

**Addendum 1: TCEQ Analysis of TCEQ Contractor Surface Water Quality Sampling Data Collected on March 24, 2019
(Final lab results)**

The Texas Commission on Environmental Quality (TCEQ) received final surface water quality data for up to 135 constituents at four (4) different sites. One sample was collected at each site on March 24, 2019 by the TCEQ's contractor. The constituents consist of inorganics, organics, metals, nutrients, chemical oxygen demand (COD), and oil and grease in water. The sampling sites were the following:

- Mouth of Tucker @ Buffalo Bayou
- Title (sic) Road @ Tucker Bayou
- Upstream Tucker
- Containment

This assessment is based on results received from the laboratory. As 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 Final Laboratory Results

	Mouth of Tucker @ Buffalo Bayou	Title (sic) Road @ Tucker Bayou	Upstream Tucker	Containment
Number of Constituents	128	128	128**	135
Number of constituents analyzed but not detected (not detected above the method detection limit or quantitation limit)	107	104	120	108
Number of constituents detected above the method detection limit or quantitation limit	21	24	8	27
Number of constituents detected but below their known PCLs	5	3	2	4
Number of constituents that exceeded their known PCLs	7	12	0	14
Number of constituents that are still pending further TCEQ evaluation	0	0	0	0
Number of constituents that do not have a PCL or are assessed with other constituents*	9	9	4	9

*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.

**The sample collected at the Upstream Tucker Bayou site included 2 constituents, Phenolic and Total Sulfide, where the MS/MSD recovery was found to be outside of the laboratory control limit 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 laboratory results.

Table 2: Mouth of Tucker Bayou @ Buffalo Bayou

Constituent	Maximum (micrograms/L)	PCL (micrograms/L)
Benzene	28100	581
Chemical Oxygen Demand	380000	150000*
2 Methyl-naphthalene	31.7	30
Oil & Grease, HEM	7980000	28000
Phenolic	175	0.29
Toluene	3470	1000
Xylenes, Total	5260	850

Table 3: Title (sic) Road @ Tucker Bayou

Constituent	Maximum (micrograms/L)	PCL (micrograms/L)
Benzene	66800	581
Chemical Oxygen Demand	1720000	150000*
Copper	9.43	3.6
Ethylbenzene	43300	1867
Lead	5.99	3.83
2 Methyl-naphthalene	493	30
Naphthalene	1230	125
Oil & Grease, HEM	31700000	28000
Phenolic	281	0.29
Toluene	128000	1000
Xylenes, Total	230000	850
Zinc	259	84.2

Table 4: Containment

Constituent	Maximum (micrograms/L)	PCL (micrograms/L)
Arsenic	10.1	10
Benzene	81100	581
Bis (2-ethylhexyl) phthalate	27.3	7.55
Chemical Oxygen Demand	3650000	150000*
Copper	12.5	3.6
Lead	7.05	3.83
2 Methyl naphthalene	181	30
Naphthalene	464	125
Nickel	15.3	13.1
Oil & Grease, HEM	101000	28000
Phenolic	612	0.29
Toluene	15900	1000
Xylenes, Total	8110	850
Zinc	588	84.2

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.