

III-D and III-E 880-X-8E-.06(1)(i)7(j)  
**HYDROLOGIC MONITORING PLAN**

COMPANY NAME Warrior 282, LLC.

MINE NAME Warrior Mine No. 1

COUNTY Jefferson

NPDES#: AL0079928

\*A MAP SHOWING ALL MONITORING POINTS MUST ACCOMPANY THIS PLAN

I. Surface Water Monitoring Program: (Discharge Points)

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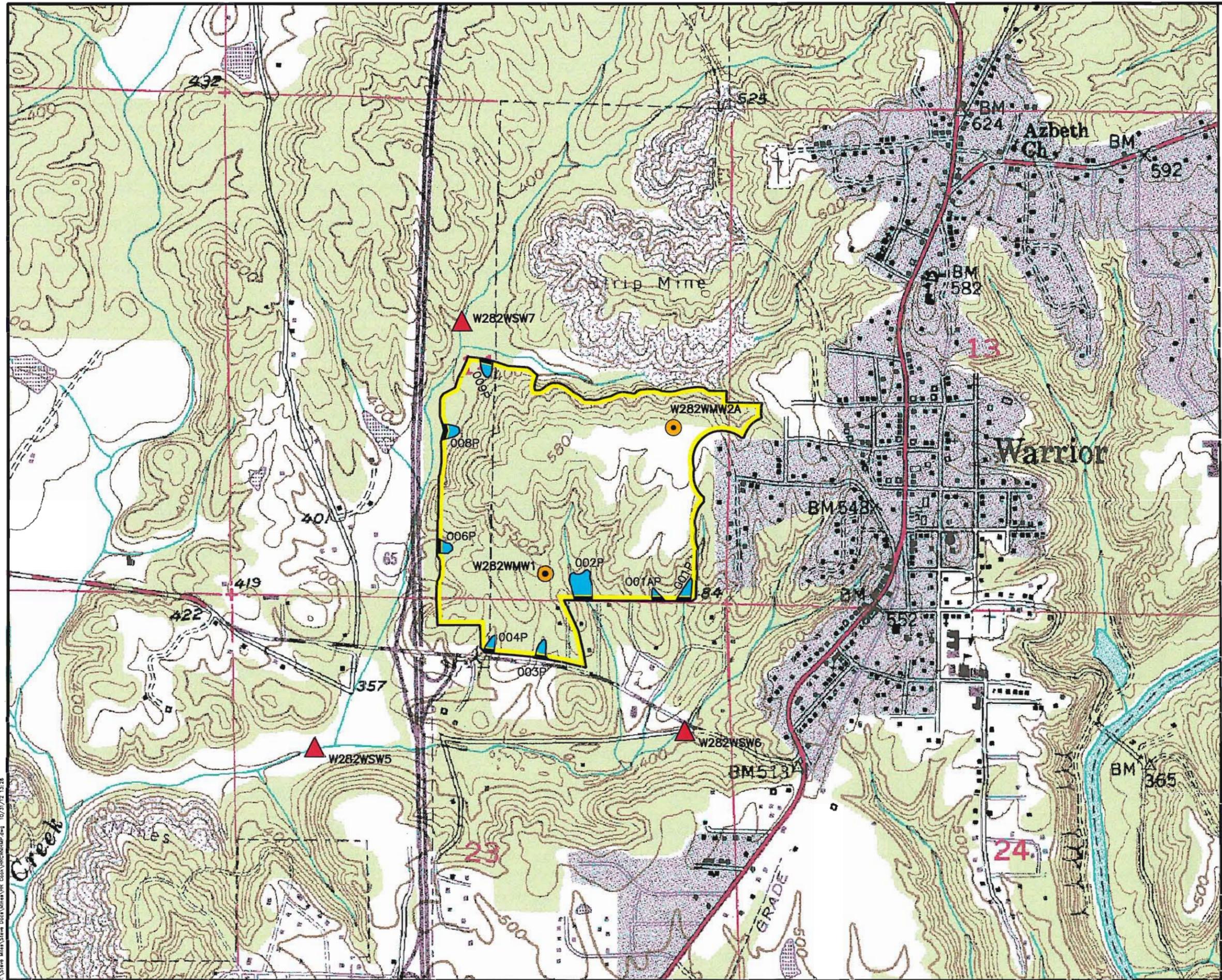
List each discharge point to be monitored and indicate type or source of discharge	List parameters to be sampled for each discharge point	List frequency of sampling for each discharge point	Duration of Monitoring
Basins: 001P 002P 003P 004P 006P 008P 009P	NPDES parameters	Twice monthly	Until joint approval by ASMC and ADEM. In no case sooner than ASMC approval of Phase II Bond re-lease.

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If a sample is taken during or within 24-hours after an applicable precipitation event (an increase in discharge volume caused by an applicable 24-hour precipitation event), an exemption for Iron (Total), Manganese (Total) and Total Suspended Solids may be claimed and Settleable Solids, pH and Flow run and reported. The exemption is only applicable if the ADEM "New Source Coal Mine and Associated Discharge Limitations, Conditions and Requirements" are followed.

See attached map for all monitoring site locations.

Note: Performance monitoring to commence no sooner than original opening of mine.



- LEGEND**
-  Proposed Permit Boundary
  -  Sediment Basin
  -  Groundwater Monitoring Site
  -  Surface Water Monitoring Site



I, Timothy S. Thomas, a Registered Professional Engineer, hereby certify the foregoing to be a true and correct map to the best of my knowledge and belief.

  
 Timothy S. Thomas, P.E.  
 AL Reg. #18830

11-1-12  
 Date



**H R Cook  
 Warrior Mine  
 Hydrologic Monitoring Plan Map**

DRAWN BY: JNG	DATE: 7-20-10
DWG. NAME: HRCWMHP	
APPROVED BY: TST	SCALE: 1"=1000'

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HYDROLOGIC MONITORING PLAN (continued)

A. Reporting and Recording Specifications:

a) NPDES outfalls:

Reporting as required by NPDES permit to Alabama Department of Environmental Management plus a simultaneous Notice of Filing to ASMC containing the following:

- 1) Name of Company
- 2) Name of Mine
- 3) ASMC permit number
- 4) NPDES number
- 5) Sampling period covered by report
- 6) List of the discharge points sampled and analysis results

b) Other:

B. Non-Compliant Discharge Reporting:

Reporting as required by the NPDES permit to Alabama Department of Environmental Management plus simultaneous copy (indicating ASMC permit number) to ASMC.

HYDROLOGIC MONITORING PLAN (continued)

II. Other Surface Water Monitoring.

Bodies of water receiving discharges from the mine:

Unnamed tributaries to Cane Creek

List Monitoring Points and indicate type or describe location	List Parameters to be sampled	Frequency (minimum)	Duration of Monitoring
W282WSW5 (downstream on unnamed trib to Cane Creek)	Discharge pH Manganese Iron Total Suspended Solids Specific Conductance Aluminum	Quarterly	Life of mine
W282WSW6 (upstream on unnamed trib to Cane Creek)	Same as Above	Same as Above	Same as Above
W282WSW7 (upstream on unnamed trib to Cane Creek)	Same as Above	Same as Above	Same as Above

## HYDROLOGIC MONITORING PLAN (continued)

### A. Reporting and Recording Specifications:

- 1) Frequency of Reporting: Quarterly
  
- 2) Contents of Report: Name of company, mine name, ASMC permit number and for all monitoring locations, the dates samples were taken and sample results for each parameter and who collected and analyzed the samples.

### III. Monitoring requirements for removal of sediment ponds and other treatment facilities:

Monthly for 6 months prior to application for approval to remove facility. Monitoring data will be submitted to ASMC with application to remove the facility.

Monitoring sites shall be located to sample water entering the facility (i.e., untreated drainage). Show proposed locations on the monitoring location map.

Parameters to be samples shall be those required by the NPDES permit.

HYDROLOGIC MONITORING PLAN (continued)

IV.

A. Monitoring requirements for Phase II bond release:

List Monitoring Sites	Parameters	Sample Frequency	Duration of Monitoring
inflow* into the following basins:  001AP 002P 003P 004P 006P 008P 009P	NPDES parameters	Monthly	No less than monthly for previous 6 months prior to application for Phase II Bond release.**

\* If no inflow into basin, then a sample of basin discharge. If no basin discharge, then grab sample from basin itself.

\*\* For the Increment within which the respective basin is bonded, or the respective basin's drainage area is located.

B. Reporting:

Reports shall be submitted with application for Phase II Bond Release indicating Sample location number, monitoring period and analysis results and date for each sample, plus sampling and analytical data. A map showing location of the sample sites should be included.

HYDROLOGIC MONITORING PLAN (continued)

V. Groundwater Monitoring

List Monitoring Sites and indicate type of site	Parameters	Frequency (minimum)	Duration of Monitoring
W282WMW1 * (Above, Within, and Below Black Creek)	Iron Manganese pH Specific Conductance Water level	Quarterly	Life of mine
W282WMW2A * (Above, Within, and Below Black Creek)	Same as Above	Same as Above	Life of mine

\* If a well is destroyed during mining and reclamation operations, this well will be re-drilled in approximately the same location. The well will be drilled to the same depth, and casing standards will be identical to those shown in 'Casing Specifications' in this report.

## HYDROLOGIC MONITORING PLAN (continued)

### A. Reporting and Recording

Reports to be filed with ASMC quarterly supplying the following information: Company name, mine name, permit number, and for each monitoring site, the date and sample results for each parameter. Include sampling and analytical information for all samples.

### VI. Maintenance of records and Availability for Inspection:

a) Active Mining - copies of all monitoring records shall be maintained at office.

b) During periods of temporary cessation of operations and after active mining, all monitoring records will be kept at:

Warrior 282, LLC. (Office)

504 Pine Ridge Trail (Address)

Birmingham, Alabama 35213 (City & State)

Stanley Hallmark (Custodian of Records)

c) All monitoring records will be made available upon request to ASMC Personnel for inspection.

VII. Describe how the data obtained from the performance monitoring may be used to determine the impacts of the operation upon the hydrologic balance. Describe how parameters to be monitored relate to the suitability of the surface and groundwater for current and approved postmining land use.

Surface Water Monitoring Site W282WSW5 is downstream of all mining to be conducted by Warrior 282, LLC.. Results of performance monitoring as outlined in the monitoring plan can be compared to the results of performance monitoring for Surface Water Monitoring Sites W282WSW6 and W282WSW7 to determine impact to the receiving streams and confirm or deny the estimates of the PHC. Groundwater Monitoring Sites W282WMW1 and W282WMW2A will monitor the characteristics of the aquifers above, within, and below the

target coal seam. Performance monitoring data will be compared to results of analysis from baseline sampling to determine impact to these aquifers and be compared to predictions made in the PHC. The proposed postmining land use is undeveloped or no current land use or management (grasses utilized as terminal vegetation). Alabama Department of Environmental Management recommendations for water quality to support this land use on this stream classification are less stringent than those limitations currently in force for surface mine effluent, therefore the existing monitoring plan is adequate and no additional parameters are recommended.

VIII. Please NOTE: ALL PERFORMANCE MONITORING REPORTS should be submitted in duplicate. For companies with multiple permits, each permit should have a corresponding monitoring report. Sites serving multiple permits should be included in all pertinent monitoring reports.

IX. If a waiver is requested for a particular water-bearing stratum, give details. 880-X-8H-.06-(1)(h)(2)

None proposed.

X. Plans For Recording and Reporting Data (779.13)

Describe how surface and groundwater quantity and quality data will be collected, recorded, and reported to the Regulatory Authority according to Section 816.52.

Surface water samples shall be taken by the 'grab' method. Flowrate measurement of surface water samples shall be according to ASTM D3858 "Standard Practice for Open Channel Flow Measurement of Water by Velocity - Area Method" or other equally valid approved methods. Groundwater samples shall be taken according to Standard Methods 105 "Collection and Preservation of Samples" and 906A "Collection" or other equally valid approved methods. pH of all samples will be measured in the field. The sample will be stored in ice and all other parameters will be analyzed within their allowable holding times as specified by Standard Methods. Practices employed 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 be used to obtain a sample when ample groundwater is present to be collected.

**WARRIOR 282, LLC.**

**WARRIOR MINE**

**HYDROLOGIC**

**RECLAMATION PLAN**

**submitted by:**

**PERC Engineering Co., Inc.**

**P.O. Box 1712**

**Jasper, AL. 35502-1712**

Hydrologic Reclamation Plan (880-X-8H-.06(1)(g)):

I. Steps to Minimize Hydrologic Balance Disturbance:

Surface mining and reclamation activities conducted on the Warrior 282, LLC.- Warrior Mine area will be conducted to minimize disturbance to the hydrologic balance. Several ways in which this will be accomplished are, but not limited to the following:

- a. Monitoring and Reporting of sediment basins 001P, 001AP, 002P, 003P, 004P, 006P, 008P, and 009P at this mine site (where all runoff from the mine area will drain), Surface Water Monitoring Sites W282WSW5, W282WSW6, and W282WSW7, and Groundwater Monitoring Sites W282WMW1 and W282WMW2A as required by the Regulatory Authorities will be performed in accordance with the approved Hydrologic Monitoring Plan.
- b. Physical and chemical treatment of the outfalls at this mine site as necessary to comply with State and Federal Water Quality Laws.
- c. Upon completion of mining, and regrading, overburden materials will be sampled systematically and sent to the Auburn University Testing Laboratory, for analyses to determine type and amount of soil amendments necessary to maintain vegetative growth as reported in Part IV-C-1 of the permit application due to a topsoil variance being applied for at this facility. This sampling system should be adequate (see below).
  1. The chemical analyses will consist of the followings parameters: pH, % Sulfur, Phosphorus, Potassium, Magnesium, Calcium, Maximum Potential Acidity, Neutralizing Potential, NO<sub>3</sub>-N, and Recommendations for the amounts of Limestone, Nitrogen, P<sub>2</sub>O<sub>5</sub>, and K<sub>2</sub>O to be added to the soil.
  2. The physical analyses will consist of the following parameters: Sieve Analysis, % Sand, % Silt, % Clay, Textural Classification, and Available Water Capacity.
- d. Husbandry practices will include, seeding spot areas within the Warrior Mine to increase cover and the addition of proper nutrients. Suitable mulch shall be used on all regraded and topsoiled areas to control erosion, promote germination of seeds and increase the moisture retention capacity of the soil. A maximum of 3 tons per acre of hay will be used as mulch.
- e. With respect to the Hydrologic Balance, because mining at this site is not expected to significantly affect the regional aquifer in the area, and the affect from this site will be extremely localized, there should be no significant adverse effect on the Hydrologic Balance from mining within the permit area.

II. Material Damage Outside the Permit Area:

All surface mining and reclamation activities within the Warrior Mine will be conducted to minimize and prevent material damage to the hydrologic balance. Several ways in which this will be accomplished are, but not limited to the following:

1. Observing the 300 ft. setbacks from occupied dwellings, unless acceptable waivers are submitted and approved by ASMC.
2. Mining within the permit boundary.
3. Observing and complying with all State and Federal Water Quality Limits.
4. Mine openings within the permit area (other than blast holes) will be eliminated in the following methods:
  - A) Exploration Holes - Exploration holes will be backfilled with the drill cuttings and capped with two (2) feet of clay.
  - B) Monitoring Wells - Groundwater monitoring wells will be sealed at the time of abandonment with a concrete cap (1.5'x1.5'x.5').
  - C) Mine Openings -- Will be mined through and eliminated.
5. Timely regrading for drainage control.
6. On site sediment control to prevent sediment from entering ponds.
7. Timely revegetation of all disturbed areas.

III. Applicable State and Federal Water Quality Laws:

To meet the applicable State and Federal effluent limitation standards as set forth by the Environmental Protection Agency and the Alabama Department of Environmental Management, the applicant shall minimize potential water quality problems by properly handling and disposing of any acid or toxic forming materials and treating contaminated drainage. To assure water quality standards, periodic performance

monitoring will be conducted as approved in the Hydrologic Monitoring Plan. Sediment basins will be utilized as collection sites for surface water treatment when runoff from the mine site requires it. In the event quality problems should arise, the following procedures will be used :

- 1) Lime or caustic soda to raise a low pH.
- 2) Potassium permanganate to decrease manganese levels if the pH is too high.
- 3) Alum to decrease total suspended solid concentrations.

In the event alternative methods or chemicals are needed, the Regulatory Authority will be notified and new methods or chemicals will be approved prior to use.

#### IV. Rights of Present Water Users:

As stated in Part II-F, a well inventory initiated by PERC Engineering Co., Inc. in October of 2010 revealed that there are 677 residences within a ½ mile radius of the Warrior Mine. The locations of all residences within a ½ mile radius of the proposed facility are shown on the attached Well Inventory Map. Pertinent information of the well inventory is attached (See Well Inventory Summary and Well Inventory Map). The well inventory will be updated and submitted to ASMC along with estimates of impact to local groundwater users during the technical review.

#### V.A. Acid and Toxic Drainage:

Geochemical analysis shown in Part II-E revealed two acid forming layers in the overburden at the Warrior Mine. These layers were from 104.10 ft. to 110.00 ft. depth in Geochemical Analysis Site W282DH-1 and from 160 ft. to 165 ft. depth in

Geochemical Analysis Site W282DH-3. Both intervals are contiguous to the target coal seams at this site and sample bags containing these intervals were found to be contaminated with coal. Due to the fact that all overburden at this site does not occupy similar areas, intervals shown in the attached analysis 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 Warrior Mine site, 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 showing both the volume weighted acid-base potential of the area each drill hole represents, but also a summary of the overall acid-base potential of the entire proposed permit area on a volume weighted basis is shown in the attached analysis. The overall results of this analysis from Geochemical Analysis Sites W282DH-1 and W282DH-3 are favorable: overburden at the Warrior Mine contains an average of 13.29 (tons CaCO<sub>3</sub>/1000 tons overburden) excess neutralization potential. This excess neutralization potential will neutralize the acid found in the acid forming layers discussed above and no acid drainage is anticipated at this site. Coal stockpiles will be created by constructing a pad made of compacted clay or shale of acceptable permeability of desired thickness to carry the weight of loading and transportation equipment. Coal stockpiles will be located in such a manner whereas excess drainage may be diverted from coal stockpile areas. When the coal stockpile becomes no longer necessary it will be reclaimed by

removing the coal which makes up the pad by truck, covering the pad area with four feet of the best available non-toxic, non-combustible material and revegetating in accordance with the approved Reclamation Plan (Part IV-C-5). The pit bottom will have a much lower permeability than the spoil after mining, which should contain any acid or toxic drainage until the highwall is reclaimed and the drainage is allowed to filter into the buffering material and be neutralized. Any material such as oil, grease, rags, etc., that may present a fire hazard will be properly disposed of in an approved landfill. Any non-coal waste will be disposed of at approved off-site landfills which meet all applicable local, state and federal requirements.

V.B. Contribution of TSS to Streamflow:

Total Suspended Solids within the permit area will be controlled by utilizing sediment basins to control runoff. These sediment basin will be designed to retain all settleable solids, skim and retain all floating solids and provide adequate detention volume and time to minimize the contribution of total suspended solids into the receiving stream. In the event that a problem arises with the TSS in the discharge of the sediment basin, Alum will be introduced into the basin to decrease total suspended solid concentrations. An alternative to Alum could be the construction of a floating silt fence to cause the solid to floc and settle to the bottom.

V.C. Water Treatment Facilities:

The sediment basin will be the primary treatment facility to which chemical treatment

may be introduced as needed to maintain effluent limits set forth by the Regulatory Authority. Sediment basins will be constructed downstream of the permit area to control drainage and collect sediment from the disturbed area during surface mining and during the reclamation phase. In the event quality problems should arise, the following procedures will be used :

- 1) Lime or caustic soda to raise a low pH.
- 2) Potassium permanganate to decrease manganese levels if the pH is too high.
- 3) Alum to decrease total suspended solid concentrations.

In the event alternative methods or chemicals are needed, the Regulatory Authority will be notified and new methods or chemicals will be approved prior to use.

#### V.D. Drainage Control:

Sediment basins will be constructed during mining operations to control drainage and collect sediment from the disturbed area during the construction phase and during the reclamation and restabilization phase. All surface and groundwater runoff will be controlled through the basin whose design is shown in Part III-B of the application. The basin will be constructed, prior to any disturbance in its drainage area, under the supervision of a qualified Registered Professional Engineer or be a qualified person under his direct supervision. Upon completion of construction the basin will then be certified to the Regulatory Authority as having been constructed by bringing desirable material in and compacting it in lifts until the construction specifications are met. Drainage structures will be installed as per design plans with any necessary erosion control and/or stabilization procedures such as riprap, concrete, drop structures, energy dissipaters, etc. being implemented as deemed necessary by the project engineer.

Upon completion of construction the entire disturbed area will be revegetated in accordance with the approved Reclamation Plan (IV-C-5). Silt fences, hay filter dams, dust control on roads, lush vegetation, diversions ditches and other prudent practices will be utilized in controlling runoff.

V.E. Restore Approximate Recharge Capacity:

Due to the unconsolidated nature of the post mine strata and the voids present after mining, gravitational forces (as opposed to capillary forces) will play a larger role in influencing infiltrated groundwater movement, therefore groundwater levels in the post mine aquifer will be lower on average than an unaffected aquifer of identical thickness and extent, and lateral groundwater movement in the post mine aquifer will be much greater than prior to mining therefore, as stated previously, baseflow to surrounding streams will increase.

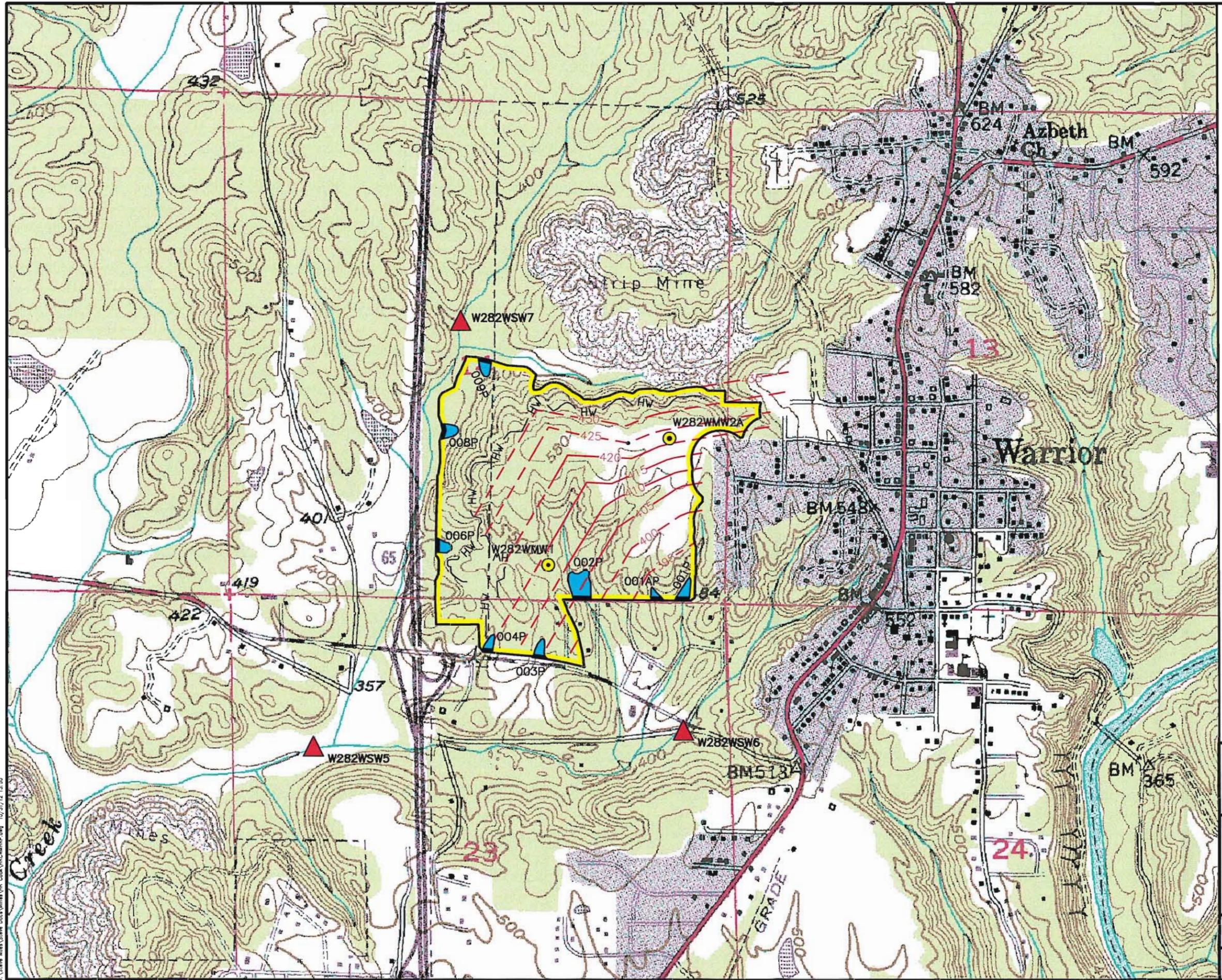
V.F. Rights of Present Water Users:

In the event that it is shown that mining by Warrior 282, LLC. has diminished the quality or quantity of surrounding well(s), 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) connect the

residence to an existing municipal water supply, or 3) other methods which replace the groundwater users supply and is agreeable to both the user and the operator will be considered an alternative.

V.G. Potential Adverse Consequences from PHC:

None anticipated.



- LEGEND**
-  Proposed Permit Boundary
  -  Sediment Basin
  -  Groundwater Monitoring Site
  -  Surface Water Monitoring Site
  -  Coal Seam Elevation Line (bottom of Black Creek Seam) (dashed where inferred)
  -  Highwall



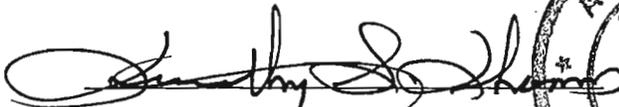
**Warrior 282, LLC.**  
**Warrior Mine**  
**Hydrologic Reclamation Plan Map**

DRAWN BY: JNG	DATE: 10-21-10
DWG. NAME: HRCWMHRP	
APPROVED BY: TST	SCALE: 1"=1000'

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**CERTIFICATION STATEMENT:**

The preceding Hydrologic Reclamation Plan for Warrior 282, LLC. at the Warrior Mine was prepared by, or under the direction of, a professional engineer and I certify that it is true and correct to the best of my knowledge and belief.



TIMOTHY S. THOMAS  
PROFESSIONAL ENGINEER  
REGISTRATION NO. 18830



Date: 11-01-12