



STATE OF ALABAMA SURFACE MINING COMMISSION

Page 1 of 25

Permit Number:P- 3960

License Number:L- 775

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:

Cedar Lake Mining Inc.
P.O. Box 1608
Jasper, AL 3550

Such operations are restricted to 660 acres as defined on the permit map and located in:

SEE ATTACHMENT

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.

P-3960
LEGAL DESCRIPTION
FOR
BULL GAP MINE

NE/SW, SE/SW, SW/SW, NE/SE, NW/SE, SE/SE, SW/SE - SECTION 8, T12S, R3E; NW/SW, SW/SW, SE/SW - SECTION 9, T12S, R3E; NW/NW - SECTION 16, T12S, R3E; NE/NE, NW/NE, SE/NE, SW/NE, NE/NW, NW/NW, SW/NW, SE/NW, NE/SW, NW/SW, SW/SW, SE/SW, NW/SE - SECTION 17, T13S, R3E; NE/NE, SW/NE, SE/NE, NE/SW, SW/SW, SE/SW, NE/SE, NW/SE, SW/SE, SE/SE - SECTION 18, T12S, R3E; NE/NE, NW/NE, NE/NW, NW/NW, SW/NW - SECTION 19, T12S, R3E; NW/NE, NE/NW - SECTION 20, T12S, R3E; NE/NE, SW/NE, SE/NE, NE/SW, NW/SW, NW/SE - SECTION 24, T12S, R2E; BLOUNT COUNTY, ALABAMA

CONDITIONS TO BE PLACED ON PERMIT P-3960-08-23-S PAGE #1

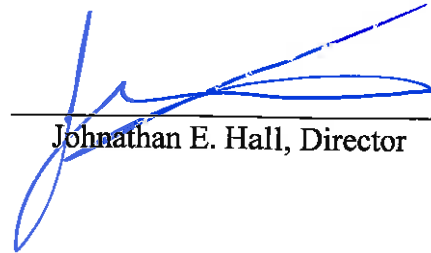
3. Surface coal mining operations are restricted to those areas for which sufficient bond has been posted with ASMC. On the date of issuance of this permit, bond was posted only for increment 5 consisting of 15 acres as defined on the permit map.
4. No mining disturbance is to occur on any part of the 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. Surface coal mining operations shall not commence within the watershed of Basin 011 until NPDES Permit AL0080781 is approved for renewal which adds Outfall 011 for ASMC Basin 011 as shown on the Permit Map is submitted to and accepted by the ASMC.
11. The permittee shall only conduct tree removal activities from October 15 – March 31.

12. No coal removal shall be conducted until the acquired mineral leases are accepted by the ASMC.

DATE ISSUED: October 31, 2018

EFFECTIVE DATE: October 31, 2018

EXPIRATION DATE: October 30, 2023



Johnathan E. Hall, Director

FINDINGS TO BE PLACED ON PERMIT NO.: P-3960-08-23-S PAGE #1

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.

FINDINGS TO BE PLACED ON PERMIT NO.: P-3960-08-23-S PAGE #2

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-10C-.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-10C-.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.

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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 (NRHP). In a letter dated March 25, 2010 the University of Alabama, Office of Archaeological Research (OAR), project number 10-137, conducted a Phase I Cultural Resource Survey in Blount County, Alabama, for approximately 885 acres from March 1-5, 2010. As a result of the Phase I survey no historic archaeological sites were identified. Based on the absence of any significant cultural materials or historic standing structures within the vicinity, OAR recommends a finding of no properties. By a letter dated June 29, 2010 the State Historical Preservation Office (SHPO) Re: AHC 10-1052, based on the cultural resource assessments conducted by the OAR, determined that the project activities will have no adverse effect on cultural resources eligible for or listed on the NRHP and therefore concur with the proposed 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. Dan Spaulding Environmental Consultant (Spaulding) conducted a Threatened and Endangered Species/Critical Habitat survey for approximately 660 acres in Blount County on November 25-26, 2017. There was no habitat for any listed Threatened and Endangered Species with the exception of possible summer roosting habitat for the Indiana bat and the Northern Long-eared bat. Spaulding recommends tree removal activity be limited to October 15- March 31 to avoid adverse effects to the possible summer roosting habitat for the Indiana and Northern Long-eared Bats. By a letter dated October 5, 2016 the Alabama Department of Conservation and Natural Resources (ADCNR) recommended a biological survey be conducted by trained professionals to ensure that no sensitive species are jeopardized by the development activities. The closest sensitive species is recorded as occurring approximately 5.2 miles from the subject site. By comments dated July 16, 2018 the U.S. Fish and Wildlife Service (FWS) stated that the project site contains suitable spring/summer roosting habitat for the endangered Indiana bat and/or threatened Northern Long-eared bat. Since tree removal will only occur between October 15 and March 31 FWS concurs that the proposed project is not likely to adversely affect the Indiana bat and Northern Long-eared bat. No other federally listed species/critical habitat are known to occur in the project area. The U.S. Army Corps of Engineers by letter dated August 9, 2018, issued a Nationwide Permit (NWP) 49, Project Number SAM-2010-01439-CHE, for the 660 acres located near Altoona, Blount County, Alabama. The project will involve placement of fill material in 7, 201 linear feet (lf) (0.46 acre) of ephemeral, intermittent and perennial streams. The permittee must show a net increase in aquatic resource


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functions, reclamation to waters of the U.S. on the project site shall be conducted in accordance with the Reclamation Plan included in the revised Pre-Construction Notification (PCN) dated July 31, 2018. 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.

19. 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.

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

DATE:


Mark A. Woodley
Permit Manger

/mw

cc: I & E, Permit File

Cedar Lake Mining, Inc.
Bull Gap Mine
ASMC P-3960

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CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

**Permit Number P-3960
Cedar Lake Mining, Inc.
Bull Gap Mine**

**HUC 031601110102
HUC 031601110205
NPDES AL0080781**

As required under Federal Public Law 95-87, Section 510(b)(3), the Alabama Surface Mining Commission (ASMC) must find in writing the following proposed 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 stated requirements.

I. GENERAL INFORMATION

The Cedar Lake Mining, Inc. (ASMC P-3960) Bull Gap Mine is for a surface coal mining operation encompassing 660 acres in Blount County, Alabama. The proposed mine site is located in parts of Sections 8, 9, 16, 17, 18 and 19, Township 12 South, Range 3 East as viewed from the Hyatt Gap, Altoona and Oneonta Alabama USGS 7.5 minute Quadrangle maps. The site is bounded on the northwest by Hale Creek and encompasses Raccoon Mountain. See Figure 1 for the location of this permit.

Geology of the Plateau Coal Field

The Pottsville Formation of Early and Middle Pennsylvanian age in Alabama is divided into four fields: the Warrior, Cahaba, Coosa and Plateau fields. All fields were once connected by an unbroken area of coal measures, however separation occurred as a result of folding, faulting and erosion of uplifted areas.

The Cumberland Plateau section is the southernmost section of the Appalachian Plateau's province of the Appalachian Highland Region. It borders the Highland Rim section to the north, the Valley and Ridge province to the southeast, and the Coastal Plane section to the southwest. The Cumberland Plateau consists of flat-topped high-elevation plateaus separated by deep, steep-sided valleys.

According to 'Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama: Area 2 Water Resources Investigations Report 88-4177' "the most prominent structural features are northeastward trending folds that are associated with physiographic features such as Murphrees, Sequatchie, and Wills Valleys, and Bount, Lookout, and Sand Mountains. The general nature of the structures can be described as a series of broad synclinal mountains separated by

narrow symmetrical to asymmetrical anticlinal valleys. Thrust faults and additional minor folding are usually associated with the folds, and geologic structures may be complex on a local scale.”

During the beginning of the Pennsylvanian age (approximately 320 million years ago), most of Alabama was still part of a shallow, warm ocean basin. The transgressions and regressions of the seas lead to the rhythmic cycle of sandstone, underclay, coal beds, and shale with zones of marine and brackish water fossils that rest on the basal resistant conglomerate orthoquartzite of the Boyles sandstone formation. This sequence immediately repeats itself with similar rocks (marine shale, sandstone or clay, coal seam, freshwater shale and sandstone). This appears to show the rise of sea level, depositing marine sediments, then the falling of sea level allowing the coal producing forests to grow. This was followed by an influx of river deposited sands and muds, which would rapidly accumulate plant material. Then, the sea would rise again repeating the process.

At the end of the Pennsylvanian, the uplift of the region left the coal bearing ecosystem behind. During this period of uplift, no new sediments could be deposited for at least 200 million years. The gap in time between the Pennsylvanian deposition and the Cretaceous deposition resulted in an unconformity that allows for surface coal mining to exist in the Alabama coal fields.

The Locust Fork of the Warrior River flows to the southwest along the length of Sand Mountain. Murphrees Valley is southeast of Sand Mountain and extends from northeast to southwest across Blount County. According to the Geological Survey of Alabama Special Report 16: Ground Waters of Northern Alabama, 1933 “in general Murphrees Valley is higher than Sand Mountain, and the structurally controlled minor streams that occupy it are tributary to Locust Fork of the Black Warrior River, on the west.”

II. CUMULATIVE IMPACT AREA

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

The CIA for surface water and groundwater for Permit P-3960 has not been defined. There are no other active or proposed mining in the area to interact with the currently proposed operations.

Active and Proposed Mines

At the time of this assessment, no other proposed mines are known within the vicinity.

A. Geologic/Hydrogeologic Information

i. Geology

The proposed P-3960 permit area is located in the Cumberland Plateau physiographic province. In the area of the proposed Bull Gap Mine the structure is complex with folded and faulted strata lending to northeast-southwest trending anticlines and synclines. The anticlines have eroded to the topographic lows of the Sequatchie Valley and Murphrees

Valley. The synclines form Sand Mountain and Blount Mountain and are capped by erosion resistant sandstones of the Pottsville Formation (Hydrology of Area 22, Eastern Coal Province, Alabama Water-Resources Investigations Open-File Report 81-135).

Within the proposed permit area none of the three coal seams to be mined (Upper Bynum, Lower Bynum and the Underwood seams) outcrop due to past surface coal mining operations. Raccoon Mountain has been encircled by contour surface coal mining and in some areas the Upper Bynum has been removed. The area also has extensive abandoned underground mining on the Underwood seam.

ii. Potentially Acid- and Toxic-Forming Materials

Samples of drill cuttings from 4 overburden holes specific for this permit were collected by personnel of MS&R or Task Engineering every 5 feet or change in lithology to at least 5 feet below the Underwood coal seam for analysis of potentially acid- and toxic- forming properties. For these samples, overburden analyses was 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 standard units (s.u.) or a deficiency in calcium carbonate (CaCO₃) 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 the area of the proposed Bull Gap Mine, precipitation averages 56 inches per year which either soaks into the ground or runs along the surface as runoff to streams and lakes and plants absorb some of the water which returns to the atmosphere as transpiration. 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).

The permit area is located in the Locust Fork Basin and is drained by Hale Creek, Bunch Creek and unnamed tributaries of the Locust Fork immediately east of Bunch Creek. "The site is bounded on the northwest by the 100' setback from Hale Creek and consists of steep contours with unnamed tributaries from Straight Mountain on the northwest and from drainage from old un-reclaimed surface coal mine spoils and abandoned underground mine discharge on the east" (Cedar Lake Mining, Inc. Bull Gap Mine P-3990 Surface Water Hydrology 880-X-8E.06(1)). It is located in the Samuels Chapel Creek and Upper Calvert Prong HUC 12 watersheds (031601110102 and 31601110205). Eleven sediment basins are proposed for this permit. There are four surface water monitoring sites for this permit. Surface water monitoring station SW-1 is located downstream of the permit area on Hale Creek with a corresponding upstream surface water monitoring station, SW-2. Surface water monitoring station SW-5 is located downstream of the permit on Bunch Creek with a corresponding upstream surface water monitoring station, SW-4.

The data collected from surface water monitoring site SW-5 was used for water quality projections. See Figure No. 2 for the location of the surface water monitoring stations.

The Alabama Department of Environmental Management (ADEM) has classified the Hale Creek and Bunch Creek as “Fish and Wildlife.” According to ADEM Admin. Code r. 335-6-11-.01(2), “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.”

ADEM Admin. Code r. 335-6-11-.01(5) states “...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 unnamed tributary to Bunch Creek has a designated use classification of Fish and Wildlife. There are no Total Maximum Daily Load (TMDL) limits on Hale Creek or Bunch Creek.

To characterize the existing quality and quantity of water within the area, baseline data were obtained and submitted in the permit applications. These include the two sites on Hale Creek and the two sites on Bunch Creek. Sampling was performed on several occasions due to the time the permit had been at the ASMC for review. Monthly samples were taken from 03/18/2009 through 06/19/2011 at surface water monitoring sites SW-1, SW-2 and SW-4. Monthly samples were taken from 03/18/2009 through 06/17/2011 at surface water monitoring site SW-5. Additional water quality data was taken monthly at each surface water monitoring site from 09/20/2015 to 03/06/2016. Updated information also included two suites of metals analysis, one low flow and one high flow condition at each site. Table 1 at the end of this assessment shows the baseline data and Table 1a. shows the updated baseline data. Table 2 shows the metals data.

iv. Ground Water

“Groundwater in Area 22 is derived from precipitation. Part of the precipitation returns to the atmosphere through evaporation and transpiration, part flows into streams and lakes as runoff, and part seeps downward through the soils and rocks to the zone of saturation.” (Hydrology of Area 22, Eastern Coal Province, Alabama Water-Resources Investigations Open-File Report 81-135). Groundwater in the Locust Fork Basin occurs in fractures and along bedding planes in the Pottsville Formation. The direction of water movement is controlled locally by the orientation of the fractures or solution openings. The openings are generally small and yields range from 5 gal/min to 50 gal/min. The depth to groundwater on the hills and ridges is generally more than 50 feet (Water-Resources Investigations Open-File Report 81-135).

According to drill logs, very little groundwater was encountered in the strata above the coal seam, and no stratigraphic zones consistently produced water. Groundwater movement near the Bull Gap Mine is to the south/southwest, in the direction of dip.

Domestic Wells

A well inventory shows there are three residences located within a ½ mile radius of the permit area. These three residences are on the south/southwest side of Straight Mountain. There are no county or city water services in the area, therefore all three residences rely on ground-water wells as their primary water supply.

Company Installed Wells

Groundwater sampling was performed on several occasions for this permit due to the time it had been at the ASMC for review. Baseline data from groundwater monitoring wells OB-01/MW-1, OB-02/MW-02, OB-03/MW-03 and OB-04/MW-04 was collected monthly from 03/18/2009 through 06/19/2011 and updated monthly from 09/20/2015 through 03/06/2016. Table 3 at the end of this assessment shows the baseline data and Table 3a shows the updated baseline data. Figure 2 shows the locations of the groundwater monitoring wells.

Groundwater monitoring well OB-01/MW-01 is located in Increment No. 1 at the southern end of the permit area. It is drilled to a depth of 110.0 feet below the Underwood seam. Groundwater monitoring well OB-02/MW-02 is located in Increment No. 2 on the upper limb of the Raccoon Mountain syncline and drilled to a depth of 85.0 feet below the Underwood seam. Groundwater monitoring well OB-03/MW-03 is located in Increment No. 3, in the middle of the permit area. It is drilled to a depth of 122.0 feet to below the Lower Bynum seam (the Underwood seam was extensively underground mined so it is not minable in this Increment). Groundwater monitoring well OB-04/MW-04 is located in Increment No. 4 in the northern portion of the permit area. It is drilled to a depth of 180.0 feet to below the Underwood seam.

There are no known wellhead protection zones or public water supply wells in or within 1,000 feet of the proposed permit area.

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 cumulative hydrologic impact assessment (CHIA), material damage to the hydrologic balance means quantifiable changes to the hydrologic balance caused by surface mining and reclamation operations to the extent that these changes would significantly affect present or potential uses as designated by the regulatory authority and that cannot be mitigated by reclamation or provision of alternate water supplies. 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 proposed permit area.

A. Potentially Acid- and Toxic-Forming Materials

Laboratory analyses of the bedrock overlying, and immediately below the Underwood coal seam reveals favorable overburden with an average of +788 tons/acre excess CaCO_3 and an acid base account of +6.64 (tons CaCO_3 /1000 tons overburden). Because of the excess neutralization potential, adverse effects to the hydrologic balance of the area are not anticipated if the overburden is mixed thoroughly prior to reclamation.

The materials handling plan included in the permit application will require any potentially acid- and toxic-forming strata encountered (such as spoiled coal) to be covered with a minimum of four feet of non-toxic, non-combustible earthen material. Also, this material may not be placed within the root zone. The material will undergo relatively quick burial that will restrict the development of acid-forming conditions.

B. Surface Water

Laboratory analyses of the samples collected from the surface waters reveal low conductivity levels and sulfate values and neutral pH values. According to the Alabama Department of Environmental Management the receiving streams' use classification is 'Fish and Wildlife'. Current surface mining regulations include Best Management Practices and mining techniques that have greatly improved environmental protection since pre-law mining days.

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 basin will be monitored by the permittee in accordance with their National Pollutant Discharge Elimination System (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.

Post-Mining water quality and quantity estimates are based on several factors:

- Baseline surface water quality
- Estimated impact during mining
- Size of the permit area compared to the impacted 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 flow, and peak flow rates relative to the baseline conditions. The NPDES maximum and average limitations set forth by the 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 AL0080781.

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. Tables 4 and 4a. show the post-mining water quality projections at surface water monitoring site SW-5.

Once mining has begun, the applicant will continue to sample and monitor surface water monitoring sites. Surface water monitoring site SW-1 is located downstream on Hale Creek, with corresponding site SW-2 upstream on the Hale Creek. Surface water monitoring site SW-5 is located downstream on Bunch Creek with corresponding upstream surface water monitoring site SW-4. These surface water monitoring sites will be used to characterize and document any effects the mining may have on the surface-water hydrologic balance. Parameters and frequency of monitoring can be obtained from the approved Hydrologic Monitoring Plan.

C. Ground Water

Laboratory analyses of the samples collected from the groundwater monitoring wells reveal acidic pH, elevated iron and manganese as well as some elevated specific conductivity. While low pH and high iron levels are typical in the Pottsville Formation, prior disturbance from pre-law mining may be a factor in the elevated specific conductivity.

The proposed operation is not expected to have a permanent adverse impact on the overall quality of the ground water at the site or surroundings. The Pottsville Formation is the predominant aquifer in north Alabama, however large water supplies are generally not available from this formation. Groundwater may occur where the underlying stratum may prevent downward migration of water, forming perched water tables along the alternating sequences of clays, sandstone, shales and coal seams. With increased depth of lithology, permeability decreases, further hindering groundwater migration.

D. Historical and Active Coal Mines

There are no active coal mines within either of the HUC 12 watersheds for this CHIA. There are three historical mines within these watersheds. In the Upper Calvert Prong watershed was the New Acton Coal Mining Company, Inc. Friday's Crossing Mine (ASMC P-3571) and the Berry Mountain Mining Co., Inc. Hendrix Mine (ASMC P-3393). Both permits are closed. Within the Samuels Chapel Creek watershed was the Sunbelt Mining, Inc. Altoona Mine (ASMC P-3711) which is also closed.

IV. CONCLUSION

The assessment of probable cumulative impacts of the Cedar Lake Mining, Inc. Bull Gap Mine (P-3960) finds the proposed operations have been designed to prevent material damage to the hydrologic balance outside the proposed permit area.

V. TABLES AND FIGURES

Table 1	Ranges/Averages of Surface Water Quality/Quantity Stream Points
Table 1a.	Updated Ranges/Averages of Surface Water Quality/Quantity Stream Points
Table 2	Additional Surface Water Baseline Data – Low Flow Metals Data
Table 2a.	Additional Surface Water Baseline Data – High Flow Metals Data
Table 3	Ranges/Averages of Groundwater Quality
Table 3a.	Updated Ranges/Averages of Groundwater Quality
Table 4	Estimate of Post-Mining, Average Event Surface Water Quality at SW-5
Table 4a.	Updated Estimate of Post-Mining, Average Event Surface Water Quality at SW-5
Figure 1	P-3960 Permit Area
Figure 2	P-3960 Permit Area and Water Quality/Quantity Monitoring Stations

Table 1
Ranges/Averages of Surface-Water Quality/Quantity Stream Points
P-3960
March 18, 2009 – June 19, 2011

Parameter	SW-1 DS Hale Creek Drainage Area 2.48 Sq. Mi.	SW-2 US Hale Creek Drainage Area 0.200 Sq. Mi.	SW-4 US Bunch Creek Drainage Area 0.232 Sq. Mi.	SW-5 DS Bunch Creek Drainage Area 2.135 Sq. Mi.
Discharge Rate (cfs)	4.21 – 55.79 (20.96)	0.1 – 4.11 (1.95)	0.38 – 2.26 (1.22)	0.98 – 12.65 (6.92)
Field pH (S. U.)	7.06 – 7.42	5.86 – 7.35	6.21 – 7.42	5.35 – 7.25
Total Suspended Solids (mg/L)	2 - 14 (7.14)	2 - 16 (7.29)	2 - 29 (7.32)	1 - 15 (6.63)
Total Iron (mg/L)	0.12 – 0.26 (0.20)	0.19 – 0.65 (0.34)	0.11 – 0.45 (0.25)	0.09 – 0.37 (0.27)
Total Manganese (mg/L)	0.22 – 0.9 (0.39)	1.28 – 4.7 (1.82)	0.15 – 1.3 (0.37)	0.2 – 1.03 (0.51)
Specific Conductivity @ 25 °C (µmhos/cm)	250 - 605 (372)	45 - 614 (141)	121-692 (354)	100 – 305 (201)
Acidity (mg/L)	5 - 11 (6.96)	4 - 19 (11.68)	5 - 17 (10.68)	8 - 21 (13)
Alkalinity (mg/L)	15 - 41 (25.5)	15 - 47 (34.3)	21 - 41 (29.9)	19 - 45 (35.5)
Sulfate (mg/L)	70 - 221 (120)	19 - 186 (48.1)	57 - 223 (117)	26 - 123 (68.75)

Average values are shown in parentheses
Averaged via all data, not seasonally
DS = Downstream
US = Upstream

Table 1a.
Updated Ranges/Averages of Surface-Water Quality/Quantity Stream Points
P-3960
September 20, 2015 – March 6, 2016

Parameter	SW-1 DS Hale Creek Drainage Area 2.48 Sq. Mi.	SW-2 US Hale Creek Drainage Area 0.200 Sq. Mi.	SW-4 US Bunch Creek Drainage Area 0.232 Sq. Mi.	SW-5 DS Bunch Creek Drainage Area 2.135 Sq. Mi.
Discharge Rate (cfs)	0*	0.018 – 7.01 (3.05)	0.129 – 7.930 (3.41)	3.04 – 14.62 (9.51)
Field pH (S. U.)	6.94 – 7.31	6.83 – 7.19	6.42 – 6.92	6.09 – 6.95
Total Suspended Solids (mg/L)	6 - 13 (9.86)	6 - 12 (8.71)	10 - 67 (30.6)	6 - 24 (11.3)
Total Iron (mg/L)	0.11 – 0.29 (0.18)	0.14 – 0.91 (0.47)	0.26 – 0.85 (0.53)	0.11 – 0.46 (0.28)
Total Manganese (mg/L)	0.01 – 0.73 (0.41)	0.04 – 1.35 (0.79)	0.43 – 1.42 (0.80)	0.33 – 0.98 (0.52)
Specific Conductivity @ 25 °C (µmhos/cm)	124 - 493 (285.3)	141 - 389 (201.5)	449 - 795 (608)	160 - 402 (245.6)
Acidity (mg/L)	4 - 6 (5.29)	8 - 15 (10.28)	4 - 12 (7.86)	10 - 18 (13.1)
Alkalinity (mg/L)	14 - 24 (17.4)	20 - 37 (29.9)	15 - 32 (24.3)	22 - 30 (27)
Sulfate (mg/L)	22 - 145 (102)	34 - 142 (59.1)	143 - 238 (199)	74 - 209 (111)

Average values are shown in parentheses
Averaged via all data, not seasonally
DS = Downstream
US = Upstream

* No flow due to Robison Lake Impoundment

Table 2
Additional Surface Water Baseline Data - Low Flow Metals Data
P-3960
September 20, 2015

Parameter	SW-1 DS Hale Creek	SW-2 US Hale Creek	SW-4 US Bunch Creek	SW-5 DS Bunch Creek
Antimony (µg/L)	ND	ND	ND	ND
Arsenic (µg/L)	0.00172	ND	ND	ND
Beryllium (µg/L)	ND	ND	ND	ND
Cadmium (µg/L)	ND	ND	ND	ND
Chromium (µg/L)	ND	ND	ND	ND
Copper (µg/L)	NND	ND	ND	ND
Lead (µg/L)	ND	ND	ND	ND
Nickel (µg/L)	0.00668	ND	0.0486	0.00212
Selenium (µg/L)	ND	ND	ND	ND
Silver (µg/L)	ND	ND	ND	ND
Thallium (µg/L)	ND	ND	ND	ND
Zinc (µg/L)	ND	ND	0.0325	ND

US = Upstream
DS = Downstream
ND = Non Detect

Table 2a.
Additional Surface Water Baseline Data - High Flow Metals Data
P-3993
March 6, 2016

Parameter	SW-1 DS Hale Creek	SW-2 US Hale Creek	SW-4 US Bunch Creek	SW-5 DS Bunch Creek
Antimony (µg/L)	ND	ND	ND	ND
Arsenic (µg/L)	ND	ND	ND	ND
Beryllium (µg/L)	ND	ND	ND	ND
Cadmium (µg/L)	ND	ND	ND	ND
Chromium (µg/L)	ND	ND	ND	NND
Copper (µg/L)	NND	ND	0.00105	ND
Lead (µg/L)	ND	ND	ND	ND
Nickel (µg/L)	0.0109	0.0359	0.0965	0.0150
Selenium (µg/L)	ND	ND	ND	ND
Silver (µg/L)	ND	ND	ND	ND
Thallium (µg/L)	ND	ND	ND	ND
Zinc (µg/L)	0.0139	0.0345	0.148	0.0157

US = Upstream
DS = Downstream
ND = Non Detect

Table 3
Ranges/Averages of Groundwater Quality
P-3960
March 18, 2009 – June 19, 2011

Parameter	MW-01 Elevation 1112.75 ft.	MW-02 Elevation 1127.9 ft.	MW-03 Elevation 1205.64 ft.	MW-04 Elevation 1252.66 ft.
Depth to Water (feet)	43.26 – 78.69 (73.49)	23.6 – 36.9 (26.85)	71.76 – 83.2 (75.7)	43.11 – 44.83 (44.14)
Field pH(S. U.)	4.45 – 6.89	3.5 – 6.22	3.31 – 6.29	4.11-5.91
Specific Conductivity @ 25 °C (µmhos/cm)	550 – 1275 (1031.8)	635 – 1165 (973.6)	65 – 1100 (690)	16 – 325 (195.5)
Total Iron (mg/L)	0.36 – 6.28 (2.21)	4.28 – 8.12 (6.28)	0.09 – 2.11 (1.47)	0.21 – 10.4 (1.55)
Total Manganese (mg/L)	0.9 – 3.24 (2.62)	13 – 34 (27.0)	BDL – 6.64 (4.23)	0.9 – 2.21 (1.35)
Acidity (mg/L)	14 – 44 (25.6)	1 – 41 (32.5)	16 – 38 (24.9)	10 – 38 (24.8)
Alkalinity (mg/L)	25 – 55 (39.5)	29 – 66 (47.75)	32 – 55 (43.8)	25 – 54 (38.5)
Sulfate (mg/L)	118-360 (248.1)	243 – 476 (355.1)	BDL – 377 (214.4)	BDL – 356 (196.1)

Average values are shown in parentheses
Averaged via all data, not seasonally
BDL – Below Detection Limit

Table 3a.
Updated Ranges/Averages of Groundwater Quality
P-3960
September 20, 2015 – March 6, 2016

Parameter	MW-01 Elevation 1112.75 ft.	MW-02 Elevation 1127.9 ft.	MW-03 Elevation 1205.64 ft.	MW-04 Elevation 1252.66 ft.
Depth to Water (feet)	70.51 – 87.23 (81.17)	34.93 – 38.96 (36.9)	71.23 – 82.65 (77.66)	39.36 – 51.12 (46.75)
Field pH (S. U.)	6.00 – 6.34	4.98 – 5.45	5.56 – 6.28	5.35 – 6.28
Specific Conductivity @ 25 °C (µmhos/cm)	864 – 1280 (1069.9)	415 – 710 (591)	614 – 842 (690.9)	169 – 465 (318.4)
Total Iron (mg/L)	1.99 – 2.89 (2.38)	0.73 – 3.05 (2.23)	0.98 – 1.86 (1.27)	1.72 – 4.4 (2.42)
Total Manganese (mg/L)	1.49 – 3.44 (2.57)	8.95 – 16.39 (12.09)	4.06 – 7.74 (5.62)	1.11 – 1.83 (1.44)
Acidity (mg/L)	10 – 26 (18.4)	20 – 35 (28.6)	16 – 32 (23.4)	12 – 24 (18.7)
Alkalinity (mg/L)	20 – 40 (30.1)	30 – 55 (42.3)	35 – 50 (43)	24 – 41 (31.1)
Sulfate (mg/L)	78 – 198 (130.9)	240 – 347 (298.9)	120 – 288 (192.6)	20 – 210 (142.1)

Average values are shown in parentheses
Averaged via all data, not seasonally

Table 4
Estimate of Post-Mining, Average Event Surface-Water Quality at SW-5
P-3960

Parameter	Estimated Value
Flow (cfsm)	1.62
pH (s.u.)	6.95
Iron (mg/L)	1.49
Manganese (mg/L)	1.22
Specific Conductivity 25 °C (µmhos/cm)	540
Total Suspended Solids (mg/L)	18

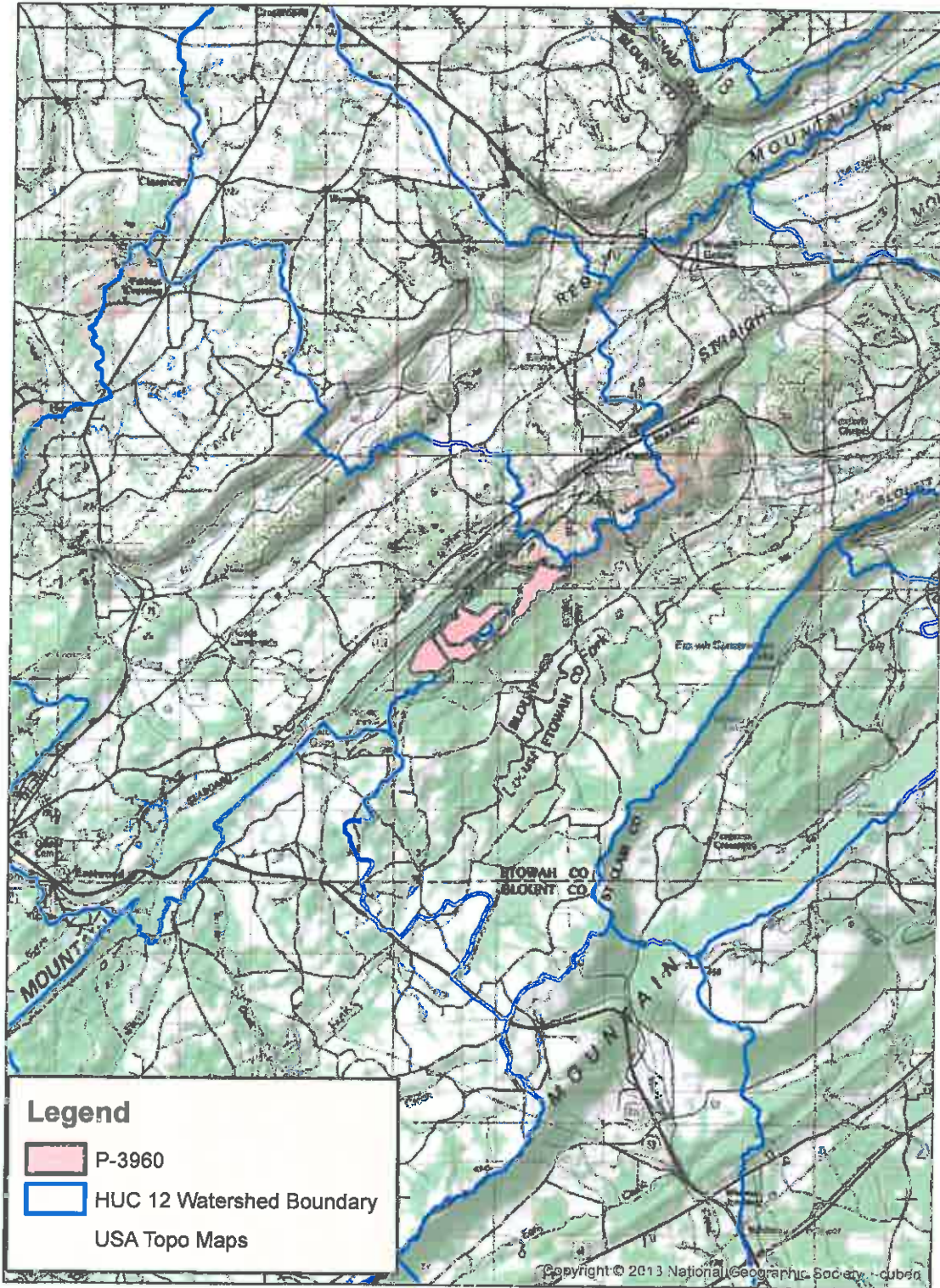
Data from P-3960 PHC Surface Water Projections Worksheet

Table 4a.
Updated Estimate of Post-Mining, Average Event Surface-Water Quality at SW-5
P-3960

Parameter	Estimated Value
Flow (cfsm)	1.62
pH (s.u.)	6.47
Iron (mg/L)	1.63
Manganese (mg/L)	1.39
Specific Conductivity 25 °C (µmhos/cm)	642
Total Suspended Solids (mg/L)	23

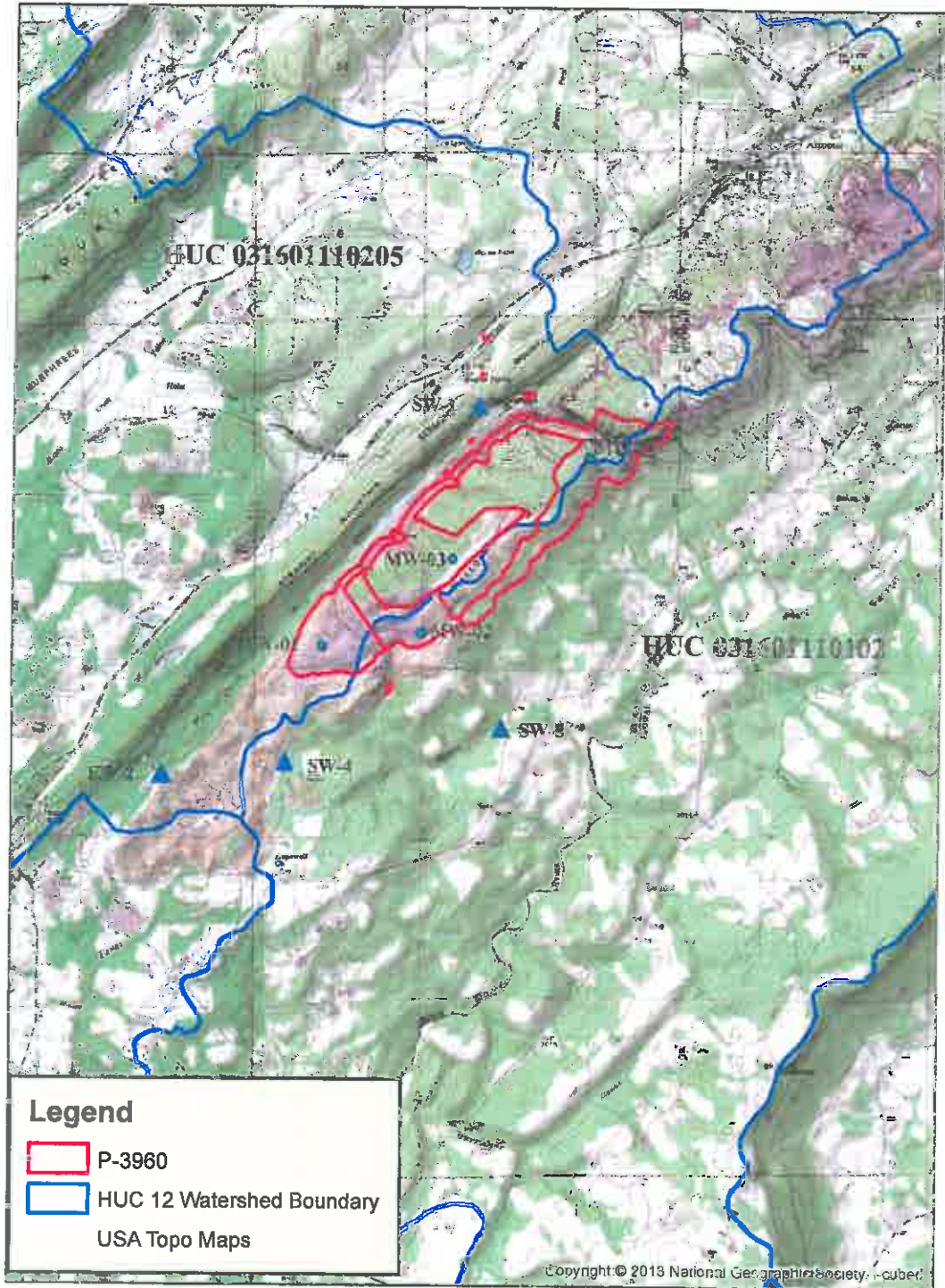
Data from P-3960 PHC Surface Water Projections Worksheet

Figure No. 1
P-3960 Permit Area



0.476 0.95 1.9 2.85 3.8
 Miles

Figure No. 2
P-3960 Permit Area and Water Quality/Quantity Monitoring Stations



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