Message

From: Wayne Miller [Miller.Wayne@azdeq.gov]
Sent: 6/7/2016 4:46:15 PM
To: d'Almeida, Carolyn K. [dAlmeida.Carolyn@epa.gov]
CC: Davis, Eva [Davis.Eva@epa.gov]
Subject: 2016-6-7 - WAFB - checking to see if I have input support - arsenic in GW - do agencies believe EBR stop to get more info - ST012 -

I need to see if I have support for a stop work letter. I have no problem with a notice letter that agencies want record to show Arsenic in GW is a concern.

From: d'Almeida, Carolyn K. [mailto:dAlmeida.Carolyn@epa.gov]
Sent: Tuesday, June 07, 2016 9:29 AM
To: Davis, Eva <Davis.Eva@epa.gov>; Wayne Miller <Miller.Wayne@azdeq.gov>
Subject: 2016-6-7 - WAFB - arsenic in GW - do agencies believe EBR stop to get more info - ST012 - cda epa

We don't even have the information we would need to know to determine if we could waive the standards. Wayne do you want to do another joint letter?

From: Davis, Eva
Sent: Tuesday, June 07, 2016 9:13 AM
To: d'Almeida, Carolyn K. <dAlmeida.Carolyn@epa.gov>; Wayne Miller <Miller.Wayne@azdeq.gov>
Subject: RE: 2016-6-7 - WAFB - FYI - arsenic GW concentration not known -- BStewart comment - ST012 EBR NA2SO4 - epa inquiry

I can't argue with that. Bo talks about ISCO sites and essentially waiving the arsenic criteria – however, I think this site is much larger than most ISCO or sulfate injection sites. Bo says long term Arsenic concentrations would be expected to return close to initial values, but the arsenic natural attenuation stuff that I found that is in my draft letter is that this stuff may be very mobile under reducing conditions.

Another site I work on in Region 1 had naturally occurring arsenic that was mobilized first by the reducing conditions created by the waste oil being there, then by the steam injection. They couldn't re-inject arsenic at concentrations above the drinking water standard. I can't quite see how at this site they could be allowed to inject this much arsenic at these concentrations.

From: d'Almeida, Carolyn K.
Sent: Tuesday, June 07, 2016 10:10 AM
To: Wayne Miller <Miller.Wayne@azdeq.gov>; Davis, Eva <Davis.Eva@epa.gov>
Subject: RE: 2016-6-7 - WAFB - FYI - arsenic GW concentration not known -- BStewart comment - ST012 EBR NA2SO4 - epa inquiry

I think we should ask them to suspend work on the EBR workplan until characterization and revised mass estimates are complete.

From: Wayne Miller [mailto:Miller.Wayne@azdeq.gov]
Sent: Tuesday, June 07, 2016 8:00 AM
To: d'Almeida, Carolyn K. <dAlmeida.Carolyn@epa.gov>; Davis, Eva <Davis.Eva@epa.gov>
Subject: 2016-6-7 - WAFB - FYI - arsenic GW concentration not known -- BStewart comment - ST012 EBR NA2SO4 - epa inquiry

FYI -

From: Steve Willis [mailto:steve@uxopro.com]
Sent: Monday, June 06, 2016 11:18 PM
To: Wayne Miller <Miller.Wayne@azdeq.gov>
Subject: 2016-6-6 - WAFB - arsenic GW concentration not known -- BStewart comment - ST012 EBR NA2SO4 - epa inquiry

Wayne,

I couldn't find much relevant information about arsenic in the East Valley. The City of Mesa Website cites arsenic in their wells up to 33 ug/l, but those are deep wells. DWR doesn't have that information; Dave Christiana said he would be asking ADEQ if he needed to know. See the response below from Bo.

Steven A. Willis, R.G.
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(480) 316-3373
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----- Original Message -----
From: Bo Stewart <Bo@praxis-enviro.com>
To: Steve Willis <steve@uxopro.com>
Sent: Monday, June 6, 2016 7:43:51 PM
Subject: Re: FWD: 2016-6-6 - WAFB - Is natural arsenic GW concentration known -- ST012 EBR NA2SO4 - epa inquiry

Hi Steve,

I can confirm Eva's calculation. This issue is addressed in the Work Plan in a couple of places and calculated in Appendix G. Amec states background concentrations in the vicinity of ST012 have been measured as high as 1.5 ug/L (p 3-8). This is a common issue for ISCO sites where pH decreases and potentially mobilizes metals but everyone usually goes along with it being limited in area. Sulfate itself has a secondary drinking water criteria of 250 mg/L, should they be allowed to exceed that in the vicinity of the site? I would think so. MNA alone likely yields secondary exceedances around the site but I haven't looked at that data. In any case, the aquifer is not currently used for drinking water and the long term Arsenic concentration would be expected to return close to initial values.

In Appendix G, Amec estimates injection of sulfate with an arsenic content of 0.95 mg/kg (min) to 3 mg/kg (max) and this yields, after mixing with the groundwater, a groundwater concentration range of 8 to 26 ug/L. Page 3-8 states a max of 36 ug/L, which could be a typo.

I think a good comment would be a request to update the Arsenic calculation in Appendix G with the most recent estimates for the NAPL and soil volumes and the mass of sulfate injection. Also, they might add in a background concentration of 1.5 ug/L to be conservative. The revised value may exceed 50 ug/L and then it becomes more of an issue.

Hope this makes sense,

Bo

On 6/6/2016 4:37 PM, Steve Willis wrote:

Hi Bo,

Can you confirm Eva's calculations below for As concentrations? Regarding arsenic background concentrations, i have some data for deep production wells, but I'm not sure if we should extrapolate that to the shallow groundwater.

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----- Original Message -----
From: Wayne Miller <Miller.Wayne@azdeq.gov>
To: Don E. Atkinson <Atkinson.Don@azdeq.gov>; steve <steve@uxopro.com>
Sent: Monday, June 6, 2016 1:40:56 PM
Subject: 2016-6-6 - WAFB - Is natural arsenic GW concentration known -- ST012 EBR NA2SO4 - epa inquiry

Any idea of GW natural arsenic concentration?

From: d'Almeida, Carolyn K. [mailto:dAlmeida.Carolyn@epa.gov]
Sent: Monday, June 06, 2016 1:06 PM
To: Davis, Eva <Davis.Eva@epa.gov>; Wayne Miller <Miller.Wayne@azdeq.gov>
Subject: 2016-6-6 - WAFB - Is natural arsenic GW concentration known -- ST012 EBR NA2SO4 - epa

…. And I understand AZ already has natural background As in groundwater issue in many places, Wayne do you know what background As is at Williams?

From: d'Almeida, Carolyn K.
Sent: Monday, June 06, 2016 1:03 PM
To: Davis, Eva <Davis.Eva@epa.gov>
Subject: RE: arsenic injection

This comment needs to be made. Another potential factor in the J&S comment I made to amec on the last BCT call, if done without agency approval. Incidentally, my attorney advised me that if need be, I can go to my DD and get a stop work order issued for the EBR portion if we think there is a problem.

Carolyn

From: Davis, Eva
Sent: Monday, June 06, 2016 12:45 PM
To: d'Almeida, Carolyn K. <dAlmeida.Carolyn@epa.gov>; Wayne Miller <Miller.Wayne@azdeq.gov>
Subject: arsenic injection

Got a question for you two –

Amec's plan is to inject 320 gm/l of sodium sulfate, that has 3 mg/kg arsenic. By my calculations that is 0.96 mg/l of arsenic going into the ground, while the drinking water standard is 0.01 mg/l. How can they be allowed to do that?

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Lloyd "Bo" Stewart, PhD, PE
Praxis Environmental Tech., Inc.

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