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OHIO EPA - DSW
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PUBLIC NOTICE NO: OEPA 13-05-106 DFT
OHIO EPA PERMIT NO: 0IL00102*DD

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June 3, 2013

CERTIFIED MAIL, RETURN RECEIPT REQUESTED

Ohio Environmental Protection Agency
Lazarus Government Center
Division of Surface Water
Permits Processing Unit
50 West Town Street, Suite 700
PO Box 1049
Columbus, Ohio 43216-1049

Ohio Environmental Protection Agency
Southeast District Office
2195 Front Street
Logan, Ohio 43138

*Re: Ohio EPA Permit No. OIL00102*DD*

Dear Sir or Madam:

Oxford Mining Company LLC (Oxford) respectfully requests an extension of time to respond to the conditions in draft Ohio EPA permit No. OIL00102*DD. The Ohio EPA has provided some numbers that allegedly form the basis for the specific numeric limits in the Draft Renewal. However, Oxford has not had a chance to evaluate these numbers and compare them to data already gathered under prior permits to determine if these specific limits are needed to protect water quality. Oxford requests a 180 day extension to submit additional comments.

Enclosed please find the comments of the Oxford prepared to date on the draft Ohio EPA Permit No. OIL00102*DD proposed on May 7, 2013 to be issued as a renewal (Draft Renewal). The Draft Renewal covers two outfalls of the Strasburg coal preparation plant. The coal preparation plant discharges (a) from outfall 002 to an unnamed tributary which then discharges to a ditch along I-77 which then discharges eventually into Sugar Creek and (b) from outfall 013 to an unnamed tributary which

discharges into a ditch along I-77 which eventually discharges to Sugar Creek. Please include these comments in the administrative record for this Draft Renewal.

Outfall 013 (not 003) is currently covered in a General NPDES Permit . Under the General Permit the outfall has manganese limits of 4000 ug/l as a daily maximum and 2000 ug/l as a monthly average. No information came with this draft explaining why an outfall already under a General NPDES permit was being given different limits by this Draft Renewal.

Ohio EPA's Draft Renewal includes new limits for Residue, Total Filterable (aka Total Dissolved Solids (TDS)), sulfate and manganese (Mn) that are unreasonable and unlawful. Among other things, Oxford objects to the inclusion of these new limitations for the reasons set forth below.

Ohio EPA has not provided Oxford with any documents, information or records that show that the Director considered the technical feasibility and economic justification for requiring the removal of TDS, sulfate and manganese from these discharges. The Director and OEPA have presented no evidence "relating to the technical feasibility and economic reasonableness of removing . . . " sulfate, TDS and manganese and no evidence that imposing these limits will benefit the people of the state as required by O.R.C. § 6111.03(J)(3).

The Director cannot legally issue the Draft Renewal as a final, enforceable permit until the Director identifies the statutorily mandated evidence, completes the statutorily mandated analysis and makes the evidence and analysis available to Oxford and the public.

According to research by the Illinois Environmental Protection Agency, that agency has granted adjusted standards and site specific relief for sulfate and TDS "because there are <u>no economically reasonable technologies</u> that remove these parameters from water." "Draft Justification for Changing Water Quality Standards for Sulfate, Total Dissolved Solids and Mixing Zones" Illinois Environmental Protection Agency, 9-28-06, p. 22.

Ohio EPA has unreasonably and unlawfully included proposed TDS and sulfate limits in the Draft Renewal. Ohio EPA has provided no evidence that such limits are necessary to protect water quality in the "unnamed tributary to Sugar Creek". Actually, there are two unnamed tributaries. Both unnamed tributaries discharge to a roadside ditch running along I-77. OAC § 3745-1-24, Table 24-1 "Use designations for water bodies in the Muskingum river drainage basin" does not list any direct unnamed tributaries to Sugar Creek. Therefore, the unnamed tributary (which should be tributaries) referenced in the Draft Renewal has no designated use. The Agency has established no relationship between imposing these sulfate and TDS limits and meeting a water quality standard in the unnamed tributaries to Sugar Creek. As explained below, the limits are not based on actual data or legitimate calculations. To issue a lawful and reasonable final permit, the Director needs to remove the TDS and sulfate limits.

1. Problems with the Sulfate Standard

The Draft Renewal establishes a sulfate limit of 1158 mg/l for both Oxford outfalls at the Strasburg coal preparation plant. In imposing a sulfate limit, OEPA has exceeded its legal authority. In addition, OEPA does not have the data to support 1158 mg/l as a necessary and appropriate effluent limitation required to protect water quality.

First, Ohio has no sulfate water quality standard for the protection of aquatic life. *See*, OAC 3745-1-07, Table 7-1. Because Ohio has no legally promulgated water quality standard for sulfate, Ohio EPA has attempted to establish a de facto water quality standard by policy memoranda such as the October 13, 2010 Memorandum from Skalski and Dudley to Hall ("Skalski Memorandum") and the December 27, 2010 Nygaard Memorandum ("Nygaard Memorandum"). *See* attached. The use of such policy as a substitute for regulation is both unlawful and unreasonable. As Ohio's Environmental Review Appeals Commission recently affirmed, guidance cannot be used in place of rules to regulate water quality in Ohio. *See*, *Oxford Mining Company v. Nally*, ERAC 12-256581 (Memorialization of Oral Argument and Ruling on Motion, Sept. 12, 2012); *see also*, *Iowa League of Cities v. Environmental Protection Agency*, No. 11-3412, 2013 WL 1188039 (C.A. 8, 2013) ("As agencies expand on the often broad language of their enabling statutes by issuing layer upon layer of guidance documents and interpretive memoranda, formerly flexible strata may ossify into rule-like rigidity. An agency potentially can avoid judicial review through the tyranny of small decisions. Notice and comment procedures secure the values of government transparency and public participation.").

Ohio EPA has not established that the unnamed tributaries to Sugar Creek are failing to meet a water quality standard because of sulfate concentrations in them. Ohio EPA has not identified what aquatic life, public water supply or other designated use are not being attained in the unnamed tributaries because of sulfate concentrations.

Second, the formula used by Ohio EPA to set the 1158 mg/l sulfate limit is based on data derived from work done in Illinois. Illinois developed a formula to calculate a sulfate water quality standard for the protection of aquatic life in a given body of water based on the hardness and chloride content of the water. Skalski Memorandum at 1. Ohio EPA has not presented any data that it developed a standard for sulfate that is actually applicable to Ohio streams or engaged in the process required by OAC 3745-1-36 ("all pollutants or combination of pollutants <u>for which aquatic life criteria have not been adopted in Rule 3745-1-07</u> . . . shall not exceed the water quality criteria or values derived <u>using the procedures . . . ." in 3745-1-36</u> (emphasis added)) to develop a sulfate aquatic life criteria. Ohio EPA's existing regulations have detailed formulas for arriving at concentrations that have acute effects and chronic effects outside a mixing zone. Nothing in the Draft Renewal or its "supporting" documents indicates Ohio EPA engaged in any of the necessary studies required by law in order to formulate a sulfate standard.

Unlike the Ohio proposed sulfate permit condition, Illinois' sulfate standard was proposed through its formal rulemaking processes. At the same time Illinois proposed its sulfate standard it proposed to delete its TDS water quality standard. *See*, Notice of Filing, Illinois Pollution Control Board No. R07-009, at 10-11. Ohio has not initiated any rulemaking to set a sulfate standard nor has it engaged in any of the research and testing that would support such a standard.

Ohio EPA has no legal or factual basis to apply an Illinois water quality standard to Ohio waters. Ohio has no properly researched and legally adopted water quality standard for sulfate.

Absent a formal rulemaking process, backed by data collected in Ohio, and data showing that the designated uses of the receiving unnamed tributaries are impaired by sulfates, Ohio EPA must remove the unsupported sulfate limit in the Draft Renewal.

Third, Ohio EPA provided one sheet with a few numbers on it that purportedly was the basis for running the Illinois formula. Even if the deficiencies above were corrected, this "documentation" is insufficient to establish that the sulfate limit in the Draft Renewal is necessary and is supported by science.

Fourth, the receiving waters are unnamed tributaries to Sugar Creek which have no designated use in OAC 3745-1-24.

When Chris Skalski wrote his Memorandum, ODNR raised many of these same concerns with Ohio EPA and these concerns have never been addressed. *See*, Attachment B, Comments of ODNR ("What is the validity of applying . . . State of Illinois sulfate equations to Ohio?"; "What Ohio did not do . . . (with respect to the Illinois study) was to evaluate based on their own similarities to primary pollutants from TDS. Ohio is simply adapting numeric criteria from other states (which are not part of the Western Allegheny Plateau) without gathering our own (Ohio) data."; "Ohio should conduct and evaluate our own sulfate toxicity study with respect to how it will affect aquatic resources.") This study is required under OAC 3745-1-36.

2. Problems with the TDS Limit

Ohio EPA points to work done in Illinois to support its Draft Renewal. In a document entitled "Draft Justification for Changing Water Quality Standards for Sulfate, Total Dissolved Solids and Mixing Zones," prepared by The Illinois Environmental Protection Agency and dated 9-28-06 ("Justification"), Illinois states the TDS standard "has been evaluated and found to be both ill-suited and unnecessary for the protection of aquatic life. Therefore, the Illinois EPA proposes to delete the TDS standard . . . ." p. 16.

The Draft Renewal sets a TDS limit of 1500 mg/L as a 30-day average. This 1500 mg/L dissolved solids number is an "Outside the Mixing Zone Average" water quality criteria under OAC § 3745-1-07, Table 7-1, Statewide water quality criteria for the protection of aquatic life. The 1500 mg/l TDS number is not an effluent limit but it is

being used as an effluent limit in this Draft Renewal. According to Ohio EPA regulations, 1500 mg/l is the average concentration of TDS that should be achieved in a receiving stream outside the mixing zone. The Draft Renewal makes no mention of any mixing zone.

Ohio EPA has done no evaluation on the concentrations of TDS entering these unnamed tributaries above the Strasburg outfalls.

Mixing Zone

If Ohio EPA were following the structure of the CWA it would calculate an individual TDS effluent limit for each outfall based on each receiving tributary achieving an in-stream concentration of 1500 mg/l TDS outside the mixing zone. Instead the Director has imposed an in-stream water quality criteria as an effluent limit and provided no mixing zone.

In Illinois, the EPA proposed changes to mixing zone regulations that would "work in tandem with General Use standards to protect water body uses yet allow for economic growth." Justification, p. 18. Ohio EPA is providing no flexibility in this regard.

3. Additional comments on specific sections of Draft Renewal

a. Regarding page 2 -- 002 Interim Effluent Limitations

i. The iron limits are: 6000 ug/l for daily maximum

3000 ug/l for monthly average

The Strasburg coal preparation plant has been in operation since the early 1970's. This is a renewal permit. The above limits of 6000 and 3000 are for facilities built after the coal regulations went into effect. In other words, Ohio EPA has imposed New Source Performance Standards on an existing source. The appropriate standards are the Best Available Technology standards for iron of 7000 ug/l daily maximum and 3,500 ug/l as a 30 day average. Pease change the iron limitations to the appropriate BAT effluent limits.

ii. Manganese limit is 2000 ug/l for a daily maximum

The Best Available Technology (BAT) effluent limitations for manganese in 40 CFR § 434.23(a) are: 4000 ug/l for a daily maximum and 2000 ug/l for a monthly average. **Please change the manganese limitation to the concentrations found in 40 CFR § 434.23(a). There is no legal basis for a 2000 mg/l daily maximum limitation.**

b. Regarding page 4 -- 002 Final Effluent Limitations

i. Sulfate limit is 1158 mg/l daily maximum.

Please remove the Sulfate limit for the reasons stated above.

ii. Iron. See previous comment in 3.a on iron.

iii. Manganese. See previous comment in 3.a on manganese.

iv. Residue, Total Filterable (aka TDS and aka DS) is a 1500 mg/l monthly average.

Please remove the Residue, Total Filterable limit for the reasons stated above.

c. The permit's final effluent limitations become effective three (3) years from permit issuance.

Does OEPA have a list of options that the Agency knows would achieve with the final limits within three years taking into account technical feasibility, the economic justification for the expenditure and the actual benefit to the public? Why is it technologically feasible and economically justifiable to impose these final limits on Outfall 002? See analysis by Illinois Environmental Protection Agency, that "there are no economically reasonable technologies that remove [the sulfate and TDS] parameters from water." (emphasis added) Justification, p. 22.

d. Regarding page 6 -- 013 Interim Effluent Limitations

i. Iron. See changes to limits requested in discussion above in 3.a.

ii. Manganese. See changes to limits requested in discussion above in 3.a.

e. Regarding page 8 -- 013 Final Effluent Limitations

i. Iron. See discussion above for why modifications are needed.

ii. Manganese. See discussion above for why modifications are needed.

iii. Sulfate. See discussions above for reasons why sulfate limits need to be removed.

iv. Residue, Total Filterable. See discussion above for reasons why these limits (aka TDS aka DS) need to be removed.

f. The permit's final effluent limitations become effective three (3) years from permit issuance.

Does OEPA have a list of options that the Agency knows would achieve compliance with the final limits within three years? Why is it technologically feasible and economically justifiable to impose these final limits on Outfall 013? See analysis by Illinois Environmental Protection Agency, that "there are no economically reasonable technologies that remove [the sulfate and TDS] parameters from water." (emphasis added) Justification, p. 22.

g. Regarding page 10

Based on preliminary investigation, the Best Available Technology economically achievable will not achieve compliance with the sulfate and TDS limitations three years from issuance of this draft permit in a technically feasible, economically justifiable and cost-effective manner.

h. Compliance Schedule

A compliance schedule is unreasonable because treatment is technically unfeasible and economically unjustifiable.

i. Regarding page 11

The correct description of the discharge sequence is a discharge from Outfall 001 to an area designated 002a which then discharges through Outfall 002 to an unnamed tributary.

j. Regarding page 16

The requirements for signs satisfies no water quality purpose. Installing and maintaining signage is an unnecessary expense which does nothing to improve water quality.

k. Pond sludge removal

Removal of pond sludge is a routine activity undertaken by Oxford under its ODNR mining permit. Adding NDPES pond cleanout requirements on top of the existing ODNR requirement imposes additional paperwork and administrative burdens on Oxford without achieving any water quality improvement. The water quality protection is already occurring under the drainage control requirements of the ODNR permit. Please remove these requirements from the Draft Renewal.

l. Regarding Page 37

The pond inspection schedule goes beyond existing ODNR requirements. Please remove these duplicative inspections.

m. Regarding Page 38

Oxford already makes visual assessments of storm water discharges under its ODNR permit. Adding these requirements imposes paperwork and administrative burdens which do not improve water quality. Please remove them.

n. Regarding page 39

The compliance inspection requirements require additional paperwork beyond what is required by the ODNR. Please remove these requirements.

o. Regarding SWPPP requirements on pages 40, 41, 42, 43 and 45

Oxford already has prepared, through the engineering drawings for drainage control required by its ODNR mining permit, a plan to control pollution from storm water runoff. Requiring a second plan duplicates effort and expense but contributes nothing to water quality improvement. Please substitute the Strasburg ODNR permit drainage control plans for the SWPPP requirements.

p. Regarding pages 46, 47 and 48

The maintenance of sediment basins is taken care of in the ODNR permit drainage control requirements already applied to Strasburg.

q. Regarding pages 49, 50 and 51

Inspections are already being performed at Strasburg. Additional inspections plus the expense of additional paperwork contributes nothing to water quality. Please remove these requirements.

For the above reasons, Oxford requests changes in the draft as stated above and also requests a six month extension to gather additional data on technical infeasibility and the unjustifiable costs of these proposed effluent limitations.

Sincerely,

Maureen A. Brennan

Maureen A. Brennan

enc. 3

cc: R. Smith
N. Leggett
C. Butler
E. Hansen
M. Gardner

Interoffice Memo

Ohio Environmental Protection Agency

To: Brian Hall, Assistant Chief, DSW

From: Chris Skalski, STS and Dan Dudley, Manager, STS

Date: October 13, 2010

Re: Sulfate and Chloride Limits for Use in the Coal Mining General Permit

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As requested, we have developed limits for the new coal mining general permit (GP). We have assumed the GP situation calls for applying limits to discharge points without dilution. Contact one of us if further discussion is needed regarding our rationale for the specification as daily limits vs. 30-day limits or the selection of ambient water quality conditions.

	Chloride		Sulfate	
Intended Application	Daily limit	30-day limit	Daily limit	30-day limit
Previously un-mined areas	600 mg/l	370 mg/l	820 mg/l	510 mg/l
Re-mined areas	630 mg/l	390 mg/l	1,900 mg/l	1,200 mg/l

The derivation of these limits is explained below.

Water Quality Criteria Equations

Chloride

The State of Iowa, in consultation with staff from USEPA, recently adopted numeric criteria for chloride to protect aquatic life. The criteria vary depending upon the background hardness and sulfate content of the receiving water and are expressed in the form of the following equations:

$$\text{Acute Chloride Criterion} = 287.8 * (\text{hardness})^{0.205797} * (\text{sulfate})^{-0.07452}$$
$$\text{Chronic Chloride Criterion} = 177.87 * (\text{hardness})^{0.205797} * (\text{sulfate})^{-0.07452}$$

The acute and chronic chloride criterion equations were used to calculate the recommended daily limit and 30-day limit, respectively. See the next page for a description of how the background hardness and sulfate inputs were determined. The ratio of acute to chronic chloride criteria (1.62) was used below to help determine a 30-day limit for sulfate.

Sulfate

The Illinois EPA, in consultation with staff from USEPA, recently adopted acute numeric criteria for sulfate to protect aquatic life. The criteria vary depending upon the background hardness and chloride content of the receiving water and are expressed in the form of the following equation:

$$\text{Acute Sulfate Criterion} = [-57.478 + 5.79\ (\text{hardness}) + 54.163\ (\text{chloride})] * 0.65$$

This equation, which is applicable for receiving waters with chloride levels of 5-25 mg/l and hardness of 100-500 mg/l $CaCO_3$, was used to calculate the recommended daily limit. See the next page for a description of how the background hardness and chloride inputs were determined.

There were not enough data to calculate chronic water quality criteria for sulfate. Illinois EPA concluded that toxicity to sulfate is probably due to the initial osmotic shock and that that the acute

criteria would probably be protective of long term exposures as well. To provide a better assurance that long term exposures are protective, we divided the recommended daily sulfate limit by the ratio of acute to chronic chloride criteria (1.62) to determine the recommended 30-day sulfate limit.

Ambient Water Quality Conditions

An examination of the ambient data in Ohio's water quality database was made to determine the hardness, chloride and sulfate background conditions for use in the water quality criteria equations above.

Water quality data from the Western Allegheny Plateau (WAP) ecoregion were used because the majority of coal mining activities within Ohio take place within the WAP ecoregion. Two cohorts of data were examined: "reference" and "mine-impacted". The reference cohort consists of water quality data associated with stations identified as such in Ohio's database. The mine-impacted cohort consists of water quality data associated with stations located within the historically surface coal mined region of Ohio at the HUC-12 (12-digit Hydrologic Unit Code) watershed scale using a GIS layer obtained from ODNR. The statistical derivations in the table below are based on the central tendency of the data for each station (either median or arithmetic mean was used, based on the amount of data available for each station).

Statistics for stations located in the WAP ecoregion[1]. Bolded values were used in the water quality criteria equations to calculate water quality criteria for sulfate and chloride.

	Reference Sites			Mine-affected Sites		
Percentile	Hardness	Sulfate	Chloride	Hardness	Sulfate	Chloride
10	**116**	**25**	**12**	120	38	8
25	145	33	18	196	72	13
50	208	53	27	**281**	**153**	**24**
75	258	142	40	417	360	44
95	419	259	86	948	945	126

[1]All units in mg/l

Selection of background values used to calculate the sulfate and chloride water quality criteria in the context of the general permit for coal mining were guided by two principles:

- Protection of aquatic life in a broad application
- Promotion of re-mining in abandoned mine lands

The 10th percentiles associated with the reference sites in the WAP ecoregion are recommended for discharges to streams in previously un-mined areas, while the 50th percentiles associated with the mine-affected sites in the WAP ecoregion are recommended for re-mining discharges. Use of the 10th percentile will ensure that the resulting permit limits are protective of aquatic life in the majority of situations where low hardness values are typical. Higher hardness values can be expected in areas of abandoned mine land and we believe using the 50th percentile will be protective of aquatic life and is in keeping with a public policy of promoting re-mining and resulting land restoration.

ATTACHMENT B

Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR | SEAN D. LOGAN, DIRECTOR

John F. Husted, Chief
Ohio Department of Natural Resources
Division of Mineral Resources Management
2045 Morse Road, Building H-3
Columbus, OH 43229-6693
Phone: (614) 265-6633 Fax: (614) 265-7998

November 19, 2010

Mr. Brian Hall
Assistant Chief, Division of Surface Water
Ohio Environmental Protection Agency
P.O. Box 1049
50 West Town Street
Columbus, Ohio 43216-1049

Dear Mr. Hall:

On November 10, 2010 the OEPA requested the Division of Mineral Resources Management (DMRM) to provide comments on the attached memo regarding sulfate and chloride limits for use in the coal mining general permit dated October 13, 2010.

Attached are comments from the DMRM staff regarding the October 13 memo. We would like to arrange a meeting to discuss these comments. Please coordinate directly with Brent Heavilin on arranging this meeting. Brent can be contacted at 740-439-9079 or 740-398-0987.

Thank you for the opportunity to comment on OEPA's proposed General Water Quality Permit water quality standards for coal mining permits.

Sincerely,

John F. Husted
Chief

JFH:cs

Attachment

C: Lanny Erdos, MRM
Dave Clark, MRM
Brent Heavilin, MRM
Mike Dillman, MRM
Cheryl Socotch, MRM
George Elmaraghy, OEPA
Craig Butler, OEPA

OEPA Draft NPDES Coal Mining General Permit for Chloride and Sulfate – OEPA Interoffice Memo dated October 13, 2010
Draft Comments
Mike Dillman, Geologist 3 – Div. of Mineral Resources Management
November 15, 2010

1. How were the equations derived? The equations were checked and the attached spreadsheet is provided.

2. What is the validity of applying State of Iowa chloride and State of Illinois sulfate equations to Ohio?

3. The document states that the chloride and sulfate criteria were developed from the equations to protect aquatic life. It is not clear whether the equations were originally developed for the determination of water quality standards or point source effluent limitations (understanding that point source discharges need to protect aquatic life). In addition, percentile concentrations have been plugged into the equations to determine an effluent limit when it appears that the original intent for the equations was to develop criteria that would vary depending on the background hardness, sulfate, and/or chloride values of the "receiving water." Therefore, the apparent change in usage of the equations should be validated.

4. The document should discuss the relationship between "acute" and "daily," as well as between "chronic" and "30-day."

5. What is the basis for applying the chloride acute-to-chronic ratio to sulfate?

6. The mine-impacted water quality data was determined from gauging stations at the HUC-12 level. It is not clear, for the "mine-impacted" data, whether the sites evaluated were actually downstream of mines, or just in a HUC where mining occurred. In addition, it should be noted that the values in the table on page 2 (and plugged into the equations on page 1) are mean values.

7. The table on page 2 shows that chloride at "mine-affected" sites is essentially the same as at the reference sites until the 95th percentile is reached. Therefore, what is the rationale for including a mining-related limit for chloride?

8. How would the values for the "re-mined" areas be applied? Would drainage from remining and non-remining areas on a permit need to be separated? Remining modified NPDES effluent limits are calculated in loadings, and require a certain evaluation protocol and statistical analyses. Separate effluent limits for remined areas are valuable, but the fact that a remining area might have both the proposed limits for chloride and sulfate in mg/l and the

Rahall Amendment limits in loadings (with very different evaluation methods) needs to be considered.

9. How would these values apply to precipitation events?

10. A DMRM AML document from January 2010, titled "Screening Guidelines for the Identification of Acid Mine Drainage (AMD) Impaired Watersheds and for Acid Mine Drainage Abatement and Treatment (AMDAT) Plan Selection and Prioritization" states that "regional baseline conductivity is <800uS/cm." This statement might need to be considered in the evaluation of the proposed levels for chloride and sulfate. Also, OEPA needs to address why the focus is on sulfate and chloride, rather than specific conductance and TDS, given that previous discussions dealt with conductance and TDS.

11. What can we get from the water database to evaluate the values presented for the reference and mine-affected sites?

12. George M. was consulted regarding oil and gas drilling and made the following comment on chlorides: "The problem I see with chlorides is that a major portion of chloride water problems are due to leaky, old oil & gas wells, regardless of whether they are producing, shut-in, orphaned (production equipment has been pulled, but they haven't yet been plugged), or plugged (either poorly plugged according to current standards due to sloppy workmanship or implementation of lax standards in existence at the time of abandonment). Consequently, coal mining operations would be jeopardized due to background conditions that first, have nothing to do with mining, and second, are often not readily remedied, if at all. This is could be a particularly large problem in Ohio, given the fact that much, if not most, of the coal-mining areas are located within areas of historic (i.e., pre-1960's) oil & gas operations. To provide perspective on this situation, it must be realized that the Oil & Gas section estimates that more than 260,000 wells have been drilled in Ohio to-date, and many of these are in coal-bearing areas. What would be particularly troublesome would be the fact that even were mining precluded from these areas, the chloride concentrations in surface water and ground water would still remain high."

13. If sulfates were to violate the limits, are there reasonable treatment techniques that could be implemented? To set a limit that could be expected to be violated, without having economically available treatment techniques to address the problem, would be very unreasonable.

14. Is the proposal addressing "total" values?

OEPA Draft NPDES Coal Mining General Permit for Chloride and Sulfate – OEPA Interoffice Memo dated October 13, 2010
Draft Comments
Cheryl Socotch, Geologist 3 – Div. of Mineral Resources Management
November 17, 2010

1. How are they defining what is considered "previously un-mined" vs. "re-mined areas"? Are they assigning this based on a watershed level (HUC-12)? Or based on the area to be disturbed (specific to the permit area)? I believe in their own way they are attempting at some allowance for background conditions (previously mined). How will this affect our remining permits with AMD Abatement areas (will they now have to meet certain chloride and sulfate numeric limits as well)?

2. I believe they have applied their standards (or calculations) based on previous studies that Illinois used for their derivation for water quality limits for sulfate and chloride. Many states, including Iowa, Indiana, North Dakota, and Missouri have adopted the same methodology as used in the Illinois study (probably several other states out there as well that I am not aware of). In the Illinois study, the toxicity associated with the major portion of TDS is predominantly due to chloride and sulfate toxicity (as compared to the other ions that make up TDS, such as sodium, magnesium, calcium and carbonates). What Ohio did not do as Iowa did (with respect to the Illinois study) was to evaluate based on their own similarities to primary pollutants from TDS. Ohio is simply adapting numeric criteria from other states (which are not part of the Western Allegheny Plateau) without gathering our own (Ohio) data.

3. As with most of the states, there are no state specific *surface* water quality limits for chloride or sulfate. There are standards for public water (drinking water) standards for both (250 mg/L for both sulfate and chloride) although are only Secondary Drinking Water Standards which address aesthetic considerations, such as taste, color and odor and do not pose a risk to human health. Some states have recommended limits for sulfate with respect to livestock of 1000 mg/L although some of those states have recently increased the level to 2000 mg/L. The USEPA is requesting that states set standards for both for the protection of aquatic life. Those states that may have NPDES standards already are more concerned with discharges and to protect drinking water uses of their state's surface waters. In other words, they are establishing new standards to protect the quality of public drinking waters supply sources. Both West Virginia and Pa were forced to prioritize this upgrade due to development in the Marcellus shale pollutants of high TDS and chlorides that have occurred in surface waters as well as ground water resources in those states (e.g. Dunkard Creek, Monongahela River, etc). I don't believe that Ohio has experienced the same events although proposal

to limit chloride will help as long as those industries (oil & gas) are required to secure discharge permits and enforce as well.

4. A specific numeric criterion for sulfate across the board (in all streams and at all outfalls) is not prudent. Sulfate toxicity is dependent on both the chloride and hardness concentrations. The sulfate criteria should vary according to the water hardness and chloride concentrations in a receiving stream. Sulfate concentration (toxicity) will vary from low-chloride waters to higher sulfate levels in hard water streams with moderate chloride levels. The greater the hardness concentration, the less toxic sulfate will be for aquatic organisms (the sulfate level could be much higher than in low hardness, high chloride waters). This variation is not being addressed with the current proposed limits although perhaps the other states are using the same approach. This will fluctuate throughout the state, and even more especially during flow regimes (periods of low and high flows). Dilution has a direct effect on certain minerals associated with mining. Mine drainage data collected from mined watersheds supports a strong correlation that certain minerals from mine sites, including specific conductance, sulfate and several other ions, decrease as stream flows increase. Certain dissolved metals, such as iron, manganese and aluminum concentrations on the other hand were virtually unrelated to changes in flows. In addition to consideration to receiving stream hardness-chloride-sulfate combination and various flow/dilution characteristics of the receiving stream, OEPA should also give further consideration to numeric criteria for both sulfate and chloride from point of outfall vs outside mixing zone in receiving stream.

5. At the time that CWA and SMCRA were established, regulations were designed to reduce acidification and increases in certain metal concentrations (iron and manganese), that were known to degrade stream water quality; not sulfate concentration. Effluent guidelines were targeted at decreasing acidification and iron and manganese.

6. Ohio should conduct and evaluate our own sulfate toxicity study with respect to how it will affect aquatic resources. Benthic invertebrates are good indicators of overall stream quality. Most benthics have a life span of about a year and many remain in the same short section of a stream during most of their lives which make them a good assessment of short-term, or more localized disturbance within a specific stream or watershed. Stream chemistry data only provides useful information about the stream's quality for only a short period of time (during the sampling) although benthic invertebrate communities can show the effects of short-term and long-term disturbances. I believe that all agencies (USEPA and OSM) are leaning toward a more comprehensive evaluation of stream quality that would include not only chemical, but biological (benthic) and physical. Assigning new chemical effluent criteria without supporting aquatic (benthic) studies for this state is

pre-mature. I believe we are on the right path and future monitoring for both benthic and aquatic will provide more useful data for Ohio to adopt in the event it is necessary to add these constituents to NPDES outfalls.

7. The proposed effluent criteria for sulfate are fairly conservative based on what other states (Illinois, Indiana) are proposing; with the exception of proposed limits for "un-mined" watersheds. The proposed numeric limit would be very difficult to meet in most mining permits. Would caution again that site specific conditions are considered based on receiving stream quality and quantity that would include not only whether a stream has had previous mining, would consider TMDL, Use-Attainment, anti-degradation and other disturbances in the watershed that would affect both the sulfate and chloride levels that would not be a response from mining activities alone. For instance, logging, construction, agricultural, other mineral development (O&G), and other soil disturbance can contribute to stream disturbance as well.

8. Mike asked if sulfates (and chlorides) were to violate the limits, are there any reasonable treatment techniques? Sulfate and chloride are very difficult to treat to meet the recommended limits. There are no passive treatment technologies that exist to treat for removal of these minerals. The only alternative for the operators would be to construct and maintain expensive active treatment facilities to treat for both sulfate and chloride. Since chloride limits have never been enforced in the past, there has been little research on the treatment for chlorides from mine water. Some underground mines have extremely high levels of chloride which may be attributed to the disposal of brines and other wastes in mine pools. Sulfates on the other hand have been monitored in the past although has not been effectively treated or reduced through passive treatment systems. Another consideration is the reagents that have typically been used for neutralization of low-pH and high metals waters (iron and manganese) typically contain salts containing sodium and chloride. If the waters are not already high in TDS from mining, although the operator needs to neutralize acidity through buffering and/or active treatment, the results will have elevated levels of both chlorides and sulfate through this process.