

**Revision #1 of Table A7
to the Sulphur River Basin Authority
Clean Rivers Program FY 2008/2009 QAPP**

**Prepared by the Sulphur
In Cooperation with the
Texas Commission on Environmental Quality (TCEQ)**

Questions concerning this QAPP should be directed to:

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Effective: **Date to be inserted by TCEQ Lead QA Specialist**

Justification: The method listed in the QAPP for total phosphorus analysis is inconsistent with the method reported by Ana-Lab.

Detail of Changes: The method for total phosphorus is currently EPA 365.2. It has been changed to EPA 365.3 to reflect the analytical method used by Ana-Lab. The revised Table A7 is as follows:

Table A7.1 Measurement Performance Specifications

PARAMETER	UNITS	MATRIX	METHOD	PARAMETER CODE	AWRL	Limit of Quantitation (LOQ)	PRECISION (RPD of LCS/LCSD)	BIAS %Rec. of LCS	LOQ CHECK STANDARD %Rec	LAB
Field Parameters										
pH	pH/ units	water	EPA 150.1 and TCEQ SOP, V1	00400	NA*	NA	NA	NA	NA	Field
DO	mg/L	water	SM 4500-O G and TCEQ SOP, V1	00300	NA*	NA	NA	NA	NA	Field
Conductivity	uS/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	NA*	NA	NA	NA	NA	Field
Temperature	B C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
Secchi Depth	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
Days since last significant rainfall	days	NA	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
Maximum pool width***	meters	water	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
Maximum pool depth***	meters	water	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
Pool length***	meters	water	TCEQ SOP, V2	89869	NA*	NA	NA	NA	NA	Field
% pool coverage***	%	water	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Total water depth	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
Flow	cfs	water	TCEQ SOP V1	00061	NA*	NA	NA	NA	NA	Field
Flow measurement method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ SOP V1	89835	NA*	NA	NA	NA	NA	Field
Flow severity	1-no flow, 2-low, 3-normal, 4-flood, 5-high, 6-dry	water	TCEQ SOP V1	01351	NA*	NA	NA	NA	NA	Field
Flow estimate	cfs	water	TCEQ SOP, V1	74069	NA*	NA	NA	NA	NA	Field
Present Weather	1-clear 2-partly cloudy 3-cloudy 4-rain 5-other	NA	NA	89966	NA	NA	NA	NA	NA	Field
Wind Intensity	1-calm 2-slight	NA	NA	89965	NA	NA	NA	NA	NA	Field

	3-moderate 4-strong									
Water Surface	1-calm 2-ripples 3-waves	NA	NA	89968	NA	NA	NA	NA	NA	Field

- * Reporting to be consistent with SWQM guidance and based on measurement capability.
- ** Chlorine residual to be collected downstream of chlorinated outfalls.
- *** To be routinely reported when collecting data from perennial pools.

Table A7.1 - Measurement Performance Specifications (Continued)

PARAMETER	UNITS	MATRIX	METHOD	PARAMETER CODE	AWRL	Limit of Quantitation (LOQ)	PRECISION (RPD of LCS/LCSD)	BIAS %Rec. of LCS	LOQ CHECK STANDARD %Rec	LAB
Conventional and Bacteriological Parameters										
TSS	mg/L	water	SM 2540 D 20 th Ed.	00530	4	4	20	80-120	NA	AnaLab
TDS, dried at 180 degrees C	mg/L	water	SM 2540 C 20 th Ed.	70300	10	10	20	80-120	NA	AnaLab
Sulfate	mg/L	water	EPA 300.0, Rev. 2.1 (1993)	00945	5	5	20	80-120	70-130	AnaLab
Chloride	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	5	20	80-120	70-130	AnaLab
Chlorophyll-a, spectrophotometric method	ug/L	water	EPA 445.0	32211	3	3	20	80-120	NA	AnaLab
* Ammonia-N, total	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	20	80-120	70-130	AnaLab
Total Kjeldahl N	mg/L	water	SM 4500-Norg B or C and SM 4500-NH3 B	00625	0.2	0.2	20	80-120	70-130	AnaLab
Nitrate-N, total	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	.05	0.05	20	80-120	70-130	AnaLab
Nitrite-N, total	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	.05	0.05	20	80-120	70-130	AnaLab
Total phosphorus-P	mg/L	water	EPA 365.3	00665	.06	0.06	20	80-120	70-130	AnaLab

* SRBA requests that data for dissolved ammonia-N or ammonia-N filtered only samples be reported.

References for Table A7.1:

- United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
- American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)
- TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2003 (RG-415).
- TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2005 (RG-416)
- American Society for Testing and Materials (ASTM) Annual Book of Standards, Vol. 11.02

Table A7.1 - Measurement Performance Specifications (Continued)

Benthics - Freshwater - RBA (Qualitative)					
PARAMETER	UNITS	MATRIX	METHOD	PARAMETER CODE	LAB***
Biological Data Reporting Units	1 = number of individuals from sub-sample; 2 = number of individuals/ft ² ; 3 = number of individuals/m ² ; 4 = total number in kicknet	Water	TCEQ SOP, V2	89899	NA
Kicknet Effort, area kicked	m ²	Water	TCEQ SOP, V2	89903	NA
Kicknet Effort, minutes kicked	minutes	Water	TCEQ SOP, V2	89904	NA
Snags and Shoreline Sampling Effort, minutes picked	minutes	Water	TCEQ SOP, V2	89905	NA
Number of individuals in benthic RBA sub-sample (∇ 100)	#	Water	TCEQ SOP, V2	89906	NA
Benthic Sampler	1=Surber, 2=Ekman, 3=kicknet, 4=Petersen, 5=Hester-Dendy	Water	TCEQ SOP, V2	89950	NA
Undercut bank at sample point	%	Water	TCEQ SOP, V2	89921	NA
Overhanging brush at sample point	%	Water	TCEQ SOP, V2	89922	NA
Gravel substrate at sample point	%	Water	TCEQ SOP, V2	89923	NA
Sand substrate at sample point	%	Water	TCEQ SOP, V2	89924	NA
Soft bottom at sample point	%	Water	TCEQ SOP, V2	89925	NA
Macrophyte bed at sample point	%	Water	TCEQ SOP, V2	89926	NA
Snags and brush at sample point	%	Water	TCEQ SOP, V2	89927	NA
Bedrock at sample point	%	Water	TCEQ SOP, V2	89928	NA
Benthic Organisms, None Present	NA	Water	TCEQ SOP, V2	90005	NA
Mesh Size, any net or sieve, average bar (diagonal measurement) for benthic collection	cm	NA	TCEQ SOP, V2	89946	NA
Stream Order	#	NA	TCEQ SOP, V1	84161	NA
Ecoregion (Texas Ecoregion Code)	#	NA	TCEQ SOP, V1	89961	NA
Total Taxa Richness, Benthos	#	Water	TCEQ SOP, V2	90055	NA
EPT Index, Abundance	#	Water	TCEQ SOP, V2	90008	NA
Biotic Index (HBI)	NA	Water	TCEQ SOP, V2	90007	NA
Chironomidae	%	Water	TCEQ SOP, V2	90062	NA
Dominant Taxon, Benthos	%	Water	TCEQ SOP, V2	90042	NA
Dominant FFG	%	Water	TCEQ SOP, V2	90010	NA
Predators	%	Water	TCEQ SOP, V2	90036	NA
Ratio of Intolerant:Tolerant taxa, Benthos	NA	Water	TCEQ SOP, V2	90050	NA
Total Trichoptera as Hydropsychidae	%	Water	TCEQ SOP, V2	90069	NA
Non-insect taxa	#	Water	TCEQ SOP, V2	90052	NA
Collector-gatherers	%	Water	TCEQ SOP, V2	90025	NA
Total number as Elmidae	%	Water	TCEQ SOP, V2	90054	NA

Table A7.1 - Measurement Performance Specifications (Continued)

Nekton- Freshwater					
PARAMETER	UNITS	MATRIX	METHOD	PARAMETER CODE	LAB***
Nekton, none captured	NA	Water	TCEQ SOP, V2	98005	NA
Electrofishing effort, duration of shocking	Seconds	Water	TCEQ SOP, V2	89944	NA
Seining effort	# of Hauls	Water	TCEQ SOP, V2	89947	NA
Combined length of seine hauls	meters	Water	TCEQ SOP, V2	89948	NA
Seining effort, duration	minutes	Water	TCEQ SOP, V2	89949	NA
Seine Minimum Mesh Size, net average bar, Nekton	in	Water	TCEQ SOP, V2	89930	NA
Seine Maximum Mesh Size, net average bar, Nekton	in	Water	TCEQ SOP, V2	89931	NA
Net length	meters	Water	TCEQ SOP, V2	89941	NA
Electrofishing method	1 = boat 2 = backpack 3 = tote barge	Water	TCEQ SOP, V2	89943	NA
Area seined	m ²	Water	TCEQ SOP, V2	89976	NA
Stream Order	#	NA	TCEQ SOP, V1	84161	NA
Ecoregion (Texas Ecoregion Code)	#	NA	TCEQ SOP, V1	89961	NA
Total number fish species	#	Water	TCEQ SOP, V2	98003	NA
Total native cyprinid species, fish	#	Water	TCEQ SOP, V2	98032	NA
Total benthic invertivore species, fish	#	Water	TCEQ SOP, V2	98052	NA
Total benthic species, fish	#	Water	TCEQ SOP, V2	98053	NA
Total sunfish species (except bass)	#	Water	TCEQ SOP, V2	98008	NA
Total intolerant fish species	#	Water	TCEQ SOP, V2	98010	NA
Tolerant individuals (excluding Western Mosquitofish), fish	%	Water	TCEQ SOP, V2	98070	NA
Omnivore individuals, fish	%	Water	TCEQ SOP, V2	98017	NA
Invertivore individuals, fish	%	Water	TCEQ SOP, V2	98021	NA
Piscivore individuals, fish	%	Water	TCEQ SOP, V2	98022	NA
Total Individuals seining	#	Water	TCEQ SOP, V2	98039	NA
Total Individuals electroshocking	#	Water	TCEQ SOP, V2	98040	NA
Individuals/seine haul	#	Water	TCEQ SOP, V2	98062	NA
Individuals/minute electroshocking	#	Water	TCEQ SOP, V2	98069	NA
Individuals as non-native species	%	Water	TCEQ SOP, V2	98033	NA
Individuals w/ disease/anomalies	%	Water	TCEQ SOP, V2	98030	NA

Table A7.1 - Measurement Performance Specifications (Continued)

Physical Habitat				
PARAMETER	UNITS	METHOD	PARAMETER CODE	LAB
Streambed slope over evaluated reach (from USGS map)	NA	TCEQ SOP, V2	72052	NA
Approximate drainage area above the most downstream transect from USGS map	km ²	TCEQ SOP, V2	89859	NA
Stream Order	#	TCEQ SOP, V2	84161	NA
Length of stream	km	TCEQ SOP, V2	89860	NA
Lateral transects made	#	TCEQ SOP, V2	89832	NA
Average stream width	meters	TCEQ SOP, V2	89861	NA
Average stream depth	meters	TCEQ SOP, V2	89862	NA
Instantaneous stream flow	cfs	TCEQ SOP, V2	00061	NA
Flow measurement method	1 = gage 2 = electric 3 = mechanical 4 = weir/flume	TCEQ SOP, V2	89835	NA
Channel Flow Status	1 = no flow 2 = low 3 = moderate 4 = high	TCEQ SOP, V2	89848	NA
Maximum pool width at time of study	meters	TCEQ SOP, V2	89864	NA
Maximum pool depth in study area	meters	TCEQ SOP, V2	89865	NA
Total stream bends	#	TCEQ SOP, V2	89839	NA
Well-defined stream bends	#	TCEQ SOP, V2	89840	NA
Moderately defined stream bends	#	TCEQ SOP, V2	89841	NA
Poorly defined stream bends	#	TCEQ SOP, V2	89842	NA
Riffles	#	TCEQ SOP, V2	89843	NA
Dominant substrate	1 = clay, 2 = silt, 3 = sand, 4 = gravel, 5 = cobble, 6 = boulder, 7 = bedrock, 8 = other	TCEQ SOP, V2	89844	NA
Avg. % of substrate gravel >2mm	%	TCEQ SOP, V2	89845	NA
Avg. % instream cover	%	TCEQ SOP, V2	84159	NA
Stream Cover Types	#	TCEQ SOP, V2	89929	NA
Avg. % stream bank erosion potential	%	TCEQ SOP, V2	89846	NA
Avg. stream bank angle	degrees	TCEQ SOP, V2	89847	NA
Avg. width natural riparian vegetation	meters	TCEQ SOP, V2	89866	NA
Avg. % trees as riparian vegetation	%	TCEQ SOP, V2	89849	NA
Avg. % shrubs as riparian vegetation	%	TCEQ SOP, V2	89850	NA
Avg. % grasses and forbes as riparian vegetation	%	TCEQ SOP, V2	89851	NA
Avg. % cultivated fields as riparian vegetation	%	TCEQ SOP, V2	89852	NA
Avg. % other as riparian vegetation	%	TCEQ SOP, V2	89853	NA
Avg.% tree canopy coverage	%	TCEQ SOP, V2	89854	NA
Overall Aesthetics	1 = wilderness 2 = natural 3 = common 4 = offensive	TCEQ SOP, V2	89867	NA
Texas Ecoregion Code	#	TCEQ SOP, V2	89961	NA

Physical Habitat				
PARAMETER	UNITS	METHOD	PARAMETER CODE	LAB
Land development impact	1 = unimpacted 2 = low 3 = moderate 4 = high	TCEQ SOP, V2	89962	NA

Table A7.1 - Measurement Performance Specifications (Continued)

24-hour Dissolved Oxygen Monitoring Parameters									
Parameter	Units	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	PRECISION (RPD of LCS/LCSD)	Bias % Rec LCS	LOQ CHECK STANDARD %Rec	Lab
24-Hr D.O. Avg.	mg/l	TCEQ SOP, V1	89857	NA	NA	NA	NA	NA	field
Max Daily DO	mg/l	TCEQ SOP, V1	89856	NA	NA	NA	NA	NA	field
Min Daily DO	mg/l	TCEQ SOP, V1	89855	NA	NA	NA	NA	NA	field
# DO measurements during 24-Hrs	# meas.	TCEQ SOP, V1	89858	NA	NA	NA	NA	NA	field
24-Hr Avg. water Temperature	B Celsius	TCEQ SOP, V1	00209	NA	NA	NA	NA	NA	field
Max Daily water Temperature	B Celsius	TCEQ SOP, V1	00210	NA	NA	NA	NA	NA	field
Min Daily water Temperature	B Celsius	TCEQ SOP, V1	00211	NA	NA	NA	NA	NA	field
# water temp measurements during 24-Hrs.	# meas.	TCEQ SOP, V1	00221	NA	NA	NA	NA	NA	field
24-Hr Avg. Spec Conductance	uS/cm	TCEQ SOP, V1	00212	NA	NA	NA	NA	NA	field
Max Spec Conductance	uS/cm	TCEQ SOP, V1	00213	NA	NA	NA	NA	NA	field
Min Spec Conductance	uS/cm	TCEQ SOP, V1	00214	NA	NA	NA	NA	NA	field
# Spec Conductance measurements during 24-Hrs.	# meas.	TCEQ SOP, V1	00222	NA	NA	NA	NA	NA	field
Max Daily pH	Standard units	TCEQ SOP, V1	00215	NA	NA	NA	NA	NA	field
Min Daily pH	Standard units	TCEQ SOP, V1	00216	NA	NA	NA	NA	NA	field

# pH measurements during 24-Hrs.	# meas.	TCEQ SOP, V1	00223	NA	NA	NA	NA	NA	field
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References:

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2003 (RG-415)

TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2005 (RG-416)

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
 American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. *(Note: the 21st may be used if it becomes available)*

United States Environmental Protection Agency (USEPA) Manual #EPA-821-R-9S-027

Distribution: QAPP Amendments/Revisions to Appendices will be distributed to all personnel on the distribution list maintained by the Planning Agency.

These changes will be incorporated into the QAPP document and TCEQ and the Sulphur River Basin Authority will acknowledge and accept these changes by signing this amendment.

Nancy Rose, Sulphur River Basin Authority Project Manager

Date

Mike Buttram, Sulphur River Basin Authority QAO

Date

ANA-LAB Corporation

Bill Peery, ANA-LAB Corporation Manager

Date

Roy White ANA-LAB Corporation Quality Assurance Officer

Date

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Jennifer Delk, CRP Project Manager Date

Jennifer Delk, CRP Project QAS Date

Laurie Curra, CRP Manager Date

Daniel R. Burke, CRP Lead QAS Date

Note: Additional signatures may be required.