

Becker, Sunny (ECY)

From: Tom Cammarata <TCammarata@soundearthinc.com>
Sent: Tuesday, April 16, 2019 12:15 PM
To: Becker, Sunny (ECY)
Cc: Dan Ramras; Ethan Marks
Subject: Groundwater results for injection well IW34
Attachments: 0651-002_2019_EL-CM-S-D.pdf

Sunny,

As you requested, SoundEarth sampled shallow and deep injection wells IW33 and IW34, respectively, and analyzed the samples for CVOCs (see attached Figure 1). SoundEarth sampled the injections wells on March 12, 2019, before injecting carbon substrate. The locations of the injection wells are shown in Figure 1 (attached). The injections wells were sampled using low-flow purging. Analytical results for the groundwater samples are as follows:

- Shallow injection well IW33: **PCE 6.3** µg/L, TCE < 1 µg/L, cis and trans 1,2-DCE < 1 µg/L, and vinyl chloride <0.2 µg/L
- Deep injection well IW34: **PCE 67,000** µg/L, TCE 150 µg/L, cis 1,2-DCE 23 µg/L, trans 1,2-DCE <1 µg/L, and vinyl chloride 4.9 µg/L

As you can see, the PCE groundwater analytical results for injection well IW34 is inconsistent with the recent groundwater sample results from nearby deep monitoring wells MW09 and MW10 sampled in November of 2018 (**PCE 160** µg/L and **210** µg/L, respectively). Also, the PCE concentration in the groundwater at injection well IW34 is two times greater than the 2014 concentration of PCE in groundwater in shallow monitoring well MW04 and 15 times greater than the 2014 concentration of PCE in deep monitoring well MW07, in fact, the highest PCE concentration ever reported in the groundwater at MW07 was 7,000 µg/L in 2004 (Figures 2 and 3). Both MW04 and MW07 monitoring wells were located proximal to the solvent tanks in the ROW and dry cleaning machine on the property. Analytical results, except for IW34 at 67,000 µg/L, are shown on the attached Figure 2.

In response to the anomalous PCE groundwater results at injection well IW34, SoundEarth resampled deep injections well IW34, sampled deep injection well IW36, and monitoring well MW10 on April 9th using a passive diffusive sampler. Before the second event, SoundEarth redeveloped injection well IW34. During redevelopment, SoundEarth purged approximately 225-gallons of mixed water and carbon substrate from injection well IW34; the water in the injection well IW34 was relatively free of carbons substrate at the time of diffusive sampler was installed. SoundEarth installed the passive samplers in the injection wells and

monitoring well on April 1, 2019 and retrieved the samplers on April 9, 2019. Analytical results for the passive samplers are as follows:

- Deep injection well IW34: **PCE 230** µg/L, TCE 21 µg/L, cis and trans 1,2-DCE 11 µg/L, trans 1,2-DCE < 1 µg/L and vinyl chloride 1.0 µg/L
- Deep injection well IW36: **PCE 0.37** µg/L, TCE < 0.2 µg/L, cis 1,2-DCE < 0.2 µg/L, trans 1,2-DCE < 0.2 µg/L and vinyl chloride < 0.2 µg/L
- Deep monitoring well MW10: **PCE 21** µg/L, TCE 1.1 µg/L, cis 1,2-DCE 1.8 µg/L, trans 1,2-DCE < 0.2 µg/L, and vinyl chloride < 0.2 µg/L

These results lead us to believe a contaminant was introduced into the injection well IW34 during its construction resulting in the anomalous PCE concentration in the groundwater sample collected from IW34 on March 12th. Redeveloping the injection well removed the contaminant resulting in a representative groundwater sample result at IW34. The April 2019 PCE results for injection well IW34 is consistent with the current conceptual site model for the site. This conclusion is supported by the April 2019 groundwater results for injection well IW36 (**PCE 0.37** µg/L) and October 2018 PCE concentrations in monitoring wells MW09 and MW10 (**PCE 160** µg/L and **210** µg/L).

Regards,

Thomas Cammarata
Principal Environmental Geochemist



SoundEarth Strategies, Inc.
2811 Fairview Ave East, Suite 2000
Seattle, Washington 98102
Main: 206.306.1900
Direct: 206.436.5940
Mobile: 206.261.8046
soundearthinc.com | Employee-Owned | Small Business

Thomas Cammarata
Principal Environmental Geochemist
<image001.png>
SoundEarth Strategies, Inc.
2811 Fairview Ave East, Suite 2000
Seattle, Washington 98102
Main: 206.306.1900