SURFACE WATER HYDROLOGY (880-X-8E-.06(1))

1. **Surface Water Hydrology Description:**

The proposed permit area is located in the Warrior River Basin and is drained by Rocky Branch and Lost Creek. Stream flow varies with rainfall with low flows usually occurring in the summer months and high flows occurring in January. During the periods of low precipitation, base flow tends to be low. The long-term effect of mining in this area will be calculated from data collected at Station P-3920 SW-2 on Rocky Branch, Station P-3929 SW-3 on Lost Creek, and Station P3844-02454000 on Lost Creek.

All surface water leaving parts of the permit area, which has been disturbed by mining, will be routed through three (3) sediment basins before being discharged into state waters. All streams in Alabama are considered to be waters of the state. There are no perennial streams or springs located within the permit boundaries. There is no known use of surface water between the permit area and the receiving stream. The Alabama Department of Environmental Management designation of streams within the surrounding area are as follows: Rocky Branch (Fish and Wildlife) and Lost Creek (Fish and Wildlife. The USGS Hydrologic Unit Code and SCS Sub-watershed Number for the area streams is 03160109-170. The Alabama Department of Environmental Management NPDES Permit No. is AL0071081 of Basin 006, AL0075086 for Basin 013 and AL0078972 for Basin 027.

Baseline surface water quality and quantity and performance monitoring for this mine site will be characterized by data taken at Station P-3920 SW-2 on Rocky Branch, Station P-3929 SW-3 on Lost Creek, and Station P3844-02454000 on Lost Creek comparing the pre-mine and post mining data.

Station P-3920 SW-2 is located downstream of the permit area and drains approximately 1,376 acres or 2.15 square miles. Approximately 94.0 acres will be disturbed by this mining operation at Station P-3920 SW-2. Station P-3929 SW-3 is located downstream of the permit area and drains approximately 10,496 acres or 16.4 square miles. Approximately 94.0 acres will be disturbed by this mining operation at Station P-3929 SW-3. Station P3844-02454000 is located downstream of the permit area and drains approximately 16,384 acres or 25.6 square miles. Approximately 158.0 acres will be disturbed by this mining operation at Station P3844-02454000.

Data collected from Station P3844-02454000 downstream of the mine site will be used in the water quality projections. For the locations of the surface water monitoring stations see the attached Hydrologic Monitoring Map.

2. **Surface Water Bodies**

A total of three (3) sediment control structures are proposed for this mining operation. The basins are proposed as permanent structures. For the locations and NPDES numbers of sediment basins see attached Hydro-Geo Map in Part II-E.

3. **Surface Water Uses:**

The known uses of surface water on Rocky Branch and Lost Creek are considered to fish and wildlife.

4. **Surface Water Quality:**

For water quality see attached Surface Water Baseline Analysis. Samples taken from Station P-3920 SW-2 on Rocky Branch, Station P-3929 SW-3 on Lost Creek, and Station P3844-02454000 on Lost Creek indicate that the water is of good quality. As shown in the Surface Water Baseline Analysis all parameters are within the expected EPA limits. These sites will be used as the PHC Point. Historical data from 1994 to 2001 for Station P3844-02454000 shows a long history of good water quality that occurred with many previously mined areas within its watershed. See attached P3844-02454000 historical data.

5. **Surface Water Quantity:**

For water quantity, drainage area and description of each surface water monitoring station see attached Surface Water Baseline Analysis and Hydrologic Monitoring Map.

6. **Surface Water Sampling and Analytical Methods:**

All surface water samples were taken by the grab method. Flowrate measurements of surface water samples were performed in accordance with ASTM D3858, 10.9.6, p.101 "Standard Practice for Open Channel Flow Measurement of Water by Velocity - Area Method". Specific Conductivity and pH of all samples were measured in the field. The samples were poured in a clean plastic container and stored at a temperature near 4oC and all other parameters were analyzed within 24 hours. If samples were not analyzed within 24 hours, after the pH was measured, the pH was adjusted to 2.0 S.U. or less with Nitric Acid (about 2 mL per liter) which allows samples to be stored up to six months at room temperature. Prior to analyzing other parameters, the pH was re-adjusted to between 4.0 and 5.0 S.U. with 0.1N Sodium Hydroxide. Samples for TSS and sulfates that were not run within 24 hours were refrigerated near 4oC and TSS analyzed within 7 days and sulfates within 28 days. Sample preservation if used was in accordance with Table 1060:I (Summary of Special Sampling or Handling Requirements) from Standard Methods for the Examination of Water and Wastewater 17th Edition 1989 (page1-37).

7. **Precipitation Modeling:**

No modeling methods are employed at this time.

8. **Surface Water Monitoring Station Location(s):**

For locations of surface water monitoring stations see the attached Hydrologic Monitoring Map.

9. **Surface Water Sampling and Analytical Information:**

For Sampling and analytical information see above statement 6 and the attached Surface Water Baseline analysis. All surface water samples were analyzed for the pH, Total Iron, Total Manganese, Total Suspended Solids, Conductivity, Acidity, Alkalinity, and Sulfates.

QUALITY COAL COMPANY, INC.
DUTTON HILL MINE NO. 2, P-3980
ATTACHMENT II-G

SURFACE WATER BASELINE ANALYSIS

SAMPLE I.D.: P-3920 SW-2
MONITORING SOURCE: ROCKY BRANCH
DRAINAGE AREA: 2.15 SQ. MI.
LOCATION FROM MINE: DOWNSTREAM

DATE	DISH. cfs	pH s.u.	SpC u-mhos/cm	TSS Mg/l	Fe Mg/l	Mn Mg/l	SO_4 Mg/l	ACID Mg/l	ALKA Mg/l
12-08-11	4.0803	8.42	462	1	0.23	0.04	--	--	--
03-28-12	2.1245	7.48	423	7	0.44	0.04	--	--	--
06-12-12	0.7969	8.00	435	6	0.13	0.02	--	--	--
09-27-12	0.8414	7.28	565	3	BDL	0.02	--	--	--
12-13-12	1.0519	7.54	528	3	0.08	BML	--	--	--
06-07-13	0.6732	7.31	518	1	0.04	BML	--	--	--
09-27-13	0.0300	7.87	439	2	0.58	0.05	--	--	--

SAMPLE I.D.: P-3929 SW-3
MONITORING SOURCE: LOST CREEK
DRAINAGE AREA: 16.4 SQ. MI.
LOCATION FROM MINE: DOWNSTREAM/UPSTREAM

DATE	DISH. cfs	pH s.u.	SpC u-mhos/cm	TSS Mg/l	Fe Mg/l	Mn Mg/l	SO_4 Mg/l	ACID Mg/l	ALKA Mg/l
02-29-08	227	7.74	621	5	0.21	0.60	--	--	--
03-19-08	159	7.67	728	4	0.30	0.60	--	--	--
04-29-08	85	7.92	1328	2	0.22	1.00	--	--	--
07-03-08	18	8.32	1084	2	0.07	0.07	--	--	--
12-17-08	571	7.08	223	24	1.13	0.08	--	--	--
03-05-13	255	7.59	861	4	0.25	0.11	--	--	--
12-19-13	145	6.57	637	6	0.42	0.06	174	6	157
01-23-14	80	7.45	813	10	0.45	0.10	23	8	184
02-10-14	84	7.63	595	8	0.32	0.09	116	9	141

SAMPLE I.D.: P3844-02454000
MONITORING SOURCE: LOST CREEK
DRAINAGE AREA: 25.6 SQ. MI.
LOCATION FROM MINE: DOWNSTREAM

DATE	DISH. cfs	pH s.u.	SpC u-mhos/cm	TSS Mg/l	Fe Mg/l	Mn Mg/l	SO_4 Mg/l	ACID Mg/l	ALKA Mg/l
04-10-12	80	7.48	1161	21	0.55	0.07	--	--	--
08-15-12	72	7.98	1088	5	0.26	0.04	--	--	--
10-26-12	47	8.07	879	2	0.26	0.06	--	--	--
01-14-13	2285	7.03	236	56	2.70	0.22	--	--	--
04-23-13	268	7.86	591	5	0.26	0.06	--	--	--
07-15-13	96.82	8.09	903	5	0.40	0.10	--	--	--
12-19-13	73.5	8.14	649	3	0.38	0.06	153	0	148
01-23-14	104	8.16	759	4	0.32	0.09	146	8	192
02-10-14	104	7.98	559	5	0.32	0.08	86	9	143

QUALITY COAL COMPANY, INC.
DUTTON HILL MINE NO. 2, P-3980
ATTACHMENT II-G

SEASONAL DATA

SAMPLE I.D.: P-3920 SW-2
MONITORING SOURCE: ROCKY BRANCH
DRAINAGE AREA: 2.15 SQ. MI.
LOCATION FROM MINE: DOWNSTREAM

SEASON	DISH. cfs	pH s.u.	SpC u-mhos/cm	TSS Mg/l	Fe Mg/l	Mn Mg/l	SO_4 Mg/l	ACID Mg/l	ALKA Mg/l
SPRING	2.1245	7.48	423	7	0.44	0.04	--	--	--
SUMMER	0.7351	7.53	477	4	0.09	0.01	--	--	--
FALL	0.4357	7.48	502	3	0.29	0.04	--	--	--
WINTER	2.5661	7.79	495	2	0.16	0.02	--	--	--
AVERAGE	1.2456	7.55	491	3	0.18	0.02	--	--	--

SAMPLE I.D.: P-3929 SW-3
MONITORING SOURCE: LOST CREEK
DRAINAGE AREA: 16.4 SQ. MI.
LOCATION FROM MINE: DOWNSTREAM/UPSTREAM

SEASON	DISH. cfs	pH s.u.	SpC u-mhos/cm	TSS Mg/l	Fe Mg/l	Mn Mg/l	SO_4 Mg/l	ACID Mg/l	ALKA Mg/l
SPRING	166.3333	7.71	972	3	0.26	0.57	--	--	--
SUMMER	18.0000	8.32	1084	2	0.07	0.07	--	--	--
FALL	--	--	--	--	--	--	--	--	--
WINTER	221.4000	7.07	578	11	0.51	0.19	104	8	161
AVERAGE	135.2444	7.44	878	5	0.28	0.28	104	8	161

SAMPLE I.D.: P3844-02454000
MONITORING SOURCE: LOST CREEK
DRAINAGE AREA: 25.6 SQ. MI.
LOCATION FROM MINE: DOWNSTREAM

SEASON	DISH. cfs	pH s.u.	SpC u-mhos/cm	TSS Mg/l	Fe Mg/l	Mn Mg/l	SO_4 Mg/l	ACID Mg/l	ALKA Mg/l
SPRING	174.0000	7.63	876	13	0.41	0.07	--	--	--
SUMMER	84.4100	8.03	996	5	0.33	0.07	--	--	--
FALL	47.0000	8.07	879	2	0.26	0.06	--	--	--
WINTER	641.6250	7.53	551	17	0.93	0.11	128	6	161
AVERAGE	236.7588	7.75	826	9	0.48	0.08	128	6	161

QUALITY COAL COMPANY, INC.
DUTTON HILL MINE NO. 2, P-3980
ATTACHMENT II-G

HIGH FLOW/LOW FLOW METALS DATA

SAMPLE I.D.: P-3920 SW-2
MONITORING SOURCE: ROCKY BRANCH
DRAINAGE AREA: 2.15 SQ. MI.
LOCATION FROM MINE: DOWNSTREAM

Parameter	High Flow Result (1.05 cfs) Date: 12-13-12	Low Flow Result (0.67 cfs) Date: 06-07-13
Antimony (µg/L)	BML	BML
Arsenic (µg/L)	0.35	0.28
Berelium (µg/L)	BML	BML
Cadmium (µg/L)	BML	BML
Chromium (µg/L)	BML	BML
Copper (µg/L)	BML	BML
Lead (µg/L)	BML	BML
Nickel (µg/L)	BML	BML
Selenium (µg/L)	BML	BML
Silver (µg/L)	BML	BML
Thalium (µg/L)	BML	BML
Zinc (µg/L)	BML	BML

BDL = Below Detectible Limits BML = Below Measureable Limits

SAMPLE I.D.: P-3929 SW-3
MONITORING SOURCE: LOST CREEK
DRAINAGE AREA: 16.4 SQ. MI.
LOCATION FROM MINE: DOWNSTREAM/UPSTREAM

Parameter	High Flow Result (84 cfs) Date: 02-10-14	Low Flow Result (65 cfs) Date: 12-19-13
Antimony (µg/L)	BML	BML
Arsenic (µg/L)	BML	0.62
Berelium (µg/L)	BML	BML
Cadmium (µg/L)	BML	0.26
Chromium (µg/L)	BML	BML
Copper (µg/L)	1.11	2.41
Lead (µg/L)	BML	0.57
Nickel (µg/L)	BML	BML
Selenium (µg/L)	BML	BML
Silver (µg/L)	BML	0.98
Thalium (µg/L)	BML	BML
Zinc (µg/L)	BML	BML

BDL = Below Detectible Limits BML = Below Measureable Limits

HIGH FLOW/LOW FLOW METALS DATA

SAMPLE I.D.: P3844-02454000
MONITORING SOURCE: LOST CREEK
DRAINAGE AREA: 25.6 SQ. MI.
LOCATION FROM MINE: DOWNSTREAM

Parameter	High Flow Result (104 cfs) Date: 02-10-14	Low Flow Result (79 cfs) Date: 12-19-13
Antimony (µg/L)	BML	BML
Arsenic (µg/L)	BML	0.56
Berelium (µg/L)	BML	BML
Cadmium (µg/L)	BML	BML
Chromium (µg/L)	BML	BML
Copper (µg/L)	BML	BML
Lead (µg/L)	BML	BML
Nickel (µg/L)	BML	BML
Selenium (µg/L)	BML	BML
Silver (µg/L)	BML	BML
Thalium (µg/L)	BML	BML
Zinc (µg/L)	BML	BML

BDL = Below Detectible Limits BML = Below Measureable Limits