

TCEQ Regional Water Monitoring Strategy for FY20 for Metals and Organics in Water, Sediment, and Fish Tissue

The following is a summary guideline for use by the TCEQ Regional Staff in planning the FY2021 Monitoring schedule.

Organics in Water

Approach

In order to efficiently utilize existing resources, SWQM staff must prioritize water bodies for organics analysis. Each region has the option to choose one or two sites to monitor each year; however, regions with a greater need for sampling will be evaluated on a case-by-case basis. Selected sites should be monitored twice a year for at least three years. The following criteria should be used to select water bodies for monitoring:

- Water bodies with concern for specific contaminants
- Water bodies identified as concerns in the Integrated Report (IR) for organics in sediment if the contaminant is also a potential contaminant in water
- Water bodies that are on the 303(d) List for organic compounds in water
- Water bodies where contamination is suspected, e.g., large urban areas, areas of major petrochemical refining, major agricultural regions

The following criteria should be used to exclude water bodies from organics in water analysis:

- Water bodies with a Total Maximum Daily Load (TMDL) or other project underway to address an organics in water impairment parameter
- Water bodies where other agencies are sampling for organics in water and providing data to the TCEQ, e.g., United States Geological Survey (USGS)

Details for sampling organics in water can be found in Chapter 5 of the SWQM Procedures Manual, Volume 1.

Sampling Considerations

Sampling Period and Time of Year

Samples should be collected twice per year for at least two years to produce enough data to assess each water body for concerns. Samples for pesticides, herbicides, volatiles (VOAs), and semi-volatiles may be collected at any time of the year during a routine sampling event. A suggested sampling schedule would be alternating seasons, such as winter-summer or fall-spring. All four types of samples may not be needed. Consider the land uses around your monitoring station. For example, volatile or semi-volatile organics are not necessary if the area is dominated by agriculture. In these cases, only choose to submit samples for pesticides and herbicides only. Sample for semi-volatiles if you are sampling an urban or industrialized area. Volatile organics samples should be collected on a case-by-case basis. The cost for analysis is high and results are typically non-detects. If volatiles are collected for MTBE analysis, collection should be during the boating season when boat motors may release MTBE.

Lab Considerations

All organics samples collected for the SWQM Program must be sent to the LCRA Lab for analysis.

Metals in Water and Sediment

Selecting Sites

When collecting metals samples choose a site in the lower portion of the segment. If the segment has concerns or nonsupport of the water quality standards, priority should be given to the sites where concerns have been identified. See Appendix A.

Details for sampling metals in water and sediment can be found in Chapter 5 and 6 of the SWQM Procedures Manual, Volume 1.

Frequency of Sample Collection

Metals in water samples should be collected quarterly. However, if a site is scheduled to be visited only twice a year, then metals can also be collected at that frequency and should continue for a minimum of two years.

Sample Kits

All metals sampling requires the use of a low-level metals kit. The TCEQ Sugar Land Lab provides clean metals kits for the SWQM Program that can be used in either freshwater or saltwater. Each kit comes with supplies to collect dissolved metals, total metals, total mercury, and associated blanks. Note: In addition to circling routine dissolved metals on the RFA form make sure that total mercury and selenium are also requested.

Order kits from the TCEQ Sugar Land Lab only. Kits should be ordered from the Sugar Land Lab at least two weeks in advance of the sampling event (in situations where kits are needed sooner please contact the Sugar Land Lab). Use the "Clean Metals Sampling Kit Request Form", located on FODWEB accessed by following the links - Programs / Water / SWQM / SWQM Forms. Questions should be directed to David Nixson at the TCEQ Sugar Land Lab at 281-269-8323.

Lab Considerations

Send metals samples to the TCEQ Sugar Land Lab only.

Organics in Sediment

Approach

Sampling plans should generate a minimum of four samples in 1 to 2 years. At a minimum, samples should be collected twice a year for two years. Regions may opt to collect all four sediment samples within one year. Details for sampling sediment can be found in Chapter 6 of the SWQM Procedures Manual, Volume 1.

Sediment data will be screened to identify concerns. If no concerns are identified after four samples are collected, no additional sampling is needed and a new site should be selected for the next fiscal year. If concerns are identified at a site, sediment sampling should be continued until a minimum of 10 samples is collected. Additional sampling may trigger monitoring of other sediment sampling triad components (toxicity testing and benthic macroinvertebrate sampling) to determine if the aquatic life use is impaired by contaminated sediment. This is not common.

Selecting Sites

Sites with concerns due to exceedances of acute/chronic criteria, human health criteria, or biological impairment should be a priority. When selecting a sampling site consider placement where there is a perceived risk of metals/organic substances contamination. Sites located downstream of domestic or industrial discharges, hazardous waste sites, metropolitan areas, or areas experiencing high nonpoint source loads may also be considered.

Sampling Considerations

Consider collecting sediment and tissue samples on the same water bodies as part of a special study designed to address pollution by toxic contaminants.

Lab Considerations

Metals and organic substances (pesticides and semi volatiles) in sediment should be requested for each sample, unless there is a specific reason to exclude one or the other. Volatile organic substances are no longer routinely requested, but can be specifically requested if there is a perceived risk.

For metals only—send two jars of sediment to the TCEQ Sugar Land Lab (metals and sediment conventional parameters analysis). For organics only— send one jar to the LCRA Lab and a second to the TCEQ Sugar Land Lab for conventionals. For metals, conventionals, and organics— send two jars to the TCEQ Sugar Land Lab and one to the LCRA Lab.

Note: Only the LCRA lab is prepared to analyze organics in sediment for the SWQM Program.

Sites with Concerns

Appendix A identifies water bodies with sediment concerns for metals and/or organic substances from the EPA approved 2018 IR. Consideration should be given to sampling toxicity or biological communities and habitat at these sites to determine if the contaminated sediments are impacting the aquatic life use. The [draft 2020 IR concerns](#) should also be reviewed for potential monitoring.

Quality Assurance Plans (QAP)

A QAP is no longer required for routine sediment sampling. This applies to all samples collected at a routine monitoring station during a routine monitoring event. However, if sediment sampling is part of an independent project, a QAP is required. Please allow at least three weeks for the QAP review and approval process.

Note: Sampling must not begin until the QAP is signed. For details and questions contact Robin Cypher, TCEQ SWQM Program, at 512-239-5256 or by email at Robin.Cypher@tceq.texas.gov.

Fish Tissue

Fish tissue sampling is requested for regions equipped with backpack or boat-mounted electrofishers or regions capable of obtaining fish through other means. The total number of samples is minimized to control high costs associated with analytical analysis.

Approach

All fish tissue sampling should be conducted as part of a special project and requires a QAP outlining the purpose for sampling and providing for the appropriate type and number of samples. Guidance provided in the SWQM Procedures Manual, Volume 1, Chapter 7, should be used to determine the details for sampling fish tissue. Samples may be submitted as either fillet or whole-body specimens. Individual samples yield more information but are costlier, therefore composite samples are most often used for screening purposes. Fish tissue data will be compared to established human health-based screening levels and may be included in the IR. If a contaminant concentration exceeds screening criteria, the affected water body may be considered for a Texas Department of State Health Services (DSHS) human health risk assessment which could result in the issuance of a fish tissue consumption advisory or aquatic life closure.

Selecting Sites

Sites identified as having concerns or impairments of acute/chronic toxicity in water criteria, human health criteria, toxics in sediment, or biological community integrity should be a priority in site selection. Additionally, water bodies which have never been sampled, a recreational fishery, or water bodies with sampling data older than the current water quality assessment date range should be considered. When selecting a sampling site consider placement where there is a perceived risk of metals/organic substances contamination. Sites located downstream of domestic or industrial discharges, hazardous waste sites, metropolitan areas, or areas experiencing high nonpoint source loads may also be considered.

Samples should not be collected in areas where the DSHS has issued [consumption advisories](#) or aquatic life closures or where DSHS has previously sampled and determined the fish no longer pose an apparent public health hazard.

Additionally, Regional Staff should contact Pat Bohannon, TCEQ SWQM Program, at 512-239-5255 or by email at pat.bohannon@tceq.texas.gov to confirm that a proposed site has not been recently sampled or scheduled to be sampled as part of another sampling project. If there have been changes which

may significantly affect contaminant concentrations in a previously sampled watershed, new sampling may be warranted.

Consider collecting sediment and tissue samples on the same water bodies as part of a special study designed to address pollution by toxic contaminants.

Sampling Considerations

Field sampling with a backpack or boat-mounted electrofisher, gill nets, seines, or trawls should normally be conducted in the summer to early fall when lipid content is generally highest in fish and water levels are low. The time period should be adjusted if the target species is most often harvested, or is only legally harvested at another time of year, or if the species' spawning period is late summer.

Lab Considerations

All tissue samples must be sent to the LCRA Lab. Metals and organic substances (pesticides and semi-volatiles) for each sample should be requested unless a specific reason exists to exclude one or the other. Volatile organic substances are no longer routinely run, but can be specifically requested if there is a perceived risk.

There is no requirement to fillet fish samples in the field. Upon request, the LCRA Lab will fillet the sample when a whole-body specimen is submitted. The LCRA Lab prefers to receive tissue samples frozen; however, this does not preclude regions from shipping tissue samples on the same day they are collected, provided they are shipped overnight. If shipping will be delayed, the samples must be frozen.

Additional Requests

Regions without electrofishing gear may have other means of collecting fish or may work closely with regional Texas Parks and Wildlife Department personnel to obtain fish when conducting sampling. Alternately, any region that prefers to conduct fish tissue sampling but has not been allocated sampling events due to lack of equipment, may contact an adjacent region or SWQM central office for assistance. Flexibility exists in the lab budget to accommodate some additional samples from regions that wish to collect more than their allotment.

Quality Assurance Considerations

A QAP is required for routine or special study tissue sampling. This requirement applies to all fish collected at a routine monitoring station during a routine monitoring event, or as part of an independent project. Please allow at least three weeks for the QAP review and approval process.

Note: Work must not begin until the QAP is signed. For details and questions contact TCEQ SWQM Program, Robin Cypher at 512-239-5256 or by email at robin.cypher@tceq.texas.gov or Pat Bohannon (fish tissue) 512-239-5255 or by email at: pat.bohannon@tceq.texas.gov.

APPENDIX A

WATER BODIES WITH LISTINGS OR CONCERNS FOR CONTAMINANTS IN WATER, SEDIMENT, AND TISSUE IN THE 2018 INTEGRATED REPORT

Segment & AU Number	Water Body Name	Media	Parameter	Integrated Support Code	No. Samples in 2018 IR (dataset)
0101A	Dixon Creek	Water	Selenium	NS	19
0209 01, 02	Pat Mayse Lake	Sediment	Manganese	CS	6
0218 03, 04	Wichita/North Fork Wichita River	Water	Selenium	CN	0
0218A	Middle Fork Wichita River	Water	Selenium	CN	0
0304	Days Creek	Sediment	Acenaphthene	CS	0
0304	Days Creek	Sediment	Benzo(a)anthracene	CS	0
0304	Days Creek	Sediment	Benzo(a)pyrene	CS	0
0304	Days Creek	Sediment	Chrysene	CS	0
0304	Days Creek	Sediment	Fluoranthene	CS	0
0304	Days Creek	Sediment	Naphthalene	CS	0
0304	Days Creek	Sediment	Phenanthrene	CS	0
0304	Days Creek	Sediment	Pyrene	CS	0
0401	Caddo Lake	Sediment	Iron	CS	0
0401 01, 02, 03, 05, 07	Caddo Lake	Biological	Mercury	CS	0
0404A	Ellison Creek Reservoir	Sediment	Cadmium	CS	0
0404A	Ellison Creek Reservoir	Sediment	Iron	CS	0
0404A	Ellison Creek Reservoir	Sediment	Lead	CS	0
0404A	Ellison Creek Reservoir	Sediment	Manganese	CS	0
0404A	Ellison Creek Reservoir	Sediment	Nickel	CS	0
0404A	Ellison Creek Reservoir	Sediment	Sediment Toxicity (LOE)	NS	0
0404A	Ellison Creek Reservoir	Sediment	Zinc	CS	0
0404N	Lake Daingerfield	Biological	Mercury	CS	0
0410	Black Cypress Bayou (Creek)	Water	Copper	CN	0
0410	Black Cypress Bayou (Creek)	Water	Copper	NS	0
0410	Black Cypress Bayou (Creek)	Water	Copper (dissolved)	CN	5
0410	Black Cypress Bayou (Creek)	Water	Copper (dissolved)	NS	5

Segment & AU Number	Water Body Name	Media	Parameter	Integrated Support Code	No. Samples in 2018 IR (dataset)
0501B 01, 02, 03	Little Cypress Bayou	Water	Water Chronic Toxicity	NS	0
0513	Big Cow Creek	Water	Lead (dissolved)	CN	6
0601	Neches River Tidal	Water	Malathion	CN	13
0601A	Star Lake Canal	Water	Malathion	CN	10
0602 01, 02, 03, 04	Neches River Below B. A. Steinhagen Lake	Biological	Mercury	CS	0
0605 01, 02, 03, 09, 10, 11	Lake Palestine	Sediment	Manganese	CS	6
0606	Neches River Above Lake Palestine	Water	Zinc (dissolved)	CN	5
0608 01, 02	Village Creek	Biological	Mercury	CS	0
0608A	Beech Creek	Water	Copper (dissolved)	NS	3
0610 01-10	Sam Rayburn Reservoir	Sediment	Iron	CS	64
0610 01-10	Sam Rayburn Reservoir	Sediment	Manganese	CS	64
0610 01-10	Sam Rayburn Reservoir	Biological	Mercury	CS	0
0701D	Shallow Prong Lake	Biological	Arsenic	CS	0
0702A	Alligator Bayou and Main Canals A, B, C, and D	Sediment	Lead	CS	8
0702A	Alligator Bayou and Main Canals A, B, C, and D	Sediment	Sediment Toxicity (LOE)	NS	0
0702A	Alligator Bayou and Main Canals A, B, C, and D	Water	Water Acute Toxicity	NS	0
0803F	Bedias Creek	Water	Zinc	CN	0
0806A	Fosdic Lake	Biological	Arsenic	CS	0
0829A	Lake Como	Biological	Arsenic	CS	0
1006	Houston Ship Channel Tidal	Sediment	DDD	CS	6
1006	Houston Ship Channel Tidal	Sediment	DDT	CS	6
1006	Houston Ship Channel Tidal	Sediment	Hexachlorobutadiene (HCBd)	CS	11
1006	Houston Ship Channel Tidal	Sediment	Mercury	CS	10
1006	Houston Ship Channel	Water	Mercury	NS	7

Segment & AU Number	Water Body Name	Media	Parameter	Integrated Support Code	No. Samples in 2018 IR (dataset)
	Tidal				
1006	Houston Ship Channel Tidal	Sediment	Sediment Acute Toxicity	NS	0
1006	Houston Ship Channel Tidal	Sediment	Sediment Toxicity (LOE)	NS	0
1007	Houston Ship Channel/Buffalo Bayou Tidal	Sediment	Sediment Acute Toxicity	NS	0
1007	Houston Ship Channel/Buffalo Bayou Tidal	Sediment	Sediment Toxicity (LOE)	NS	0
1008B	Upper Panther Branch	Water	Cadmium (dissolved)	CN	4
1209A	Country Club Lake	Sediment	Arsenic	CS	0
1209A	Country Club Lake	Sediment	Sediment Toxicity (LOE)	NS	0
1209B	Fin Feather Lake	Sediment	Arsenic	CS	0
1209B	Fin Feather Lake	Sediment	Chromium	CS	0
1209B	Fin Feather Lake	Sediment	Copper	CS	0
1209B	Fin Feather Lake	Sediment	DDD	CS	0
1209B	Fin Feather Lake	Sediment	DDE	CS	0
1209B	Fin Feather Lake	Sediment	Sediment Toxicity (LOE)	NS	0
1209B	Fin Feather Lake	Sediment	Zinc	CS	0
1209O	Normangee Lake	Sediment	Arsenic	CS	0
1254	Aquilla Reservoir	Sediment	Arsenic	CS	2
1403	Lake Austin	Sediment	Manganese	CS	0
1407	Inks Lake	Sediment	Manganese	CS	0
1407A	Clear Creek	Water	Aluminum (dissolved)	NS	11
1407A	Clear Creek	Water	Cadmium	CN	0
1407A	Clear Creek	Water	Copper (dissolved)	NS	11
1407A	Clear Creek	Water	Nickel (dissolved)	NS	11
1407A	Clear Creek	Water	Zinc (dissolved)	NS	11
1418	Lake Brownwood	Sediment	Manganese	CS	4
1429	Lady Bird Lake (formerly Town Lake)	Sediment	Dibenz(a,h)anthracene	CS	11
1429C	Waller Creek	Sediment	Benzo(a)anthracene	CS	2
1429C	Waller Creek	Sediment	Benzo(a)pyrene	CS	2

Segment & AU Number	Water Body Name	Media	Parameter	Integrated Support Code	No. Samples in 2018 IR (dataset)
1429C	Waller Creek	Sediment	Chrysene	CS	2
1429C	Waller Creek	Sediment	Dibenz(a,h)anthracene	CS	2
1429C	Waller Creek	Sediment	Fluoranthene	CS	2
1429C	Waller Creek	Sediment	Lead	CS	2
1429C	Waller Creek	Sediment	Phenanthrene	CS	2
1429C	Waller Creek	Sediment	Pyrene	CS	2
1429D	East Bouldin Creek	Sediment	Benzo(a)anthracene	CS	0
1429D	East Bouldin Creek	Sediment	Cadmium	CS	0
1429D	East Bouldin Creek	Sediment	Chrysene	CS	0
1429D	East Bouldin Creek	Sediment	Dibenz(a,h)anthracene	CS	0
1429D	East Bouldin Creek	Sediment	Fluoranthene	CS	0
1429D	East Bouldin Creek	Sediment	Lead	CS	0
1429D	East Bouldin Creek	Sediment	Phenanthrene	CS	0
1429D	East Bouldin Creek	Sediment	Pyrene	CS	0
1430	Barton Creek	Sediment	Sediment Toxicity (LOE)	CN	0
1430A	Barton Springs	Sediment	Sediment Toxicity (LOE)	CN	0
1906	Lower Leon Creek	Sediment	Silver	CS	10
1906	Lower Leon Creek	Sediment	Silver	CS	1
2303	International Falcon Reservoir	Water	Water toxicity (sub-lethal effects)	CN	0
2304 03, 04	Rio Grande Below Amistad Reservoir	Water	Water toxicity (sub-lethal effects)	CN	0
2304B	Manadas Creek	Sediment	Antimony	CS	13
2425	Clear Lake	Water	Copper (dissolved)	NS	8
2438	Bayport Channel	Water	Copper (dissolved)	NS	10
2453D	Lavaca Bay Ship Channel Area	Water	Copper (dissolved)	NS	12
2454	Cox Bay	Water	Copper (dissolved)	NS	11
2482	Nueces Bay	Water	Copper (dissolved)	NS	14
2483A	Conn Brown Harbor	Water	Copper (dissolved)	CN	1
2484	Corpus Christi Inner Harbor	Water	Copper (dissolved)	NS	23