UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

AUG 0 5 2010

Colonel Keith A. Landry
District Engineer
Louisville District Corps of Engineers
Attn: Lee Anne Devine (Regulatory Branch)
OP-FN, Room 752
P.O. Box 59
Louisville, Kentucky 40201-0059

Subject: Pre-Discharge Notification (PDN) for LRL 2009-849,
Sapphire Coal Company, Smoot Creek Surface Mine
Kentucky Division of Mine Permits (KDMP) #867-0450

Dear Colonel Landry:

The U.S. Environmental Protection Agency (EPA), Region 4, has reviewed the Pre-Discharge Notice (PDN) associated with U.S. Army Corps of Engineers (Corps) Louisville District Nationwide Permit (NWP) 49 application (ID No. LRL-2009-0849) submitted by Sapphire Coal Company (KDMP #867-0450), for surface coal mining activity impacts to 2,390 linear feet (lf) of unnamed intermittent and ephemeral tributaries of Smoot Creek of the North Fork of the Kentucky River in Letcher County, Kentucky. On June 15, 2010, Kevin H. Miller of my staff provided via email comments and recommendations on this application. This letter formalizes those comments and recommendations for the record, including recommended special permit conditions that EPA believes are necessary to ensure compliance with the requirements of our regulations in Section 404(b)(1) of the Clean Water Act.

The applicant has requested authorization under NWP 49 to construct one hollow fill extension (HF2) and utilize one existing in-channel sediment pond (SS2). Hollow fill 2 was originally proposed to permanently fill 1,539 lf of intermittent streams and 650 lf of ephemeral tributaries of Smoot Creek on the North Fork of the Kentucky River. However, the applicant has significantly reduced the proposed permanent impacts by 1,716 lf to only 473 lf. The 473 lf is made up of 326 lf of intermittent stream and 147 lf of ephemeral stream. These reductions were identified with the implementation of the Kentucky Fill Placement Optimization Protocol (FPOP). Also, the application refers to an additional 201 lf of temporary impacts to an intermittent tributary of Smoot Creek between the toe of the HF2 and the existing sediment structure SS2 (i.e., "drainage corridor"). However, we understand from Justin Branham, Louisville District Corps (via email correspondence dated June 17, 2010, to Kevin H. Miller, EPA), that the Corps considers this drainage corridor as an existing impact rather than a temporary impact associated with this project, and that it does not require mitigation. The applicant proposes to offset the permanent impacts by on-site stream restoration and enhancement. EPA Region 4 offers the following comments and recommended special conditions for this permit.

Avoidance and Minimization

The FPOP report, received electronically from the applicant's consultant, has been reviewed and found to be in compliance with the requirements of KDMP Reclamation Advisory Memorandum 145. The FPOP resulted in a reduction of permanent stream impacts from 2,189 lf to 473 lf. The original Corps application proposed impacts to three stream segments: only one, Segment 3, has specific conductance (SC) below 500 uS/cm[1] (193 uS/cm, according to the application); the other two segments are above 500 uS/cm (723 uS/cm for Segment 1 and 930 uS/cm for Segment 2). We were initially concerned that the reduction realized through the FPOP still proposes impacts to Segment 3, although only to the furthest downstream 100 lf or so. However, it is noted that Segment 3 is ephemeral, and the SC was measured within seven days of heavy rain. Additionally, it is understood that the proposed fill will be built on top of an existing older fill (apparently just a pre-law push-over). Therefore, if proper fill design and recommended best management practices (BMPs) are used (see "Best Management Practices and Adaptive Management Plan (AMP)," below), the proposed fill is anticipated to improve the water quality coming from the older fill, making the revised proposal the Least Environmentally Damaging Practicable Alternative.

Water Quality

According to my 402 program staff, this project is covered by a Kentucky Pollutant Discharge Elimination System (KPDES) General Permit (KYG045133), which was originally issued by the Kentucky Division of Water (KDOW) to Holbrook Mining Co. on September 30, 1996, subsequently transferred to Cook & Sons on October 23, 2002, and finally transferred to Sapphire Coal on August 18, 2005. The General Permit includes only limited effluent and in-stream monitoring. Therefore, we recommend that the Corps require the applicant to conduct additional effluent and in-stream physical, chemical and biological monitoring as described in the enclosed special permit conditions (see Enclosure, Special Permit Condition #4). These special conditions are designed to supplement KDOW's KPDES General Permit. In addition, please note that these data are necessary to demonstrate that the project will result in a "net increase in aquatic resource functions through reclamation," as required by regulation under NWP 49.

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[1] On April 1, 2010, EPA released interim final guidance to the Regional Offices titled: *Guidance on Improving EPA Review of Appalachian Surface Coal Mining Operations under the Clean Water Act, National Environmental Policy Act, and the Environmental Justice Executive Order* (SCM Guidance). The SCM Guidance provides a framework for the Regions when they review permits for discharges associated with Appalachian surface mining projects. At the same time, EPA released two Office of Research and Development (ORD) reports: *The Effects of Mountaintop Mines and Valley Fills on Aquatic Ecosystems of the Central Appalachian Coalfields* and *A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams*. The ORD reports have been submitted to the EPA Science Advisory Board (SAB) for review and are also publicly available. In the interim, EPA views the reports as providing information, along with published, peer-reviewed scientific literature, that may inform permit reviews.

Based on the best information available to EPA, projects with predicted specific conductance (conductivity) values below 300 µS/cm generally are not likely to cause water quality violations or significant degradation of the aquatic ecosystem. Discharges with levels of conductivity above 500 µS/cm generally are likely to be associated with adverse impacts that could cause or contribute to significant degradation and/or excursions from narrative water quality criteria.

Construction Best Management Practices

To our knowledge, Sapphire Coal has not identified specific construction BMPs that would be implemented during the placement of fill material into waters of the United States and during construction activities. Therefore, we recommend the use of mine design alternatives, BMPs, and the best available treatment technologies that will help reduce adverse water quality effects (especially from SC), including, but not limited to, the following:

- Identify and isolate toxic-producing (total dissolved solids (TDS) and/or sulfate producing) materials;
- Implement hollow fill design alternatives that reduce surface area disturbance;
- Construct underdrain utilizing low-reactive durable rock;
- Implement the Forest Reclamation Approach on the crest of backfill areas;
- Implement enhanced stormwater drainage control by using a weep berm-forest-passive treatment system;
- Use flocculents designed specifically to reduce total suspended solids/TDS/SC; and
- Use floating siphons to decant the cleanest water from the pond.

Adaptive Management Plan for Water Quality

Water quality monitoring required by KPDES will provide valuable data regarding the BMPs discussed above. However, as the efficacy of many of these practices with regard to the reduction of SC has not been quantified, an AMP should be implemented if the water quality goal of monthly flow-weighted average conductivity exceeds 500 µS/cm, as described in the enclosed special permit condition (see Enclosure 1, Special Permit Condition #2).

In order to comply with the requirements of the Clean Water Act, EPA believes a phased approach to the AMP is necessary, increasing the level of response required over time until water quality goals are met. If the monthly flow-weighted average SC continues to exceed 500 µS/cm after the initial six months, Phase I of the AMP will be developed (see Enclosure 2, Projected Adaptive Management Plan Implementation Timeline). This AMP, developed by the applicant and approved by EPA and the Corps, must be based on the best technologically advanced approaches available for identifying and hydrologically isolating sources of elevated conductivity and toxic materials.

If water quality goals are not met after an additional six months (16 months from permit issuance; see Enclosure 1, Special Condition #2 and Enclosure 2, Projected Adaptive Management Plan Implementation Timeline), Phase II of the AMP will be initiated. This plan will also be developed by the applicant and approved by the Corps and EPA, but should incorporate, at a minimum, the following actions:

- The applicant will enhance stormwater drainage control on the reclaimed mine benches through diffuse discharge to riparian zone using a weep berm-forest-passive treatment system; and
- The applicant will reforest 70 percent or more of the watershed of the Smoot Creek tributaries being mined using the Forest Reclamation Approach.

Compensatory Mitigation

Because the applicant proposes on-site mitigation (identified on the Mine Reclamation Plan map as "Segment 1A; 1,370 feet"), we understand the Corps will require special permit conditions regarding restoration using natural channel design, appropriate success criteria (based on achieving an increase in Ecological Integrity Index (EII) scores), and annual monitoring (for a minimum of five years, including pH, conductivity, flow, temperature, physical characterization, pebble counts and habitat assessment for high gradient streams; as described in the Corps permit application). It is our understanding that although the applicant has reduced the length of stream impact, they will still follow the original mitigation proposal (that is, they will not reduce the length of stream reach to be restored, or 650 lf of the unnamed tributary of Smoot Creek designated as "Segment 1A"). Sufficient physical characterization (longitudinal profiles, riffle and pool cross-sections and bank stability assessment) must be done to ensure the restored reach is stable and, if not, to indicate the need for remedial action or adaptive management measures. Monitoring of planted vegetation must also be done to evaluate vegetation success and to indicate the need for remedial action or adaptive management measures (e.g., re-planting). Biological monitoring (macroinvertebrates) consistent with KDOW protocols should be required if the restored stream has an intermittent or perennial flow regime. Finally, Pond SS-2 and the drainage corridor will be removed and restored as part of reclamation.

I want to thank you and your staff for your cooperation and willingness to address our issues. We look forward to working closely with you and the applicant to resolve the concerns outlined above. If you have any questions, please call me at (404) 562-9470 or Kevin H. Miller of my staff at (404) 562-9435.

Sincerely,

James D. Giattina
Director
Water Protection Division

Enclosures: 1) Special Permit Conditions
2) Projected Adaptive Management Plan Implementation Trigger

cc: Jim Townsend, Louisville District, Louisville, KY
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Enclosure 1

Draft Special Permit Conditions

1. The permittee shall adhere to the plans and conditions included in the August 6, 2009 permit application and all subsequently obtained supplemental information.

2. The permittee must submit monthly flow-weighted conductivity, $\overline{K}$, for the effluent of Pond SS-2 following the commencement of discharges of material into "waters of the United States," to the U.S. Army Corps of Engineers (Corps) Louisville District and the U.S. Environmental Protection Agency, Region 4. Monthly flow-weighted conductivity shall be calculated as follows:

$$\overline{K} = \frac{\sum_i (Q_i \times K_i)}{\sum_i Q_i}$$

where:

$\overline{K}$ = monthly flow-weighted conductivity, µS/cm
Qi = flow for the i^{th} sample, cfs
K_i = conductivity for the i^{th} sample, µS/cm.

The monthly flow-weighted conductivity, $\overline{K}$, will be plotted as a time series and the trend in effluent conductivity calculated by linear regression. If the trend indicates that the monthly flow-weighted conductivity will exceed 500 µS/cm, or if any three consecutive monthly flow-weighted conductivity values exceed 500 µS/cm, then the permittee will conduct an analysis of the sources of effluent conductivity and develop an adaptive management plan(AMP) to reduce effluent conductivity (or specific conductance (SC) and total dissolved solids (TDS). Examples of design alternatives, best management practices (BMP), and treatment technologies to include in the adaptive management plan may include, but are not limited to:

- Fill design alternatives that allow for a sequenced fill construction approach;
- Underdrain construction utilizing low-reactive durable rock;
- Implementing the Forest Reclamation Approach on the face of the fill and backfill areas as practicable to increase evapotranspiration and minimize infiltration through the fill;
- The use of synthetic caps and/or liners to minimize infiltration;
- Enhanced stormwater drainage control through diffuse discharge to riparian zone using a weep berm-forest-passive treatment system;
- The use of flocculents designed specifically to reduce total suspended solids/TDS/SC
- Floating siphons to decant the cleanest water prior to discharge to receiving streams.

The conductivity trend analysis and adaptive management plan shall be submitted to the Corps and EPA for approval within 30 days of determining that the trend will exceed 500 µS/cm or three consecutive monthly flow-weighted conductivity values exceed 500 µS/cm. The plan shall be implemented within 45 days of written approval by the Corps and EPA. Implementation of the plan will continue until the trend indicates that monthly flow-weighted conductivity will fall below 500 µS/cm or any three consecutive monthly flow-weighted conductivity values fall below 500 µS/cm.

If either the trend or monthly flow-weighted conductivity values exceed 500 µS/cm continually for six months, the permittee will retain, within 30 days, a consultant mutually agreed upon by the permittee, the Corps and EPA. The consultant shall prepare within 90 days recommendations for additional actions to reduce effluent conductivity. These recommendations shall be implemented within 45 day of written approval by the Corps and EPA.

3. The permittee shall submit documentation to the Corps and EPA indicating all BMPs employed to minimize TDS and SC during the placement of fill material into waters of the United States and during the construction of the valley fill. The initial documentation must be submitted within 30 days of site preparation and commencement of construction of the rock underdrain. After this initial submittal, the permittee shall submit documentation every 6 months unless the AMP has been triggered in Special Condition 2. All monitoring data and analyses (effluent monitoring, in-stream chemical and biological monitoring, and mitigation monitoring, and AMP trigger analysis) shall be reported to the Corps, KDOW, and EPA Region 4 within 30 days of being collected.

4. Effluent and In-stream Chemical and Biological Monitoring

Effluent Monitoring

The permittee should perform effluent monitoring on at least one outfall (i.e., a "representative outfall") for each receiving water body, to be specified in the permit by KDOW.

a. Parameters and Test Methods
The permittee should perform effluent monitoring, using at least one grab sample, for the parameters listed in Table 1, below. EPA Test Methods in 40 Code of Federal Regulations (C.F.R.) Part136 should be used.

Table 1. List of Parameters To Be Sampled

Parameter	**EPA Test Method**
Bicarbonate Alkalinity, mg/l	
Chlorides, mg/l	300.0
Flow rate, cubic feet per second (cfs)	
Duration of discharge, days	
Hardness, mg/l (as $CaCO_3$)	SM 2340B
pH, Standard Units	
Sulfates, mg/l	300.0

Specific conductance (SC), uS/cm [2]	120.1
Total Calcium, ug/l	200.7
Total Magnesium, ug/l	200.7
Total Potassium, ug/l	
Total Sodium, ug/l	
Total Dissolved Solids (TDS), mg/l	
Total Recoverable Antimony, ug/l	200.8
Total Recoverable Arsenic, ug/l	200.8
Total Recoverable Beryllium, ug/l	200.8
Total Recoverable Cadmium, ug/l	200.8
Total Recoverable Chromium (III), ug/l	
Total Recoverable Chromium (VI), ug/l	
Total Recoverable Copper, ug/l	200.8
Total Recoverable Iron, ug/l [1]	200.8
Total Recoverable Lead, ug/l	200.8
Total Recoverable Manganese, ug/l [1]	200.8
Total Recoverable Mercury, ug/l	1631E or 245.7
Total Recoverable Nickel, ug/l	200.8
Total Recoverable Selenium, ug/l	200.8
Total Recoverable Silver, ug/l	200.8
Total Recoverable Thallium, ug/L	200.8
Total Recoverable Zinc, ug/l	200.8
Turbidity, Nephelometric Turbidity Units (NTU)	

b. Sampling Location

The sampling should be conducted at each representative outfall, to be specified in the permit by KDOW. Selected outfalls for each receiving water body should be representative of the effluent being discharged from the mine site and expected by KDOW to have the greatest impact on downstream water quality (e.g., the mine site area which is currently undergoing the most mining disturbance, or the outfall with the largest discharge) based on data/information submitted in the permit application.

c. Sampling Frequency

The sampling frequency should be quarterly, at least 5 days apart, and the inches of precipitation for the previous 24 hour period should be measured at the sampling location should be recorded and reported as part of the sampling report. In the event that in-stream monitoring results (as described below) show in-stream conductivity levels above 400 uS/cm, the permittee is required to increase the monitoring frequency to 2 times per month, at least 5 days apart.

d. Reporting

All results should be reported to:

EPA-Wetlands, Coastal and Oceans Branch
61 Forsyth Street
Atlanta, GA 30303-8960

[2] Specific conductance, manganese, and iron need to be sampled at in-stream chemical monitoring locations only. These parameters are monitored as part of the NPDES permit effluent conditions.

WET Monitoring

Depending on the duration of the discharge, EPA believes coal mine permits should require the permittee to perform either acute or chronic WET tests on the representative outfalls (as specified above under "Effluent Monitoring") for surface mine discharges and for all underground mine discharges (as applicable). The results of WET monitoring will be used to determine the effectiveness of the BMPs.

In cases where monitoring data indicate a sedimentation pond with any volume of discharge lasting more than 4consecutive days, chronic WET tests should be performed using *Ceriodaphnia dubia* and *Pimephales promelas* and using a dilution series that includes 100 percent effluent and the in-stream waste concentration. The end points should be reported as the inhibition concentration that affects 25% of the test organisms compared to the control (IC_{25}). Sampling should be performed quarterly. The operator should use WET testing procedures outlined in EPA's document entitled, "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (October 2002).

In cases where the effluent discharge may be short in duration, it may be necessary to collect a high volume effluent sample and properly preserve it for use in the static-renewal test. Please refer to Section 8.5.4 on page 32 of EPA's document entitled, "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (October 2002). Alternative acute WET test organisms are either *Daphnia magna* or *D. pulex* and *Pimaphales promelas*. All results should be reported to KDOW.

In-stream Chemical Monitoring

The permittee should perform in-stream monitoring for the parameters listed above in Table 1, in accordance with 40 C.F.R. §122.44(d)(1)(vi)(C)(3). EPA Test Methods in 40 C.F.R. Part 136 should be used.

a. Sample Type
Grab samples should be taken whenever possible.

b. Sample Frequency
The sampling frequency should be quarterly, at least five days apart, until reclamation is completed and the final bond is released. In the event that monitoring results show in-stream conductivity levels above 400 uS/cm as a monthly average, the permittee should increase the monitoring frequency to 2 times per month, at least 5 days apart. The amount of precipitation for the previous 24 hour period should be noted.

c. Sampling Sites and Representative Outfalls
Samples should be taken from the following locations:

i. One sampling point located upstream of the sediment pond for each representative outfall, as specified above under "Effluent Monitoring." If there is no upstream location, an appropriate background location within the 12-digit hydrologic unit code should be used.

ii. One in-stream monitoring site located immediately below the toe of the sediment pond for each representative outfall, as specified above under "Effluent Monitoring."

iii. One sampling point located *the further* of 200 meters (656 feet) downstream of for each representative outfall, as specified above under "Effluent Monitoring," or the furthest downstream location that is upstream of any intervening tributaries. The sampling point should be downstream of riprap and other disturbance and located within a relatively natural and intact riparian zone.

iv. One sampling point located downstream of the first intervening tributary.

d. Conditions for Taking Samples
Samples should be collected during low- or base-flow conditions (e.g., not during, or within 24 hours after, a precipitation event).

e. New/Proposed Mines
For new/proposed mines, in-stream samples should be taken at a point upstream of the proposed outfall at a point near a representative proposed outfall which is up-gradient of any other confluence/stream segment and below the proposed representative outfall.

f. Test Methods
All analyses should be done using EPA methods in 40 C.F.R. Part 136; specific low-level methods for metals are indicated in Table 1.

g. Reporting
The permittee should submit the laboratory report showing the analytical results and the latitude and longitude of the sampling locations, to KDOW.

In-stream Biological Monitoring

The permittee should implement an annual benthic macroinvertebrate study plan during critical low-flow conditions using approved state protocols for benthic macroinvertebrate sampling.

a. Concurrent in-stream monitoring
In-stream samples for SC, TDS, pH, temperature and dissolved oxygen should be taken at the same locations as the benthic samples.

b. Methods
The permittee should implement an annual benthic macroinvertebrate study plan using approved state-protocols for benthic macroinvertebrate sampling.

c. Sampling Locations
Use the same locations as shown above for in-stream chemical monitoring.

d. Sampling Time
Sampling should be avoided during periods of excessive precipitation and scouring floods. In cases where a large flow rate of the receiving water does not lend itself to a benthic assessment (i.e., only has non-wadeable sites), the permittee should perform a bioassessment using fish. Both fish and benthic macroinvertebrate studies should be performed for receiving waterbodies that are conducive to fish assessments. Results from sampling either of the two assemblages may be used to determine if the water body is impaired.

e. Reporting

The permittee should submit the results of the study to KDOW no later than 30 days following the permittee's receipt of the final report.

Enclosure 2

Projected Adaptive Management Plan Implementation Timeline

Phase	**Action**	**Time allowed**	**Time since commencement of discharge of fill material**
Initial Monitoring		6 months	6 months
AMP Phase I	Submit AMP I	30 days after Initial Monitoring	7 months
AMP Phase I	Approve AMP I	not specified in Special Condition, estimate 45 days (1.5 months)	8.5 months
AMP Phase I	Implement AMP I	45 days after AMP I Approval	10 months
AMP Phase I	Monitor AMP I	6 months	16 months
AMP Phase II	Retain consultant	30 days after AMP I Monitoring	17 months
AMP Phase II	Develop and submit AMP II	90 days after Consultant Retained	20 months
AMP Phase II	Approve AMP II	not specified in Special Condition, estimate 45 days (1.5 months)	21.5 months
AMP Phase II	Implement AMP II	45 days after AMP II Approval	23 months
AMP Phase II	Monitor AMP II	6 months	29 months