Brent Thomas J CNIN
From: Ramanauskas.Peter@epamail.epa.gov
Sent: Tuesday, November 07, 2000 12:16 PM
To: GatesWH@efdsouth.navfac.navy.mil
Cc: johnstont@ttnus.com; Brent Thomas J CNIN
Subject: Re: FW: Thiodiglycol Soil MDL Study

Gentlemen,

In light of this latest information, we are in agreement.

Thanks,
Peter

GatesWH@efdsouth.navfac.navy.mil on 11/07/2000 09:13:23 AM

To: Peter Ramanauskas/R5/USEPA/US
cc: johnstont@ttnus.com, brent_t@crane.navy.mil
Subject: FW: Thiodiglycol Soil MDL Study

Pete - Based on the following I don't think we need to redo the MDL study. Please let me know what you think. If you disagree lets get the appropriate people on the phone and discuss further.

Thanks
Bill

-----Original Message-----

From: **Johnston, Tom [mailto:JohnstonT@ttnus.com]**
Sent: Tuesday, November 07, 2000 9:37 AM
To: 'GatesWH@efdsouth.navfac.navy.mil'
Cc: 'gdeel@scitechinc.com'
Subject: Thiodiglycol Soil MDL Study

Bill,

In response to Peter Ramanauskas' query on the MDL study:

1. The "soil" used by the Edgewood Chemical Biological Center (ECBC) for the thiodiglycol (TDG) method detection limit study was the standard sodium sulfate recommended by EPA. Peter's point about MDLs being sensitive to sample matrix is not a bad one but there is another issue that I failed to bring up which I believe puts this whole soil MDL thing into perspective. The soil risk-based target level (RBTL) for thiodiglycol is 1,800 mg/kg. The computed MDL (with the low recoveries) is four orders of magnitude LESS than this concentration. Having demonstrated that recovery is at least 20% at such a relatively low MDL is quite an achievement. Therefore, I still have to vote for not asking the laboratory to do any more work on this. I apologize for not bringing this up earlier, as this is a significant consideration.

I just spoke with Gail Deel of the ECBC laboratory and she has the same perspective. She also cites the not uncommon SW-846 recovery values of 0% to something less than 100% for standard target analytes using SW-846 methods. These limits are not for use at the MDL because it is well known that precision and accuracy are not good at the MDL, yet they still allow for less than 20% recoveries. I won't say that I particularly like those kind of recoveries myself, but it does point out that the TDG analysis is performing at least as well as some SW-846 target analytes. I must add that the published SW-846 recoveries were almost surely not all achieved in representative soils, either. As a data user I believe the performance of the TDG in soil is adequate and on par with standard methods. Gail tells me that she is expecting about 70% to 130% recovery for TDG at the 1,800 mg/kg limit. This performance is typical for organic compounds in soil that exhibit good recoveries. Please keep in mind that Gail has been doing these analyses for years and is quite familiar with their performance. In fact, the ECBC is the world's experts on these analyses.

Perhaps it's time to get EPA on the phone with the lab?

Regards,

Tom Johnston
Tetra Tech NUS, Inc.
661 Andersen Dr
Pittsburgh, PA 15220-2745
412-921-8615

Brent Thomas J CNIN

From: Gates, William (Efdsouth) [GatesWH@EFDSOUTH.NAVFAC.NAVY.mil]
Sent: Monday, November 06, 2000 11:23 AM
To: Ramanauskas Peter (E-mail)
Cc: Brent Thomas J CNIN; Freeman Christine D CNIN; Johnston Tom (E-mail)
Subject: THIODIGLYCOL ANALYSES

Pete - The following are responses prepared by Tom Johnston at Tetra Tech to your email concerning thiodiglycol analyses. If you have further questions or concerns, lets resolve them by conference call with the appropriate people.

Thanks
Bill

Response 1:

TDP is thiodipropanol. This is indeed the surrogate used during the TDG analysis. I apologize for not having identified this compound in the initial submittal.

Response 2:

The Edgewood Chemical Biological Center laboratory and I acknowledge the low recoveries for TDG on some runs during the method detection limit (MDL) study. There were two runs in the solid matrix that exhibited particularly low recoveries. The ECBC had asked me whether they should make two reruns to replace the runs exhibiting those low recoveries. I elected not to do that because we want the MDL to represent what can be achieved under routine circumstances, even if the performance is not as good as one might hope. Let me explain this position.

Based on the data, the reruns would probably have resulted in better recoveries that are closer to the other five "good" runs. If we replaced the "bad" runs with these two "good" runs, the better recoveries would then have yielded a lower standard deviation which would appear to be better performance with a lower MDL. I don't believe the lower MDL would represent routine conditions.

I believe a better approach would be to rerun the entire set of seven MDL runs. However, there is no reason to believe that the overall performance would be better than the data already indicate, except perhaps by chance. The ECBC laboratory acknowledges that TDG is a difficult compound to measure. I must defer to their experience with this analysis.

One thing to keep in mind is that the concentration of the MDL standard used in these studies (especially in the solid matrix) is very close to the computed MDL. This is both good and bad. On one hand, the similarity to the computed MDL (0.2 mg/kg versus 0.14 mg/kg, respectively) provides good confidence that the MDL is accurate. On the other hand, it is generally acknowledged that performance very near the MDL is usually not so great.

If we were to rerun the MDL study, I would recommend to the ECBC laboratory that they increase the MDL standard concentrations by factors of two (water matrix) and three (solid matrix). However, my vote is for keeping the data as they are and simply recognizing that the data are telling us what we already know—that performance very near the MDL is not so good.

Please advise,

Tom Johnston
Tetra Tech NUS, Inc.
661 Andersen Dr
Pittsburgh, PA 15220-2745
412-921-8615

-----Original Message-----

From: **Gates, William (Efdsouth)**
[SMTP:GatesWH@EFDSOUTH.NAVFAC.NAVY.mil]
Sent: Monday, November 06, 2000 7:19 AM
To: Johnston Tom (E-mail)
Subject: FW: FW: CTO 131 Thiodiglycol Analyses

Please respond. Thanks

-----Original Message-----
From: **Ramanauskas.Peter@epamail.epa.gov**
[mailto:Ramanauskas.Peter@epamail.epa.gov]
Sent: Friday, November 03, 2000 2:28 PM
To: GatesWH@efdsouth.navfac.navy.mil
Subject: Re: FW: CTO 131 Thiodiglycol Analyses

Hello Bill,

Regarding Topic 1, MDL Study, the compound "TDP" should be identified. We presume this is a surrogate used to monitor system performance during the course
of the MDL study?

Some of the % TDG recoveries were rather low (i.e. 5% to 35%) in the two media
subjected to test.

Regarding Topic 2, the proposed screening method seems acceptable.

Thanks & have a good weekend,
Pete

Brent Thomas J CNIN

From: Gates, William (Efdsouth) [GatesWH@EFDSOUTH.NAVFAC.NAVY.mil]
Sent: Monday, October 30, 2000 10:37 AM
To: Ramanauskas Peter (E-mail)
Cc: Brent Thomas J CNIN; Johnston Tom (E-mail)
Subject: FW: CTO 131 Thiodiglycol Analyses

MDLs-Recalc by TJ, 10-27.xls

Pete - The following email addresses two topics concerning the SWMU 1, Mustard Gas Burial Grounds, Draft QAPP currently under EPA review.

Topic 1 - Thiodiglycol MDLs are provided. Please add these MDLs to Table 1-5, page 1 of 11. They are currently listed as TBDs. Supporting documentation is provided in the attachment.

Topic 2 - A method for screening out thiodiglycol analysis is proposed.

Your review and approval is requested.

Revisions to the QAPP will be provided in conjunction with the Final QAPP and response to comments for the Draft QAPP. Let me know if you have any questions.

Thanks
Bill Gates

----Original Message----

From: **Johnston, Tom [mailto:JohnstonT@ttnus.com]**
Sent: Friday, October 27, 2000 5:13 PM
To: 'Gates, William (Efdsouth)'
Cc: 'Brent Thomas J CNIN'; 'gdeel@scitechinc.com'
Subject: CTO 131 Thiodiglycol Analyses

Bill,

This message addresses two separate topics.

Topic 1. The Edgewood Chemical Biological Center laboratory has submitted a set of method detection limits (MDLs) for thiodiglycol in water and in soil. These are the last outstanding data promised to EPA Region 5 for completion of the CTO 131 QAPP.

Upon receipt, there was some question about the calculations so I recomputed the limits and had the limits verified independently in house. The attached Excel file shows these recomputed values (0.07 mg/L for water and 0.14 mg/kg for soil) that were based on the ECBC laboratory raw data. The attached limits differ by about 10% from the limits provided by the ECBC laboratory (0.079 mg/L for water and 0.13 mg/kg for soil). I chose to use the attached limits as the official TDG MDLs because the attached limits were verified in two different ways by two different people. In actuality it doesn't matter which set of values is used because the uncertainty at concentrations near the detection limit is quite high.

I respectfully request that these MDLs (0.07 mg/L and 0.14 mg/kg) and supporting data be forwarded to EPA Region 5 to complete the CTO 131 QAPP, which is currently undergoing their review.

Topic 2. The ECBC laboratory has proposed using thiodiglycol analyses on a provisional basis. A copy of an email from Tom Rosso of the ECBC laboratory that justifies this position is attached.

The intent is to only analyze samples for thiodiglycol if one or both of the other two mustard gas degradation products is detected. This approach is technically sound and could save time and money. Time is a particularly crucial concern because of the short turnaround time required to ensure that, for example, VOC sample integrity is not compromised.

I offer this to you and Tom Brent as a proposal to be extended to EPA Region 5 as a change to be incorporated into the CTO 131 QAPP. The change would be incorporated into the final version of the QAPP. Please note from Tom Rosso's message that this approach is being used with success elsewhere.

Regards,

Tom Johnston
Tetra Tech NUS, Inc.
661 Andersen Dr
Pittsburgh, PA 15220-2745
412-921-8615

<<MDLs-Recalc by TJ, 10-27.xls>>

Copy of Justification for Provisional Thiodiglycol Analyses:

Tom and Linda,

Here are Tom Rosso's comments regarding our TDG views.

Have a godd one!

Gail Deel
Laboratory Manager
SciTech Services, INC

From: **Rosso, Thomas E SBCCOM**
To: 'gdeel@scitechinc.com'
Subject: TDG message
Date: Wednesday, October 25, 2000 5:03PM

Gail, Please forward this to Tom Johnston concerning the TDG analysis.

Tom

During remediation operations in support of the Huntsville Core of Engineers, we have established protocols on analyses for TDG in suspected mustard removal areas. We routinely screen all soils headspace with a MINICAMS detector for the presence of HD at the AEL. Once cleared for "gross" level of contamination, we conduct soil extractions for the presence of HD, 1,4-dithiane and 1,4-thioxane (1,4-Oxathiane). These compounds may be screened within a single methylene chloride extraction. If the instrumentation detects HD, then the soils are considered contaminated and must be remediated prior to removal from the site. If the initial extraction results indicate the presence of 1,4-dithiane or 1,4-thioxane, then the analyst conducts a second extraction for the presence of TDG. If the initial extraction results indicate ND (non detects) for HD, dithiane and thioxane, then no further analysis is conducted.

The reasoning for this approach is that thiodigylcol detected alone without detection of dithiane or thioxane does not necessarily indicate that the area was once contaminated with HD. Sources for TDG are well documented and it stands to reason that just a detection of TDG would not necessarily indicate previous HD exposure. However, when the evidence contains detection of dithiane and TDG (which is most common), then the changes [corrrecton by T. Johnston: changes = chances] are much improved that this sample had been exposed to HD.

I hope that this helps with your coordination of the sample analysis. It is important to note that this approach does not require any change in sample size.

Tom Rosso
ECBC Monitoring Branch

ECBC Thiodiglycol MDL Calculations
MDL = (t-value)*(Std Dev)
t-value = 3.143 for 7 samples (6 degrees of freedom)
t-value = 2.998 for 8 samples (7 degrees of freedom)
SD = sample standard deviation
MDL = method detction limit
%R = Percent Recovery
Raw data are from e-mail provided by ECBC on 10-23-00 (Provided at bottom of this worksheet)
All calcs are by T. Johnston, 10-27-00
Calculations verified by T., Johnston (manual calc.) and J.P. Kumar (calculator) on 10-27-00

Water

Sample #	0.202 ppb TDG MDL Std. Measured Conc'n, ppb	%R
1	0.05	25
2	0.12	60
3	0.09	45
4	0.09	45
5	0.1	50
6	0.07	35
7	0.09	45
SD =	0.022147	
MDL =	0.07	mg/L

Soil

Sample #	0.20 ppm TDG MDL Std. Measured Conc'n, ppm	%R
1	0.14	70
2	0.02	10
3	0.01	5
4	0.06	30
5	0.08	40
6	0.04	20
7	0.03	15
8	0.12	60
SD =	0.0474	
MDL =	0.14	mg/L

Raw data from ECBC Laboratory, Water

Sample ID	d-TDG ppm	d-TDG %d-TDP ppm	d-TDP %rec
1 ppm check standard	1.19	104 1.11	103
Reagent blank	ND	ND	
Matrix spike #1	0.1	50 1.07	68
Matrix spike #2	0.11	55 1.05	67
Water matrix blank	ND	0.92	87
Water P&A #1	0.05	25 0.99	63
Water P&A #2	0.12	60 1.12	71
Water P&A #3	0.09	45 1.07	68
Water P&A #4	0.09	45 1.01	64
Water P&A #5	0.1	50 1.07	68
Water P&A #6	0.07	35 1.01	64
Water P&A #7	0.09	45 1.08	69
1.0 ppm check standard	1.21	106 1.13	105

Raw data from ECBC Laboratory, Soil

Sample ID	d-TDG ppm	d-TDG %d-TDP ppm	d-TDP %rec
1 ppm check standard	1.23	108 1.15	107
Reagent blank	ND	ND	
Matrix spike #1	0.13	65 1.11	71
Matrix spike #2	0.13	65 1.13	72
Soil matrix blank	ND	0.93	59
Soil P&A #1	0.14	70 1.02	65
Soil P&A #2	0.02	10 0.94	60
Soil P&A #3	0.01	5 0.57	36
Soil P&A #4	0.06	30 0.91	58
Soil P&A #5	0.08	40 1.04	66
Soil P&A #6	0.04	20 1.06	68
Soil P&A #7	0.03	15 0.98	62
Soil P&A #8	0.12	60 1.03	66
1 ppm check standard	1.25	110 1.16	107