From:	William H Orem
To:	Axelrad, Don
Cc:	kalla.peter@epa.gov; scheidt.dan@epamail.epa.gov; wlanding@fsu.edu; G. Ronnie Best; David P Krabbenhoft; gilmourc@si.edu
Subject:	Re: FW: Sulfide method
Date:	Wednesday, January 07, 2009 11:23:08 AM
Attachments:	H2SSWEEsumcdfwet.xls H2SSWEEsumcdfdry.xls

Don, Dan, and Peter:

Happy New Year to all of you. Hard for me to believe it is 2009 already. My head is still back in 2000! Time marches on too fast for me; guess that is a sign of being over 50. On the sulfide measurement issue, methylene blue is certainly a widely used method. I have used it as well going back a long way. We switched over to the electrode method years ago for several reasons: (1) easier to use, especially in the field, (2) very accurate, electrodes are very stable and give same standard curve for a year or more, detection limit of 0.1 ppb, (3) no problems with inteferences from colored waters. We have had issues in the past with highly colored water giving erroneous sulfide readings using the methylene blue method. Of course you use the local surface water to blank out the meter, but colored water can sometimes (not always) cause weird readings. Cindy might have additional insight from her perspective. In general, using the elcetrode method, we do not see sulfide in surface water except at places like WCA 2A - F1 (highly contaminated), and there it is only in the 10s of ppb. The EPA numbers seem generally higher overall, and they are seeing surface water sulfide in areas we did not see any sulfide. I'm not saying the EPA numbers are necessarily wrong, just higher than what we have observed. Cindy may have an opinion from her sulfide measurements in surface water as well. Although sulfide oxidation to sulfate chemically is slow, sulfur oxidizing bacteria in the ecosystem can rapidly oxidize sulfide to sulfate. These bacteria are often photosynthetic. The reason sulfide may exist at F1 in our dataset besides the high sulfate loads is that the dense vegetation and highly colored water there may to some degree shade out the sulfur oxidizing bacteria. Just some thoughts.

Bill

"Axelrad, Don" <Don.Axelrad@dep.state.fl.us>

01/06/2009 07:12 PM

To <wlanding@fsu.edu>

cc <kalla.peter@epa.gov>, <scheidt.dan@epamail.epa.gov>, <borem@usgs.gov>

Subject FW: Sulfide method

Bill,

We discussed briefly driving from Gulfport, the matter of USEPA's Everglades surface water sulfide data.

See method info below from Pete Kalla and attached R-EMAP figures from Pete and Dan Scheidt (CCed).

If you believe this total sulfides method is OK, and that acid-soluble metal sulfides are not a significant component of total sulfides (I have no idea), then it may be worth calculating H2S from these total sulfide numbers adjusting for pH and temperature.

Pete or Dan, am I correct in assuming unfiltered water was used for this analysis?

USEPA's recommended water quality criterion (surface water) for sulfide as H2S is 2 ug/l.

Don

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From: Kalla.Peter@epamail.epa.gov [mailto:Kalla.Peter@epamail.epa.gov]
Sent: Monday, December 22, 2008 4:27 PM
To: Axelrad, Don
Cc: Scheidt.Dan@epamail.epa.gov
Subject: sulfide method.

Hi Don --

We used the field analytical method EPA 8131 (equivalent to Standard Method 4500-S2-D), the Methylene Blue method, which, as you probably know, is a Hach kit (colorimetric) procedure. So, the definitive, short answer to your question is that the test results were total sulfides, S2-),, in mg/l. That is how the R-EMAP data are expressed. The method measures total sulfides, H2S, HS-, and acid-soluble metal sulfides, in combination. As you pointed out when you called, it may diminish the impact of our findings, but only by a little. Thanks for asking, and have a safe and happy Holiday season.

-- Pete

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survey: http://survey.dep.state.fl.us/?refemail=Don.Axelrad@dep.state.fl.us Thank you in advance for completing the survey.