Ex. 5 Deliberative Process (DP)

From: Smallbeck, Donald R. [mailto:Donald.Smallbeck@amecfw.com]
Sent: Thursday, September 15, 2016 7:56 AM
To: d'Almeida, Carolyn K. <dAlmeida.Carolyn@epa.gov>; JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW <catherine.jerrard@us.af.mil>
Cc: Davis, Eva <Davis.Eva@epa.gov>; Dan Pope <DPope@css-dynamac.com>; Levine, Herb <Levine.Herb@epa.gov>; Brasaemle, Karla <KBrasaemle@TechLawInc.com>; Wayne Miller <Miller.Wayne@azdeq.gov>
Subject: RE: question

Carolyn

Sorry for the tardiness in replying to your question

Yes, the initial LNAPL BTEX concentrations are a critical input parameter for the model. Amec Foster Wheeler has Pre-SEE (see attached pdf from TerraTherm for design) and SEE operation data on the LNAPL BTEX constituents. The SEE results are summarized in Table 2-5 of Addendum 2 and the data is included in the SEE Waste Profile and Disposal Records appendices of the quarterly reports. The BETX data for samples collected during SEE (see table below) was used as the basis in our mass calculations. Although the TerraTherm data did not include BTEX pre-SEE, the percentages reported by TerraTherm for the PIANO Pre-SEE sample are similar to the percentages during SEE within the variability typical of this analytical method):

Paraffinic - 21.74% Pre-SEE (23.11% average during SEE)
Isoparaffinic - 30.43% Pre-SEE (28.20% average during SEE)
Aromatic – 17.79% Pre-SEE (21.61% average during SEE)
Naphthenic – 29.38% Pre-SEE (26.73% average during SEE)
Olefinic – 0.65% Pre-SEE (0.27% average during SEE)

Amec Foster Wheeler's rationale for use of the data from SEE to estimate BETX+N content of the remaining LNAPL is that the pre-SEE and during SEE PIANO samples are similar; thus, it was appropriate to use the data from SEE to estimate BETX+N content of the remaining LNAPL. Amec Foster Wheeler used the average values provided below in our in the mass calculations in the RD/RAWP Addendum #2. Additional analysis of LNAPL samples collected from outside the former TTZs would not be expected to significantly change the mass calculations. The table of LNAPL composition is included in the Draft Final RD/RAWP Addendum #2 in Section 2.3 as Table 2-5, on page 2-11: Clipped image is below:

Table 2-5 Conditioned LNAPL Composition during SEE Treatment by Percentage

Compound Class/ Compound	LNAPL Sampling Date							Average
	1/8/15	2/19/15	3/11/15	3/25/15	4/1/15	5/6/15	6/10/15	
Paraffinic	22.7	23.9	23.1	22.5	22.2	23.3	24.1	23.1
Isoparaffinic	29.0	29.8	29.5	30.0	29.9	24.5	24.7	28.2
Aromatic	19.5	16.3	19.1	18.3	19.0	28.9	30.3	21.6
Benzene	0.28	0.45	0.42	0.47	0.46	0.29	0.18	0.36
Toluene[1]	1.9	0.0	2.4	2.6	2.6	1.9	2.1	2.3
Ethylbenzene	1.9	1.9	2.1	2.0	2.0	2.3	2.5	2.1
Total Xylenes	4.0	4.9	4.2	4.1	5.0	5.1	6.4	4.8
Naphthenic	28.6	29.8	28.1	29.1	28.8	22.3	20.4	26.7
Naphthalene	0.18	0.25	0.25	0.11	0.10	0.67	0.46	0.29
Olefinic	0.16	0.28	0.22	0.17	0.17	0.47	0.42	0.27
BTEX+N Total	8.3	7.5	9.3	9.3	10.2	10.2	11.6	9.1

Notes:
[1] Coelutes with 2,3,3-trimethylpentane. February 19, 2015 data treated as outlier - not included in average.
BTEX+N - benzene, toluene, ethylbenzene, total xylenes, and naphthalene
LNAPL – light non-aqueous phase liquid

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From: d'Almeida, Carolyn K. [mailto:dAlmeida.Carolyn@epa.gov]
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To: Smallbeck, Donald R.; JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW
Cc: Davis, Eva; Dan Pope; Levine, Herb; Brasaemle, Karla; Wayne Miller
Subject: RE: question

Don

Thank you. The LNAPL collected from SEE operations would be expected to be somewhat depleted in BTEX constituents relative to untreated LNAPL from outside the SEE system. As your workplan proposes to treat virgin LNAPL outside of the TTZ with EBR, isn't initial LNAPL BTEX concentrations a critical input parameter for the model?

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Carolyn

There are LNAPL constituent data from samples collected at various time intervals during SEE operations. Results are summarized in Table 2-5 of Addendum 2 and the data is included in the SEE Waste Profile and Disposal Records appendices of the quarterly reports. At this time there are currently no plans to collect additional LNAPL samples for constituent analysis.

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Cc: Davis, Eva; Dan Pope; Levine, Herb; Brasaemle, Karla; Wayne Miller
Subject: RE: question

Thanks Don. Do we have data on concentrations of LNAPL constituents, or any plans to collect data on LNAPL constituents?

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Carolyn

These results are dissolved concentrations in groundwater.

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Cc: Davis, Eva; Dan Pope; Levine, Herb; Brasaemle, Karla; Wayne Miller
Subject: question

Cathy/ Don

Thanks for this data. Can you clarify for us if these concentrations represent dissolved phase, LNAPL, or emulsion of both?

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"Because a waste is a terrible thing to mind..."

amec foster wheeler

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