the Overburden Restabilization Plan cannot be met, the Applicant shall redisc the overburden and resample. If increasing the mechanical breakage will not enhance the graded overburden to a satisfactory level, additional soil will be hauled and spread on site until the criteria is achieved.

DATE ISSUED: **September 1, 2016**
EFFECTIVE DATE: **September 1, 2016**
EXPIRATION DATE: **August 31, 2021**

Johnathan E. Hall, Director

The ASMC, acting by and through its Director, hereby finds, on the basis of information set forth in the application or from information otherwise available, that --

1. The permit application is complete and accurate and the applicant has complied with all requirements of the Act and the regulatory program.

2. The applicant has demonstrated that reclamation as required by the Act and the regulatory program can be accomplished under the reclamation plan contained in the permit application.

3. The proposed permit area is:

   (a) Not within an area under study or administrative proceedings under a petition, filed pursuant to Chapter 880-X-7 to have an area designated as unsuitable for surface coal mining operations;

   (b) Not within an area designated as unsuitable for mining pursuant to Chapter 880-X-7 or subject to the prohibitions or limitations of Section 880-X-7B.-06 and Section 880-X-7B-.07 of this chapter; or

4. For mining operations where the private mineral estate to be mined has been severed from the private surface estate, the applicant has submitted to the Regulatory Authority the documentation required under Section 880-X-8D.07 and Section 880-X-8G-.07 of this chapter.

5. The Regulatory Authority has made an assessment of the probable cumulative impacts of all anticipated coal mining on the hydrologic balance in the cumulative impact area and has determined that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

6. The applicant has demonstrated that any existing structure will comply with Section 880-X-2B-.01, and the applicable performance standards of Chapter 3 or 10.

7. The applicant has paid all reclamation fees from previous and existing operations as required by 30 C.F.R., Subchapter R.

8. The applicant has satisfied the applicable requirements of Subchapter 880-X-8J.

9. The applicant has, if applicable, satisfied the requirements for approval of a long-term, intensive agricultural, postmining land use, in accordance with the requirements of 880-X-l0C-.58(4) and 880-X-10D-.52(4).

10. The operation will not affect the continued existence of endangered or threatened species, or result in destruction or adverse modification of their critical habitats, as determined under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).

11. The Regulatory Authority has taken into account the effect of the proposed permitting action on properties listed or eligible for listing on the National Register of Historic Places. This finding is supported in part by inclusion of appropriate permit conditions or changes in the operation plan protecting historic resources, or a documented decision that the Regulatory Authority has determined that no additional protection measures are necessary.

12. For a proposed remining operation where the applicant intends to reclaim in accordance with the requirements of Section 880-X-l0C-.56 or 880-X-10D.-49, the site of the operation is a previously mined area as defined in Section 880-X-2A-.06.

13. Surface coal mining and reclamation operations will not adversely affect a cemetery.

14. After application approval but prior to issue of permit, ASMC reconsidered its approval, based on the compliance review required by Section 880-X-8K-.10(2)(a) in light of any new information submitted under 880-X-8D-.05(8).

15. The applicant has submitted the performance bond or other equivalent guarantee required under Chapter 880-X-9 of the ASMC Rules prior to the issuance of the permit.

16. For mining operations where a waiver is granted from the 100' setback from a public road according to 880-X-7B-.07, the interests of the public and affected landowners have been protected.

17. The Regulatory Authority has taken into account the effect of the proposed permitting action on properties listed or eligible for listing on the National Register of Historic Places. In a letter dated October 17, 2014 the University of Alabama, Office of Archaeological Research (OAR), project number 15-103, conducted a Phase I Cultural Resource Survey in Shelby County, Alabama, from September 24-30, 2014. The proposed project's area of potential effect (APE) is approximately 213 acres. As a result of the Phase 1 survey no new archaeological sites or historic standing structures were identified or documented within the boundaries of the APE. Two previously recorded sites, 1Sh249 and 1Sh449, were revisited and are not recommended as meeting the eligibility criteria for listing in the National Register of Historic Places (NRHP). The proposed project area contained steeply sloping terrain and was found to be significantly altered due to timber harvesting/silviculture, mining, natural gas well pad manufacture, water and gas pipeline construction, earthen dam construction, access road placement, transmission line construction and erosion. Based on these findings, it is the opinion of OAR that the proposed Murry Creek Mine will not affect any significant historic properties and a finding of properties is recommended.

By a letter dated November 21, 2014 the State Historical Preservation Office (SHPO) Re: AHC 2015-0053, based on the cultural resource assessments conducted by the OAR, determined that archaeological sites 1Sh249 and 1Sh449 and not eligible for the National Register, and the project activities will have no adverse effect on cultural resources eligible for or listed on the NRHP. Therefore SHPO concurs with the project activities. This finding is supported in part by inclusion of appropriate permit conditions or changes in the operation plan protecting historic resources, or a documented decision that the Regulatory Authority has determined that no additional protection measures are necessary. Concerns for unknown resources, which might be discovered during mining, have been made conditions of the permit.

18. McGehee Engineering Corp (MEC) conducted an environmental assessment for the habitat and the possible presence of federally listed and state protected sensitive species for Shelby County, Alabama in August 2014 through March of 2015. The approximately 527 acre survey area for the proposed Murry Creek Mine consists of upland area disturbed by multiple previous mining operations, gas well operations, and timber harvest operations. No habitat was found for the listed aquatic threatened and endangered species (T&E). No evidence was found or observed for the presence or possible presence of the listed species. There is no continuous flowing water on this site to support the T&E aquatic species. No habitat was found for the listed terrestrial T&E species, with the exception of the potential summer roosting habitat for the Indiana Bat (*Myotis sodalis*) and Northern Long-eared Bat (*Myotis Septentrionalis*). Broken and segmented areas totaling approximately 93 acres of potential summer roosting habitat was found for the Indiana bat and Northern Long-eared bat along the boundary of the project site. An Acoustic Presence/Absence Survey was performed on May 18th, 19th, July 15th, 16th, 2015 by MEC in accordance with the US Fish and Wildlife Service (FWS) approved plan dated April 15th, 2015 for the Indiana and Northern Long-eared bats due to the potential summer roosting habitat located within the project area. The findings of the survey indicate that there were no Myotid calls captured during the survey, and that disturbance of the area identified as potential summer roosting habitat is not likely to have a significant adverse effect upon the Indiana and Northern Long-eared bats. By comments dated September 29, 2015 the US Fish and Wildlife Service (FWS) agree with the findings that no federally listed species/critical habitat occur in the project area. In a letter dated August 13, 2014 the Alabama Department of Conservation and Natural Resources (ADCNR) states the closest sensitive species as occurring approximately 2.0 miles from the subject site. US Army Corps of Engineers (USACE) issued a Nationwide Permit Authorization-Project Number SAM-2014-01052-CMS, on December 7, 2015 for the Murry Creek Mine re-mining project. The work will involve placement of fill in 1,809 linear feet (lf) of intermittent stream, 416 lf of ephemeral stream, and 0.42 acre of wetlands associated with the installation of a sediment pond and coal removal activities. USACE special condition: to show a net increase in aquatic resource functions, reclamation to waters of the U. S. on the project site shall be conducted in accordance with the Reclamation Plan dated May 2015, as attached to the PCN dated April 28, 2015, and Addendum No. 1 dated October 22, 2015. The Alabama Surface Mining Commission finds that the proposed operation will not jeopardize the continued existence of endangered or threatened species or critical habitat thereof.

BASED ON THESE FINDINGS, I RECOMMEND THAT THIS PERMIT BE ISSUED.

DATE: September 1, 2016

Mark Woodley

Mark Woodley
Permit Manager

/ml

cc: I & E, Permit File

Cumulative Hydrologic Impact Assessment
Jesse Creek Mining, LLC
Murry Creek Mine
ASMC P-3985

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Jesse Creek Mining, LLC
Murry Creek Mine
ASMC Permit Number P-3985
NPDES Permit Number AL0069108

As required under Federal Public Law 95-87, Section 510(b)(3), the Alabama Surface Mining Commission (ASMC) must find in writing the following operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The applicant must submit a determination of probable hydrologic consequences of mining and reclamation operations in Part II.H of the permit application for areas both on and off the mine site. This determination will allow the ASMC to assess probable cumulative impacts of all anticipated mining activities on the surface and ground water hydrology of the permit and adjacent areas as stated in Federal Public Law 95-87, Section 507(b)(11) and ASMC Rule 880-X-8E-.06(1)(g). The following assessment and findings are intended to fulfill the above.

I. GENERAL INFORMATION

The Jesse Creek Mining, LLC Permit P-3985 is for a surface coal mining and highwall mining operation encompassing a total of 199 acres in Shelby County, Alabama. The mine site includes 35 acres of surface mining and 164 acres of highwall mining, haul/access roads, impoundments, stockpiles, equipment storage areas and diversion ditches.

The mine site is located in parts of Sections 13, 14, 15, 22, 23 and 24, Township 21 South, Range 4 West, Shelby County, Alabama as seen from the 1979 Pea Ridge, Alabama USGS 7.5 minute quadrangle.

II. CUMULATIVE IMPACT AREA (CIA)

The Cumulative Impact Area (CIA) is that area, including the permit area, within which impacts resulting from the operation may interact with the hydrologic impacts of all other past, current and anticipated coal mining on the surface and groundwater systems.

The permit area is located directly east of the confluence of Piney Woods Creek and Murry Creek which becomes Piney Woods Creek. This permit encompasses part of the Jesse Creek Mining, LLC Gholson Mine (P-3663) and is in proximity to the Yeshic, LLC Yeshic Mine No. 2 (P-3940), the Twin Pines II, LLC Segco Mine No. 1 (P-3901) and the Yeshic, LLC Yeshic Mine (P-3914). Other permits within the vicinity and CIA include the Jesse Creek Mining, LLC Gurnee Mine (P-3978), the Jesse Creek Mining, LLC Helena Mine (P-3916) and the Timcoaland, Inc. Montevallo Mine (P-3273). See Figure 1 for location of these permits. An informational table is shown in Table 1 at the end of this assessment.

The CIA for surface water for Permit P-3985 has been defined as the area that encompasses Murry Creek and Piney Woods Creek. Murry Creek flows into Piney Woods Creek, which in turn flows

into the Cahaba River approximately 1.8 miles downstream. This includes area in the Murry Creek – Piney Woods Creek sub watershed HUC12 - 031502020205. See Figure 2 for the CIA.

The critical point is a discharge-weighted technique used to find the concentrations of solutes at different locations in a stream system. Baseline conditions are needed for the general area as well as an estimate of solute concentrations for the mining area. The estimate of solute concentrations are given in the Probably Hydrologic Consequences (PHC). For this permit, the evaluation point will be the Twin Pines, LLC site 4113006 for the Segco Mine (P-3901). This site is downstream of the Murry Creek Mine and includes discharges from the Yeshic, LLC Yeshic Mine No. 2 (P-3940) and the Jesse Creek Mining, LLC Gholson Mine (P-3663). The baseline of the general area comes from the data in P-3901. This site is shown in Figure 2.

The CIA for groundwater for this permit is limited to the permit area. The CIA has been selected based upon the Commission's assessment of the possible hydrologic impacts, which may occur as a result of mining operations. The subsurface hydrologic components considered in this assessment include all significant water-bearing units in, and within the vicinity of, the permit and adjacent areas. Other areas of proposed, future mining are not known at this time; however, no cumulative impacts to groundwater are expected due to the limited areal extent of the aquifer system as well as underground works that exist within and adjacent to the P-3985 area.

A. Geologic/Hydrogeologic Information

i. Geology

The P-3985 permit area is located in the Cahaba Coal Field of the Valley and Ridge Province. In this region of Alabama, the uppermost bedrock is Pennsylvanian in age and consists predominantly of alternating layers of gray sandstone, conglomerate, siltstone and shale with beds of coal and underclay of the Pottsville Formation (Hydrologic Assessment, Eastern Coal Province Area 23, Alabama).

Generally alternating sequences of gray sandstone, conglomerate, siltstone, shale and underclay separate the coalfields of the Cahaba Coal Field. This mine site will remove the Gholson and Clark coal seams. According to "The Geological Survey Bulletin 1182-B, Geology and Coal Resources of the Coal-Bearing Rocks in Alabama", in the Cahaba Coal Field, the boundary between Early and Middle Pennsylvanian is provisionally placed at the Yeshic coal bed, which is located above the Gholson and Clark seams.

This permit area is located in the Dry Creek Basin, which is bounded on the east by the Helena thrust fault, to the south by the Piney Woods anticline, and to the north by the Cahaba River.

ii. Potentially Acid- and Toxic-Forming Materials

Samples of drill cuttings from 1 overburden hole specific for this permit were collected by personnel of Jesse Creek Mining every 5 ft. or change in lithology to at least 5 feet

below the Clark coal seam for analysis of potentially acid- and toxic- forming properties. Additionally four additional spoil samples from the previous mining were collected. For these samples, overburden analyses were conducted including paste pH, total sulfur, maximum potential acidity and neutralization potential in order to obtain the acid-base account of the overburden. Potentially acid- and toxic- forming materials are those that exhibit a pH of less than 4.0 s.u. or a deficiency in calcium carbonate equivalent of at least 0.0 tons per 1,000 tons of material (T/KT).

iii. Surface Water

All water moves through the hydrologic cycle. In Alabama, precipitation averages 55 inches per year which either soaks into the ground or runs along the surface as runoff to streams and lakes (on average of 22 inches per year) and plants absorb some of the water which returns to the atmosphere as transpiration (on average of 33 inches/year). Seventeen major streams flow through Alabama and approximately 15 percent of all surface water flowing through the lower 48 states flows through Alabama (www.gsa.alabama.gov/gsa/water/water-information).

This permit area is located in the Cahaba River Basin. It is drained by Piney Woods Creek to the north and Murry Creek to the south. Murry Creek drains into Piney Woods Creek which empties into the Cahaba River west of the permit site. There are four surface water monitoring sites for this permit. Surface water monitoring station SW-2 is located downstream of the permit area on Piney Woods Creek and drains approximately 3,247 acres (5.07 square miles). Surface water monitoring station SW-3 is located downstream on Murry Creek and drains approximately 5,388 acres (8.4 square miles). The data collected from SW-3 was used for water quality projections. Surface water monitoring station SW-14 is located upstream on Piney Woods Creek and drains approximately 2,067 acres (3.23 square miles). Surface water monitoring site SW-5 is located upstream on Murry Creek and drains approximately 4,377 acres (6.84 square miles). The Alabama Department of Environmental Management (ADEM) has classified Murry Creek and Piney Woods Creek as "Fish and Wildlife."

According to the ADEM Admin. Code r. 335-6-11-.02, "use classifications apply water quality criteria adopted for particular uses based on existing utilizations, uses reasonably expected in the future, and those uses not now possible because of correctable pollution but which could be made if the effects of pollution were controlled or eliminated. Of necessity, the assignment of use classifications must take into consideration the physical capability of waters to meet certain uses." Those segments which are not included by name will be considered to be acceptable for a "Fish and Wildlife" classification unless it can be demonstrated that such a generalizations is inappropriate in specific instances."

The Environmental Protection Agency has approved Total Maximum Daily Loads (TMDLs) for a stretch of the Cahaba River at that includes the location were Piney Woods Creek empties into it for pathogens (E. coli), siltation and habitat alteration and nutrients. The ADEM issued National Pollutant Discharge Elimination System permit

AL0069108 on March 31, 2015 with an effective date of April 1, 2015. The draft NPDES permit contains a permit rationale dated December 12, 2014 that indicates permit limitations take into account the results of the TMDL for siltation in the Cahaba River Watershed. The ADEM draft NPDES permit rationale also states that monitoring for nutrient related parameters are imposed on all outfalls during the months of April through October due to the nutrient TMDL for the Cahaba River watershed. The ADEM draft NPDES permit rational also states "If the requirements of the proposed permit and pollution abatement plan are fully implemented, there is reasonable assurance that the facility will not discharge pollutants at levels that will cause or contribute to a violation of the approved TMDLs set forth by the Alabama Department of Environmental Management."

To characterize the existing quality and quantity of water within the area, baseline data were obtained and submitted in the permit application. These include two sites on Piney Woods Creek (upstream and downstream), and two sites on Murry Creek (upstream and downstream). At least six months of consecutive data was submitted, including two suites of metals analysis at each site. Table 2, included at the end of this assessment, presents the baseline data. Tables 3 and 3a present the metals baseline data.

During mining, six proposed sediment control structures with five point source discharges will be used under ADEM NPDES permit number AL0069108. One of the basins is an upstream structure of another basin, therefore not a point source. The purpose of sediment basins is to allow sediment to settle and not discharge into receiving streams. All sediment basins are proposed as temporary structures.

iv. Ground Water

Alabama has 20 major aquifers that supply water from the surface to depths of up to 3000 feet. While on average Alabama receives approximately 55 inches of rainfall per year, only 6-7 inches on average move underground to become ground water recharge. There is approximately 586 trillion gallons of water (both surface and ground), with 553 trillion gallons of that water stored in underground aquifers. Many large cities and smaller towns utilize groundwater for water needs, especially in south Alabama. While fresh water in some areas of Alabama extends to the depths of 3000 feet or more, in a few areas fresh water extends only to 150 feet below the surface. (www.gsa.alabama.gov/gsa/water/water-information).

According to the "Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama, Area 4" by the U.S. Geological Survey, Water-Resources Investigations Report 88-4133, large water supplies are generally not available from the Pottsville Formation and there are no municipal wells in Pottsville Formation within the study area. The Pottsville Formation is defined by the "Regional Analysis of the Black Creek-Cobb Coalbed Methane Target Interval, Black Warrior Alabama, USGS Bulletin 145" as a low yielding, fractured aquifer with water occurring in coal seams, along bedding planes, joints, fractures and some sandstone.

Domestic Wells

A well inventory of the permit area concluded there are no groundwater users within one-half mile of the permit area.

Company Installed Wells

No groundwater baseline monitoring was conducted for this permit application. The first reason being there are no groundwater users within the vicinity. Additionally, the dip of the coal seam is between 15 and 20 degrees south and south west. Drilling indicates claystone below the Gholson and Clark seams, which would act as a confining unit for an aquifer. As such, with increasing depth of a confining unit, water availability would increase in depth if there were a connected aquifer system. Published information shows the aquifer system in this area as fractured and not connected.

B. Coal Processing Waste

Coal processing waste (gob and slurry) will not be generated or disposed of at the site.

C. Material Damages

With respect to the CHIA, material damage to the hydrologic balance means the changes to the hydrologic balance caused by surface mining and reclamation operations to the extent that these changes would significantly affect present and potential uses as designated by the regulatory authority. This includes the hydrologic impact that results from the cumulation of flows from all coal mining sites in a cumulative impact area. Examples of material damage are: permanent destruction of a major regional aquifer; temporary contamination of an aquifer in use that cannot be mitigated; and solute contributions to streams above receiving stream standards.

A CHIA is based on the best currently available data and is a prediction of mining-related impacts to the hydrologic balance. Permittees (and permit applicants) are required to monitor water quality and quantity. Exceeding material damage thresholds might also cause significant reduction of the capability of an area to support aquatic life, livestock and wildlife communities.

III. FINDINGS

Based on the information presented above, the following findings have been made relative to the permit area.

A. Potentially Acid- and Toxic-Forming Materials

Laboratory analyses of the bedrock overlying the Clark Coal seam show a positive acid-base account. As stated earlier potentially acid- and toxic-forming materials are those that

exhibit a pH of less than 4.0 s. u. or a deficiency in calcium carbonate equivalent of at least 0.0 tons per 1,000 tons of material (T/KT). In the analysis submitted by the permittee the net neutralization potential at the Murry Creek Mine contains an excess of 8.25 (tons $CaCO_3$/1000 tons overburden) based on the overburden analysis from drill hole JC14-02 as well as four spoil samples utilized.

Adverse effects to the hydrologic balance of the area are not anticipated as shown by the acid-base account of the overburden materials. In addition, the overburden at this site has low sulfur, which is a major constituent in the acid-forming process.

B. Surface Water

Based on laboratory analysis of the samples collected at surface water sites SW-2, SW-3, SW-5 and SW-14, the surface water is alkaline. The samples also contain low TSS, iron, manganese and sulfates. Metals analysis was included in the permit application for these surface water sites. All metals were BML (Below Measurable Limits) with the exception of arsenic, cadmium, lead, nickel and selenium upstream on Piney Woods Creek; arsenic and lead downstream on Piney Woods Creek; arsenic and lead both upstream and downstream on Murry Creek (in the same concentrations). This information is presented in Tables 3 and 3a at the end of this assessment.

A critical evaluation point was chosen to evaluate the new concentration of solutes that are not likely to precipitate. Baseline or background concentrations of these solutes are needed for the general area, as well as an estimate of solute concentrations for the proposed area (given in the PHC). This evaluation point will be the Twin Pines, LLC site 4113006 (SW-6) for the Segco Mine, P-3901. This monitoring site was added after mining began at the Segco Mine. The analysis shows the contribution of solutes from the P-3985 permit will have negligible effect on the downstream surface water site. The surface water sites used for surface water predictions, SW-3 downstream on Murry Creek, also receives water from the P-3663 and P-3940. A worksheet showing the results of the critical point evaluation is shown in Table 4 at the end of this assessment.

Changes in the quantity and quality of the waters in the streams draining the site are expected to be minimal due to the proposed mining activities. During mining, runoff from the disturbed areas will be diverted into sediment basins that have been designed to retain the runoff to allow sediment to settle out prior to discharging. Effluent from the sediment basins will be monitored by the permittee in accordance with their NPDES permit requirements issued by the ADEM. The effluent will be chemically treated, if necessary, in accordance with the NPDES permit. The basins will be monitored through final bond release in order to characterize and document any effects mining may have on the surface-water hydrologic balance. The basins are all proposed as temporary water impoundments.

Post-Mining water quality and quantity estimates provided by the applicant are based on several factors:

- Baseline surface water quality

- Estimated impact during mining
- Size of the permit area compared to the size of the watershed
- Amount of previous mining within the watershed

According to the permit application, this mine site is expected to have a negligible increase in base flow, average flows, and peak flow rates relative to the baseline conditions. The NPDES maximum and average limitations set forth by ADEM for this mine site can be seen on their NPDES permit. The NPDES permit can be viewed at the ADEM website under the eFile system using permit number AL0069108.

Sediment basins, vegetation of the disturbed areas and erosion control practices should serve to lessen impacts to the streams and surface water bodies. Should any increase in mineralization occur in the surface waters as a result of the mining operations, it is anticipated the levels will diminish and return to pre-mining concentrations once mining and reclamation activities are complete. Table 5 shows the post-mining water quality projections.

C. Ground Water

The proposed operations are not expected to have a permanent adverse impact on the overall quality of the ground water at the site or surroundings. The main aquifer in this area is a Pottsville sandstone unit located below the Clark Coal seam. The extensive underground mining in the area has most likely affected shallow groundwater movement. According to the permit application, regional groundwater movement is in the southeast direction. Due to the lack of any users and an approval of a groundwater waiver, a cumulative impact area for groundwater was not outlined; however, as stated earlier it is defined as the permit area.

Should any increase in mineralization occur in the ground water as a result of the proposed activities, it is anticipated the levels will diminish and return to pre-mining concentrations once mining and reclamation activities are complete.

D. Historical and Active Coal Mines

The presence of the active permits within and adjacent to the Murry Creek Mine are not expected to have impacts to the hydrologic balance in this area. The baseline water quality analysis shows little impact to receiving streams in this area with mining having already occurred, and ongoing. Additional water quality parameters will be monitored during active and post mining.

IV. CONCLUSION

The assessment of probable cumulative impacts of the Jesse Creek Mining, Inc. Murry Creek Mine (P-3985) finds the proposed operations have been designed to prevent material damage to the hydrologic balance outside the permit area.

V. TABLES AND FIGURES

Table 1
Mining Operations in the Cumulative Impact Area
P-3985

Permit No.	Permittee	Permit Name	Date Issued	Acres*	Description	Coal Seam(s)
P-3978	Jesse Creek Mining, LLC	Gurnee Mine	5/6/2014	280	Surface Mine, Active coal removal	Gholson Bed Clark Bed
P-3940	Yeshic, LLC	Yeshic Mine No. 2	5/28/2010	276	Surface Mine, Reclamation activities	Yeshic Bed
P-3914	Yeshic, LLC	Yeshic Mine	6/26/2009	110	Surface Mine, Reclamation activities	Yeshic Bed
P-3901	Twin Pines II, LLC	Segco Mine No. 1	2/7/2008	923	Surface Mine, Reclamation activities	Helena Bed Thompson Beds
P-3663	Jesse Creek Mining, LLC	Gholson Mine	5/24/1991	744	Underground Mine, Reclamation activities	Gholson Bed Coke Bed Thompson Beds Jones Bed
P-3273	Timcoaland, Inc.	Montevallo Mine	3/30/1983	226	Surface Mine, Reclaimed	Montevallo Bed

*Acres at Issuance

Table 2
Ranges/Averages of Surface-Water Quality/Quantity Stream Points
P-3985

Parameter	SW-2 DS Piney Woods Creek	SW-14 US Piney Woods Creek	SW-3 DS Murry Creek	SW-5 US Murry Creek
Discharge Rate (cfs)	0.45 – 17.53 (2.21)	0.88 – 4.08 (2.32)	2.38 – 61.20 (15.6)	0 – 47.83 (11.0)
Field pH (S. U.)	6.32 – 8.02	7.08 – 7.97	6.94 – 8.08	6.87 – 7.72
Total Suspended Solids (mg/L)	1 - 9 (4.5)	3 - 20 (10.7)	1 - 4 (2.0)	2 – 6 (2.8)
Total Iron (mg/L)	0.13 – 0.44 (0.33)	0.1 – 0.66 (0.40)	0.11 – 0.23 (0.16)	0.12 – 0.38 (0.23)
Total Manganese (mg/L)	0.04 – 0.34 (0.19)	*BML - 0.62 (0.3)	*BML – 0.14 (0.04)	0.01 – 0.24 (0.09)
Specific Conductivity 25 ^{0}C (μmhos/cm)	141.3 - 429 (285.7)	236 - 702 (469.5)	246 - 760 (555.5)	202 – 753 (501)
Acidity (mg/L)	5 - 47 (15.3)	6 - 22 (12.2)	0 - 18 (6.2)	NA
Alkalinity (mg/L)	20 - 59 (36.5)	21 - 80 (48.3)	32 - 162 (90.0)	NA
Sulfates (mg/L)	40 – 151 (90.7)	91 - 378 (200.8)	63 - 225 (150)	NA

Average values are shown in parentheses.
Averaged via all data, not seasonally.
DS = Downstream
US = Upstream
BML = Below Measurable Limits
*For manganese average, BML was represented as 0.01 mg/l
NA – Not Analyzed (quarterly performance monitoring data)

Table 3
Additional Surface Water Baseline Data - High Flow Metals Data
P-3985

Parameter	SW-2 DS Piney Woods Creek	SW-14 US Piney Woods Creek	SW-3 DS Murry Creek	SW-5 US Murry Creek
Antimony (µg/L)	BML	BML	BML	BML
Arsenic (µg/L)	0.36	0.43	0.91	0.91
Beryllium (µg/L)	BML	BML	BML	BML
Cadmium (µg/L)	BML	0.10	BML	BML
Chromium (µg/L)	BML	BML	BML	BML
Copper (µg/L)	BML	1.28	BML	BML
Lead (µg/L)	0.57	2.16	1.12	1.12
Nickel (µg/L)	BML	8.45	BML	BML
Selenium (µg/L)	BML	2.28	BML	BML
Silver (µg/L)	BML	BML	BML	BML
Thallium (µg/L)	BML	BML	BML	BML
Zinc (µg/L)	BML	BML	BML	BML

BML = Below Measurable Limits
DS = Downstream
US = Upstream

Table 3a.
Additional Surface Water Baseline Data - Low Flow Metals Data
P-3985

Parameter	SW-2 DS Piney Woods Creek	SW-14 US Piney Woods Creek	SW-3 DS Murry Creek	SW-5 US Murry Creek
Antimony (µg/L)	BML	BML	BML	BML
Arsenic (µg/L)	0.55	0.3	0.72	0.72
Beryllium (µg/L)	BML	BML	BML	BML
Cadmium (µg/L)	BML	BML	BML	BML
Chromium (µg/L)	BML	BML	BML	BML
Copper (µg/L)	BML	BML	BML	0.92
Lead (µg/L)	BML	BML	BML	0.55
Nickel (µg/L)	BML	BML	BML	BML
Selenium (µg/L)	BML	3.09	BML	BML
Silver (µg/L)	BML	BML	BML	BML
Thallium (µg/L)	BML	BML	BML	BML
Zinc (µg/L)	BML	BML	BML	BML

BML = Below Measurable Limits
DS = Downstream
US = Upstream

Table 4
Jesse Creek Mining, LLC P-3985
Critical Point Evaluation 4113006 (SW-6)

$$C_{nc} = \frac{Q_a C_a + Q_c[(A_c - A_a)/A_c]C_g}{Q_a + Q_c[(A_c - A_a)/A_c]}$$

C_{nc} = new concentration at the critical point

C_g = concentration from the general area

C_a = concentration from the anticipated mine area

A_c = drainage area above the critical point

A_a = anticipated mine area in the drainage basin

Q_c = average flow at the critical point

				Units
Standards:		A_c	14.13	sq mi
		A_a	0.228	sq mi
		Q_a	13.2	cfs
		Q_c	8.15	cfs

Variables:		C_g	C_a	**Units**
TSS		7.68	3.0	mg/L
Fe		0.85	0.33	mg/L

Results:	C_{nc}
TSS	4.77 mg/L
Fe	0.81 mg/L

A_c Data from P-3901 PHC

A_a Data from P-3985 PHC

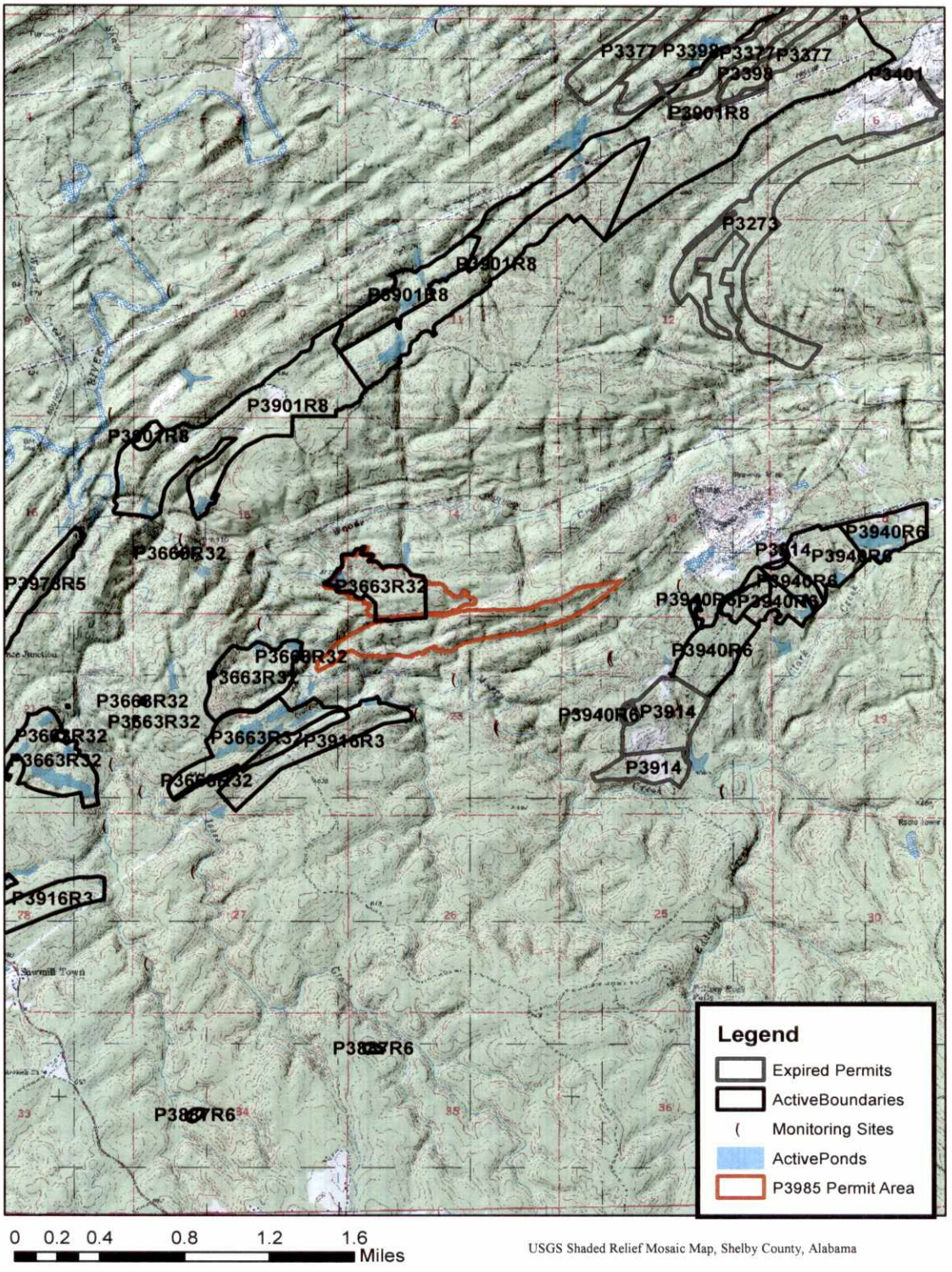
Q_a Data taken P-3985 PHC

Q_c Data taken P-3901 Performance Monitoring

Table 5
Estimate of Post-Mining, Average Event Surface-Water Quality at SW-3
P-3985

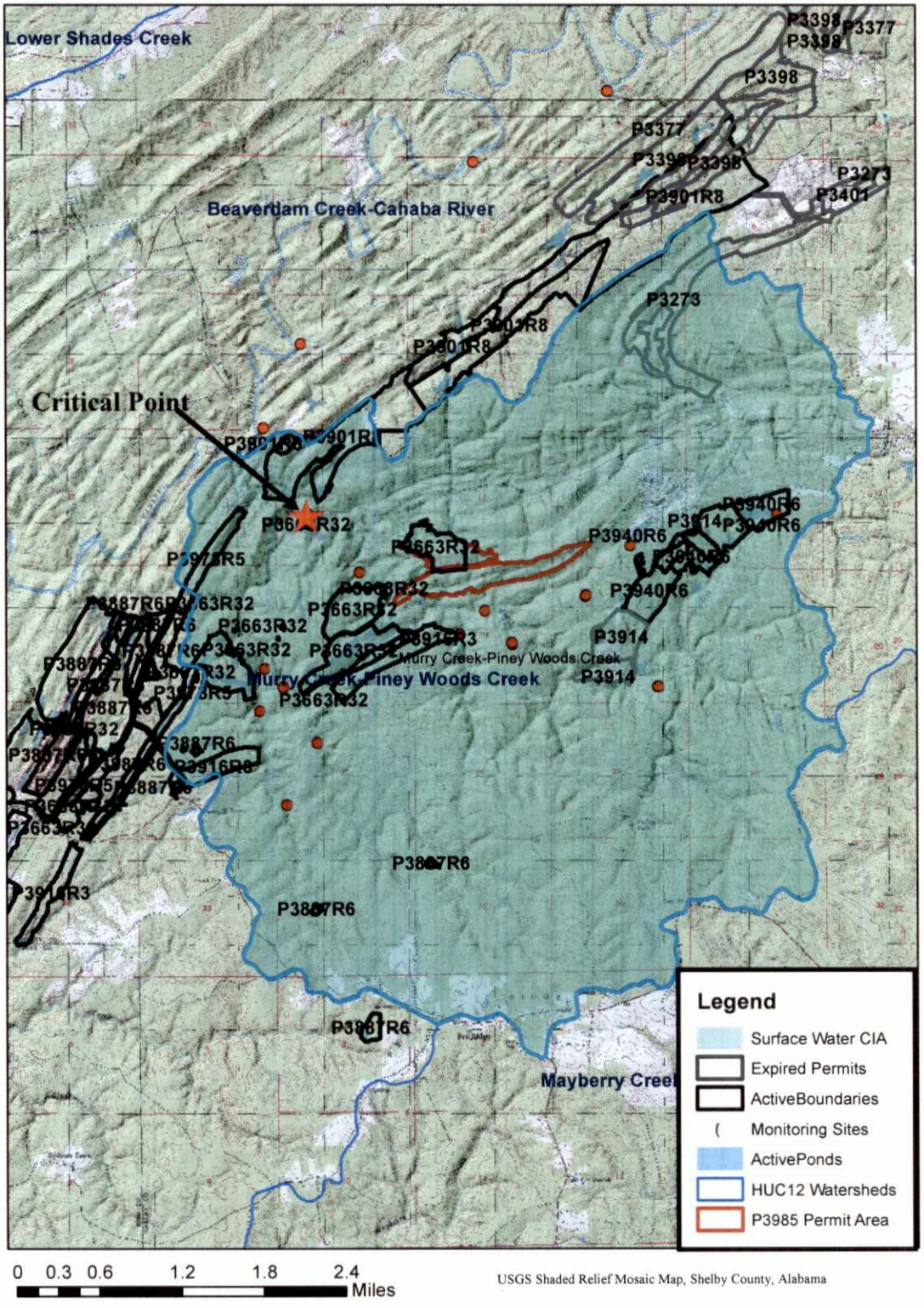
Parameter	Estimated Value
Flow (cfsm)	1.56
pH (s.u.)	7.43
Iron (mg/L)	0.33
Manganese (mg/L)	0.14
Specific Conductivity 25 ^{0}C (μmhos/cm)	480
TSS (mg/L)	3

Figure 1
P-3985 Permit Area



USGS Shaded Relief Mosaic Map, Shelby County, Alabama

Figure 2
P-3985 Cumulative Impact Area



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