US EPA ARCHIVE DOCUMENT

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

OCT 2 2 2010

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Sandy Gruzesky
Director, Division of Water
Kentucky Department for Environmental Protection
200 Fair Oaks Lane, 4th Floor
Frankfort, Kentucky 40601

Re: Notice of Specific Objection – Xinergy Corporation (KY0108014)

Dear Ms. Gruzesky:

On July 27, 2010, the above referenced National Pollutant Discharge Elimination System (NPDES) draft permit was received by the United States Environmental Protection Agency (EPA) Region 4 from the Kentucky Division of Water (KDOW). On August 25, 2010, EPA sent a letter to KDOW exercising the right to a 90-day review in accordance with Section IV.B.3 of the Commonwealth of Kentucky/EPA NPDES Program Memorandum of Agreement (MOA) and 40 Code of Federal Regulations (CFR) § 123.44(a). EPA has completed its review of the draft permit and is providing notice of its specific objection to the draft permit in accordance with MOA Section IV.B.7 and 40 CFR § 123.44.

40 CFR § 123.44(c) identifies the bases upon which EPA may object to an NPDES permit proposed by a state, which include:

> "The permit fails to apply, or to ensure compliance with, any applicable requirement of this part" [1] [123.44(c)(1)]; and
>
> "The effluent limits of a permit fail to satisfy the requirements of 40 CFR 122.44(d)" [123.44(c)(8)].

EPA's objections to the draft permit fit within these authorized bases for objections to proposed state permits. EPA's objection relates to KDOW's failure to conduct an adequate reasonable potential analysis (RPA), in accordance with 40 CFR § 122.44(d), to determine whether the proposed discharge will cause, have the reasonable potential to cause, or contribute to a violation of state water quality standards (WQS), and KDOW's failure to include in the permit effluent limits necessary to ensure that the proposed discharge will not cause or contribute to a violation of WQS, as required by the Clean Water Act (CWA) § 301(b)(1)(C), 40 CFR § 122.4((a) and (d)), and 40 CFR § 122.44(d)(1).

[1] This part refers to 40 CFR Part 123, which includes at 40 CFR § 123.25 a list of additional regulations applicable to State NPDES Programs. The regulations cited as a basis for objection in this letter are either contained in Part 123 or made applicable to state programs by 40 CFR § 123.25.

EPA's objections consider, in part, the emerging science regarding the impacts of surface coal mining on water quality. Scientific literature has increasingly recognized the relationship between discharges from surface coal mining operations and downstream water quality impairments.[2] In addition to these studies, KDOW's 2008 CWA § 303(d) list of impaired waters identifies 1,199 stream miles in the Upper Kentucky River watershed, 487 stream miles in the Upper Cumberland River watershed, and 780 stream miles in the Big Sandy/Little Sandy/Tygarts Creek watershed as impaired with coal mining identified as a suspected source. The "2008 Integrated Report to Congress on Water Quality in Kentucky" (305(b) Report) ranks total dissolved solids (TDS) as the 7th leading cause of pollution to Kentucky rivers and streams and ranks Specific Conductance (SC) as 17th. Only 12 percent of waters statewide have been assessed for impairments, and based on in-stream data available from surface mining permit applications and other sources, many unassessed streams receiving coal mine discharges are likely failing to meet WQS.[3]

This objection is also informed by the Permit Quality Review (PQR) recently conducted by EPA of State NPDES permitting practices for surface coal mines in West Virginia, Kentucky, Tennessee, and Ohio.[4] The PQR identified widespread concerns related to effective protection of downstream water quality consistent with CWA requirements, in particular with respect to compliance with narrative WQS. NPDES regulations at 40 CFR § 122.44(d)(1)(vi) are clear that NPDES permits must contain provisions implementing narrative WQS, and the RPA that must be completed for numeric WQS, must also be completed for narrative standards.[5] In the draft permit and fact sheet, RPAs for a variety of numeric and narrative Kentucky WQS are either absent or inadequate. A more detailed explanation of the reasons for EPA's objections and the actions that KDOW must take to eliminate the objections is provided below.

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[2] A 2003 published study, "Field and Laboratory Assessment of a Coal Processing Effluent in the Leading Creek Watershed, Meigs County, Ohio" by Kennedy, et al. linked elevated Specific Conductivity (SC) levels in the effluent to impaired, sensitive aquatic fauna. A 2004 Kentucky Department for Environmental Protection, Division of Water, Water Quality Branch study, "Effects of Surface Mining and Residential Land Use on Headwater Stream Biotic Integrity in the Eastern Kentucky Coalfield Region" found that the wholesale loss of mayflies at mined sites indicated that these organisms are especially sensitive to coal mine drainage. Dissolved solids emanating from hollow fills are a primary cause of biological impairment because of their severe impact to mayflies (a key component of headwater stream communities) and other sensitive taxa. A 2005 published study, "Evaluation of Ionic Contribution to the Toxicity of a Coal-Mine Effluent Using *Ceriodaphnia dubia*" by Kennedy, et al. linked impairment of aquatic life to elevated TDS levels. A 2008 published study, "Downstream effects of mountaintop coal mining: comparing biological conditions using family- and genus-level macroinvertebrate bioassessment tools" by Pond, et al. found evidence indicating that mining activities have subtle to severe impacts on aquatic life and the biological conditions of a stream. A 2010 published study, "Mountaintop Mining Consequences" by Palmer, et al. shows that ecological losses downstream of coal mining valley fills are associated with increased levels of TDS/SC, sulfates, and selenium. A 2010 published study by Pond, "Patterns of *Ephemeroptera* taxa loss in Appalachian headwater streams (Kentucky, USA)," links SC as the most strongly correlated factor to *Ephemeroptera* abundance in streams impacted by mining and residential development. A draft report by EPA, "The Effects of Mountaintop Mines and Valley Fills on Aquatic Ecosystems of the Central Appalachian Coalfields," found effects that include resource loss, water quality impairment, and adverse effects on aquatic resources. Finally, another draft report by EPA, "A Field-based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams" recognizes stream-life impacts associated with SC.

[3] KDOW's 2008 CWA § 303(d) list shows Straight Creek (mile 1.7 – 23.3) has a WAH impairment for coal mining related pollutants: sedimentation/siltation, SC, and sulfates.

[4] Review of CWA § 402 Permitting for Surface Coal Mines by Appalachian States: Findings and Recommendations (August 4, 2010).

[5] Kentucky's WQS include narrative standards for the protection of aquatic life, SC, TDS. "Total dissolved solids or specific conductance shall not be changed to the extent that the indigenous aquatic community is adversely affected." 401 Kentucky Administrative Regulations (KAR) 10:031, Section 4(1)(f); and "Surface waters shall not be aesthetically or otherwise degraded by substances that ... injure, are chronically or acutely toxic to or produce adverse physiological or behavioral responses in humans, animals, fish and other aquatic life" 401 KAR 10:031, Section 2. In addition, Kentucky has narrative standards for TSS and settleable solids. See 401 KAR 10:031(4)(1)(g) and (h); (g) Total suspended solids. Total suspended solids shall not be changed to the extent that the indigenous aquatic community is adversely affected; (h) Settleable solids. The addition of settleable solids that may alter the stream bottom so as to adversely affect productive aquatic communities is prohibited.

1. KDOW did not perform an adequate RPA for some pollutants and did not include appropriate effluent limits.

NPDES permits must contain limitations for all pollutants that have the reasonable potential to cause or contribute to violations of numeric or narrative WQS, as required under 40 CFR § 122.44(d). An adequate RPA is necessary to determine if the receiving water body (RWB) has sufficient assimilative capacity to ensure that the proposed discharges do not cause or contribute to violations of applicable numeric and narrative WQS. With respect to some coal mining related pollutants (metals, sulfates, SC, and TDS), KDOW did not perform an RPA, and failed to consider available information indicating that the proposed discharges do have the reasonable potential to cause or contribute to violations of applicable WQS. In the case of some other coal mining related pollutants (iron and total suspended solids (TSS)), KDOW performed an RPA, but failed to include in the draft permit effluent limits determined to be necessary by its own analysis. As a result, discharges that would be authorized by this permit may cause or contribute to violations of WQS.

A. KDOW did not perform an adequate RPA for some pollutants that are generally known to be present at significant levels in coal mine discharges.

KDOW did not conduct a complete RPA for metals (except for iron), sulfates, SC, or TDS to ensure that the proposed discharges would not cause or contribute to an excursion above any Kentucky WQS, including human health criteria, and acute and chronic aquatic life criteria. In the fact sheet, KDOW states that it had insufficient data to conduct the RPA for these pollutants and, therefore, is requiring five quarters of effluent monitoring for these pollutants, coupled with in-stream chemical and biological monitoring. KDOW proposes to conduct the required RPA during the permit term after it receives the results of the required monitoring and reopen the permit, if necessary, to add water quality based effluent limits (WQBELs).

While additional data on water quality is always welcome, this approach by KDOW does not consider available, valid, and representative data showing that the proposed discharges have the reasonable potential to cause or contribute to violations of WQS. Given the existence of information indicating that reasonable potential exists, KDOW's proposal to conduct the RPA during the permit term does not comply with the CWA and its implementing regulations, which require that the permit contain WQBELs for all discharges that have reasonable potential to cause or contribute to a violation of WQS (40 CFR § 122.44(d)(1)(iii, iv, vi)).

In explaining its decision to not conduct the required RPA for these pollutants, KDOW states in the Fact Sheet:

> The Division of Water's "procedures for determining "reasonable potential" requires a minimum of five (5) effluent samples for analysis. The permittee in conformance with the application requirements of Form C submitted one effluent analysis. Therefore, insufficient effluent data from the operation is available to determine the "reasonable potential" for the permittee to cause or contribute to an excursion above a water quality standard. The permit

has been conditioned to require the collection and submission of this analytical data within two (2) years of its effective date." [6]

EPA believes that these procedures are an insufficient basis for KDOW's failure to perform an RPA based on available data. KDOW's procedures also provide, in Section V, that "in determining reasonable potential, the agency will assume any single data point to be representative of the discharge." Moreover, the procedures KDOW cites and their preference for having a more robust data set for conducting an RPA cannot justify a failure to conduct the RPA using valid and representative data and information that is available. In cases where site-specific data is unavailable, KDOW can characterize the effluent using data from similar discharges from nearby or adjacent mining facilities having similar geologic characteristics as the mine under review, and/or from ambient data collected as part of the CWA § 404 (if applicable) or Surface Mining Control and Reclamation Act (SMCRA) permit applications, or other sources of information about the likely composition of the effluent. KDOW could have independently sought to obtain such data or rejected the application as not sufficient and required additional data from the applicant. Instead, KDOW submitted the draft permit to EPA without considering or obtaining additional effluent data.

In addition to data from other similar and nearby mines, and available in-stream data, KDOW should also have considered and addressed the status of RWBs as already impaired for coal-mining pollutants, and the numerous studies, including those identified in footnote 2 that demonstrate a relationship between discharges from surface coal mines and downstream water quality impairments. KDOW has discounted the findings of those studies as not necessarily representative of site-specific conditions, but failed to develop site-specific information to counter the studies and inform the RPA for the draft permit. Given the existence of information indicating that reasonable potential does exist, KDOW's approach of deferring an RPA to the middle of the permit term is inadequate. If EPA was issuing this permit, EPA would perform an RPA using EPA's *Technical Support Document for Water Quality-Based Toxics Control*, which provides guidance on conducting RPAs and setting WQBELs.[7] EPA would include in the permit effluent limits necessary to meet WQS based on the results of the RPA. In performing the RPA, EPA would

[6] The KDOW approach of authorizing the discharge without WQBELs and monitoring to resolve uncertainties regarding the effluent composition might be appropriate if available information, including information about the likely composition of the effluent, such as data from reference facilities, available instream data, and scientific literature about the relationship between coal mine discharges and impacts to aquatic life, did not support a determination that there is reasonable potential that the proposed discharges will cause a violation of WQS. It is not uncommon for permitting authorities to authorize a discharge and require monitoring to address data gaps and later revisit the reasonable potential analysis to ensure ongoing protection. EPA is not rejecting such an approach where warranted by available information. In this case, however, existing information regarding the relationship between coal mining discharges and water quality impairments, together with available information regarding the effluent and the receiving streams, renders such an approach inconsistent with the CWA.

[7] Where EPA has approved more than one analytical method for a pollutant, the Agency expects that applicants and permittees would select methods that are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Criteria. NPDES permit applicants should not use a less sensitive or less appropriate method, thus masking the presence of a pollutant in the discharge, when an EPA-approved method is available that can quantify the pollutant concentration at the lower levels needed for permit decision making. For purposes of permit applications and compliance monitoring, a method is "sufficiently sensitive" when (1) the method quantitation level is at or below the level of the applicable water quality criterion for the pollutant or (2) the method quantitation level is above the applicable water quality criterion, but the amount of pollutant in a facility's discharge is high enough that the method detects and quantifies the level of pollutant in the discharge.

consider relevant and available information, including the studies cited above in footnote 2, and available data (including data from discharge monitoring reports, surface water monitoring reports, CWA § 404 permit application (if applicable), SMCRA permit application, and representative data from other sites).

B. KDOW's draft permit does not include effluent limits determined to be necessary by its own RPA for iron and TSS.

KDOW conducted an RPA for certain pollutants (iron, TSS, and settleable solids) for which it deemed existing data adequate to support its analysis. However, KDOW did not include effluent limits for iron and TSS in the draft permit that, under its own RPA, are necessary to ensure compliance with WQS.

i. Iron

KDOW conducted an RPA for iron and determined that an average monthly limit (AML) of 3.5 mg/l was necessary to ensure compliance with Kentucky's chronic aquatic life criteria, and that a maximum daily limit (MDL) of 4.0 mg/l was necessary to ensure compliance with Kentucky's acute aquatic life criteria. KDOW compared these limits to new source performance standards (NSPS) in 40 CFR Part 434 to determine which was more stringent and, therefore, controlling. However, in the draft permit, KDOW did not apply the WQBELs to post-mining areas and precipitation-induced discharges even though the WQBELs were more stringent. Accordingly, the draft permit fails to ensure compliance with WQS for iron with respect to discharges from post-mining areas and precipitation-induced discharges. To adequately protect water quality, the draft permit must apply the WQBELs of 4.0 mg/l as an MDL and 3.5 mg/l as an AML to post-mining areas and precipitation-induced discharges.

ii. TSS

KDOW conducted an RPA for TSS and found that discharges controlled by the effluent limits established by the NSPS at 40 CFR Part 434 would not cause or contribute to violations of WQS. KDOW based its conclusion for TSS on a 2006 study which suggested that impacts to benthic macroinvertebrates were observed when the in-stream TSS concentration was increased by 40 mg/l or more.[8] Based on a pristine stream with an average flow of zero cfs, KDOW arrived at an end of pipe effluent limit of 40 mg/l. Noting that this is less stringent than the NSPS limit of 35 mg/l as a monthly average, KDOW's fact sheet states that "the numeric effluent guideline requirement prevails." Under KDOW's draft permit, however, the more stringent NSPS limit of 35 mg/l is not applicable to post-mining discharges or precipitation-induced discharges. The draft permit does not impose any TSS effluent limit on post-mining areas or on precipitation-induced discharges, since the NSPS does not impose any limit on TSS for precipitation-induced or post-mining discharges. Thus, with respect to discharges of TSS from post-mining areas and precipitation-induced discharges,

[8] Suspended Solids and Turbidity Requirements of Freshwater Aquatic Life and Example Relationship Between TSS (mg/l) and Turbidity (NTUs) for a Treated Municipal Effluent (Robertson-Bryan, Inc., March 2006).

the draft permit fails to ensure compliance with WQS. To adequately protect water quality, the draft permit must apply the WQBEL limit of 40 mg/l to post-mining areas and precipitation-induced discharges.

C. Additional Errors in KDOW's RPA.

EPA notes other errors in KDOW's RPA, which are similar to those EPA has seen when reviewing other KDOW permits. Each of these errors can have the effect of underestimating the reasonable potential that these discharges will cause or contribute to an exceedance of WQS.

- KDOW's RPA assumes a background concentration of zero. This is not a reasonable assumption except in the case of streams for which the 7Q10 flow is zero cfs, in which case the RPA would be based on effluent alone without dilution from stream flow.[9] KDOW should have obtained actual in-stream data, or if such data was unavailable, used stream data from a reference stream with a similar flow and level of mining activity. Alternatively, KDOW can request the applicant supply in-stream background data prior to permit issuance pursuant to 40 CFR § 122.21(g)(13).

- KDOW's RPA assumes that discharges from the active mining areas are precipitation-dependent. Sedimentation ponds at surface coal mining sites can discharge continually or intermittently but frequently. Thus, in the absence of data regarding discharge flow duration and frequency, it is not appropriate to assume that the discharges will only occur with precipitation. To ensure that protective limits are included in the permit, KDOW should have assumed continuous discharges.

- KDOW inappropriately applied a mixing zone when conducting an RPA for the chronic aquatic life criteria, which is not appropriate for a receiving stream that is dominated by effluent. The fact sheet states that the basis for using a mixing zone is 401 Kentucky Administrative Records (KAR) 10:029, Section 4(c), which states that the mixing zone "shall not exceed 1/3 of the width of the receiving water." 401 KAR 10:029 Section 4(e) provides more guidance on the applicable use of mixing zones which states "An assigned mixing zone shall be limited to an area or volume that shall not adversely affect the designated uses of the receiving water and shall not be so large as to adversely affect an established community of aquatic organisms." The use of mixing zones is not appropriate in streams where the flow rate is low, the stream width is small, and the mining discharge is the dominating cause of flow in the stream.

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[9] Assuming background concentrations of zero is inconsistent with KDOW's own procedures for conducting RPAs unless KDOW has first made a demonstration that it has reviewed all available data and information. Section V of KDOW's document entitled *Permitting Procedures for Determining Reasonable Potential* (dated May 1, 2000) states, "In the absence of any data in close proximity to the discharge, the reviewer will generally assume background levels of zero for use in the respective computations. Prior to making this assumption, a review of all available data will be performed. This review will include, but not limited to data available in STORET, data collected as a result of watershed studies, and other site-specific studies when available."

2. **Effluent limits are necessary to ensure that discharges do not cause or contribute to violations of WQS.**

Effluent limitations are required for any pollutant or pollutant parameters for which there is reasonable potential for the discharge to cause or contribute to an excursion above WQS according to 40 CFR § 122.44(d)(1)(i). To address EPA's objection KDOW must submit a revised permit with effluent limitations that are as stringent as necessary to meet applicable narrative and numeric WQS.

A proposed permit and revised fact sheet must be submitted to the Agency in accordance with the provisions of 40 CFR § 123.44(j) and MOA Section III.B.6. EPA also asks that KDOW submit a summary of all public comments that have been received for the draft permit and KDOW's response to them. Within ninety (90) days of the receipt of this letter, KDOW, or any interested person may request that a public hearing be held in accordance with MOA Section IV.B.7 and 40 CFR § 123.44. If a public hearing is not held and KDOW does not submit a proposed permit that has been revised to meet our specific objection within ninety (90) calendar days of receipt of this letter, exclusive authority to issue the permit passes to EPA for one permit term in accordance with 40 CFR § 123.44(h). Any requests for a hearing on the objection and the procedures for resolving any objection shall be governed by 40 CFR § 123.44, as provided in MOA Section IV.B.7.

EPA commits to working with KDOW to resolve the issues in a manner that ensures that the permit will be consistent with the requirements of the CWA. If you have any questions, please call me at (404) 562-9345 or Mark Nuhfer of the Municipal and Industrial NPDES Section at (404) 562-9390.

Sincerely,

James D. Giattina
Director
Water Protection Division

cc: Mr. John Ledington
Xinergy Corporation