



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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March 28, 2017

Mr. Mark A. Chandler
Environmental Services
TOC Holdings Co.
2737 West Commodore Way
Seattle, WA 98199-1233

Dear Mr. Chandler,

Thank you for providing the following documents to Ecology for review.

- “Proposed Alternative Approaches to Remediate Residual Groundwater Contamination”, dated Jan. 12, 2017
- “Clarifications to the Proposal to Downsize the Current Groundwater Monitoring Program”, dated Feb. 14, 2017.
- “Enhanced Fluid Recovery Methods and Results”, dated December 22, 2016
- “TOC Holdings Co., Mountlake Terrace Site, Plan for Remediation Systems”, dated February 21, 2017

Ecology provides the following comments on these documents:

- Ecology agrees with TOC’s proposal to downsize the current groundwater monitoring program. The number of wells to be monitored will be reduced to 38 from 106. The monitoring wells that are damaged, or unusable should be abandoned properly. All other wells that are not being monitored should remain in place at this time.
- The enhanced fluid recovery (EFR) appears to be effective. Contrary to your conclusion in letter to Ecology dated February 21, 2017, in which TOC states the EFR conducted by HydroCon at monitoring wells MW48, MW69 and MW90 “was not successful in reducing concentrations further on a long term basis”. However, to Ecology’s knowledge, no longer term data has been provided to Ecology for evaluation.
- Groundwater data were collected three and six months after the EFR was applied. These two rounds of groundwater data (the table below) , considered as short term data, showed



variable GRPH groundwater concentrations in monitoring wells MW48, MW69 and MW90. This may be caused by the applied vacuum from EFR that mingled TPH contaminants from the soil into groundwater.

	September 2015 (Pre EFR) (ppb)	December 2015 (Pre EFR) (ppb)	February 2016 (Pre EFR) (ppb)	March 2016 (1 months after EFR) (ppb)	2Q2016, May 2016 (3 months after EFR) (ppb)	3Q2016, Sept. 2016 (6 months after EFR) (ppb)
MW48	5400	11000	1800	980	4800	3100
MW90	Not Sampled	3100	530	Not Sampled	4600	Not Sampled
MW69	4100	2700	3700	Not Sampled	3300	5800
MW25	Not Sampled	Not Sampled	5200	Not Sampled	530	Not Sampled

- Ecology recommends additional EFR be applied in areas where monitoring wells show persistent elevated groundwater concentrations. It is likely that groundwater concentrations in wells MW48, MW69 and MW90 will eventually be reduced after additional EFR. Long term groundwater data, such as 3-5 years after the EFR being applied, should be collected.
- Ecology request the continued operation of the three remediation systems. These extraction systems removed about 20 pounds of vapor phase hydrocarbon each in second quarter and third quarters, 2016.
- Ecology request TOC provide time versus vapor removal graphs to identify the long-term trend of vapor phase hydrocarbon removal. Please provide this time-mass trend graphs since the inception of vapor removal.

If you have any question, please call me at (425) 649-7187.

Sincerely,



Sunny Becker
Toxics Cleanup Program