TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 21, 2011

Allen M. Pappas
Project Manager
Red River Authority
3000 Hammon Road, P. O. Box 240
Wichita Falls, TX 76307-0240

Re: Amendment #1 to the RRA FY 2012-2013 Clean Rivers Program QAPP

Dear Mr. Pappas:

Enclosed is an approved copy of the referenced QA document for your files and distribution.

Please ensure that copies of this document are distributed to each sub-tier participant as required by Section A3 of the QAPP. Please also secure written documentation from each sub-tier participant (e.g. subcontractors, other units of government, laboratories, etc.) stating the organization's awareness of and commitment to the requirements contained in the document, if appropriate. The documentation of QAPP distribution and subcontractor commitment to QAPP requirements must be available for review during monitoring system audits.

If you have any questions, please contact your TCEQ Clean Rivers Program project manager, or you may contact me at (512) 239-0011, or by email at dburke@tceq.state.tx.us.

Sincerely,

Daniel R. Burke
Lead CRP Quality Assurance Specialist

enclosure

cc: Julie McEntire, TCEQ CRP Project Manager, MC 234

Amendment # 1
to the Red River Authority of Texas'
Clean Rivers Program FY 2012-2013 QAPP

Prepared by the Red River Authority of Texas
In Cooperation with the
Texas Commission on Environmental Quality (TCEQ)

Questions concerning this QAPP should be directed to:

Red River Authority
Allen M. Pappas
Clean Rivers Program Project Manager
3000 Hammon Road
PO Box 240
Wichita Falls, Texas 76307-0240
(940) 723-8697
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Effective: Immediately Upon Approval by all parties

JUSTIFICATION

These changes are in response to a request from the North Texas Municipal Water District (NTMWD) to modify the analytical methods for three parameters on Table A7.1 (Sulfate, Nitrate-N, Total and Nitrite-N, Total), change the LOQ for TOC and add TDS. Additionally, in Appendix C, both Field Data Sheets in use by NTMWD, as well as the Field Data Sheet used for Lake/Reservoir Monitoring by the Red River Authority of Texas have been slightly modified. The final change is in Section B9 – Non-Direct Measurements, to incorporate language allowing the submittal of reservoir/drought-related data at the request of TCEQ.

DETAIL OF CHANGES

Section B9 – Non-Direct Measurements

Section B9 was modified to incorporate additional language allowing the use of data from the Texas Water Development Board (TWDB) website to be used for reporting both Reservoir Stage (TCEQ parameter code 00052) and Reservoir Percent Full (TCEQ parameter code 00053). *(This additional language is notated in italics).*

Table A7.1 – Measurement Performance Specifications

Field Parameters

Table A7.1 will be modified to incorporate the following reservoir-related parameters:

Description	TCEQ ID
Reservoir Stage	Parameter Code 00052
Reservoir Percent Full	Parameter Code 00053
Reservoir Access Not Possible Level Too Low	Parameter Code 00051
Depth of Bottom of Water Body at Sample Site	Parameter Code 82903

Table A7.1 will be modified to incorporate the following drought-related parameters:

Description	TCEQ ID
Maximum Pool Width at Time of Study (Meters)	Parameter Code 89864
Maximum Pool Depth at Time of Study (Meters)	Parameter Code 89865
Pool Length, Meters	Parameter Code 89869
% Pool Coverage in 500 Meter Reach	Parameter Code 89870

Conventional and Bacteriological Parameters

Table A7.1 will be modified to incorporate changes in three analytical methodologies utilized by the NTMWD. These changes are as follows:

Parameter	Original Methodology	Modified Methodology
Sulfate	EPA 375.2	EPA 300.0
Nitrate-N, Total	EPA 300.0	EPA 353.2
Nitrite-N, Total	EPA 300.0	SM 4500 NO_2 B

Table A7.1 will also be modified to reflect a change in the LOQ for Total Organic Carbon (TOC) by NTMWD from 0.1 ppm to 0.5 ppm. Additionally, Total Dissolved Solids (TDS) per SM 2540 C

(TCEQ parameter code 70300) and TDS (calculated) (TCEQ parameter code 70294) will be added as parameters analyzed by NTMWD.

Appendix C – Field Data Sheets

Both Field Data Sheets for the NTMWD will be modified to reflect the NTMWD **Work Order #** instead of the **Chain of Custody #**. Additionally on NTMWD's Field Data Sheets, the **RRA Lab ID #** will be modified to read **NTMWD Lab ID #**. This provides a link between field and laboratory data to ensure traceability and accuracy when submitting the data to SWQMIS. In addition, the drought/reservoir related parameters have been added to the sheet to simplify its recording. The back of the Field Data Sheet has also been modified to remove the **Left/Right Bank Section**, as well as the statement in the **Notes Section** that read, "*Lab Turbidity, E. coli, and Fecal Coliform results are reported from RRA's ESD Laboratory Parameter Result Sheet.*"

DISTRIBUTION

QAPP Amendments/Revisions to Appendices will be distributed to all personnel on the distribution list maintained by the Red River Authority of Texas.

These changes will be incorporated into the FY12-13 QAPP document and TCEQ and the Red River Authority of Texas will acknowledge and accept these changes by signing this amendment.

Allen M. Pappas, 11/18/11
Red River Authority Project Manager

Allen M. Pappas, 11/18/11
Red River Authority CRP QA Officer

Red River Regional Environmental Services Laboratory

Michael J. Carlo 11/18/11
Red River Authority ESD Manager

Allen M. Pappas, 11/18/11
Red River Authority Laboratory QA Officer

North Texas Municipal Water District

Jerry Allen, 11/17/2011
NTMWD CRP Project Manager — Date

Wayne Gilliland, 11/17/2011
NTMWD CRP QA Officer — Date

Texas Commission on Environmental Quality

Julie McEntire, 11/21/11
CRP Project Manager — Date

Jennifer Delk, 11/21/11
CRP Project QAS — Date

Allison Woodall, 11/21/11
CRP Group Leader — Date

Daniel R. Burke, 11/21/2011
CRP Lead QAS — Date

B9 NON-DIRECT MEASUREMENTS

The following non-direct measurement source(s) will be used for this project:

USGS gage station data will be used throughout the project to aid in determining gage height and flow. Rigorous QA checks are completed on gage data by the USGS and the data is approved by the USGS and permanently stored at the USGS. This data will be submitted to the TCEQ under parameter code 00061 Flow, Instantaneous or parameter code 74069 Flow Estimate, depending on the proximity of monitoring station to the USGS gage station.

Reservoir stage data are collected every day from United States Geological Society (USGS), International Boundary Water Commission (IBWC), and United States Army Corps of Engineers (USACE) websites. These data are preliminary and subject to revision. The Texas Water Development Board (TWDB) derives Reservoir storage (in acre-feet) from these stage data (elevation in feet above mean sea level), by using the latest rating curve datasets available. These data are published on the TWDB website at:

http://wiid.twdb.state.tx.us/ims/resinfo/BushButton/lakeStatus.asp?selcat=3&slbasin=2.

The web application uses real time gauged observations 7 AM reading each day (or closest reading available) from 119 major reservoirs to approximate daily storage for each reservoir, as well as daily total storage for water planning regions, river basins and the state of Texas. These instantaneous data are updated to mean daily data for all previous days. These data will be submitted to the TCEQ under parameter code 00052 Reservoir Stage and parameter code 00053 Reservoir Percent Full.

Table A7.1 Measurement Performance Specifications

Parameter	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ Check Standard %Rec	Precision (RPD of LCS/LCSD)	Bias % Rec. of LCS	Lab
FIELD PARAMETERS										
Days Since Last Significant Rain	Days	NA	TCEQ SOP V1	72053	NA[1]	NA	NA	NA	NA	Field
Depth of Bottom of Water Body at Sample Site	Meters	Water	TCEQ SOP V2	82903	NA[1]	NA	NA	NA	NA	Field
Dissolved Oxygen	mg/L	Water	TCEQ SOP V1, SM 4500-O G	00300	NA[1]	NA	NA	NA	NA	Field
Flow	cfs	Water	TCEQ SOP V1	00061	NA[1]	NA	NA	NA	NA	Field
Flow Estimate	cfs	Water	TCEQ SOP V1	74069	NA[1]	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[1]	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[1]	NA	NA	NA	NA	Field
Maximum Pool Width at Time of Study (Meters)	Meters	Other	TCEQ SOP V2	89864	NA[1]	NA	NA	NA	NA	Field
Maximum Pool Depth at Time of Study (Meters)	Meters	Other	TCEQ SOP V2	89865	NA[1]	NA	NA	NA	NA	Field
pH	Standard Units	Water	TCEQ SOP V1, EPA 150.1	00400	NA[1]	NA	NA	NA	NA	Field
% Pool Coverage in 500 Meter Reach[6]	%	Other	TCEQ SOP V2	89870	NA[1]	NA	NA	NA	NA	Field
Pool Length, Meters[6]	Meters	Other	TCEQ SOP V2	89869	NA[1]	NA	NA	NA	NA	Field
Present Weather	1 - clear 2 - ptly cldy 3 - cloudy 4 - rain 5 - other	NA	NA	89966	NA	NA	NA	NA	NA	Field
Reservoir Stage (Feet Above Mean Sea Level)[5]	FT Above MSL	Water	TWDB	00052	NA[1]	NA	NA	NA	NA	Field
Reservoir Percent Full[5]	% Reservoir Capacity	Water	TWDB	00053	NA[1]	NA	NA	NA	NA	Field
Reservoir Access Not Possible Level Too Low	NS	Other	TCEQ Drought Guidance	00051	NA[1]	NA	NA	NA	NA	Field
Secchi Depth	meters	Water	TCEQ SOP V1	00078	NA[1]	NA	NA	NA	NA	Field
Specific Conductance	ΦS/cm	Water	TCEQ SOP V1, SM 2510 B, EPA 120.1	00094	NA[1]	NA	NA	NA	NA	Field
Temperature	BC	Water	TCEQ SOP V1 SM 2550 B	00010	NA[1]	NA	NA	NA	NA	Field

Table A7.1 Measurement Performance Specifications

Parameter	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ Check Standard %Rec	Precision (RPD of LCS/LCSD)	Bias % Rec. of LCS	Lab
Water Clarity	1 - excellent 2 - good 3 - fair 4 - poor 5 - other	NA	NA	20424	NA	NA	NA	NA	NA	Field
Water Color	1 - brownish 2 - reddish 3 - greenish 4 - blackish 5 - clear 6 - other	NA	NA	89969	NA	NA	NA	NA	NA	Field
Water Odor	1 - sewage 2 - chemical 3 - rotten egg 4 - musky 5 - fishy 6 - none 7 - other	NA	NA	89971	NA	NA	NA	NA	NA	Field
Wind Intensity	1 - calm 2 - slight 3 - moderate 4 - strong	NA	NA	89965	NA	NA	NA	NA	NA	Field
Water Surface	1 – calm 2 - ripples 3 - waves 4 – white cap	NA	NA	89968	NA	NA	NA	NA	NA	Field
CONVENTIONAL AND BACTERIOLOGICAL PARAMETERS										
Turbidity	NTU	Water	SM 2130 B	82079	0.5	0.5	70-130	20	80-120	RR, SH
			EPA 180.1			0.1				NM
Total Suspended Solids	mg/L	Water	SM 2540 D	00530	4	2.5	NA	20	NA	RR, SH, NM
Total Dissolved Solids, (Dried at 180 Degrees Celsius)	mg/L	Water	SM 2540 C	70300	10	10	NA	20	80-120	RR, NM
Total Dissolved Solids (Calculated)	mg/L	Water	Calculation	70294	NA	NA	NA	NA	NA	RR, NM
Sulfate	mg/L	Water	EPA 300.0	00945	5	10^4	70-130	20	80-120	RR
			EPA 300.0			1				NM
Chloride	mg/L	Water	EPA 300.0	00940	5	10^4	70-130	20	80-120	RR
						1				NM
Chlorophyll-*a*, (Fluorometric Method)	ug/L	Water	EPA 445.0	70953	3	2	NA	20	80-120	LC
Pheophytin, (Fluorometric Method)	ug/L	Water	EPA 445.0	32213	3	2	NA	NA	NA	LC
Chlorophyll-*a*, (Spectrophoto-metric Method) (Backup)	ug/L	Water	EPA 446.0	32211	3	2	NA	20	80-120	LC
Pheophytin, (Spectrophoto-metric Method) (Backup)	ug/L	Water	EPA 446.0	32218	3	2	NA	NA	NA	LC
Chlorophyll-*a*, (Spectrophoto-metric Method)	ug/L	Water	SM 10200 H	32211	3	3	NA	20	80-120	NM

Table A7.1 Measurement Performance Specifications

Parameter	Units	Matrix	Method	Parameter Code	AWRL	Limit of Quantitation (LOQ)	LOQ Check Standard %Rec	Precision (RPD of LCS/LCSD)	Bias % Rec. of LCS	Lab
Pheophytin, (Spectrophoto-metric Method)	ug/L	Water	SM 10200 H	32218	3	3	NA	NA	NA	NM
E. coli, IDEXX Colilert[3]	MPN/100 mL	Water	SM 9223 B	31699	1	1	NA	.5[2]	NA	RR
Holding time, *E. coli*, IDEXX Colilert[3]	Hours	Water	NA	31704	NA	NA	NA	NA	NA	RR, SH, NM
E. coli, IDEXX Colilert[3]	MPN/100 mL	Water	Colilert®	31699	1	1	NA	.5[2]	NA	SH, NM
			Colilert®-18							SH
Fecal Coliform, (membrane filtration)	org/100mL	Water	SM 9222-D	31616	1	1	NA	.5[2]	NA	RRA
Ammonia-N, total	mg/L	Water	SM 4500-NH3D	00610	0.1	0.1	70-130	20	80-120	RR
			EPA 350.1							NM
Alkalinity, total	mg/L	Water	SM 2320 B	00410	20	20	NA	20	NA	RR, NM
Chemical Oxygen Demand	mg/L	Water	HACH 8000	00335	10	10	70-130	20	80-120	RR, NM
O-Phosphate-P, (Diss. field filter <15 min)	mg/L	Water	EPA 365.3	00671	0.04	0.02	70-130	20	80-120	NM
Total Phosphorus-P	mg/L	Water	SM 4500 P E	00665	0.06	0.06	70-130	20	80-120	RR
			EPA 365.3			0.02				NM
Nitrate + nitrite-N, Total	mg/L	Water	EPA 353.2	00630	0.05	0.05	70-130	20	80-120	NM
Nitrate-N, Total	mg/L	Water	EPA 300.0	00620	0.05	0.04	70-130	20	80-120	RR
			EPA 353.2			0.05				NM
Organic Carbon, Total	mg/L	Water	SM 5310 B	00680	2	1	70-130	20	80-120	RR
			SM 5310 C			0.5	70-130	20	80-120	NM
Volatile Suspended Solids	mg/L	Water	EPA 160.4	00535	4	2.5	NA	NA	NA	RR, NM
Calcium, Dissolved	mg/L	Water	SM 3500 Ca B	00915	0.5	2.0[4]	70-130	20	80-120	RR
Nitrite-N, Total	mg/L	Water	SM 4500 NO_2 B	00615	0.05	0.02	70-130	20	80-120	NM
Kjeldahl Nitrogen, Total	mg/L	Water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	NM
METAL PARAMETERS										
Iron, Total	ug/L	Water	EPA 200.8	01045	300	200	70-130	20	80-120	NM
Manganese, Total	ug/L	Water	EPA 200.8	01055	50	1	70-130	20	80-120	NM
Hardness, Total	mg/L	Water	SM 2340 C	00900	5	5	NA	20	80-120	NM

RR – Red River Authority of Texas
LC – Lower Colorado River Authority
SH – City of Sherman
NM – North Texas Municipal Water District

[1] Reporting to be consistent with SWQM guidance and based on measurement capability.
[2] Based on a range statistic as described in Standard Methods, 21st Edition, Section 9020-B, "Quality Assurance/Quality Control – Intra-laboratory Quality Control Guidelines". This criterion applies to bacteriological duplicates with concentrations >10 MPN/100mL or >10 organisms/100mL.
[3] *E. coli* samples analyzed by SM 9223-B should always be processed as soon as possible and within eight hours. When transport conditions necessitate delays in delivery longer than six hours, the holding time may be extended and samples must be processed as soon as possible and within 48 hours.
[4] The LOQ for chloride, sulfate and calcium is higher than the established AWRL since concentrations for these parameters are extremely high in both the Canadian and Red River Basins and values are typically not observed at concentrations below 10 mg/L.
[5] 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.
[6] To be routinely reported when collecting data from perennial pools.

RED RIVER AUTHORITY OF TEXAS
LAKE / RESERVOIR
CRP FIELD DATA REPORTING FORM

Date:	Station Location:		TCEQ Site ID:
Time:	Basin/Reach/Segment:	HUA No.	RRA Tag No:
County:	Monitoring Type:	QAO:	DE:
RRA Lab ID #:		Total Depth: (m)	Total Measurements:
Chain of Custody #:		Time Start:	Time End:
Tech(s):			

Parameter Code	Sample Collection Depth _____Meters		Sample Depth (m)	Temp (°C)	pH (s. u.)	D.O. (mg/L)	Conductivity (uS/cm)
20424		Water Clarity 1 – Excellent 2 – Good 3 – Fair 4 – Poor 5 – Other*					
89965		Wind Condition 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____					
89966		Weather 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*					
89968		Water Surface 1 – Calm 2 – Ripple 3 – Wave 4 – Whitecap					
89969		Water Color 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 - Other*					
89971		Water Odor 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*					
00078		Secchi Disk (m)					
72053		Significant Precip. (< or > Days)					
00021		Air Temperature (° Fahrenheit)					
00051		Reservoir Access Not Possible					
00052		Reservoir Stage (TWDB Website)					
00053		Reservoir Percent Full (TWDB Website)					
82903		Depth of Bottom of Water Body					

Comments and details/descriptions for parameter codes marked other*:

MEASUREMENT COMMENTS AND FIELD OBSERVATIONS

Biological Activities:

Aquatic Vegetation:

Terrestrial Vegetation:

Aquatic Animals:

Terrestrial Animals:

Aquatic Insects:

Terrestrial Insects:

Watershed Activities:

Water Body Uses Observed:

Specific Sample Info:

Missing Parameters:

Notes:

ESD-01 (Revised October 2011)

NORTH TEXAS MUNICIPAL WATER DISTRICT
LAKE / RESERVOIR
CRP FIELD DATA REPORTING FORM

Date:	**Station Location:**		**TCEQ Site ID:**
Time:	**Basin/Reach/Segment:**	**HUA No.**	**RRA Tag No:**
County:	**Monitoring Type:**	**QAO:**	**DE:**
NTMWD Laboratory ID #:		**Total Depth: (m)**	**Total Measurements:**
Work Order #:		**Time Start:**	**Time End:**
Tech(s):			

Parameter Code	Sample Collection Depth _____Meters		Sample Depth (m)	Temp (°C)	pH (s. u.)	D.O. (mg/L)	Conductivity (uS/cm)
20424		**Water Clarity** 1 – Excellent 2 – Good 3 – Fair 4 – Poor 5 – Other*					
89965		**Wind Condition** 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____					
89966		**Weather** 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*					
89968		**Water Surface** 1 – Calm 2 – Ripple 3 – Wave 4 – Whitecap					
89969		**Water Color** 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 - Other*					
89971		**Water Odor** 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*					
00078		**Secchi Disk (m)**					
72053		**Significant Precip. (< or > Days)**					
00021		**Air Temperature (° Fahrenheit)**					
00051		**Reservoir Access Not Possible**					
00052		**Reservoir Stage** (TWDB Website)					
00053		**Reservoir Percent Full** (TWDB Website)					
82903		**Depth of Bottom of Water Body**					

Comments and details/descriptions for parameter codes marked other*:

MEASUREMENT COMMENTS AND FIELD OBSERVATIONS

Biological Activities:

Aquatic Vegetation:

Terrestrial Vegetation:

Aquatic Animals:

Terrestrial Animals:

Aquatic Insects:

Terrestrial Insects:

Watershed Activities:

Water Body Uses Observed:

Specific Sample Info:

Missing Parameters:

Notes:

ESD-01 (Revised October 2011)

NORTH TEXAS MUNICIPAL WATER DISTRICT
STREAM
CRP FIELD DATA REPORTING FORM

Date:	Station Location:		TCEQ Site ID:
Time:	Basin/Reach/Segment:	HUA No.	RRA Tag No:
County:	Monitoring Type:	QAO:	DE:

NTMWD Laboratory ID #:	Stream Width: (ft)	Section Width: (ft)
Work Order #:	Time Start:	Time End:
Tech(s):		

Parameter Code	Sample Collection Depth _____Meters			Section Midpoint	Section Depth (ft)	Velocity (ft/S)	Discharge (CFS)
			1				
00010		Water Temp (°C)	2				
00094		Conductivity (uS/cm)	3				
00300		Dissolved Oxygen (mg/L)	4				
00400		pH (Standard Units)	5				
01351		Flow Severity 1 – No Flow 2 – Low Flow 3 – Normal 4 – Flood 5 – High 6 - Dry	6				
			7				
00061		Flow (CFS)	8				
89835		Flow Measurement Method 1 – Gauge 2 – Electronic 3 – Mechanical 4 – Weir/Flume 5 – Doppler	9				
			10				
20424		Water Clarity 1 – Excellent 2 – Good 3 – Fair 4 – Poor 5 – Other*	11				
			12				
89969		Water Color 1 – Brown 2 – Reddish 3 – Green 4 – Black 5 – Clear 6 - Other*	13				
			14				
89971		Water Odor 1 – Sewage 2 – Oily/Chem 3 – Rotten Eggs 4 – Musky 5 – Fishy 6 – None 7 – Other*	15				
			16				
00021		Air Temperature (° Fahrenheit)	17				
89966		Weather 1 – Clear 2 – Partly Cloudy 3 – Cloudy 4 – Rain 5 – Other*	18				
			19				
89965		Wind Condition 1 – Calm 2 – Slight 3 – Moderate 4 – Strong Direction _____	20				
72053		Significant Precip. (< or > Days)	Total Flow in CFS				

Comments and details/descriptions for parameter codes marked other*:

MEASUREMENT COMMENTS AND FIELD OBSERVATIONS

Biological Activities:

Aquatic Vegetation:

Terrestrial Vegetation:

Aquatic Animals:

Terrestrial Animals:

Aquatic Insects:

Terrestrial Insects:

Left Bank:

Right Bank:

Watershed Activities:

Water Quality/Stream Use:

Specific Sample Info:

Missing Parameters:

Notes:

ESD-01 (Revised October 2011)