Message

From: d'Almeida, Carolyn K. [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9EC4401AFA1846DD93D52A0DDA973581-CDALMEID]
Sent: 6/16/2016 11:26:43 PM
To: Wayne Miller [Miller.Wayne@azdeq.gov]
Subject: FW: Draft Response Letter to AF from AH and TLP re ST012 SEE EBR

Resending this in case you didn't see it – in reference to your question. Also, is ADEQ management aware of how much arsenic amec intends to dump into the groundwater?

From: d'Almeida, Carolyn K.
Sent: Wednesday, June 15, 2016 1:42 PM
To: Henning, Loren <Henning.Loren@epa.gov>; Butler, Thomas <Butler.Thomas@epa.gov>
Cc: 'Wayne Miller' <Miller.Wayne@azdeq.gov>
Subject: RE: Draft Response Letter to AF from AH and TLP re ST012 SEE EBR

Looking at the ST12 FFS from 2013, from description of Alternative 4 EBR + Ozonation, some interesting quotes:

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6.5.3 Long-Term Effectiveness and Permanence

Residual risk from Alternative ST012-4 is related to time to cleanup, which would be shortened by source destruction. It is estimated that cleanup criteria could be achieved in 30 to 60 years however, there is significant uncertainty on the time frames and, without a pilot test there is uncertainty regarding the overall effectiveness of the technology. Semiannual groundwater monitoring would provide data for assessment of dissolved plume behavior. Periodic evaluation of the alternative would be addressed in the 5-year review. It is not clear whether adequate distribution of sparged gases can be achieved at ST012 due to the heterogeneous nature of the soil. Pilot studies would be required to confirm effectiveness of the technology.

No pilot test has been done of the technology amec intends to employ. The Permits and Approvals necessary as noted on the evaluation summary table are largely being ignored now.

Table 6-2: Alternative Evaluation Summary

Criteria	Alternative			
	STD12-1 No Action	STD12-2 MNA with Free Product Removal and Treatment	STD12-3 Steam Injection and Enhanced Bioremediation	STD12-4 Enhanced Bioremediation and Ozonation
Overall Protection of Human Health and the Environment	Protective through existing institutional controls	Protective through existing institutional controls	Protective through existing institutional controls and active treatment to reduce concentrations	Protective through existing institutional controls and active treatment to reduce concentrations
Compliance with ARARs	Compliance through natural attenuation over a long duration	Compliance through natural attenuation over a long duration	Complies through a combination of active treatment and natural attenuation.	Complies through a combination of active treatment and natural attenuation.
Long-term Effectiveness and Permanence	Not a permanent solution, relies on continued effectiveness of institutional controls over hundreds of years.	Not a permanent solution, relies on continued effectiveness of institutional controls over hundreds of years.	A permanent and effective solution likely to achieve ARARs around 15 years after steam treatment.	Pilot study required to establish long-term effectiveness
Reduction of Toxicity, Mobility, and Volume Through Treatment	No reduction through treatment	Reduces toxicity and volume through removal and treatment of LNAPL that accumulates in wells.	Reduces toxicity, mobility, and volume through treatment	Reduces toxicity, mobility, and volume treatment.
Short-Term Effectiveness	No risks to community, and the environment. Risks to site workers during groundwater sampling.	No risks to community and the environment. Risks to workers removing LNAPL and sampling groundwater	Highest risks to the community and site workers occur during steam injection. Impacts neighboring properties for a 1 to 2 year duration.	Risks to the community and site workers occur during sparing/ozonation. Impacts neighboring properties for decades.
Implementability	Technically implementable but regulator acceptance is unlikely.	Technically implementable but regulator acceptance is unlikely.	Implementation complex, but feasible; permits and approvals necessary.	Pilot study required; permits and approvals necessary. Moderate implementation complexity.
Cost (present worth, up to 30 years)	$1.4 M	$4.6 M	$21.0 M	$16.9 M
Remedial Duration (Years)	300 to 700	300 to 700	15 to 20 years	30 to 60

6.5.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative ST012-4 would result in substantial reduction of contaminant volume through destruction of dissolved and residual LNAPL and the process of biological degradation and chemical oxidation. Air sparging/ozonation technology is capable of rapid dissolved contaminant destruction. The combination of LNAPL destruction and bioremediation will reduce the contaminant volume over the course of the projected life of the remedial action. There is some risk of unintended mobilization of LNAPL with sparging.

This is consistent with concerns we expressed about potential spreading of the plume. Recall Don S. made the comment in the BCT meeting that MNA via dissolution was an accepted remedial practice.

6.6.5 Cost

Present worth alternative costs range from $1.7 million for Alternative ST012-1 (No Action) to $21.0 million for Alternative ST012-3 (Steam Injection and Enhanced Bioremediation). The next lowest cost alternative to ST012-1 is MNA, Alternative ST012-2, for $4.6 million followed by Alternative ST01204 at $10.9 million. Alternative ST012-3 is expected to reach RAOs with the period of the cost estimate where Alternatives ST012-1 and ST012-2 do not and Alternative ST012-4 likely does not.

From: d'Almeida, Carolyn K.

ent: Wednesday, June 15, 2016 12:10 PM
To: Henning, Loren <Henning.Loren@epa.gov>; Butler, Thomas <Butler.Thomas@epa.gov>
Cc: Wayne Miller <Miller.Wayne@azdeq.gov>
Subject: RE: Draft Response Letter to AF from AH and TLP re ST012 SEE EBR

Wayne /all

Use this version of the response letter let me know what you think; I made a few changes to the earlier version that I sent.

I am looking through the 2013 ROD now. The selected remedy to remove LNAPL at the site was alternative 3: SEE + EBR. The ROD did not distinguish between a SEE treatment zone and an EBR treatment zone for LNAPL, they were intended to be sequential treatments. There was an Alternative 4 that was evaluated that was for EBR + ozonation which Amec is now defaulting to (without ozonation as they are selecting the slower anaerobic process) for the areas outside of the SEE treatment zone. Need to read that section for reasons why alternative 4 was not selected. But nevertheless they are trying to push a fundamental change to the remedy.

Carolyn

From: Henning, Loren
Sent: Wednesday, June 15, 2016 10:57 AM
To: Butler, Thomas <Butler.Thomas@epa.gov>

Cc: d'Almeida, Carolyn K. <dAlmeida.Carolyn@epa.gov>
Subject: Re: Draft Response Letter to AF from AH and TLP re ST012 SEE EBR

I'm having an update with Angeles tomorrow so will have some direction to share then.

Loren

Sent from my iPhone

On Jun 15, 2016, at 10:54 AM, Butler, Thomas <Butler.Thomas@epa.gov> wrote:

<image001.gif>
I'm fine with this concept. I would word-smith it a touch before going final, but we need to loop in ADEQ first anyway so it may make sense for me to wait to see their approach. Regardless, we kind of need this to move quickly, so once you've heard from Loren, if you can convey it to Wayne with a sense of urgency, that'd be helpful.

From: d'Almeida, Carolyn K.
Sent: Wednesday, June 15, 2016 9:22 AM
To: Butler, Thomas <Butler.Thomas@epa.gov>; Henning, Loren <Henning.Loren@epa.gov>
Subject: RE: Draft Response Letter to AF from AH and TLP re ST012 SEE EBR

I embellished the letter a bit with technical details - see how this reads

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From: Butler, Thomas
Sent: Tuesday, June 14, 2016 5:21 PM
To: d'Almeida, Carolyn K. <dAlmeida.Carolyn@epa.gov>; Henning, Loren <Henning.Loren@epa.gov>
Subject: Draft Response Letter to AF from AH and TLP re ST012 SEE EBR

All,

I don't know exactly where we are with this anymore, but I've drafted a short and sweet response essentially asking for Phil to engage with Angeles/Tina on this set of ST012 issues. I reference the FFA, including Section 11 (which contains the Work Stoppage section), without invoking it.

Let me know how you want to move forward.

Thanks,

Thomas

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