Amendment # 2
Update to Appendix B Sampling Process Design and Monitoring Schedule to the Sulphur River Basin Authority Clean Rivers Program FY 2016/2017 QAPP

Prepared by the Basin Planning Agency in Cooperation with the Texas Commission on Environmental Quality (TCEQ)

Effective: Immediately upon approval by all parties

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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 document.

Texas Commission on Environmental Quality

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The Sulphur River Basin Authority will provide copies of this project plan and any amendments or appendices of this plan to each person on this list and to each sub-tier project participant, e.g., subcontractors, other units of government. The Sulphur River Basin Authority will document distribution of the plan and any amendments and appendices, maintain this documentation as part of the project's quality assurance records, and will ensure the documentation is available for review.

Justification

This document details the changes made to the basin-wide Quality Assurance Project Plan to update Appendix B for fiscal year 2017.

Summary of Changes

Tables A7.6 and A7.9 for North Texas Municipal Water District (NTMWD) have been updated to reflect the parameters monitored and submitted to the SRBA for inclusion in SWQMIS.

The following information in Appendix B is amended to reflect changes to:

- Sample design rationale FY 2017
- Monitoring Sites table with updated legends
- Maps of sampling sites

Detail of Changes

The following parameter codes were added/deleted to **Table A7** for NTMWD:

Section/Figure/Table	Page	Change	Justification
TABLE A7.9 Measurement Performance Specifications for NTMWD		Add parameter code (00054) for reservoir storage-acre feet	NTMWD utilizes this code in their data submittal. Because they submit to more than one entity, it is of advantage to have them all the same.
TABLE A7.9 Measurement Performance Specifications for NTMWD		Add parameter code (20424) for water clarity	NTMWD utilizes this code in their data submittal. Because they submit to more than one entity, it is of advantage to have them all the same.
TABLE A7.9 Measurement Performance Specifications for NTMWD		Add parameter code (89969) for water color	NTMWD utilizes this code in their data submittal. Because they submit to more than one entity, it is of advantage to have them all the same.
TABLE A7.9 Measurement Performance Specifications for NTMWD		Add parameter code (89971) for water odor	NTMWD utilizes this code in their data submittal. Because they submit to more than one entity, it is of advantage to have them all the same.
TABLE A7.6 Measurement Performance Specifications for NTMWD		Add parameter code (70507) for orthophosphate, laboratory filtered. The parameter code 00671 was removed because the sample is not field filtered.	This code change matches what NTMWD is submitting
TABLE A7.6 Measurement Performance Specifications for NTMWD		The parameter code 00671 was removed because the sample is not field filtered.	This code change matches what NTMWD is submitting

The following changes were made to **Table B1.1**:

Section/Figure/Table	Page	Change	Justification
TABLE B1.1		Texarkana College will discontinue the Wright Patman Lake site (Station ID 16859) at International Paper water intake.	The number of AUs for the lake has been reduced and the site is no longer necessary.
TABLE B1.1		Sulphur River Basin Authority will add site Anderson Creek at FM 98 (Station ID 20765) for quarterly conventional chemistry, field, flow, bacteria and Diel monitoring	Added at the request of TCEQ.
TABLE B1.1		Sulphur River Basin Authority will add the site (Station ID 14475) on Wagner Creek at US Hwy 82.	At the request of TCEQ to investigate low flow levels during summer months or periods of drought. Only field and flow data will be monitored.
TABLE B1.1		NTMWD will add a site (Station ID 21810) Jim Chapman Lake 10.4 km west of Gate Tower. The site will be monitored monthly for field parameters. The site will only be monitored when it is accessible by the local boat ramp.	At the request of TCEQ.
TABLE B1.1		NTMWD will discontinue monitoring the Middle Sulphur River site (Station ID 17616) at FM 1531	Discontinued because Jim Chapman Lake backs into the area when water levels are high.
TABLE B1.1		NTMWD will add a site (Station ID 10223) Middle Fork Sulphur River at SH 24 North of Commerce. The site will be monitored monthly for metals, conventional chemistry, bacteria, flow, and field parameters.	Added this site to replace (Station ID 17616) Middle Sulphur River at FM 1531 Northeast of Commerce.

TABLES A7.6 and A7.9 NTMWD FY 2017

TABLES A7.6 and A7.9 Measurement Performance Specifications for NTWMD have been updated and accompany this submission.

TABLE A7.6 Measurement Performance Specifications for NTWMD

Conventional Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
CHEMICAL OXYGEN DEMAND, .025N K2CR2O7 (MG/L)	mg/L	water	HACH 8000	00335	10	10	70-130	20	80-120	NM
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	water	SM 2320B	00410	20	20	NA	20	NA	NM
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	2.5	NA	20	NA	NM
RESIDUE, VOLATILE NONFILTRABLE (MG/L)	mg/L	water	EPA 160.4	00535	4	2.5	NA	NA	NA	NM
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	70-130	20	80-120	NM
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	SM 4500 NO2 B	00615	0.05	0.02	70-130	20	80-120	NM
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	SM 4500 NO2 B	00620	0.05	N/A	70-130	20	80-120	NM
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	NM
NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	mg/L	water	EPA 363.2	00630	0.05	0.05	70-130	20	80-120	NM
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70-130	20	80-120	NM
CARBON, TOTAL ORGANIC, NPOC (TOC), MG/L	mg/L	water	SM 5310 C	00680	2	0.5	70-130	20	80-120	NM
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	1	70-130	20	80-120	NM
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	1	70-130	20	80-120	NM
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	SM 10200 H	32211	3	3	NA	20	80-120	NM
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	SM 10200 H	32218	3	3	NA	NA	NA	NM
RESIDUE, TOT DISS,UNSPEC CALC BASED ON COND (MG/	mg/L	water	calculation	70294	NA	NA	NA	NA	NA	NM
RESIDUE,TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540C	70300	10	10	NA	20	80-120	NM
ORTHOPHOSPHATE PHOSPHORUS,DISS,MG/L,FILTER >15MIN	mg/L	water	EPA 365.3	70507	0.04	0.02	70-130	20	80-120	NM
BROMIDE	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	71870	0.25	0.25	80-120	10	90-110	NM
TURBIDITY,LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130B	82079	0.5	0.2	NA	NA	NA	NM

*Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).

References:

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, 2012 (RG-415).

TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2014 (RG-416)

TABLE A7.9 Measurement Performance Specifications for NTMWD										
Field Parameters										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE,FIELD (US/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
RESERVOIR STORAGE - ACRE FEET	acre/feet	water	TWDB	00054						Field
SALINITY - PARTS PER THOUSAND	PPT	water	SM 2520 and TCEQ SOP V1	00480	NA*	NA	NA	NA	NA	Field
WATER CLARITY, 1=EXCELLENT 2=GOOD 3=FAIR 4=POOR	NU	water	NA	20424						Field
CHLORINE, TOTAL RESIDUAL (MG/L)**	mg/L	water	SM 4500-Cl G and TCEQ SOP V1	50060	0.1	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)†	FT ABOVE MSL	water	TWDB	00052	NA*	NA	NA	NA	NA	Field
RESERVOIR PERCENT FULL†	% RESERVOIR CAPACITY	water	TWDB	00053	NA*	NA	NA	NA	NA	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)***	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)***	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS***	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH***	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	NA	NA	NA	NA	NA	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	NA	NA	NA	NA	NA	Field
WATER SURFACE(1=CALM,2=RIPPLE,3=WAVE,4=WHITECAP)	NU	water	NA	89968	NA	NA	NA	NA	NA	Field
TIDE STAGE 1=LOW,2=FALLING,3=SLACK,4=RISING,5=HI	NU	water	NA	89972	NA	NA	NA	NA	NA	Field
WATER COLOR 1=BRWN 2=RED 3=GRN 4=BLCK 5=CLR 6=OT	NU	water	NA	89969						Field
WATER ODOR (1=SEWAGE, 2=OILY/CHEMICAL, 3=ROTTEN EGGS, 4=MUSKY, 5=FISHY, 6=NONE, 7=OTHER (WRITE IN COMMENTS))	NU	water	NA	89971						Field
PRIMARY CONTACT, OBSERVED ACTIVITY (# OF PEOPLE OBSERVED)	# of people observed	other	NA	89978	NA	NA	NA	NA	NA	Field
EVIDENCE OF PRIMARY CONTACT RECREATION (1 = OBSERVED, 0 = NOT OBSERVED)	NU	other	NA	89979	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.
† As published by the Texas Water Development Board on their website http://wiid.twdb.state.tx.us/ims/resinfo/BushButton/lakestatus.asp?selcat=3&slbasin=2

References:
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.)
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TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data, 2014 (RG-416)

Sample Design Rationale FY 2017

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Water Quality Integrated Report, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the Sulphur River Basin Authority coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed.

Appendix B is added to reflect sample design rationale for FY 2017. The following changes or additions have been made to the monitoring schedule. These changes have come about because of concerns or requests of steering committee members or monitoring entities.

See Detail of Changes section for more information on changes to the monitoring schedule and justification.

Monitoring Sites for FY 2017

The sample design for SWQM is shown in Table B1.1 below.

Table B1.1 Sample Design and Schedule, FY 2017

Site Description	Station ID	Waterbody ID	Region	Basin	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
AIKEN CREEK AKA AKIN CREEK IMMEDIATELY DOWNSTREAM OF US HIGHWAY 67	18356	0301A	5	3	SU	TC	RT					4	4	
EAST FORK ELLIOTT CREEK AT FM991 APPROX 3.6KM NNE OF REDWATER	15946	0302	5	3	SU	TC	BS	2				2	2	With routine monitoring in 3rd and 4th quarter
EAST FORK ELLIOTT CREEK AT FM991 APPROX 3.6KM NNE OF REDWATER	15946	0302	5	3	SU	TC	RT			4	4	4	4	
ELLIOTT CREEK AT FM 991 IN BOWIE COUNTY	21699	0302	5	3	SU	TC	BS	2				2	2	With routine monitoring in 3rd and 4th quarter
ELLIOTT CREEK AT FM 991 IN BOWIE COUNTY	21699	0302	5	3	SU	TC	RT			4	4	4	4	
WRIGHT PATMAN LAKE 215 METERS WEST AND 370 METERS NORTH OF	16205	0302	5	3	SU	TC	RT	4					4	

Site Description	Station ID	Waterbody ID	Region	Basin	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
KNIGHTS BLUFF LANDING BOAT RAMP IN ATLANTA STATE PARK														
WRIGHT PATMAN LAKE 450 METERS SOUTH AND 80 METERS WEST OF CORPS ROAD 12 BOAT RAMP IN NORTH SHORE PARK	15061	0302	5	3	SU	TC	RT	4					4	
WRIGHT PATMAN LAKE IN BIG CREEK ARM APPROX 2.4MI /3.9KM EAST OF FM991 BRIDGE	16860	0302	5	3	SU	TC	RT	4					4	
WRIGHT PATMAN LAKE NEAR DAM APPROX 2.1KM SW OF SPILLWAY AND 1.1KM NW OF RAW WATER INTAKE STRUCTURE	10213	0302	5	3	SU	TC	RT	4					4	
WRIGHT PATMAN LAKE USGS SITE AC 0.25 MILE WEST OF DAM AND 0.5 MILE NORTHWEST OF DAM GATED	14097	0302	5	3	SU	TC	RT	4					4	
WRIGHT PATMAN LAKE USGS SITE EC MID LAKE 0.8 MILES SOUTHWEST OF BERRY FARM PARK 1.3 MILES NORTH OF ATLANTA STATE PARK ROAD 42	14103	0302	5	3	SU	TC	RT	4					4	
BIG CREEK AT FM 2149 IN BOWIE COUNTY	21701	0302A	5	3	SU	TC	BS	2				2	2	With routine monitoring in 3rd and 4th quarter
BIG CREEK AT FM 2149 IN BOWIE COUNTY	21701	0302A	5	3	SU	TC	RT			4	4	4	4	
ANDERSON CREEK AT SH 98 410 METERS EAST AND 1.24 KILOMETERS NORTH OF THE INTERSECTION OF FM 561 AND SH 98 SOUTH OF NEW BOSTON IN BOWIE COUNTY	20765	0302C	5	3	SU	TC	RT	4		4	4	4	4	
CANEY CREEK AT BOWIE CR 1108	21700	0302D	5	3	SU	TC	BS	2				2	2	With routine monitoring in 3rd and 4th quarter
CANEY CREEK AT BOWIE CR 1108	21700	0302D	5	3	SU	TC	RT			4	4	4	4	
MUSTANG CREEK AT HIGHWAY 37 IN RED RIVER COUNTY	21695	0303	5	3	SU	TC	BS	2				2	2	With routine monitoring in 3rd and 4th quarter
MUSTANG CREEK AT HIGHWAY 37 IN RED RIVER COUNTY	21695	0303	5	3	SU	TC	RT			4	4	4	4	
CUTHAND CREEK AT FM 909 IN RED RIVER COUNTY	21696	0303J	5	3	SU	TC	BS	2				2	2	With routine monitoring in 3rd and 4th

Site Description	Station ID	Waterbody ID	Region	Basin	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
														quarter
CUTHAND CREEK AT FM 909 IN RED RIVER COUNTY	21696	0303J	5	3	SU	TC	RT			4	4	4	4	
SCATTER CREEK AT FM 909 IN RED RIVER COUNTY	21702	0303J	5	3	SU	TC	BS	2				2	2	With routine monitoring in 3rd and 4th quarter
SCATTER CREEK AT FM 909 IN RED RIVER COUNTY	21702	0303J	5	3	SU	TC	RT			4	4	4	4	
KICKAPOO CREEK AT RED RIVER CR 4225	21698	0303L	5	3	SU	TC	BS	2				2	2	With routine monitoring in 3rd and 4th quarter
KICKAPOO CREEK AT RED RIVER CR 4225	21698	0303L	5	3	SU	TC	RT			4	4	4	4	
DAYS CREEK AT STATELINE ROAD SOUTH OF TEXARKANA	10226	0304	5	3	SU	TC	RT			4	4	4	4	
WAGNER CREEK AKA WAGGONER CREEK AT US 82 BETWEEN NASH AND TEXARKANA CITY OF TEXARKANA PERMIT 10374-007	14475	0304C	5	3	SU	TC	BF					4	4	Flow under low flow or no flow conditions. 30 meters upstream of Hwy 82.
WAGNER CREEK AT US HWY 67 / W 7TH STREET IN TEXARKANA	21176	0304C	5	3	SU	TC	RT			4	4	4	4	
SOUTH SULPHUR RIVER AT STATE HWY 11 SOUTHEAST OF COMMERCE	10238	0306	4	3	SU	NM	RT		12	12	12	12	12	
JIM CHAPMAN LAKE 10.4 KM WEST OF GATE TOWER	21810	0307	5	3	SU	NM	RT						12	Site will be monitored when accessible.
JIM CHAPMAN LAKE / COOPER LAKE AT DAM GATE TOWER	21715	0307	5	3	SU	NM	RT		12	12	12		12	
JIM CHAPMAN LAKE / COOPER LAKE DOCTORS CREEK ARM APPROX 980 METERS SOUTH AND 295 METERS EAST OF BOAT RAMP	21712	0307	5	3	SU	NM	RT		12	12	12		12	
JIM CHAPMAN LAKE / COOPER LAKE MAIN BODY APPROX 100 METERS NORTH AND 2.08 KILOMETERS WEST OF THE DAM GATE STRUCTURE	21714	0307	5	3	SU	NM	RT		12	12	12		12	
JIM CHAPMAN LAKE / COOPER LAKE MID LAKE APPROXIMATELY 1740 METERS NORTH OF SOUTH SULPHUR PARK BOAT RAMP ADJACENT TO OAK GROVE CAMPING	21713	0307	5	3	SU	NM	RT		12	12	12		12	

Site Description	Station ID	Waterbody ID	Region	Basin	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
AREA														
MIDDLE FORK SULPHUR AT SH 24 NORTH OF COMMERCE	10223	0307A	5	3	SU	NM	RT		12	12	12	12	12	
EAST FORK JERNIGAN CREEK AT FM 2068 IN DELTA COUNTY	21711	0307B	5	3	SU	NM	RT		12	12	12	12	12	

Appendix C: Station Location Maps

Station Location Maps

Maps of stations monitored by the Sulphur River Basin Authority are provided below. The maps were generated by the Sulphur River Basin Authority. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact Nancy Rose, Phone # 903-223-7887.