To: Hall, John[Hall.John@epa.gov]
Sent: Tue 1/9/2018 8:56:13 PM
Subject: RE: Quick question- list of AWG parameters

Sounds good.

From: Hall, John
Sent: Tuesday, January 09, 2018 3:23 PM
To: Jahne, Michael <Jahne.Michael@epa.gov>
Subject: RE: Quick question- list of AWG parameters

I agree. Turbidity is going to be super low and not correlated to anything their machine is really doing unless there is a filter fail or bypass which is really not what you guys are trying to evaluate. I don't think DO is particularly relevant either since their machine does not really aerate the water in the treatment train. ORP is a good indicator of the prescence of contamination but that is for a chlorinated or chloraminated system. Not sure how much it helps with just uv disinfection.

I think the RH and Temp are the real drivers for how much water you can make and the bacterial sampling that you are doing is the real indication of the quality of the water.

John

From: Jahne, Michael
Sent: Tuesday, January 09, 2018 2:08 PM
To: Hall, John <Hall.John@epa.gov>
Subject: Quick question- list of AWG parameters

Hi John,

If we would like to keep this quick and easy, do you think it's worth having them monitor turbidity with a separate instrument? Given that it is anticipated to be low. Also thinking we

can nix DO and ORP measurements since they are not particularly relevant for this. Let me know your thoughts.

Thanks,

Michael

From: Meiners, Greg [Ex. 4 - CBI]
Sent: Thursday, January 04, 2018 1:31 PM
To: Jahne, Michael <Jahne.Michael@epa.gov>; Hall, John <Hall.John@epa.gov>
Cc: radha.krishnan[Ex. 6 - Personal Privacy] Witt, Sue [Ex. 4 - CBI]; Kling, Timothy [Ex. 4 - CBI]
Subject: RE: Atmospheric Water Generator Study

Michael,

The attached list covers the instruments and calibrations solutions that will be used to analyze the grab samples taken for the WaterGen project. We will be using a YSI 556 for temperature, DO, conductivity, pH & ORP. A Hach 2100P turbidimeter will be used for measuring turbidity. If chlorine determinations are necessary, a Hach DR900 spectrophotometer will be used to measure free and total chlorine. Finally, a Horiba U-53 multiparameter sonde will be used in place of the YSI 556 if needed.

Please let me know if you have any questions.

APTIM

Greg Meiners

[Ex. 4 - CBI]

APTIM

Ex. 4 - CBI

www.aptim.com

From: Jahne, Michael [Jahne.Michael@epa.gov]
Sent: Thursday, January 04, 2018 9:25 AM
To: Hall, John
Cc: Meiners, Greg; Krishnan, Radha
Subject: RE: Atmospheric Water Generator Study

Thanks John. Greg, let me know which probes you will be using and I will include in the QAPP and HASP. Also, what reagents will you be using for calibration etc.? Need to include them in the HASP as well.

Thanks,

Michael

From: Hall, John
Sent: Tuesday, January 02, 2018 9:22 AM
To: Jahne, Michael <Jahne.Michael@epa.gov>
Cc: Meiners, Greg Ex. 4 - CBI radha.krishnan Ex. 4 - CBI
Subject: RE: Atmospheric Water Generator Study

Sorry I have been gone for so long on use or lose vacation. I am fine with replacing the probes on the YSI. My main concern is keeping it quick and simple for the technician taking the grab samples. In our experience, there are lots of good probes by lots of manufacturers. They all are relatively accurate especially for the intended purpose of these samples from the water condenser. I am happy to upgrade whatever Greg thinks is easiest and quickest to use for this sampling.

Note to Radha: Pay for the probe upgrades if needed out of WA 4-06 but exclude them from the total cost of the supporting the Israeli condenser project because we should probably have a working set of YSI probes for other projects too.

From: Jahne, Michael
Sent: Tuesday, December 19, 2017 5:04 PM
To: Hall, John <Hall.John@epa.gov>
Subject: FW: Atmospheric Water Generator Study

What are your thoughts on cost to service instruments and replace probes?

From: Meiners, Greg Ex. 4 - CBI
Sent: Tuesday, December 19, 2017 4:48 PM
To: Jahne, Michael <Jahne.Michael@epa.gov>; Hall, John <Hall.John@epa.gov>
Cc: radha.krishnan Ex. 4 - CBI ; Kling, Timothy Ex. 4 - CBI Witt, Sue Ex. 4 - CBI
Subject: RE: Atmospheric Water Generator Study

Hi Mike,

We have a YSI 556 multiparameter sonde that measures pH, ORP, conductivity, temperature and DO. We also have a Horiba U-53 that measures pH, ORP, conductivity, temperature, DO, turbidity and a calculated/estimated TDS value. True TDS is a manual method that requires filtering, weighing and drying. The turbidity probe on the Horiba is not really suitable for drinking water, it's too clean. It's really made to throw in a pond, lake or stream. We measure drinking water turbidity using a Hach turbidimeter that is located in the BSL-2 lab. This is also a manual method.

Both of the referenced instruments (YSI & Horiba) need new pH/ORP probes, maintenance and calibration. The probes are ~ $700 each. If you decide this is the method(s) to use, please let me know and I can work on getting the sondes in good operating order. Thanks!

APTIM

Greg Meiners

Scientist 4

Ex. 4 - CBI

www.aptim.com

From: Krishnan, Radha
Sent: Tuesday, December 19, 2017 2:08 PM
To: Meiners, Greg; Kling, Timothy; Witt, Sue
Cc: Jahne, Michael; Hall, John (Hall.John@epa.gov)
Subject: RE: Atmospheric Water Generator Study

Greg, can you please coordinate a response to Mike on his information needs for the Water-gen study?

Thanks.

APTIM

Radha Krishnan, P.E.

Ex. 4 - CBI

Ex. 4 - CBI

From: Jahne, Michael [mailto:Jahne.Michael@epa.gov]
Sent: Tuesday, December 19, 2017 2:04 PM
To: Krishnan, Radha Ex. 4 - CBI
Cc: Hall, John <Hall.John@epa.gov>
Subject: Atmospheric Water Generator Study

Hi Radha,

I'm organizing the QAPP and HASP for the atmospheric water generator testing at T&E, and wanted to touch bases with you on some of the details. My understanding is that APTIM will operating the unit under John's contract, which will entail monitoring the unit; draining periodically; and recording some basic water quality parameters (temp, pH, conductivity, etc.). A couple of specific questions:

1) What do you have for water quality probes that would work well for this study? Thinking temperature, pH, conductivity, turbidity, and TDS would be of interest but we are flexible depending on what's convenient. I need info on model, calibration, and operation for the

QAPP/HASP; if you already have an SOP that would work too.

2) What and who should I include in the QAPP/HASP on your end? I already have them from the Solstreme study so can cross-reference them as appropriate.

Let me know your thoughts.

Thanks,

Michael