

**Addendum 5: TCEQ Analysis of TCEQ Contractor Water Quality Sampling Data Collected on March 20, 2019
(lab results)**

The TCEQ previously reported its analysis of preliminary surface water quality data. The TCEQ has since received additional surface water quality data. This TCEQ analysis is an addendum to the original TCEQ Analysis of TCEQ contractor surface water quality sampling data. Final lab results have been received for the sampling conducted at the Tucker Bayou at Buffalo Bayou Outside of Containment Boom site on March 20, 2019. Updated lab results have been received for the sampling conducted at the Tucker Bayou at Buffalo Bayou Inside of Containment Boom and Upstream Tucker Bayou sites on March 20, 2019.

The Texas Commission on Environmental Quality (TCEQ) received preliminary surface water quality data for up to 129 constituents at three (3) different sites. One sample was collected at each site on March 20, 2019 by the TCEQ's contractor. The constituents consist of inorganics, organics, metals, nutrients, total suspended solids, chemical oxygen demand (COD), and oil and grease in water. The sampling sites were the following:

- Tucker Bayou at Buffalo Bayou Outside of Containment Boom
- Tucker Bayou at Buffalo Bayou Inside of Containment Boom
- Upstream Tucker Bayou

This assessment is based on results received from the laboratory. Laboratory results are subject to change once the final report is issued. As sample results are received, or additional water quality sampling is completed, the data will be assessed, and results made available.

The TCEQ used the Texas Water Quality Standards and the Texas Risk Reduction Program as references for determining the known health protective concentration levels (PCLs) in surface water. PCLs are very conservative and below levels where we would expect any health impacts. The TCEQ is using these PCLs to evaluate impacts to aquatic life and human health. No public drinking water system draws its source water from the Houston Ship Channel. This methodology was also used for previously reviewed data from samples collected by ITC and will be used to review samples from the TCEQ contractor. The TCEQ used the PCLs listed in the tables below to assess the surface water quality data.

Table 1: Assessment of Preliminary Laboratory Results

	Tucker Bayou at Buffalo Bayou Inside of Containment Boom	Tucker Bayou at Buffalo Bayou Outside of Containment Boom	Upstream Tucker Bayou
Number of Constituents	127	129	128*
Number of constituents analyzed but not detected (not detected above the method detection limit or quantitation limit)	108	105	117
Number of constituents detected above the method detection limit or quantitation limit	19	24	9
Number of constituents detected but below their known protective concentration levels	2	10	3
Number of constituents that exceeded their known PCLs	9	5	2
Number of constituents that are still pending further TCEQ evaluation	0	0	0
Number of constituents that do not have a PCL or are assessed with other constituents**	8	9	4

*Two constituents, Total Kjeldahl Nitrogen and Phenolic, collected at the Upstream Tucker Bayou site included samples where the MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix/chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD. Therefore, they were excluded from the assessment of preliminary laboratory results.

**The water quality parameters ammonia nitrogen (as N), total Kjeldahl nitrogen, total phosphate, total organic nitrogen, total sulfides, and total suspended solids are not related to human health; therefore it is not appropriate to develop human health comparison values to evaluate these parameters. Three chemicals on the laboratory target analyte list (4-bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, and benzo(g,h,i)perylene) do not have surface water comparison values and consequently will not be evaluated. These water quality parameters and chemicals are not directly related to the ITC incident, and the TCEQ is evaluating the chemicals that are directly related to the ITC incident (benzene and toluene, for example). C6-12, C12-28 and C28-35 range hydrocarbons, as well as total petroleum hydrocarbons, are included in the assessment of oil and grease. Therefore, these constituents are not assessed individually.

Table 2: Tucker Bayou at Buffalo Bayou Inside of Containment Boom

Constituent	Maximum (micrograms/L)	PCL (micrograms/L)
Oil & Grease, HEM	47000000	28000
Phenolic	688	0.29
Xylenes, Total	17700	850
Benzene	5220	581
Copper	26.2	3.6
Lead	20.3	3.83
Zinc	424	84.2
Toluene	1610	1000
Nickel	14.5	13.1

Table 3: Tucker Bayou @ Buffalo Bayou Outside Containment Boom

Constituent	Maximum (micrograms/L)	PCL (micrograms/L)
Benzene	854	581
COD	540000	150000*
Oil and Grease	120000	28000
Phenolic	52.3	0.29
Xylenes, Total	1150	850

Footnote:

*COD is a measure of the oxygen demand exerted by chemical constituents in water. There was not a known PCL for COD, therefore the permitted technology-based limit was used for comparison purposes. Although COD levels for treated process wastewater vary 150000 micrograms/L for noncontact stormwater was provided for comparison purposes.

Table 4. Upstream Tucker Bayou

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Constituent	Maximum (micrograms/L)	PCL (micrograms/L)
Cyanide, Total	5.67	5.6
Copper	4.23	3.6