Message

From: Craig, Harry [Craig.Harry@epa.gov]
Sent: 9/15/2016 6:32:45 PM
To: Gerhard, Sasha [Gerhard.Sasha@epa.gov]
CC: Shuster, Kenneth [Shuster.Kenneth@epa.gov]
Subject: RE: Draft QAPP for Radford Arsenal OBG Flyer Testing

Sasha,

This has always been one of the problems with the "air guys" such as Brian and Bill Michell before him. I'm not against looking at air emissions issues, but it clearly does not address all the environmental effects from OB/OD. Although air emissions are often the most visible, they are also short-lived and difficult to measure.

The material that does not make it into combustion gasses and is in the fallout or entrained in the soil ejecta as unreacted energetics is usually the most long term environmental issue, especially if it ends up contaminating groundwater. We have one OB/OD unit cleanup in R10 at Bangor Site A that has had a groundwater treatment system that has been operating since 1994, and will take decades longer to complete. That site also had 8,000 tons of soil treated as well.

Regards,

Harry

From: Gerhard, Sasha
Sent: Thursday, September 15, 2016 10:58 AM
To: Craig, Harry <Craig.Harry@epa.gov>
Cc: Shuster, Kenneth <Shuster.Kenneth@epa.gov>
Subject: RE: Draft QAPP for Radford Arsenal OBG Flyer Testing

Thank you Harry! I was not quite sure how to respond to Brian. Fortunately, I think Brian is open-minded and willing to work with us.

Sasha Gerhard
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703-347-8964 (office)
703-879-8501 (telework)

From: Craig, Harry
Sent: Thursday, September 15, 2016 1:47 PM
To: Gullett, Brian <Gullett.Brian@epa.gov>; Gerhard, Sasha <Gerhard.Sasha@epa.gov>; Ashby.Scott@deq.virginia.gov
Cc: leslie.romanchik@deq.virginia.gov; Shuster, Kenneth <Shuster.Kenneth@epa.gov>; Galbraith, Michael <Galbraith.Michael@epa.gov>; Crosby-Vega, Terri <Crosby-Vega.Terri@epa.gov>; Gaines, Jeff <Gaines.Jeff@epa.gov>; Colon, Lilybeth <Colon.Lilybeth@epa.gov>; McGoldrick, Catherine <McGoldrick.Catherine@epa.gov>; pizarro, luis <pizarro.luis@epa.gov>; Wanslow, Julie <Wanslow.Julie@epa.gov>; Foley, Gary <Foley.Gary@epa.gov>; McKinney, Doug <Mckinney.Douglas@epa.gov>; Maddox, Doug <Maddox.Doug@epa.gov>; Hendrickson, Charles <hendrickson.charles@epa.gov>; Mayer, Richard <mayer.richard@epa.gov>; Dolan, Jane <Dolan.Jane@epa.gov>
Subject: RE: Draft QAPP for Radford Arsenal OBG Flyer Testing

Brian,

There is plenty of field evidence and research that shows unreacted energetic residues in soil (and groundwater) from OB and OD. The Regions and States often deal with OB/OD units that have been used for years or decades, with multiple operations performed including surface and buried detonations, soil rework, and historical surface burns on the ground and burns in above ground burn trays. In the past, DOD also attempted to burn pink water lagoon sludges at burning grounds, and it clearly was not very efficient based on the levels of TNT and RDX present in soils.

Soil sampling presents its own set of challenges due to the heterogeneity of the compounds, and the update to EPA SW-846 Method 8330B in 2006 included sampling design considerations and lab preparation steps in the method itself. We tried to incorporate most of these issues in the EPA guidance document for sampling various types of sites for energetic residues:

https://www.epa.gov/sites/production/files/documents/site_characterization_for_munitions_constituents.pdf

I would be happy to provide any assistance on development of soil sampling plans if it is conducted, as we have done a number of remedial investigations and remedial action sampling plans in Region 10 for sites that are currently undergoing remediation, and I was one of the reviewers for Method 8330B when it was updated in 2006.

Regards,

Harry

From: Gullett, Brian
Sent: Thursday, September 15, 2016 9:16 AM
To: Gerhard, Sasha <Gerhard.Sasha@epa.gov>; Ashby.Scott@deq.virginia.gov
Cc: leslie.romanchik@deq.virginia.gov; Shuster, Kenneth <Shuster.Kenneth@epa.gov>; Galbraith, Michael <Galbraith.Michael@epa.gov>; Crosby-Vega, Terri <Crosby-Vega.Terri@epa.gov>; Gaines, Jeff <Gaines.Jeff@epa.gov>; Craig, Harry <Craig.Harry@epa.gov>; Colon, Lilybeth <Colon.Lilybeth@epa.gov>; McGoldrick, Catherine <McGoldrick.Catherine@epa.gov>; pizarro, luis <pizarro.luis@epa.gov>; Wanslow, Julie <Wanslow.Julie@epa.gov>; Foley, Gary <Foley.Gary@epa.gov>; McKinney, Doug <Mckinney.Douglas@epa.gov>; Maddox, Doug <Maddox.Doug@epa.gov>
Subject: RE: Draft QAPP for Radford Arsenal OBG Flyer Testing

Sasha,

My team will be conducting the sampling at Radford Ammunition Plant.

I appreciate the comments you, Ken, and Harry have provided on the Radford QAPP and wanted to give you my perspective also.

We believe we will be able to characterize the emissions from these burns. I'm not sure what "definitive" means for emission factors (we never used this term) but we believe we have done an excellent job at advancing new technologies that can characterize under actual conditions a broad range of emissions with good reproducibility (relative standard deviations are typically 10% or less). We also never claim to be able to do a "mass balance" whatever that means for a combustible fuel.

I agree that the issue of ground deposition is a valid one. While my visual observation of 100's of Open Burning events indicates little if any residue, this could be supported by testing (and may have been, unbeknownst to me). I participated in one DoD Open Detonation project (through SERDP) which has looked at this issue. We found that snow deposition of RDX from a 5.2 kg C4 detonation was about 35 mg, or over five 9's destruction and air emissions were much less at about 400 ug.

You've pointed out factors that are involved in sampling emissions but I think we have overcome these issues. Through use of the carbon balance method, we sample multiple, whole plume events to arrive at a composite sample. This

method has been employed successfully in five field campaigns since 2010 and is the standard method employed for quantitative sampling of forest fires, etc. Our low relative standard deviation attests to the precision of the method.

If you feel that our methods suffer from the multiple factors you mentioned I'd be pleased to see your evidence of this so that we can work on improvements. We are always working to develop better methods and better instrumentation and would be happy to do this in concert with a deposition sampling effort.

Brian

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From: Gerhard, Sasha
Sent: Monday, September 12, 2016 5:47 AM
To: Ashby.Scott@deq.virginia.gov
Cc: leslie.romanchik@deq.virginia.gov; Shuster, Kenneth <Shuster.Kenneth@epa.gov>; Galbraith, Michael <Galbraith.Michael@epa.gov>; Crosby-Vega, Terri <Crosby-Vega.Terri@epa.gov>; Gaines, Jeff <Gaines.Jeff@epa.gov>; Craig, Harry <Craig.Harry@epa.gov>; Colon, Lilybeth <Colon.Lilybeth@epa.gov>; McGoldrick, Catherine <McGoldrick.Catherine@epa.gov>; pizarro, luis <pizarro.luis@epa.gov>; Gullett, Brian <Gullett.Brian@epa.gov>; Wanslow, Julie <Wanslow.Julie@epa.gov>
Subject: Draft QAPP for Radford Arsenal OBG Flyer Testing

Hi Ashby,

Our apologies for not getting back to you before the deadline. I would like to preface our comments by noting that we understand that the public is the driver for this flyer testing, and thus, it was not designed to address our broader concerns regarding emission factor development.

Ken, Harry Craig (R10), and I reviewed the QAPP. As alluded to above, we view this more as a research project that will attempt to improve our ability to characterize air emissions from open burning, rather than, in our opinion, a project that will enable a definitive characterization of total air emissions from open burning as the plan implies. The project will likely improve our knowledge of emission contaminants (i.e., their presence) in the air, and be able to quantify what the samplers capture, but we have reservations that the effort will be able to capture enough representative samples to enable a definitive calculation (quantification) of the total emissions, or mass balance analysis, as the plan implies.

We have two major observations/comments. Our first comment pertains to the limited scope of the testing; there is no confirmation sampling of the fallout and kick-out at the ground level. That is, the project's sole focus is to collect combusted air emissions from the plume. That is not necessarily a bad thing, as it certainly is beneficial to collect additional data from live events (versus laboratory) for continued development of emission factors (EFs). As we discussed a few months ago on a conference call with you and Leslie, we are concerned that the EFs under development do not account for deposition of fallout and kick-out onto the soil, which is a critical factor in development of EFs for

OB/OD. Ideally, we would like to see this test also include confirmative soil deposition profiles (i.e., sampling of fallout and kick-out on the ground, using such collection methods as tarps or sampling trays), since we feel air sampling misses a lot (discussed in our second comment). Unfortunately, the location of the Radford burn pans along the New River limits the ability to take representative ground level (soil) samples...which is a separate concern of ours regarding the suitability of this site location.

Our second comment regards the elusive nature of fugitive air emissions and the difficulties in capturing samples that are representative enough to enable quantifications of total emissions, i.e., to enable the emissions factors projections that are proposed. The ability to take representative, reproducible, and meaningful air samples is impacted by many factors including the position of the sampler relative to the plume, the timing of the initiation and conclusion of sampling in the plume, the speed at which the sample is taken, dilution, interferences from other contaminants, meaningful detection limits, velocity of contaminants, dispersion, duration and volume of the sample, wind speed and direction, drone speed, and so forth, let alone the sampling problems that arise from the energetic forces propelling contaminants (especially true of open detonation). Thus, it is difficult to know definitively whether the reported results will be truly representative. In short, to do the proposed calculations, the concentration of every contaminant throughout the whole plume on a volumetric basis is needed. This is why, in the RCRA program we emphasize soil monitoring over air monitoring. As mentioned above, it would be beneficial to be able to correlate the emissions captured by the drone to the deposition on the soil.

We appreciate the opportunity to review and comment.

Regards,

Sasha

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