2021 TRIENNIAL SUMMARY REPORT

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER PLANNING AND ASSESSMENT DIVISION

DEQ
LOUISIANA

STATE FISCAL YEARS 2018 – 2021

ASSET

AQUIFER SAMPLING AND ASSESSMENT PROGRAM

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ACKNOWLEDGEMENTS

The Water Planning and Assessment Division's (WPAD) Aquifer Sampling and Assessment (ASSET) Program owes its success to many people and agencies for their continual support through the years. Without this support, the ASSET Program could not exist.

The water well owners, who voluntarily participate in ASSET, are owed a debt of gratitude. Without access to private, corporate, and public property and wellheads, this program could not operate.

The Louisiana Department of Natural Resources (LDNR) Ground Water Resources Program makes the Water Well Registration data set available to LDEQ, and ultimately to the WPAD, which is used for multiple purposes in the execution of ASSET.

The United States Geological Survey (USGS) Water Resources Division frequently provides well schedule data that are used during the execution of ASSET. These data are made available to the Program through a USGS-LDOTD cooperative program. In addition, the USGS allows its observation wells to be sampled.

Gratitude is also owed to the staff at EPA Region 6, Water Quality Protection Division, Assistance Programs Branch and the Source Water Protection Branch, for their assistance and support for ASSET.

This Program is funded in part by the U.S. Environmental Protection Agency through the Clean Water Act.

BACKGROUND

The Aquifer Sampling and Assessment Program, or ASSET, is conducted as a Clean Water Act activity. ASSET is designed to determine and monitor the quality of groundwater in the major freshwater aquifers across Louisiana. The data derived from this process are provided to LDEQ to aid in groundwater protection through nonpoint source pollution prevention, source water protection and remediation strategies for the State. It is also available to the public through LDEQ's website, email, and through the mail upon request. In addition, each well owner receives a copy of the field measures and laboratory analytical results from the sampling of their well.

For this reporting period, the ASSET Program monitored 166 wells in fourteen major freshwater aquifers throughout the state. Table 2 illustrates their stratigraphic occurrence while Table 3 lists these major aquifers. The number of wells assigned to each aquifer is based on its areal extent. Currently, the well density goal is approximately one well per 400 square miles. For example, an aquifer with an areal extent of 4,800 square miles would require a minimum of 12 wells to be assigned to it, 4,800/400 = 12. An effort is made to distribute sample locations (wells) evenly within the areal extent of each aquifer so that a representative sampling of the aquifer can be accomplished. Table 3 lists the areal extent of each aquifer in square miles, the number of wells currently assigned to it and the well density for each aquifer. Charts 1 - 3 more readily illustrate this by graphing the data found in Table 3. Also, the last row of Table 3 lists the total areal extent of all monitored aquifers, total number of wells sampled and the overall well density for the Program.

The sampling process is designed so that each well is monitored every three years. Following this design, all fourteen aquifers are monitored within the three-year period. The process repeats at the end of a three-year cycle. An effort is made to sample all assigned wells of the aquifer in a narrow period. Aquifers of small areal extent may be completed in a single event, whereas larger aquifers may require several events to complete. Table 4 lists the sample schedule by aquifer along with the month and number of wells sampled.

Each well is sampled for conventional parameters, inorganics, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and PCBs. In addition to the samples collected for analysis by a laboratory, field parameters (temperature, pH, specific conductance, total dissolved solids, and salinity) are measured and recorded at each well. Table 8 lists these field and laboratory parameters along with their reporting units. For specific lists of analytes, methods, and detection limits, please refer to the aquifer summaries appended to this document.

SUMMARY OF FINDINGS

INTRODUCTION

This report summarizes ASSET sampling that occurred from July 2018 through June 2021. One hundred seventy-six wells completed in fourteen different aquifers were monitored. Table 9 contains a listing of all the wells sampled, each well's owner, completed depth, use made of produced water, and the aquifers they produce from. In order to preserve privacy, "Private Owner" is listed for the well owner when a well is owned by a private citizen.

Table 5 lists the minimum, average and maximum sample results for the samples collected from each aquifer for field and conventional parameters. Table 6 lists the minimum, average and maximum sample results for the samples collected from each aquifer for inorganic parameters.

A brief summation of each aquifer's sample results and conclusions begins on the next page. Each summation includes the findings for hardness based on the scale below, and a statement on the general water quality of the aquifer based on the data derived from the wells sampled. The number of federal primary Maximum Contaminant Levels (MCLs), if any, and the number of secondary MCLs (SMCLs) that were exceeded are noted also.

For a detailed discussion of each aquifer's findings, see the aquifer summaries appended to this document. Each summary consists of a discussion of the aquifer's geology and hydrogeology, and an interpretation of the laboratory analyses. The lab analysis interpretation is accomplished by evaluating the general water quality and by comparing the historical data averages with the current data averages to detect changes in water quality over time. Initial water quality is evaluated by comparing individual parameters to their respective MCLs to assess the aquifer's use as a drinking water source, and is rated as good (no MCL exceedances), fair (no MCL exceedances in a drinking water well) or poor (one or more MCL exceedance in a drinking water well). Additionally a second water quality evaluation is made by taking into account whether or not Action Levels were exceeded, whether or not volatile organic compounds, semi-volatile organic compounds, pesticides or PCBs were detected, the number of SMCLs exceeded in relation to the number of wells sampled, and the average hardness value. This rating uses values of good, fair and poor.

It should be noted that all statements about hardness (as $CaCO_3$) in the aquifer sections and summary section are based on the following scale[1]:

Soft	< 50 milligrams per Liter (mg/L)
Moderately hard	50-150 mg/L
Hard	151-300 mg/L
Very hard	> 300 mg/L

A statewide summary of findings and summary statement can be found in the section following the Aquifer Summations section.

[1] Classification based on hardness scale from: Peavy, H. S. et al. *Environmental Engineering*. New York: McGraw-Hill, 1985.

AQUIFER SUMMATIONS

Sparta Aquifer

Thirteen wells ranging in depth from 153 feet to 726 feet, with an average depth of 507 feet were sampled for this aquifer. Laboratory and field data show that of the 13 wells sampled during this reporting period no primary MCL was exceeded for any well sampled, while 14 secondary standards were exceeded. The data also show that the groundwater produced from this aquifer is soft and is of good quality when considering short-term or long-term health risk guidelines. Water produced from this aquifer is of good quality when considering taste, odor, or appearance guidelines.

Carrizo-Wilcox Aquifer

Nine wells ranging in depth from 105 feet to 395 feet, with an average depth of 231 feet were sampled for this aquifer. Laboratory and field data show that no assigned well that was sampled during this reporting period for the Carrizo-Wilcox aquifer exceeded a primary MCL, with 14 exceedances of secondary standards. The data show that the groundwater produced from this aquifer is generally soft and is of good quality when considering short-term or long-term health risk guidelines. Water produced from this aquifer is also of good quality when considering taste, odor, or appearance guidelines.

Red River Alluvial Aquifer

Four wells ranging in depth from 47 feet to 89 feet, with an average depth of 68 feet were sampled for this aquifer. Laboratory and field data show that no assigned well that was sampled during this reporting period for the Red River Alluvial aquifer exceeded a primary MCL, while seven secondary standards were exceeded. The data also show that the groundwater produced from this aquifer is very hard and is of poor quality when considering taste, odor, or appearance guidelines, but is of good quality when considering short-term or long-term health risk guidelines.

Evangeline Aquifer

Eleven wells ranging in depth from 170 feet to 1,715 feet, with an average depth of 650 feet were sampled for this aquifer. Laboratory and field data show that no assigned well that was sampled during this reporting period for the Evangeline aquifer exceeded a primary MCL, while there were 12 exceedances of secondary standards. The data show that the groundwater produced from this aquifer is soft and is of good quality when considering short-term or long-term health risk guidelines. Water produced from this aquifer is also of good quality when considering taste, odor, or appearance guidelines.

Catahoula Aquifer

Five wells ranging in depth from 352 feet to 910 feet, with an average depth of 635 feet were sampled for this aquifer. Laboratory and field data show that no assigned well that was sampled during this reporting period for the Catahoula aquifer exceeded a primary MCL, while there were three exceedances of secondary standards. The data show that the groundwater produced from this aquifer is soft and is of good quality when considering short or long-term health risk guidelines. Also, the water produced from this aquifer is of good quality when considering taste, odor, or appearance guidelines.

North Louisiana Terrace Aquifer

Nine wells ranging in depth from 85 feet to 154 feet, with an average depth of 107 feet were sampled for this aquifer. Laboratory and field data show that the groundwater produced from this aquifer is moderately hard and is of fair to good quality when considering taste, odor, or appearance guidelines, with eight secondary standards exceeded. It is also of good quality when considering short-term or long-term health risk guidelines in that no well sampled for this time period exceeded a primary MCL.

Carnahan Bayou Aquifer

Eight wells ranging in depth from 165 feet to 2,036 feet, with an average depth of 975 feet were sampled for this aquifer. Laboratory and field data show that no assigned well that was sampled during this reporting period for the Carnahan Bayou aquifer exceeded a primary MCL, and only four secondary standards were exceeded. The data show that the groundwater produced from this aquifer is soft. Data also show that it is of good quality when considering short or long-term health risk guidelines, and is of good quality when considering taste, odor, or appearance guidelines.

Mississippi River Alluvial Aquifer

Nineteen wells ranging in depth from 30 feet to 230 feet, with an average depth of 122 feet were sampled for this aquifer. Laboratory and field data show that the groundwater produced from the Mississippi River Alluvial aquifer is hard, and that the primary MCL for arsenic was exceeded in two of the 19 wells sampled.

Review of this data shows that this aquifer is of poor quality when considering taste, odor, or appearance guidelines, with 25 secondary standards being exceeded. It also shows that two wells exceeded the MCL for arsenic, making certain locations of this aquifer to be of poor quality when considering short-term or long-term health risk guidelines. It is important to note that there are certain localized areas of the Mississippi River Alluvial aquifer that exhibit good water quality characteristics, but it still exhibits the poorest overall water quality characteristics of any of the fourteen aquifers sampled. It is also important to note that a number of wells in the Calcasieu and Cameron parishes were not sampled due to hurricane Laura.

Cockfield Aquifer

Thirteen wells ranging in depth from 80 feet to 445 feet, with an average depth of 258 feet were sampled for this aquifer. Laboratory and field data show that the groundwater produced from this aquifer is of good quality when considering short or long-term health risk guidelines given that no primary MCL was exceeded. The data also show that this aquifer is moderately hard and is of poor quality when considering taste, odor, or appearance guidelines, with 16 secondary standards exceeded in 11 of the 13 wells sampled.

Chicot Aquifer

Sixteen wells ranging in depth from 66 feet to 697 feet, with an average depth of 255 feet were sampled for this aquifer. Laboratory and field data show that no well exceeded a primary MCL and that the water produced from the Chicot aquifer is of good quality when considering short-term or long-term health risk guidelines. The data also show that the water produced from the Chicot aquifer is hard and is of poor quality when considering taste, odor, or appearance guidelines, with 16 secondary exceedances.

Williamson Creek Aquifer

Six wells ranging in depth from 355 feet to 1,657 feet, with an average depth of 719 feet were sampled for this aquifer. Laboratory and field data show that no assigned well that was sampled during this reporting period for the Williamson Creek aquifer exceeded a primary MCL and only five secondary standards were exceeded. Review of the data shows that the water produced from the Williamson Creek aquifer is moderately hard, is of good quality when considering short-term or long-term health risk guidelines, and is also of good quality when considering taste, odor, or appearance guidelines.

Chicot Equivalent Aquifer

Twenty-four wells ranging in depth from 90 feet to 775 feet, with an average depth of 343 feet were sampled for this aquifer. Laboratory and field data show that this aquifer is of good quality when considering short-term or long-term health risk guidelines given that no primary MCL was exceeded in any of the wells sampled. These findings also show that the water produced from this aquifer is soft and is of fair quality when considering taste, odor, or appearance guidelines, with 26 secondary standards exceeded in 16 of the 25 wells.

Evangeline Equivalent Aquifer

Fifteen wells ranging in depth from 185 feet to 1,900 feet, with an average depth of 976 feet were sampled for this aquifer. Laboratory and field data show that no assigned well that was sampled during this reporting period for the Evangeline Equivalent aquifer exceeded a primary MCL, whereas 14 secondary standards were exceeded. The data show that the water produced from the Evangeline Equivalent aquifer is soft and of good quality when considering short-term or long-term health risk guidelines, and is also of good quality when considering taste, odor, or appearance guidelines.

Jasper Equivalent Aquifer

Fifteen wells ranging in depth from 960 feet to 2,700 feet, with an average depth of 2,025 feet were sampled for this aquifer. Laboratory and field data show that no assigned well that was sampled during this reporting period for the Jasper Equivalent aquifer exceeded a primary MCL, while 10 secondary standards were exceeded. The data also show that the water produced from the Jasper Equivalent aquifer is soft and of good quality when considering short-term or long-term health risk guidelines, and is of good quality when considering taste, odor, or appearance guidelines.

STATEWIDE SUMMARY OF FINDINGS

COMBINED AQUIFER DATA AND HISTORICAL COMPARISON

Table 7 shows the minimum and maximum sample results from the fourteen aquifers sampled for field parameters, conventional parameters, and inorganics, as well as an average of all these sample results. A comparison of the current average values to historical average values of the reporting periods since fiscal year 2000 shows that there was only minor change for many of the parameters measured.

Table 1 highlights the minimum, maximum, and average statewide values for pH, TDS, hardness, chloride, iron, and nitrite-nitrate found in Table 7. The only statewide average listed in Table 1 that did not meet federal drinking water standards is the average for iron, which is not a health-related primary standard, but an aesthetic, non-enforceable, secondary standard. Figures 4 – 7 are the graphed representations of the average values for these same parameters on an aquifer by aquifer basis for the current reporting period, July 2018– June 2021.

Charts 10-29 are the graphed representations of selected analytes resulting from the statewide average for each analyte for each three-year period from 2000 to 2021. Some are presented in logarithmic scale to more readily show the relationship between the graphed values and the limits associated with the analyte. Analytes with multiple non-detect values were analyzed using regression analysis in RStudio.

Increasing or decreasing trend statements made here are based on an R-square value of 0.30 or greater for the statewide averages. Of the 20 parameters represented, three exhibited an increase in average concentration, four exhibited a decrease in average concentration, and thirteen exhibited little or no change in average concentration from 2000 to 2021. The three parameters showing an increase in average concentration are pH, salinity, and total phosphorus. The three parameters showing decrease in average concentration are copper, temperature, and zinc.

FEDERAL PRIMARY MCL EXCEEDANCES

A review of the laboratory and field data from all the aquifers sampled show that there were two primary MCL exceedances for arsenic, both in the Mississippi River Alluvial aquifer. For further discussion, refer to the Mississippi River Alluvial aquifer summary.

QUALITY RANKINGS

As stated previously, initial water quality is evaluated by comparing individual parameters to primary MCLs to assess the aquifer's use as a drinking water source, and is rated as good (no MCL exceedances), fair (no MCL exceedances in a drinking water well), or poor (one or more MCL exceedance in a drinking water well). Additionally, a second water quality evaluation is made by taking into account whether or not Action Levels were exceeded, whether or not volatile organic compounds, semi-volatile organic compounds, pesticides or PCBs were detected, the number of secondary standards exceeded in relation to the number of wells sampled, and the average hardness value. This rating uses values of good, fair and poor.

Using the above stated criteria against the data derived from the FY18 – FY21 sampling period it was determined, based on initial evaluation, that all but one of the aquifers monitored exhibit good water quality characteristics, while only one exhibits poor water quality characteristics. Secondary evaluation shows that four are in the good range; five are in the fair range and five are considered poor.

Those aquifers considered by the ASSET Program to have Good water quality characteristics in both categories are: Carnahan-Bayou, Catahoula, Evangeline, and Jasper Equivalent. The Chicot Equivalent North Louisiana Terrace, Sparta, Carrizo-Wilcox, and Evangeline Equivalent aquifers are considered to have Good water quality in the initial category and Fair water quality in the second category. Aquifers considered having Good initial water quality with Poor secondary water quality characteristics are the Chicot, Cockfield, and Red River Alluvial aquifers. The Mississippi River Alluvial aquifer is considered to have Poor initial and secondary water quality characteristics by this Program.

SUMMARY STATEMENT

The majority of the major freshwater aquifers of Louisiana that were sampled by the ASSET Program exhibited Good water quality characteristics when considering health based standards and Good water quality characteristics when considering non-health based standards. Only the Mississippi River Alluvial aquifer exhibited Poor water quality characteristics in both categories.

Those aquifers with deeper average well depths typically exhibit the best water quality characteristics while those with shallower average well depths exhibit some of the poorest water quality characteristics. One notable exception to this is the North Louisiana Terrace aquifer that has an average well depth of just over 100 feet and exhibits similar water quality characteristics to those aquifers with much deeper average well depths.

Taking into account short-term and long-term health risk guidelines, along with the findings of the Aquifer Sampling and Assessment Program for the Fiscal Years 2000 to 2021, it is determined that the overall quality of the waters produced from Louisiana's principal freshwater aquifers is good, and that there is minimal change in the water quality characteristics of these aquifers.

TABLES AND CHARTS

Table 1 – Select Statewide Values

PARAMETER	MINIMUM	AVERAGE	MAXIMUM	DRINKING WATER LIMITS (PRIMARY OR SECONDARY)
pH (SU)	5.23	7.59	9.33	>6.5 - <8.5 Secondary
Chloride (mg/L))	1.90	52.47	629	250 Secondary
TDS (mg/L)	< DL	322.67	1,200	500 Secondary
Hardness (mg/L)	< DL	107.36	780	N/A
Iron (µg/L)	< DL	1391.06	23900	300 Secondary
Nitrite-Nitrate (mg/L)	< DL	0.21	7.40	10 Primary

Table 2 – Hydrogeologic Column of Aquifers

SYSTEM	SERIES	Stratigraphic Unit		Hydrogeologic Unit: Northern Louisiana	Central and southwestern Louisiana			Southeastern Louisiana			
				Aquifer or confining unit	Aquifer system or confining unit	Aquifer or confining unit: Lake Charles area	Aquifer or confining unit: Rice growing area	Aquifer system or confining unit	Aquifer[1] or confining unit: Baton Rouge area	Aquifer[1] or confining unit: St. Tammany, Tangipahoa, and Washington Parishes	Aquifer[1] or confining unit: New Orleans area and lower Mississippi River parishes
Quaternary	Pleistocene	Red River alluvial deposits Miss. River alluvial deposits Northern La. Terrace deposits Unnamed Pleistocene deposits		Red River alluvial aquifer or surficial confining unit Mississippi River alluvial aquifer or surficial confining unit Upland terrace aquifer or surficial confining unit	Chicot aquifer system or surficial confining unit	"200-foot" sand	Upper sand unit	Chicot Equivalent aquifer system[2] or surficial confining unit	Mississippi River alluvial aquifer or surficial confining unit Shallow sand "400-foot" sand "600-foot" sand	Upland terrace aquifer Upper Ponchatoula aquifer	Gramercy aquifer[3] Norco aquifer[3] Gonzales-New Orleans Aquifer[3] "1,200-foot" sand[3]
						"500-foot" sand "700-foot" sand	Lower sand unit				
Tertiary	Pliocene -----?-----	Fleming Formation	Blounts Creek Member	Pliocene-Miocene aquifers are absent in this area	Evangeline aquifer or surficial confining unit			Evangeline equivalent aquifer system[2] or surficial confining unit	"800-foot" sand "1,000-foot" sand "1,200-foot" sand "1,500-foot" sand "1,700-foot" sand	Lower Ponchatoula Aquifer Big Branch aquifer Kentwood aquifer Abita aquifer Covington aquifer Slidell aquifer	
	Miocene		Castor Creek Member		Castor Creek confining unit			Unnamed confining unit	"2,000-foot" sand "2,400-foot" sand "2,800-foot" sand	Tchefuncte aquifer Hammond aquifer Amite aquifer Ramsay aquifer Franklinton aquifer	
	-----?-----		Williamson Creek Member Dough Hills Member Carnahan Bayou Member		Jasper aquifer system or surficial confining unit	Williamson Creek aquifer Dough Hills confining unit Carnahan Bayou aquifer		Jasper equivalent aquifer system[2] or surficial confining unit			
	Oligocene		Lena Member		Lena confining unit			Unnamed confining unit			
		Catahoula Formation			Catahoula aquifer			Catahoula equivalent aquifer system[2] or surficial confining unit			
		Vicksburg Group, undifferentiated		Vicksburg-Jackson confining unit	No fresh water occurs in older aquifers						
	Eocene	Jackson Group, undifferentiated									
		Claiborne Group	Cockfield Formation	Cockfield aquifer or surficial confining unit							
			Cook Mountain Formation	Cook Mountain aquifer or confining unit							
			Sparta Sand	Sparta aquifer or surficial confining unit							
			Cane River Formation	Cane River aquifer or confining unit							
			Carrizo Sand	Carrizo-Wilcox aquifer or surficial confining unit							
	Paleocene	Wilcox Group, undifferentiated									
		Midway Group, undifferentiated		Midway confining unit							

[1]Clay units separating aquifers in southeastern Louisiana are discontinuous

[2]Four aquifer systems as a group are called the Southern Hills aquifer system.

[3]Four aquifers as a group are called the New Orleans aquifer system.

Source: DOTD/USGS Water Resources Special Report No. 9, 1995

Table 3 - Aquifers Monitored

AQUIFER	WELL DEPTH RANGE (feet)	AVERAGE WELL DEPTH (feet)	NUMBER OF WELLS	AREAL EXTENT (sq. mi.)	WELL DENSITY (sq. mi./well)
Sparta	153 – 726	507	13	6,923	533
Carrizo-Wilcox	105 – 395	231	9	4,795	532
Red River Alluvial	47 – 89	68	4	1,387	346
Evangeline	170 – 1,715	650	11	4,547	413
Catahoula	352 – 910	636	5	2,590	518
North Louisiana Terrace	85 – 154	107	9	2,152	239
Carnahan Bayou	165 – 2,036	975	8	3,640	455
Mississippi River Alluvial	30 – 230	122	19	9,947	52
Cockfield	80 – 445	258	13	5,161	397
Chicot	66 – 697	255	16	9,949	622
Williamson Creek	355 – 1,657	719	6	3,243	540
Chicot Equivalent	90 – 775	343	24	6,800	283
Evangeline Equivalent	185 – 1,900	976	15	6,252	416
Jasper Equivalent	960 – 2,700	2,009	14	6,051	432
STATEWIDE	**30ft – 2,700 ft.**	**561.14 ft.**	**166 wells**	**73,437 sq. mi.**	**442 sq. mi./well**

Table 4 – Aquifers and Number of Wells Sampled by Month

AQUIFER	MONTH(S) SAMPLED	NUMBER OF WELLS SAMPLED	TOTAL NUMBER OF WELLS SAMPLED PER AQUIFER
State Fiscal Year 2019 (July 2018 – June 2019)			
Sparta	August	7	13
	October	1	
	November	2	
	January	1	
	March	1	
	May	1	
Carrizo-Wilcox	March	5	9
	May	2	
	July	1	
	October	1	
Red River Alluvial	March	2	4
	July	1	
	October	1	
Evangeline	May	3	11
	June	7	
	July	1	
Catahoula	January	3	5
	May	1	
	July	1	
North Louisiana Terrace	October	3	9
	January	1	
	May	5	
Carnahan Bayou	November	1	8
	January	1	
	May	3	
	June	1	
	July	2	
State Fiscal Year 2020 (July 2019 – June 2020)			
Mississippi River Alluvial	September	2	19
	January	4	
	June	10	
	July	3	
Cockfield	October	2	13
	June	11	

AQUIFER	MONTH(S) SAMPLED	NUMBER OF WELLS SAMPLED	TOTAL NUMBER OF WELLS SAMPLED PER AQUIFER
Chicot	February	5	16
	March	5	
	May	6	
State Fiscal Year 2021 (July 2020 – June 2021)			
Williamson Creek	August	1	6
	June	5	
Chicot Equivalent	September	3	24
	October	2	
	November	2	
	March	5	
	April	5	
	May	5	
	June	2	
Evangeline Equivalent	August	3	15
	September	2	
	October	2	
	November	3	
	March	5	
Jasper Equivalent	August	2	14
	September	3	
	October	2	
	November	3	
	March	4	

Table 5 – Conventional Parameters Statistics by Aquifer

	FIELD PARAMETERS					LABORATORY PARAMETERS												
	pH SU	Sal. ppt	Sp. Cond. mmhos/cm	TDS g/L	Temp. Deg. C	Alk. mg/L	Ammonia mg/L	Cl mg/L	Color PCU	Hard mg/L	Nitrite-Nitrate (as N) mg/L	TKN mg/L	Tot. P mg/L	Sp. Cond. umhos/cm	SO4 mg/L	TDS mg/L	TSS mg/L	Turb NTU
	LABORATORY DETECTION LIMITS →					2/5	0.1	1	1/5	1/5	0.01/0.05	0.1	0.05	1/10	0.25/1	10	4	0.1/0.3/0.5
SPARTA AQUIFER																		
Min	6.38	0.01	0.03	0.02	16.56	3.70	< DL	1.90	< DL	< DL	< DL	< DL	< DL	1.50	< DL	< DL	< DL	< DL
Max	8.56	0.90	1.78	1.16	21.73	548	0.82	392	75	66	1	1.40	0.80	1720	17.60	860	8	4
Avg	7.30	0.31	0.61	0.40	19.18	179	0.46	104	14	15	< DL	0.85	0.33	617	8.39	404.38	< DL	0.98
CARRIZO-WILCOX AQUIFER																		
Min	6.13	0.14	0.29	0.19	15.83	23.2	< DL	21.60	< DL	< DL	< DL	0.21	0.15	252	< DL	190	< DL	0.29
Max	9.33	0.79	1.55	1.01	20.43	1490	1.70	130	41	140	0.19	1.70	0.80	1490	255	930	10	28.80
Avg	8.07	0.40	0.81	0.53	17.68	420.6	0.75	65.09	13.66	49.20	0.07	0.95	0.42	822	48.14	486	4.70	3.88
RED RIVER ALLUVIAL AQUIFER																		
Min	6.87	0.33	0.68	0.44	15.69	364	0.56	12	5	324	< DL	1.00	0.43	592	< DL	435	7	44.30
Max	7.23	0.73	1.45	0.94	17.12	465	1.20	115	14	560	< DL	1.50	0.59	1630	198.00	725	86	189
Avg	7.10	0.54	1.08	0.70	16.68	412.50	0.84	64.93	9.67	431	< DL	1.35	0.50	1026	68.28	536	32	84.90
EVANGELINE AQUIFER																		
Min	6.16	0.02	0.04	0.03	17.92	9.70	< DL	2.80	< DL	< DL	< DL	< DL	< DL	36.80	< DL	35	< DL	0.20
Max	9.26	0.64	1.27	0.83	24.67	373	0.60	140	60	96.00	0.09	0.68	0.47	1340	72.50	710	< DL	12.90
Avg	7.71	0.21	0.43	0.28	20.32	156.57	0.19	28.70	14.09	37.18	< DL	0.20	0.24	430.82	8.93	247.27	< DL	1.93
CATAHOULA AQUIFER																		
Min	6.00	0.10	0.29	59.83	17.50	85.80	< DL	2.50	< DL	< DL	< DL	1.20	0.49	160	< DL	85	< DL	0.19
Max	8.20	0.16	0.31	239.89	23.22	155	0.24	33	12	12	< DL	0.31	0.14	377	16.00	260	< DL	4.00
Avg	7.23	0.12	0.30	173.37	20.86	110.12	0.15	16.08	8.40	7.40	< DL	0.60	0.29	290.40	16.98	190	< DL	1.16
NORTH LOUISIANA TERRACE AQUIFER																		
Min	6.08	0.06	0.14	0.14	15.55	30.20	< DL	6.90	< DL	26	< DL	< DL	0.12	127	< DL	105	< DL	0.20
Max	8.32	0.83	1.64	1.07	18.33	270	0.92	335	13	280	0.98	0.82	0.71	1550	38.90	300	20	29.20
Avg	6.97	0.23	0.47	0.30	16.91	138.12	0.22	62.50	6.60	100.40	0.35	0.34	0.43	469.44	8.46	186.11	< DL	5.02
CARNAHAN BAYOU AQUIFER																		
Min	7.47	0.15	0.32	0.21	15.74	21.40	0.21	5.40	< DL	< DL	< DL	< DL	< DL	81.50	< DL	65	< DL	< DL
Max	8.52	0.85	1.70	1.11	31.51	305	0.63	361	11	108	< DL	1.10	0.11	1770	36	295	4	4
Avg	8.04	0.28	0.58	0.38	23.60	151.49	0.45	63.04	6.88	26.14	< DL	0.64	< DL	544.93	10.79	296.43	< DL	< DL

Table 5 (Cont'd) – Conventional Parameters Statistics by Aquifer

	FIELD PARAMETERS					LABORATORY PARAMETERS												
	pH SU	Sal. ppt	Sp. Cond. mmhos/cm	TDS g/L	Temp. Deg. C	Alk. mg/L	Ammonia mg/L	Cl mg/L	Color PCU	Hard mg/L	Nitrite-Nitrate (as N) mg/L	TKN mg/L	Tot. P mg/L	Sp. Cond. umhos/ cm	SO4 mg/L	TDS mg/L	TSS mg/L	Turb NTU
	LABORATORY DETECTION LIMITS →					2/5	0.1	1	1/5	1/5	0.01/0.05	0.1	0.05	1/10	0.25/1	10	4	0.1/0.3/ 0.5
MISSISSIPPI RIVER ALLUVIAL AQUIFER																		
Min	6.50	0.11	0.22	145.83	12.38	55.50	< DL	9.50	5	80	< DL	< DL	0.05	290	< DL	195	4	0.82
Max	7.92	0.79	1.75	1017.38	25.76	434	< DL	270	55	680	7.40	2.20	1.10	4494	151	911	32	190
Avg	7.16	0.41	0.87	536.29	19.27	271.71	< DL	70.49	11.67	349.44	0.99	0.78	0.44	1170	20.29	470	12.41	54.76
COCKFIELD AQUIFER																		
Min	6.30	0.20	0.41	0.27	16.21	71.30	< DL	2.60	< DL	< DL	< DL	0.10	< DL	2.40	< DL	65	< DL	< DL
Max	8.92	0.79	1.30	844.10	27.01	424	1.30	99.20	20	420	0.34	1.90	4.20	1760	250	295	4	4
Avg	7.61	0.41	0.70	349.45	21.96	257.50	0.59	49.32	8.64	127.23	0.08	0.90	0.64	688.91	29.47	296.43	< DL	< DL
CHICOT AQUIFER																		
Min	5.24	0.01	0.03	16.61	15.68	5.00	< DL	2.70	5	28	< DL	0.10	< DL	31	< DL	< DL	< DL	0.75
Max	7.61	0.56	1.12	730	24.50	329	2	1300	10	720	1.30	2.30	0.50	1230	9.32	605	10	32.90
Avg	7.02	0.26	0.35	224.29	20.67	171.27	0.66	104.16	9	183.50	0.10	0.87	0.35	551.66	2.75	301.07	3.78	9.75
WILLIAMSON CREEK																		
Min	6.60	0.15	0.31	200	21.89	17	0.26	7.90	< DL	14	< DL	0.29	0.08	269	< DL	165	< DL	0.20
Max	8.34	0.30	0.61	398	29.50	207	0.48	93.90	15	42	< DL	2.20	0.23	684	27	300	< DL	2.70
Avg	7.51	0.22	0.45	295.48	24.56	127.73	0.36	37.79	< DL	25.43	< DL	0.90	0.15	475.86	5.98	230	< DL	1.99
CHICOT EQUIVALENT AQUIFER																		
Min	5.23	0.01	0.02	0.01	19.85	5.80	< DL	2.60	< DL	8	< DL	< DL	< DL	30	< DL	10	< DL	0.17
Max	8.52	1.28	2.04	1.61	25.96	363	4.90	629	30	178	0.17	2.60	0.73	2880	14.50	1260	6	10.30
Avg	7.37	0.30	0.56	0.39	22.62	129.50	0.69	93.47	7.69	58.38	0.07	0.74	0.28	630	2.93	341	4.19	1.79
EVANGELINE EQUIVALENT AQUIFER																		
Min	5.71	0.02	0.04	26.78	17.48	6	< DL	2.40	< DL	< DL	< DL	0.11	< DL	39.10	< DL	25	< DL	0.15
Max	9.09	0.29	0.60	389.14	26.81	290	0.68	17.60	10	124	0.43	0.89	0.81	835	11.50	370	< DL	1.60
Avg	7.90	0.13	0.27	174.11	23.58	112.89	0.20	6.36	< DL	26.53	< DL	0.46	0.28	335.17	6.65	164.67	< DL	0.57
JASPER EQUIVALENT AQUIFER																		
Min	7.93	0.09	0.22	143.24	24.50	80.50	0.12	2.50	< DL	< DL	< DL	0.25	0.12	213	6.60	115	< DL	< DL
Max	9.29	0.32	0.67	433.17	35.29	277	0.64	13.60	10	102	< DL	0.98	0.59	643	70.70	330	5	0.72
Avg	8.70	0.16	0.33	213.62	28.14	146.65	0.34	5.71	< DL	17.84	< DL	0.60	0.32	393.05	8.53	208.42	< DL	0.44

Table 6 – Inorganic Parameters Statistics by Aquifer

ANALYTE	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Cadmium µg/L	Chromium µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Mercury µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Thallium µg/L	Zinc µg/L
Laboratory Detection Limits	1	1	1	0.5	1	1	2/3	50/100	1	0.2	1/2	1/5	0.5/1	0.5/2	5
SPARTA AQUIFER															
Min	< DL	< DL	4.70	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	< DL	220.00	< DL	< DL	< DL	12.10	2040.00	< DL	< DL	< DL	< DL	< DL	< DL	57.90
Avg	< DL	< DL	56.40	< DL	< DL	< DL	4.35	455.05	< DL	< DL	< DL	< DL	< DL	< DL	< DL
CARRIZO-WILCOX AQUIFER															
Min	< DL	< DL	11.20	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	< DL	197.00	0.65	< DL	< DL	17.20	3510.00	9.00	< DL	6.10	< DL	< DL	< DL	1850
Avg	< DL	< DL	73.14	< DL	< DL	< DL	5.60	668.02	1.92	< DL	1.63	< DL	< DL	< DL	341.00
RED RIVER ALLUVIAL AQUIFER															
Min	< DL	< DL	162.00	< DL	< DL	< DL	< DL	4030.00	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	8.70	590.00	< DL	< DL	< DL	< DL	13000.00	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Avg	< DL	3.48	445.75	< DL	< DL	< DL	< DL	8335.00	< DL	< DL	< DL	< DL	< DL	< DL	< DL
EVANGELINE AQUIFER															
Min	< DL	< DL	8.50	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	1.20	5.10	287.00	< DL	< DL	< DL	30.90	4140.00	1.20	< DL	< DL	< DL	< DL	< DL	< DL
Avg	< DL	1.42	82.47	< DL	< DL	< DL	6.72	580.95	< DL	< DL	< DL	< DL	< DL	< DL	6.69
CATAHOULA AQUIFER															
Min	< DL	< DL	1.10	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	< DL	13.40	< DL	< DL	< DL	< DL	429.00	< DL	< DL	< DL	< DL	< DL	< DL	14.80
Avg	< DL	< DL	5.46	< DL	< DL	< DL	< DL	202.10	< DL	< DL	< DL	< DL	< DL	< DL	6.60
NORTH LOUISIANA TERRACE AQUIFER															
Min	< DL	< DL	26.30	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	2.50	451	< DL	< DL	2.20	57.20	8520.00	4.00	< DL	< DL	< DL	< DL	< DL	18.60
Avg	< DL	1.29	191.08	< DL	< DL	1.18	14.64	1206.50	< DL	< DL	< DL	< DL	< DL	< DL	10.33
CARNAHAN BAYOU AQUIFER															
Min	< DL	< DL	1.80	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	2.40	< DL	49.80	< DL	< DL	< DL	27.00	1180.00	2.00	< DL	< DL	< DL	< DL	< DL	5.40
Avg	1.24	< DL	76.96	< DL	< DL	< DL	6.36	242.90	< DL	< DL	< DL	< DL	< DL	< DL	< DL

Table 6 (Cont'd) – Inorganic Parameters Statistics by Aquifer

ANALYTE	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Cadmium µg/L	Chromium µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Mercury µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Thallium µg/L	Zinc µg/L
Laboratory Detection Limits	1	1	1	0.5	1	1	2/3	50/100	1	0.2	1/2	1/5	0.5/1	0.5/2	5
MISSISSIPPI RIVER ALLUVIAL AQUIFER															
Min	< DL	< DL	11.80	< DL	< DL	0.62	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	3.70
Max	< DL	9.00	1878.00	< DL	< DL	1.30	16.60	4030.00	8.50	< DL	2.20	< DL	< DL	< DL	28.80
Avg	< DL	2.29	323.15	< DL	< DL	0.929	3.05	1182.78	< DL	< DL	1.03	< DL	< DL	< DL	9.27
COCKFIELD AQUIFER															
Min	< DL	< DL	4.30	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	3.50
Max	0.12	5.80	408	< DL	< DL	4.10	99.30	23900.00	6.70	< DL	1.80	1.90	< DL	< DL	79.90
Avg	< DL	< DL	150.71	< DL	< DL	1.18	11.78	2714.26	1.15	< DL	< DL	1.18	< DL	< DL	28.88
CHICOT AQUIFER															
Min	< DL	< DL	38.80	< DL	< DL	< DL	< DL	< DL	0.11	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	7.70	607.00	< DL	< DL	1.00	390.00	3400.00	2.80	< DL	1.70	< DL	< DL	< DL	88.70
Avg	< DL	1.25	310.96	< DL	< DL	< DL	7.87	2518.00	< DL	< DL	0.87	< DL	< DL	< DL	8.59
WILLIAMSON CREEK AQUIFER															
Min	< DL	< DL	34.70	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	1.10	88.50	< DL	< DL	2.00	< DL	904.00	2.20	< DL	33.40	< DL	< DL	< DL	417.00
Avg	< DL	< DL	55.03	< DL	< DL	< DL	< DL	1415.14	< DL	< DL	6.74	< DL	< DL	< DL	64.39
CHICOT EQUIVALENT AQUIFER															
Min	< DL	< DL	11.80	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	10.00	543.00	0.57	< DL	3.50	165.00	786.00	8.70	< DL	3.00	1.80	< DL	< DL	561.00
Avg	< DL	1.04	137.10	< DL	< DL	0.71	15.90	321.04	1.72	< DL	1.14	< DL	< DL	< DL	40.58
EVANGELINE EQUIVALENT AQUIFER															
Min	< DL	< DL	1.80	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	0.59	84.70	1.10	< DL	2.40	25.60	615.00	1.60	< DL	< DL	< DL	< DL	< DL	20.10
Avg	< DL	< DL	35.23	< DL	< DL	0.94	6.51	70.83	0.65	< DL	< DL	< DL	< DL	< DL	5.67
JASPER EQUIVALENT AQUIFER															
Min	< DL	< DL	3.00	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Max	< DL	< DL	43.30	0.94	< DL	0.57	< DL	61.40	1.30	< DL	< DL	< DL	< DL	< DL	12.00
Avg	< DL	< DL	12.43	< DL	< DL	< DL	< DL	35.97	0.63	< DL	< DL	< DL	< DL	< DL	< DL

Table 7 – Combined Aquifer Statistics

CONVENTIOAL PARAMETERS	FIELD PARAMETERS					LABORATORY PARAMETERS												
	pH SU	**Sal. ppt**	**Sp. Cond. mmhos/cm**	**TDS g/L**	**Temp. Deg. C**	**Alk. mg/L**	**NH3 mg/L**	**Cl mg/L**	**Color PCU**	**Hard mg/L**	**Nitrite-Nitrate (as N) mg/L**	**TKN mg/L**	**Tot. P mg/L**	**Sp. Cond. umhos/cm**	**SO4 mg/L**	**TDS mg/L**	**TSS mg/L**	**Turb NTU**
	LABORATORY DETECTION LIMITS →					2/5	0.1	1	1/5	1/5	0.01 0.05	0.1	0.05	1/10	0.25/1	10	4	0.1 0.3 0.5
COMBINED AQUIFER DATA																		
Min	5.23	0.01	0.03	0.06	12.38	3.70	< DL	1.90	< DL	< DL	< DL	0.10	0.05	1.50	< DL	< DL	< DL	< DL
Max	9.33	1.28	2.48	1.61	35.29	1490	4.90	629	75	780.00	7.40	2.60	4.20	2880	255	1200	86	199
Avg	7.59	0.29	0.61	0.38	21.34	194.47	0.47	52.47	9.56	107.36	0.21	0.71	0.35	597	14.21	325	6.28	12.41

DETECTION LIMITS →	INORGANIC PARAMETERS														
	Antimony µg/L	**Arsenic µg/L**	**Barium µg/L**	**Beryllium µg/L**	**Cadmium µg/L**	**Chromium µg/L**	**Copper µg/L**	**Iron µg/L**	**Lead µg/L**	**Mercury µg/L**	**Nickel µg/L**	**Selenium µg/L**	**Silver µg/L**	**Thallium µg/L**	**Zinc µg/L**
	1	1	1	0.5	1	1	2/3	50/100	1	0.2	1/2	1/15	0.5/1	0.5/1	5
COMBINED AQUIFER DATA															
Min	< DL	0.59	0.81	< DLL	< DL	< DL	0.29	20.70	< DL	< DL	0.94	0.44	< DL	< DL	2.30
Max	10.00	28.50	1260	1.40	< DL	5.00	390.00	23900	9.00	< DL	33.40	2.50	< DL	< DL	24100
Avg	0.17	1.46	150.24	< DL	< DL	0.62	7.94	1391	0.65	< DL	1.35	0.73	< DL	< DL	141.77

Table 8 – Parameter List

PARAMETER GROUP	LIST OF ANALYTES	REPORTING UNITS
FIELD	pH	Standard Units (SU)
	Temperature	Degrees C.
	Specific Conductance	mmhos/cm
	Total Dissolved Solids	g/L or mg/L
	Salinity	parts per thousand (ppt)
CONVENTIONALS	Alkalinity	mg/L
	Chloride	mg/L
	Color	PCU
	Specific Conductance	µmhos/cm
	Sulfate	mg/L
	Total Dissolved Solids	mg/L
	Total Suspended Solids	mg/L
	Turbidity	NTU
	Ammonia (NH_3) – as N	mg/L
	Hardness – as $CaCO_3$	mg/L
	Nitrite-Nitrate (NO_2-NO_3) – as N	mg/L
	Total Kjeldahl Nitrogen	mg/L
	Total Phosphorus	mg/L
INORGANICS	Antimony	µg/L
	Arsenic	µg/L
	Barium	µg/L
	Beryllium	µg/L
	Cadmium	µg/L
	Chromium	µg/L
	Copper	µg/L
	Iron	µg/L
	Lead	µg/L
	Mercury	µg/L
	Nickel	µg/L
	Selenium	µg/L
	Silver	µg/L
	Thallium	µg/L
	Zinc	µg/L
VOLATILE ORGANIC COMPOUNDS	1,1,1-Trichloroethane	µg/L
	1,1,2,2-Tetrachloroethane	µg/L
	1,1,2-Trichloroethane	µg/L
	1,1-Dichloroethane	µg/L
	1,1-Dichloroethene	µg/L

PARAMETER GROUP	LIST OF ANALYTES	REPORTING UNITS
VOLATILE ORGANIC COMPOUNDS (Cont'd)	1,2-Dichorobenzene	µg/L
	1,2-Dichloroethane	µg/L
	1,2-Dichloropropane	µg/L
	1,3-Dichorobenzene	µg/L
	1,4-Dichorobenzene	µg/L
	Benzene	µg/L
	Bromodichloromethane	µg/L
	Bromoform	µg/L
	Bromomethane	µg/L
	Carbon Tetrachloride	µg/L
	Chlorobenzene	µg/L
	Chloroethane	µg/L
	Chloroform	µg/L
	Chloromethane	µg/L
	Cis-1,3-Dichloropropene	µg/L
	Dibromochloromethane	µg/L
	Ethyl Benzene	µg/L
	Methylene Chloride	µg/L
	O-Xylene (1,2-Dimethylbenzene)	µg/L
	Styrene	µg/L
	Tert-Butyl Methyl Ether	µg/L
	Tetrachloroethylene (PCE)	µg/L
	Toluene	µg/L
	Trans-1,2-Dichlroethene	µg/L
	Trans-1,3-Dichloropropene	µg/L
	Trichloroethylene (TCE)	µg/L
	Trichlorofluoromethane (Freon-11)	µg/L
	Vinyl Chloride	µg/L
	Xylenes, M & P	µg/L
SEMI-VOLATILE ORGANIC COMPOUNDS	1,2,4-Trichlorbenzene	µg/L
	2,4,6-Trichorophenol	µg/L
	2,4-Dichlorphenol	µg/L
	2,4-Dinitrophenol	µg/L
	2,4-Dinitrotoluene	µg/L
	2-Chloronaphthalene	µg/L
	2-Chlorophenol	µg/L
	2-Nitrophenol	µg/L
	3,3'-Dichlorobenzidine	µg/L
	4,6-Dinitro-2-Methylphenol	µg/L
	4-Bromophenyl Phenyl Ether	µg/L
	4-Chloro-3-Methylphenol	µg/L

PARAMETER GROUP	LIST OF ANALYTES	REPORTING UNITS
SEMI-VOLATILE ORGANIC COMPOUNDS (Cont'd)	4-Nitrophenol	µg/L
	Acenaphthene	µg/L
	Acenaphthylene	µg/L
	Anthracene	µg/L
	Benzidine	µg/L
	Benzo(A)Anthracene	µg/L
	Benzo(A)Pyrene	µg/L
	Benzo(B)Fluoranthene	µg/L
	Benzo(G,H,I)Perylene	µg/L
	Benzo(K)Fluoranthene	µg/L
	Benzyl Butyl Phthalate	µg/L
	Bis(2-Chloroethoxy) Methane	µg/L
	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	µg/L
	Bis(2-Ethylethoxy) Phthalate	µg/L
	Chrysene	µg/L
	Dibenz(A,H)Anthracene	µg/L
	Diethyl Phthalate	µg/L
	Dimethyl Phthalate	µg/L
	Di-N-Butyl Phthalate	µg/L
	Di-N-Octyl Phthalate	µg/L
	Fluoranthene	µg/L
	Fluorene	µg/L
	Hexachlorobenzene	µg/L
	Hexachlorobutadiene	µg/L
	Hexachlorocyclopentadiene	µg/L
	Hexachloroethane	µg/L
	Indeno(1,2,3-C,D)Pyrene	µg/L
	Isophorone	µg/L
	Naphthalene	µg/L
	Nitrobenzene	µg/L
	N-Nitrosodimethylamine	µg/L
	N-Nitrosodi-N-Propylamine	µg/L
	N-Nitrosodiphenylamine	µg/L
	Pentachlorophenol	µg/L
	Phenanthrene	µg/L
	Phenol	µg/L
	Pyrene	µg/L
PESTICIDES	Aldrin	µg/L
	Alpha BHC (Alpha Hexachlorocyclohexane)	µg/L
	Alpha Endosulfan	µg/L
	Alpha Chlorodane	µg/L

PARAMETER GROUP	LIST OF ANALYTES	REPORTING UNITS
PESTICIDES (Cont'd)	Beta BHC (Beta Hexachlorocyclohexane)	µg/L
	Beta Endosulfan	µg/L
	Chlorodane	µg/L
	Delta BHC (Delta Hexachlorocyclohexane)	µg/L
	Dieldrin	µg/L
	Endolufan sulfate	µg/L
	Endrin	µg/L
	Endrin Aldehyde	µg/L
	Endrin Keytone	µg/L
	Gamma Chlorodane	µg/L
	Heptachlor	µg/L
	Heptachlor Epoxide	µg/L
	Methoxychlor	µg/L
	P,P'-DDD	µg/L
	P,P'-DDE	µg/L
	P,P'-DDT	µg/L
	Toxaphene	µg/L
PCBS	PCB-1016 (Arochlor 1016)	µg/L
	PCB-1221 (Arochlor 1221)	µg/L
	PCB-1232 (Arochlor 1232)	µg/L
	PCB-1242 (Arochlor 1242)	µg/L
	PCB-1248 (Arochlor 1248)	µg/L
	PCB-1254 (Arochlor 1254)	µg/L
	PCB-1260 (Arochlor 1260)	µg/L

Table 9 – Wells Sampled

WELL NUMBER	OWNER	DEPTH (FEET)	WELL USE	AQUIFER/SYSTEM
BI-192	Lucky Water System	153	Public Supply	Sparta
BI-212	RockTenn	490	Industrial	Sparta
CA-105	Vixen Water System	525	Public Supply	Sparta
CL-203	Town of Homer	460	Public Supply	Sparta
L-31	City of Ruston	636	Public Supply	Sparta
L-32	City of Ruston	652	Public Supply	Sparta
OU-635	Graphic Packaging International, Inc.	726	Industrial	Sparta
OU-67	Angus Chemical	563	Industrial	Sparta
SA-570	Boise Cascade, Florien	545	Industrial	Sparta
UN-205	D'Arbonne Water System	725	Public Supply	Sparta
W-237	Town of Winnfield	430	Public Supply	Sparta
WB-241	Town of Springhill	408	Public Supply	Sparta
WB-269	City of Minden	280	Public Supply	Sparta
DS-5297Z	Private Owner	170	Domestic	Carrizo-Wilcox
DS-5996Z	Private Owner	360	Domestic	Carrizo-Wilcox
CD-630	Private Owner	240	Irrigation	Carrizo-Wilcox
CD-639	SI Precast	200	Industrial	Carrizo-Wilcox
CD-642	Louisiana Lift	210	Industrial	Carrizo-Wilcox
BO-274	Village Water System	395	Public Supply	Carrizo-Wilcox
CD-453	City of Vivian	228	Public Supply	Carrizo-Wilcox
SA-5848Z	Private Owner	170	Domestic	Carrizo-Wilcox
RR-5070Z	Private Owner	105	Domestic	Carrizo-Wilcox
CD-859	East Ridge Country Club	58	Irrigation	Red River Alluvial
CD-11849Z	Private Owner	47	Domestic	Red River Alluvial
NA-5404Z	Seven C’s Ranch	76	Domestic	Red River Alluvial
RR-345	Bundrick Farms	89	Irrigation	Red River Alluvial
AL-120	City of Oakdale	910	Public Supply	Evangeline
AL-363	West Allen Parish Water District	1715	Public Supply	Evangeline
AL-373	Town of Oberlin	747	Public Supply	Evangeline
AL-391	Fairview Water System	800	Public Supply	Evangeline
AV-441	Town of Evergreen	319	Public Supply	Evangeline
BE-512	Singer Water District	918	Public Supply	Evangeline
CU-1362	LAWCO	635	Public Supply	Evangeline
EV-858	Savoy Swords Water System	472	Public Supply	Evangeline
R-1350	Private Owner	180	Irrigation	Evangeline
V-668	LDWF/Fort Polk WMA HQ	280	Other	Evangeline

WELL NUMBER	OWNER	DEPTH (FEET)	WELL USE	AQUIFER/SYSTEM
V-5065Z	Private Owner	170	Domestic	Evangeline
CT-118	City of Jonesville	762	Public Supply	Catahoula
G-493	Pollock Area Water System	642	Public Supply	Catahoula
LS-278	Rogers Water System	352	Public Supply	Catahoula
R-1311	Lena Water System, Inc.	514	Public Supply	Catahoula
V-434	Town of Anacoco	910	Public Supply	Catahoula
BI-52	Town of Ringgold	112	Public Supply	North Louisiana Terrace
BO-434	Red Chute Utilities	94	Public Supply	North Louisiana Terrace
BO-578	Village Water System	85	Public Supply	North Louisiana Terrace
BO-7896Z	Private Owner	96	Domestic	North Louisiana Terrace
LS-264	City of Jena	105	Public Supply	North Louisiana Terrace
MO-124	Texas Gas	133	Public Supply	North Louisiana Terrace
MO-364	People Water Service	154	Public Supply	North Louisiana Terrace
OU-5524Z	Private Owner	95	Domestic	North Louisiana Terrace
RR-254	East Cross Water System	93	Public Supply	North Louisiana Terrace
BE-405	PCA, DeRidder	1016	Industrial	Carnahan Bayou
CO-47	City of Vidalia	310	Public Supply	Carnahan Bayou
G-5178Z	Private Owner	165	Domestic	Carnahan Bayou
R-1001	Gardner Water System	1080	Public Supply	Carnahan Bayou
R-1172	Cleco-Rodemacher	298	Power Generation	Carnahan Bayou
R-1210	City of Alexandria	2036	Public Supply	Carnahan Bayou
V-496	U.S. Army/Fort Polk	1415	Public Supply	Carnahan Bayou
V-656	East Central Vernon Water System	1477	Public Supply	Carnahan Bayou
AV-126	Private Owner	155	Domestic	Mississippi River Alluvial
AV-462	Farm, LLC.	110	Irrigation	Mississippi River Alluvial
AV-5495Z	Private Owner	90	Domestic	Mississippi River Alluvial
CO-433	Whitehall Plantation	149	Domestic	Mississippi River Alluvial
CT-DENNIS	Private Owner	30	Domestic	Mississippi River Alluvial
FR-1358	Macon Ridge Research Station	60	Irrigation	Mississippi River Alluvial
IB-363	Syngenta Crop Protection, Inc.	225	Industrial	Mississippi River Alluvial
IB-COM	Private Owner	185	Domestic	Mississippi River Alluvial
MA-248	Tallulah Water Service	153	Public Supply	Mississippi River Alluvial
MO-871	Private Owner	80	Irrigation	Mississippi River Alluvial
PC-5515Z	Private Owner	156	Domestic	Mississippi River Alluvial
RI-469	Liddieville Water System	90	Public Supply	Mississippi River Alluvial
RI-730	Start Water System	101	Public Supply	Mississippi River Alluvial
RI-RAYVIL	Rayville Water Department	230	Public Supply	Mississippi River Alluvial
SMN-33	LDOTD/Lafayette District	125	Public Supply	Mississippi River Alluvial

WELL NUMBER	OWNER	DEPTH (FEET)	WELL USE	AQUIFER/SYSTEM
TS-61	Town of St. Joseph	140	Public Supply	Mississippi River Alluvial
TS-FORTENB	Private Owner	33	Domestic	Mississippi River Alluvial
WC-91	New Carroll Water Association	115	Public Supply	Mississippi River Alluvial
WC-527	Private Owner	85	Irrigation	Mississippi River Alluvial
CA-35	City of Columbia	298	Public Supply	Cockfield
EC-233	Town of Lake Providence	371	Public Supply	Cockfield
MO-479	Bayou Bonne Idee Water System	258	Public Supply	Cockfield
NA-5449Z	Private Owner	170	Domestic	Cockfield
OU-FRITH	Private Owner	80	Domestic	Cockfield
RI-127	Delhi Water Works	416	Public Supply	Cockfield
RI-450	River Road Waterworks	283	Public Supply	Cockfield
SA-BYRD	Private Owner	150	Domestic	Cockfield
UN-5332Z	Private Owner	160	Irrigation	Cockfield
W-192	Red Hill Water System	210	Public Supply	Cockfield
W-198	Atlanta Water System	445	Public Supply	Cockfield
WC-187	New Carroll Water System	110	Public Supply	Cockfield
WC-487	Town of Oak Grove	396	Public Supply	Cockfield
JD-862	City Of Welsh	697	Public Supply	Chicot
R-6947Z	Private Owner	110	Domestic	Chicot
LF-572	Lafayette Utilities System	570	Public Supply	Chicot
BE-378	Transcontinental Gas Pipeline	172	Industrial	Chicot
BE-412	PCA, DeRidder	202	Industrial	Chicot
BE-488	Singer Water District	262	Public Supply	Chicot
I-7312Z	Breaux Electric	180	Public Supply	Chicot
SL-7152Z	Private Owner	180	Domestic	Chicot
AC-539	City Of Rayne	251	Public Supply	Chicot
AC-8316Z	Private Owner	165	Domestic	Chicot
V-535	Marlow Fire Station	66	Public Supply	Chicot
VE-151	Vermilion Oaks Country Club	250	Irrigation	Chicot
VE-862	Town of Gueydan	249	Public Supply	Chicot
VE-882	City of Kaplan	279	Public Supply	Chicot
EV-673	City Of Mamou	247	Public Supply	Chicot
VE-VIATOR	Private Owner	200	Domestic	Chicot
BE-407	PCA, DeRidder	1657	Industrial	Williamson Creek
CO-163	USACE	513	Public Supply	Williamson Creek
R-932	City of Alexandria	466	Public Supply	Williamson Creek
R-1099	Kolin-Ruby Wise	355	Public Supply	Williamson Creek
V-420	U.S. Army/Fort Polk	920	Public Supply	Williamson Creek

WELL NUMBER	OWNER	DEPTH (FEET)	WELL USE	AQUIFER/SYSTEM
R-1362	International Paper Co.	402	Industrial	Williamson Creek
AN-266	City of Gonzales	548	Public Supply	Chicot Equivalent
AN-321	Rubicon, Inc.	523	Industrial	Chicot Equivalent
AN-337	BASF Corp.	459	Public Supply	Chicot Equivalent
AN-500	Lion Copolymer	480	Industrial	Chicot Equivalent
AN-6297Z	Oxy Chemical	294	Monitor	Chicot Equivalent
AN-9183Z	Private Owner	630	Domestic	Chicot Equivalent
EB-34	ExxonMobil USA	453	Industrial	Chicot Equivalent
EB-991B	Baton Rouge Water Company	565	Public Supply	Chicot Equivalent
EB-1231	Georgia Pacific	280	Industrial	Chicot Equivalent
EB-8599Z	Private Owner	180	Domestic	Chicot Equivalent
EF-5329Z	Private Owner	97	Domestic	Chicot Equivalent
JF-224	Entergy	775	Industrial	Chicot Equivalent
LI-5477Z	Private Owner	106	Domestic	Chicot Equivalent
LI-7945Z	French Settlement Water System	455	Public Supply	Chicot Equivalent
LI-7965Z	LIGO	205	Public Supply	Chicot Equivalent
SC-179	Union Carbide	460	Industrial	Chicot Equivalent
SH-5333Z	Private Owner	230	Domestic	Chicot Equivalent
SH-77	Transco	170	Public Supply	Chicot Equivalent
SJ-226	Noranda Alumina, LLC	248	Industrial	Chicot Equivalent
SJB-173	DuPont	425	Industrial	Chicot Equivalent
ST-11516Z	Louisiana State Parks	340	Domestic	Chicot Equivalent
TA-7627Z	Global Wildlife Center	120	Domestic	Chicot Equivalent
WA-5295Z	Private Owner	100	Domestic	Chicot Equivalent
WA-5311Z	Private Owner	90	Domestic	Chicot Equivalent
AV-680	Avoyelles Water Commission	553	Public Supply	Evangeline Equivalent
EB-1003	Baton Rouge Water Company	1430	Public Supply	Evangeline Equivalent
EF-MILEY	Private Owner	185	Domestic	Evangeline Equivalent
PC-325	Alma Plantation LTD	1252	Industrial	Evangeline Equivalent
SL-679	Alon USA	1152	Industrial	Evangeline Equivalent
ST-532	Northlake Hospital	1520	Public Supply	Evangeline Equivalent
ST-6711Z	Private Owner	860	Domestic	Evangeline Equivalent
ST-SMMHP	Southern Manor MHP	2004	Public Supply	Evangeline Equivalent
TA-284	City of Ponchatoula	608	Public Supply	Evangeline Equivalent
TA-286	Town of Kentwood	640	Public Supply	Evangeline Equivalent
TA-10046Z	Highway 51 MHP	590	Public Supply	Evangeline Equivalent
WA-241	Private Owner	400	Irrigation	Evangeline Equivalent
WA-5210Z	Private Owner	752	Domestic	Evangeline Equivalent

WELL NUMBER	OWNER	DEPTH (FEET)	WELL USE	AQUIFER/SYSTEM
WBR-181	Port of Greater Baton Rouge	1900	Industrial	Evangeline Equivalent
WF-DELEE	Private Owner	240	Domestic	Evangeline Equivalent
EB-854	City of Zachary	2090	Public Supply	Jasper Equivalent
EF-272	Louisiana. War Vets Home	1325	Public Supply	Jasper Equivalent
LI-185	City of Denham Springs	2610	Public Supply	Jasper Equivalent
LI-229	Ward 2 Water District	1826	Public Supply	Jasper Equivalent
LI-257	Village of Albany	1842	Public Supply	Jasper Equivalent
PC-275	Private Owner	1912	Domestic	Jasper Equivalent
SH-104	Cal Maine Foods	1652	Industrial	Jasper Equivalent
ST-995	Insta-Gator	2290	Irrigation	Jasper Equivalent
ST-1135	Lakeshore Estates	2605	Public Supply	Jasper Equivalent
ST-FOLSOM	Village of Folsom	2265	Public Supply	Jasper Equivalent
TA-560	Town of Roseland	2032	Public Supply	Jasper Equivalent
TA-826	City of Ponchatoula	2015	Public Supply	Jasper Equivalent
WA-248	Town of Franklinton	2700	Public Supply	Jasper Equivalent
WF-264	West Feliciana Parish Utilities	960	Public Supply	Jasper Equivalent

Chart 1 – Number of Wells Sampled by Aquifer

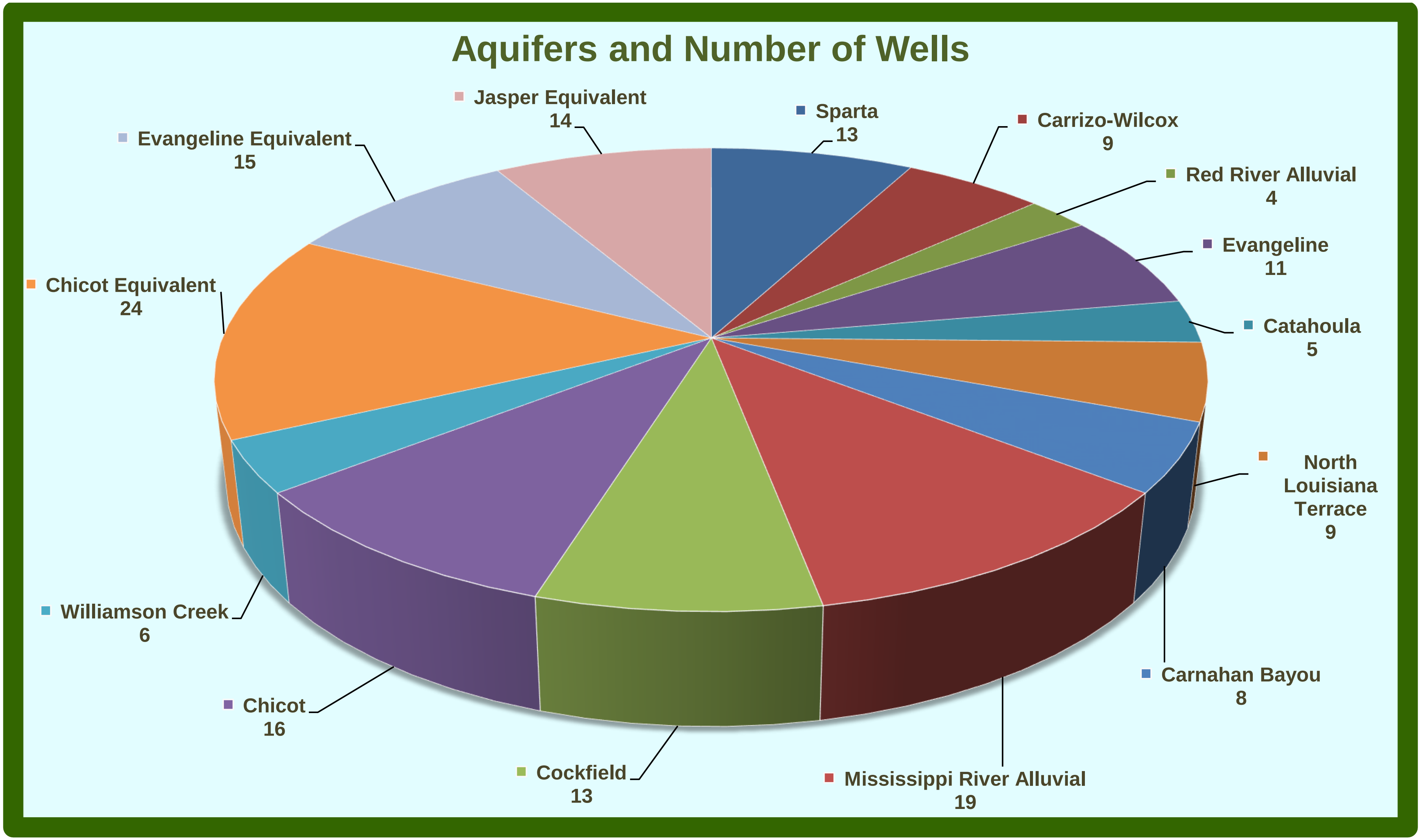


Chart 2 – Aquifer Areal Extent

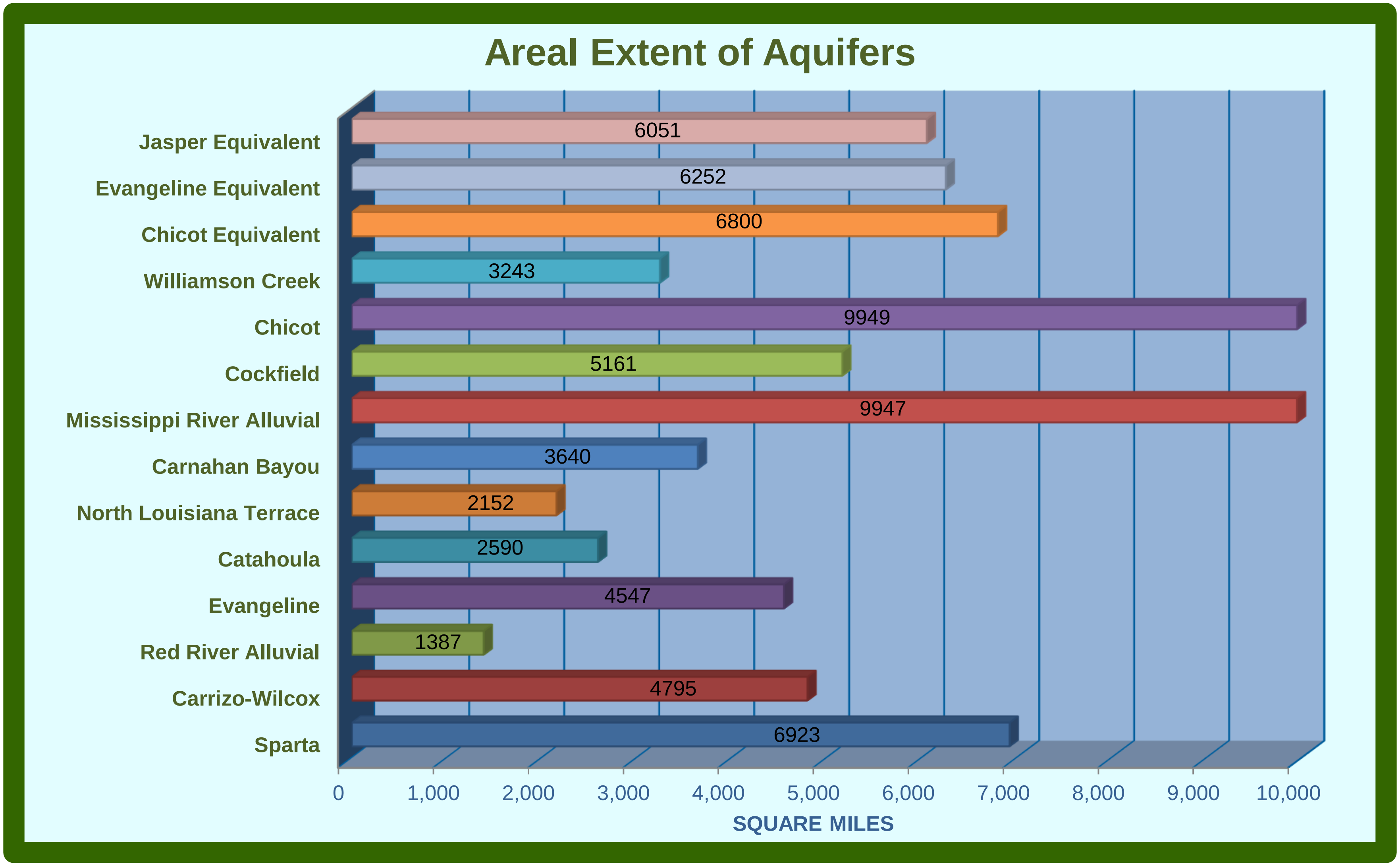


Chart 3 – Well Depth Statistics

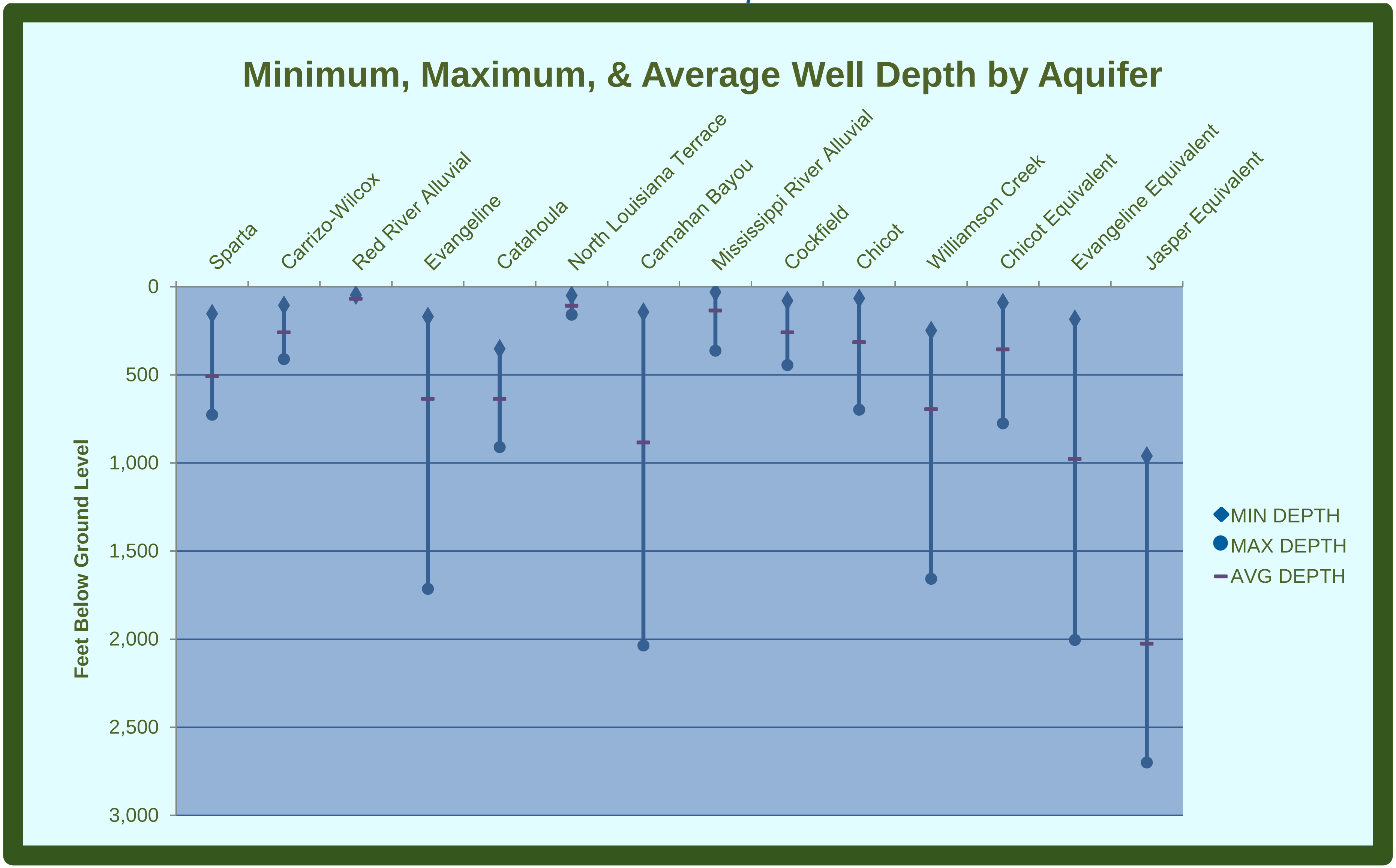


Chart 4 – Average pH Values

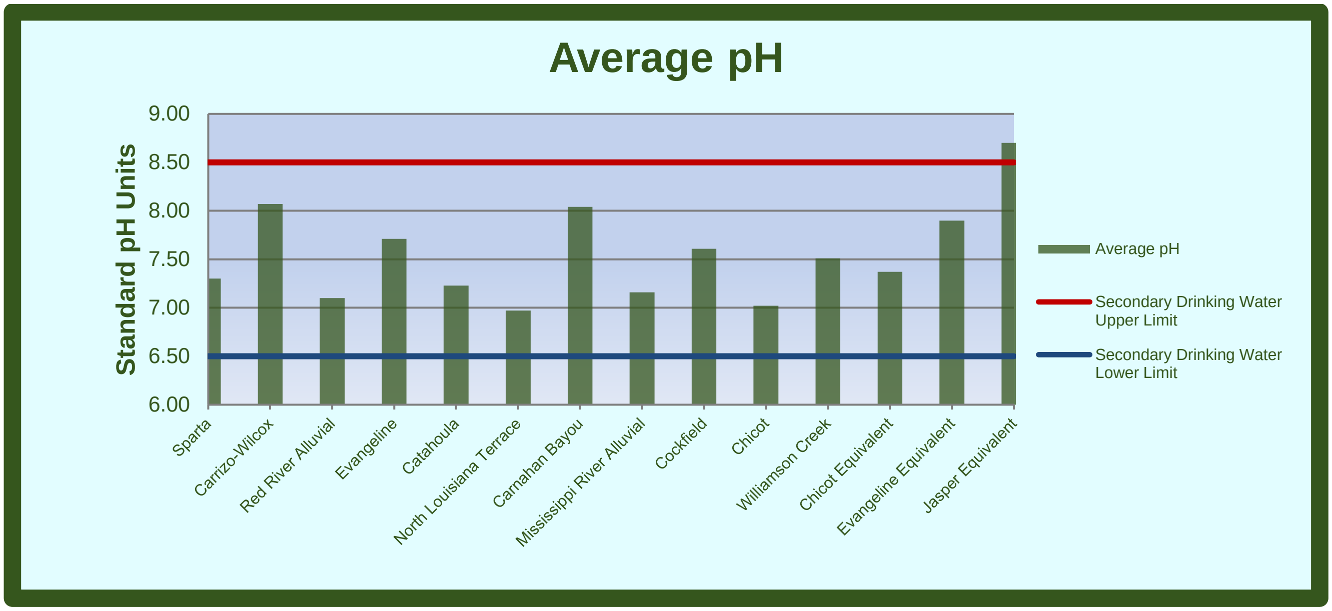


Chart 5 – Average Chloride Values

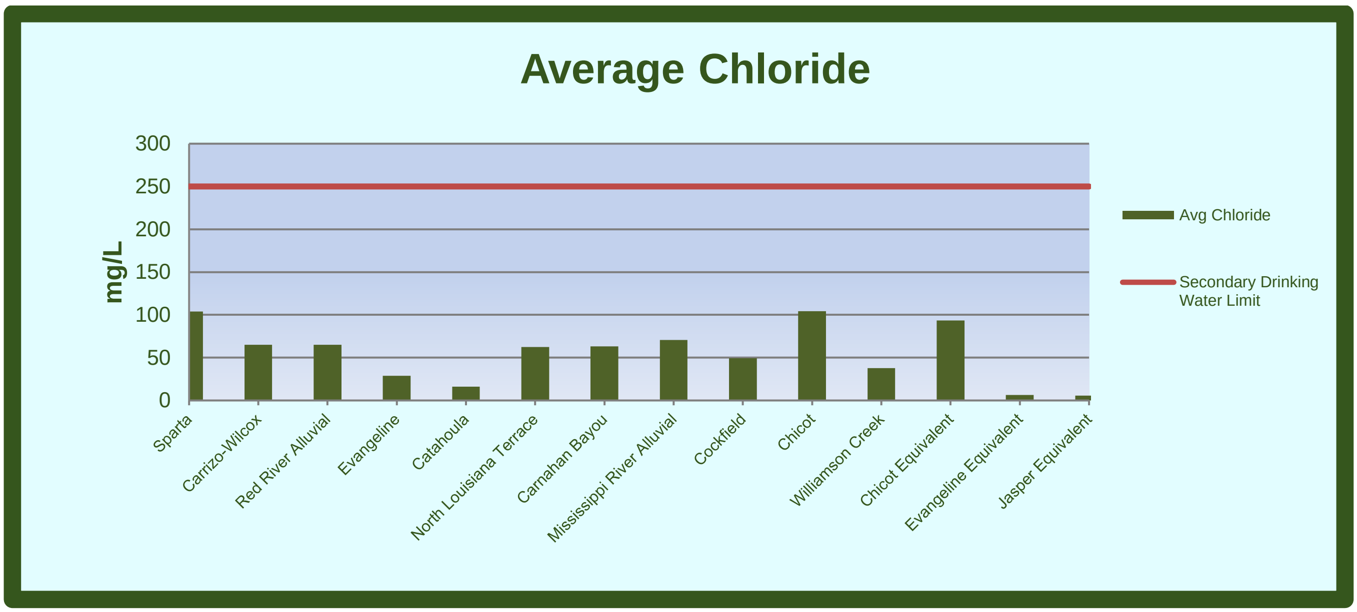


Chart 6 – Average Total Dissolved Solids Values

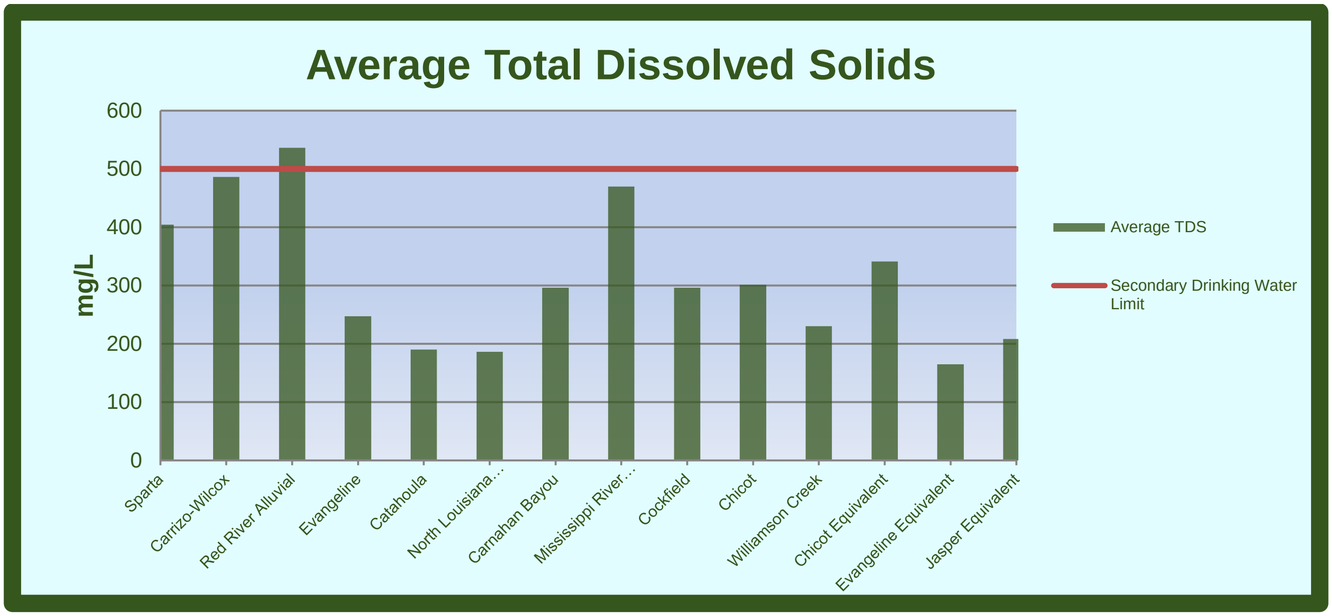
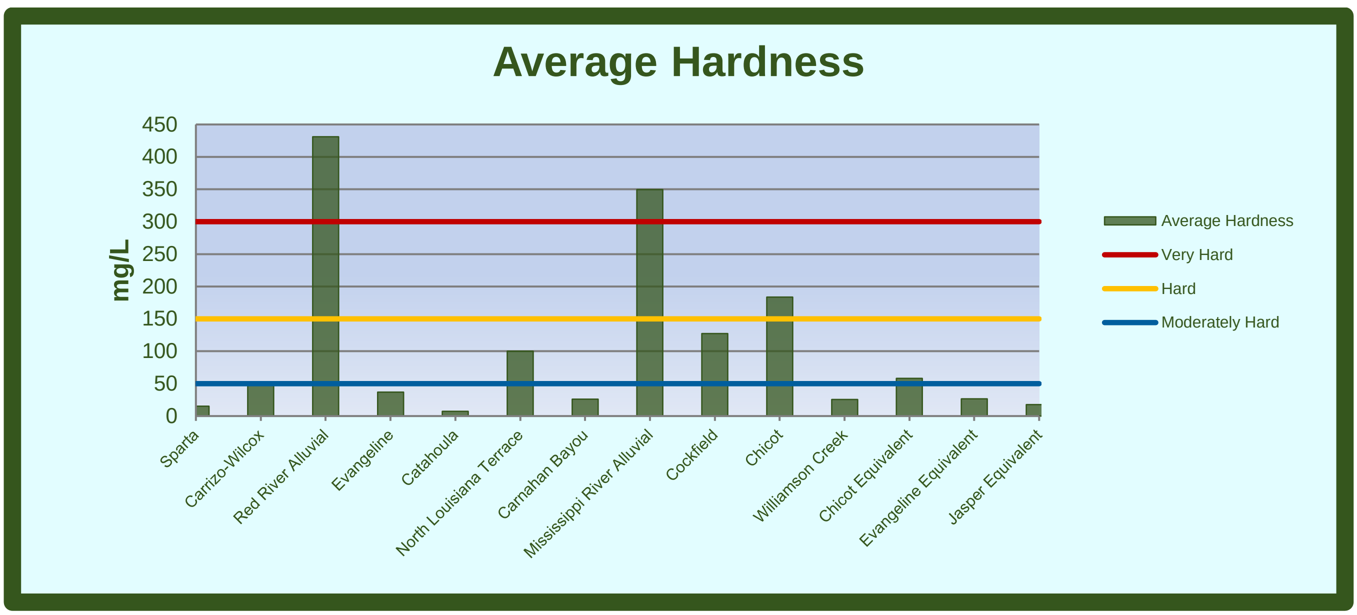
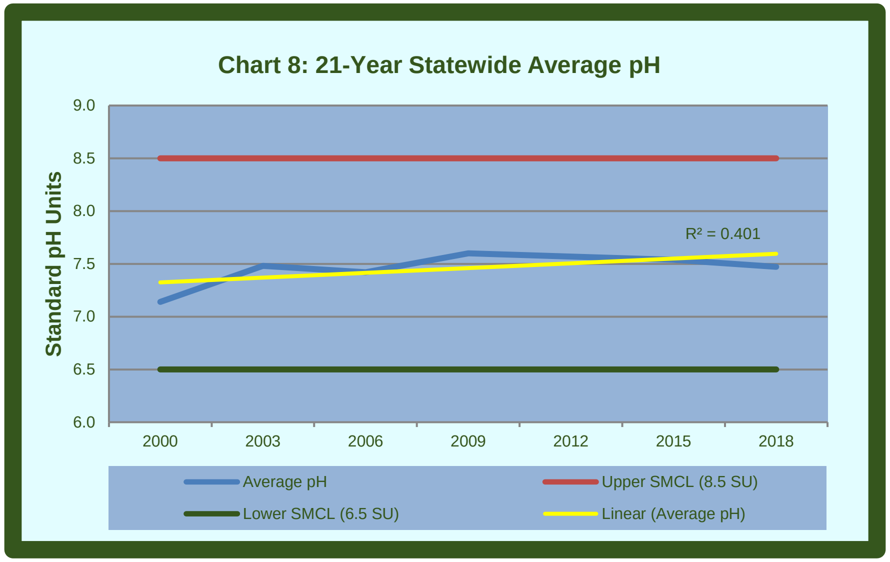


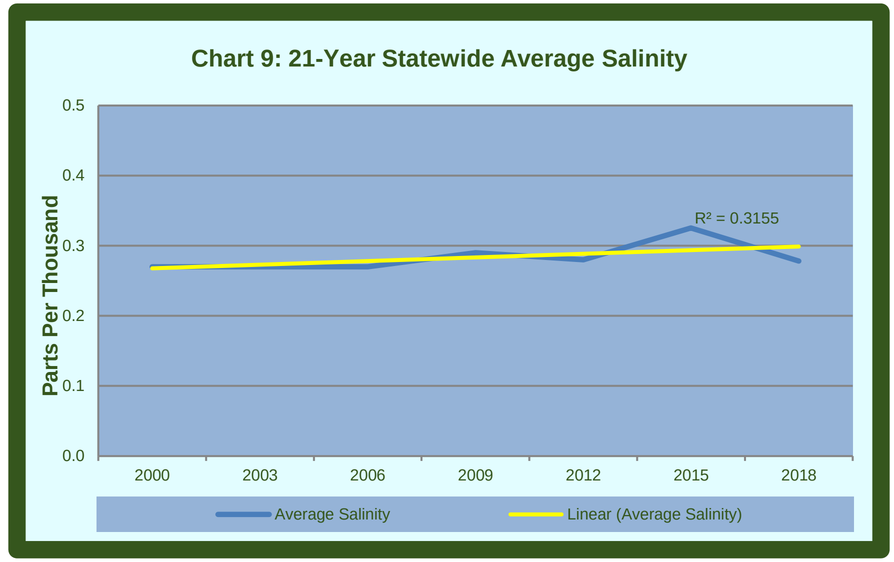
Chart 7 – Average Hardness Values

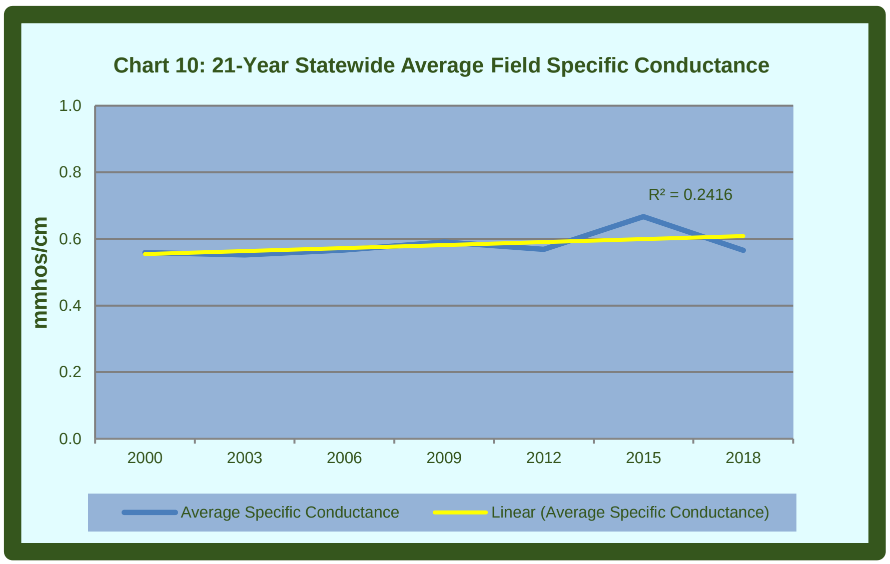


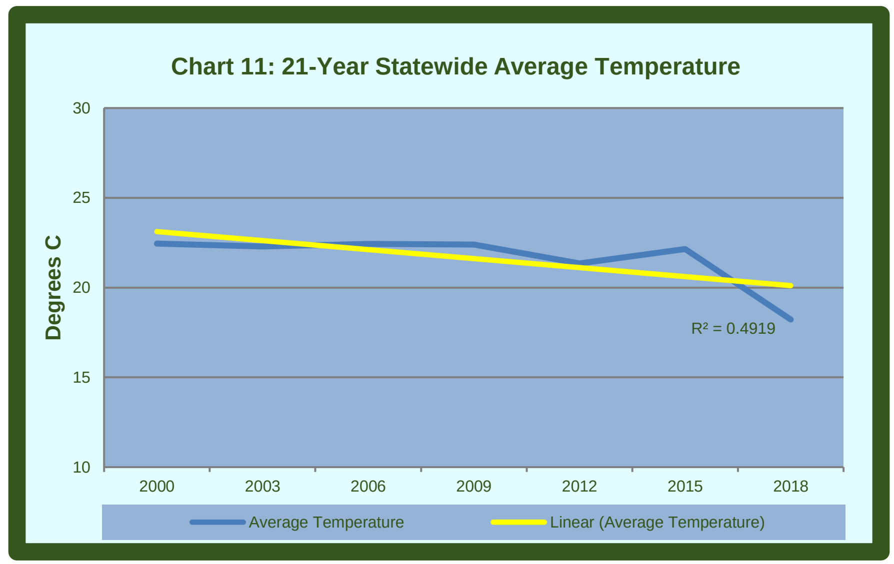
TWENTY-ONE YEAR TREND OF SELECT PARAMETER AVERAGES (2000 – 2021)

FIELD PARAMETERS









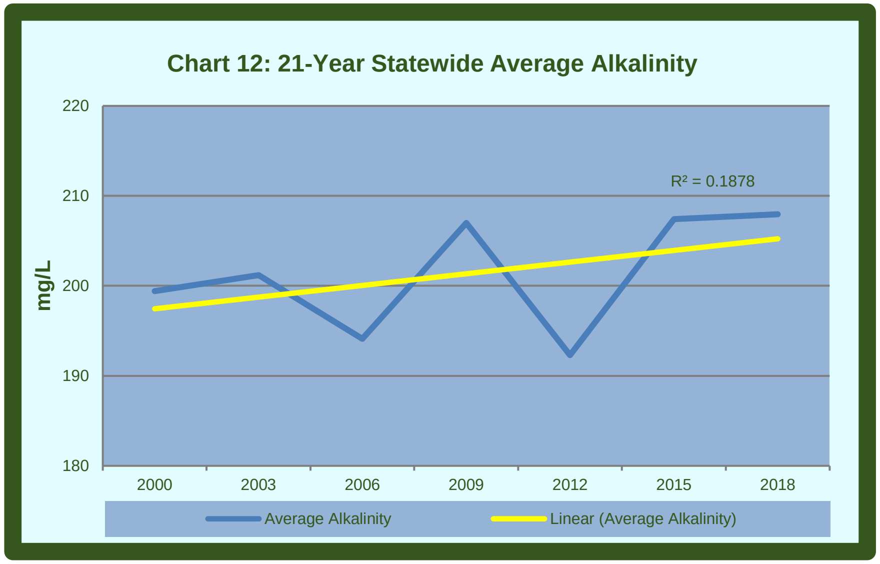


Chart 12: 21-Year Statewide Average Alkalinity
mg/L
220
210
200
190
180
2000
2003
2006
2009
2012
2015
2018
R² = 0.1878
Average Alkalinity
Linear (Average Alkalinity)

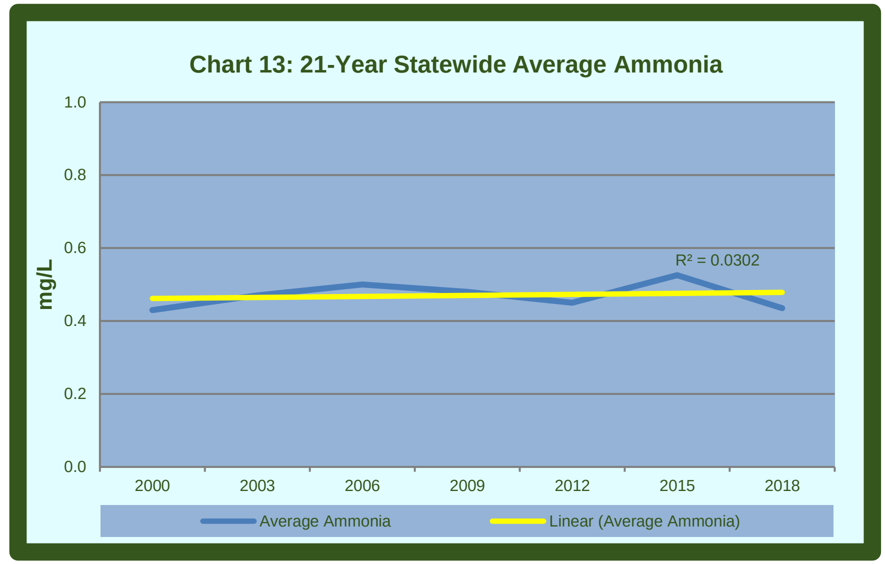


Chart 13: 21-Year Statewide Average Ammonia
mg/L
1.0
0.8
0.6
0.4
0.2
0.0
2000
2003
2006
2009
2012
2015
2018
R² = 0.0302
Average Ammonia
Linear (Average Ammonia)

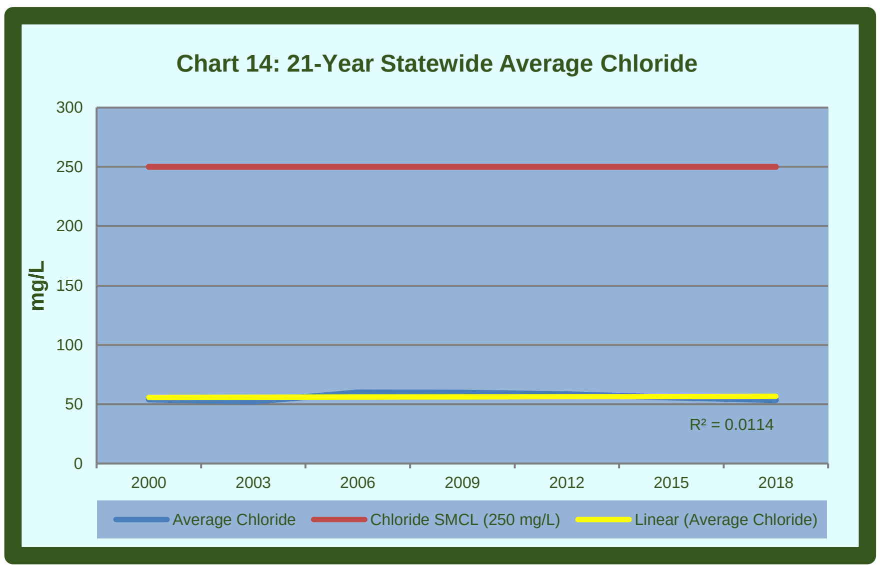


Chart 14: 21-Year Statewide Average Chloride
mg/L
300
250
200
150
100
50
0
2000
2003
2006
2009
2012
2015
2018
R² = 0.0114
Average Chloride
Chloride SMCL (250 mg/L)
Linear (Average Chloride)

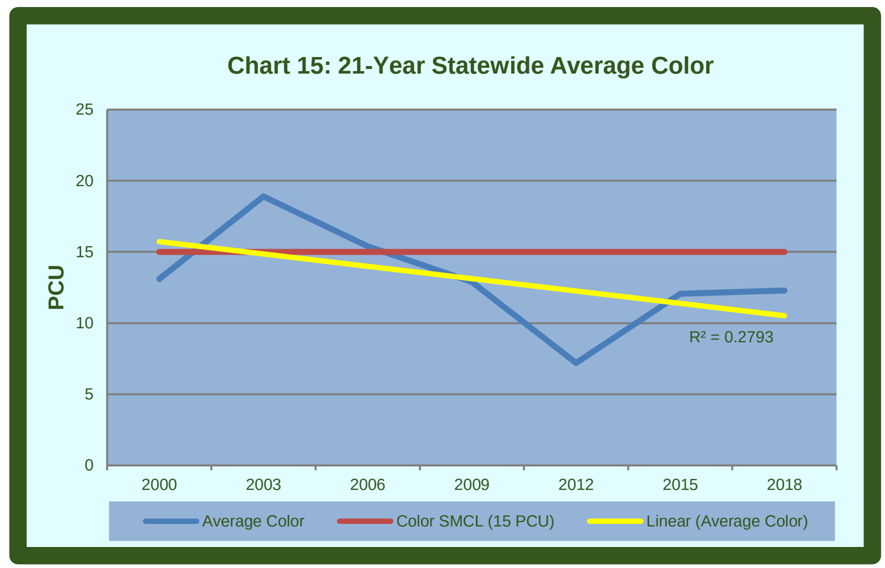
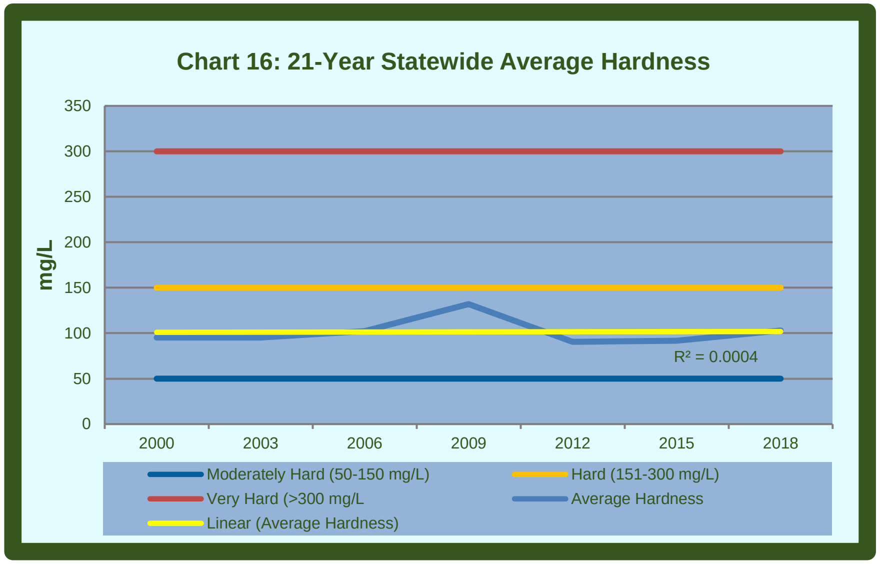
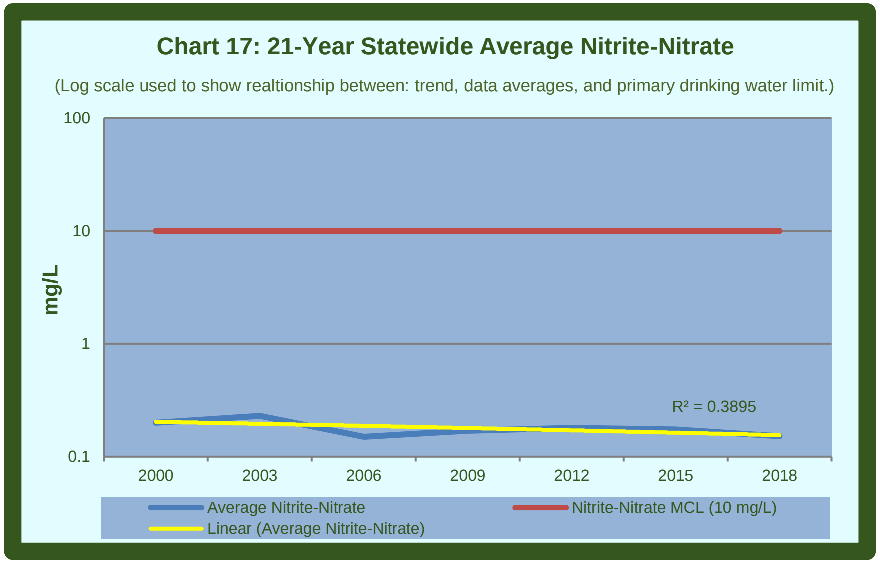
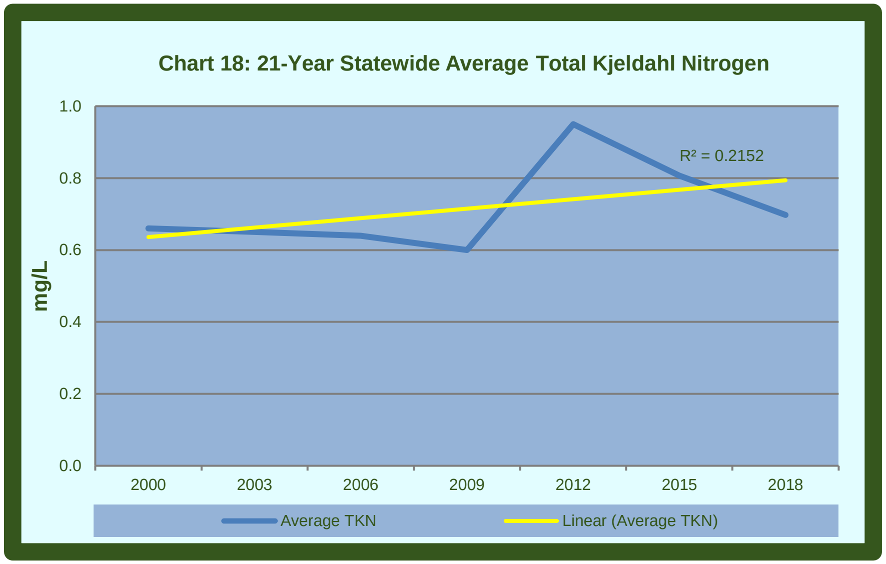


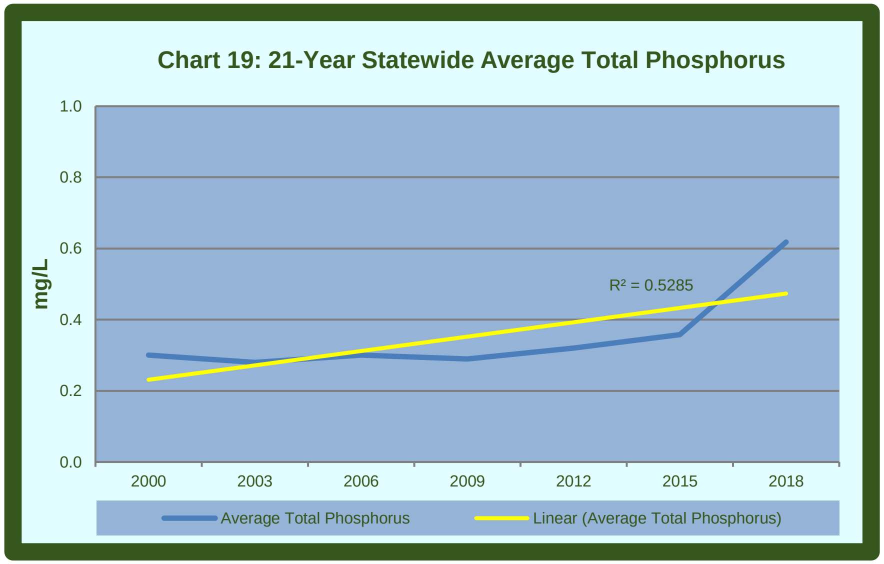
Chart 15: 21-Year Statewide Average Color
PCU
25
20
15
10
5
0
2000
2003
2006
2009
2012
2015
2018
R² = 0.2793
Average Color
Color SMCL (15 PCU)
Linear (Average Color)

CONVENTIONAL PARAMETERS – CONTINUED

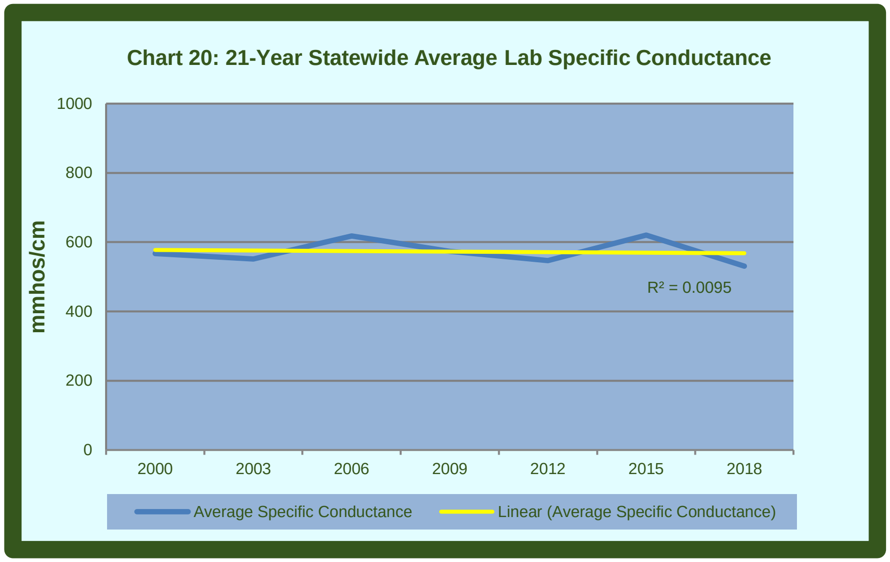


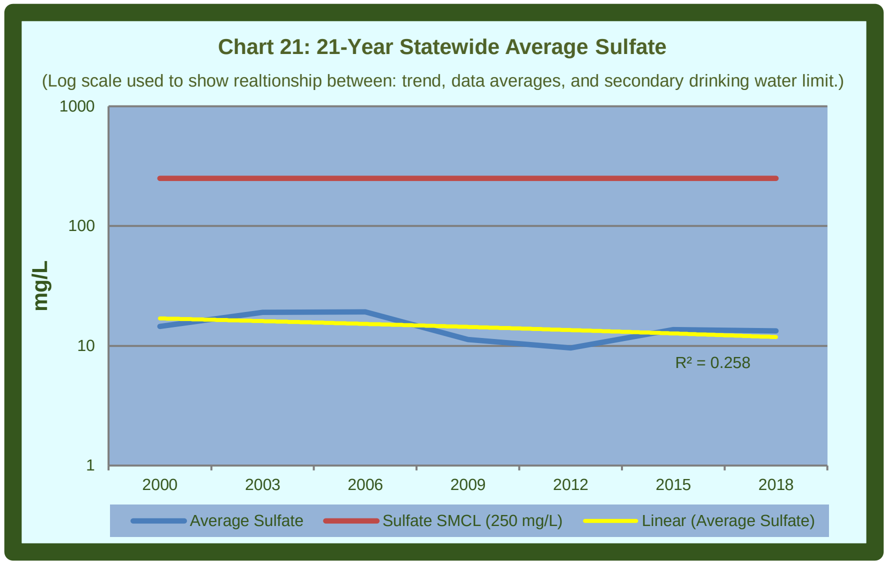


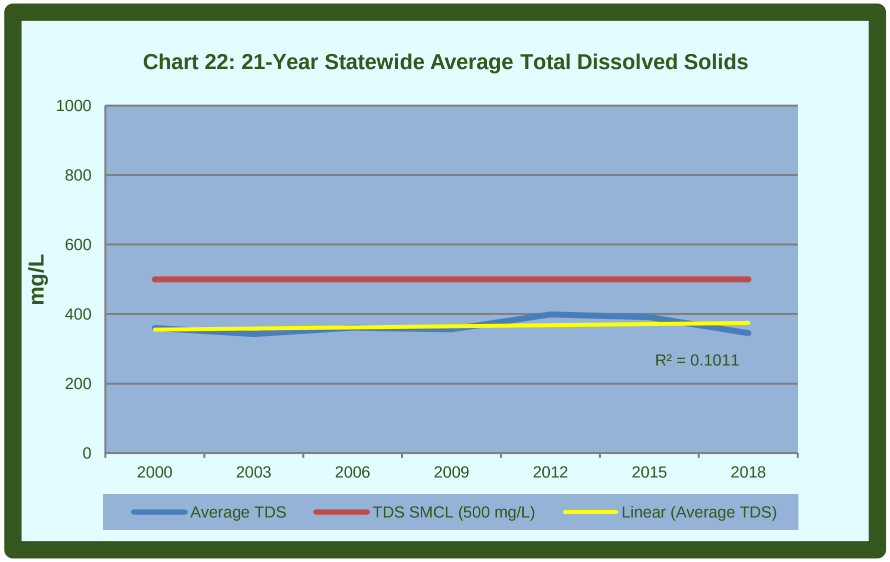


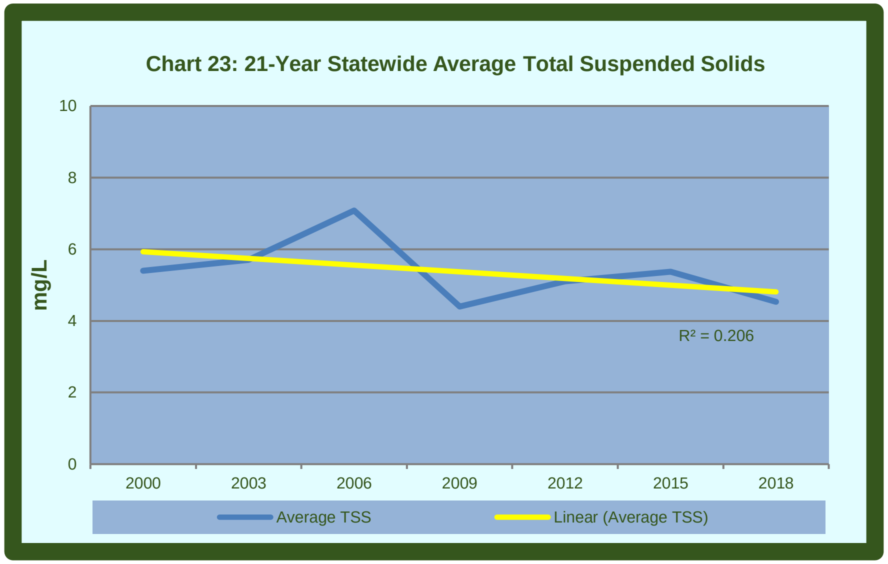


CONVENTIONAL PARAMETERS – CONTINUED

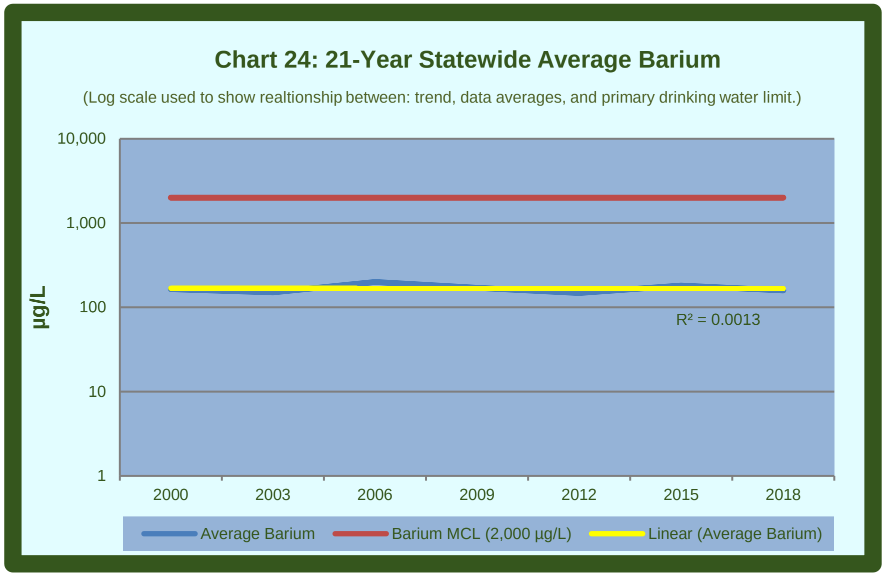


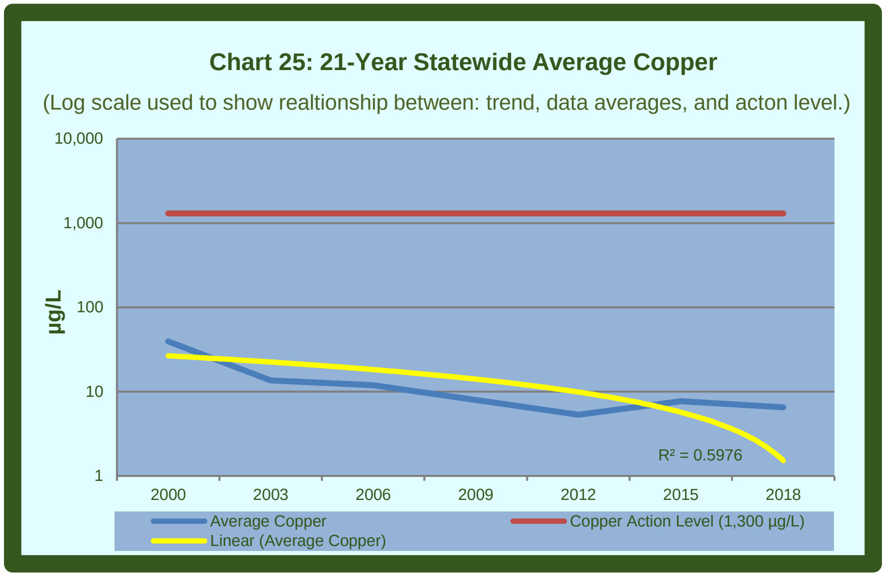


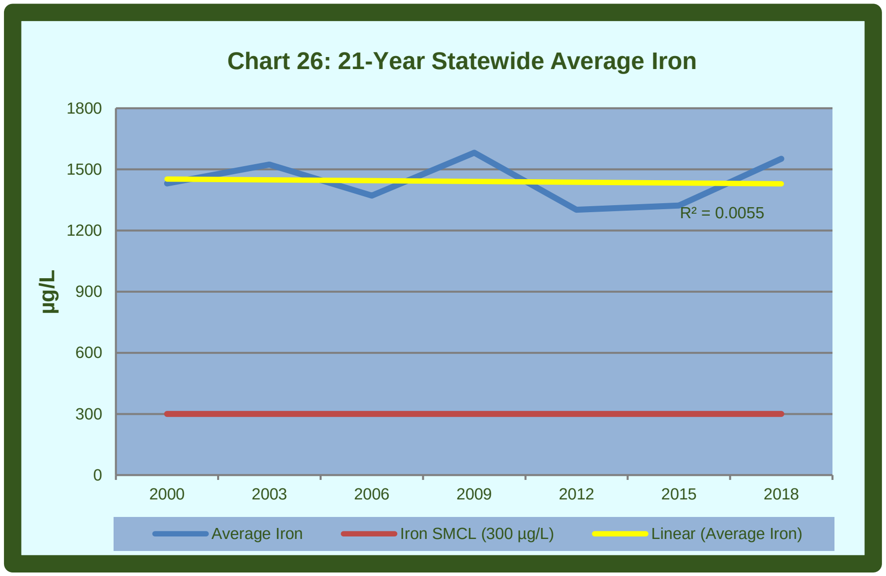


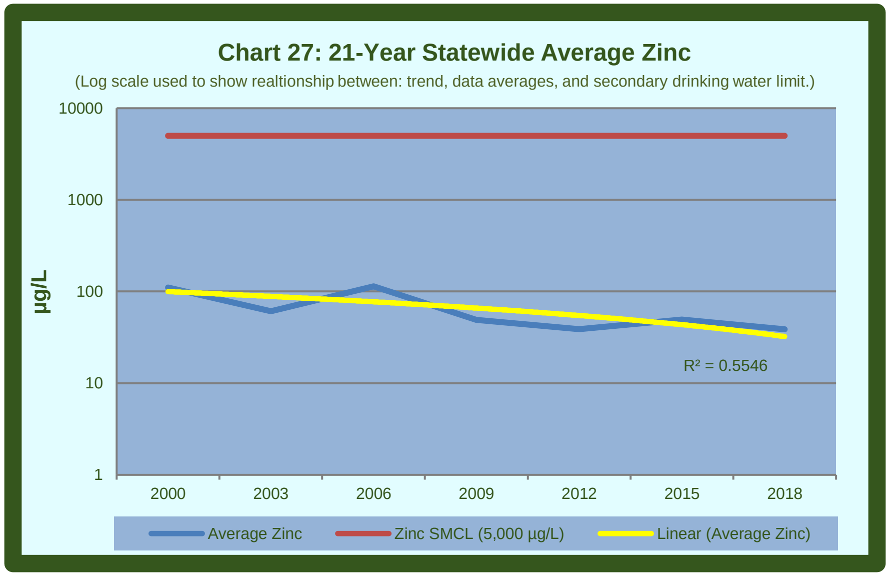


INORGANIC PARAMETERS



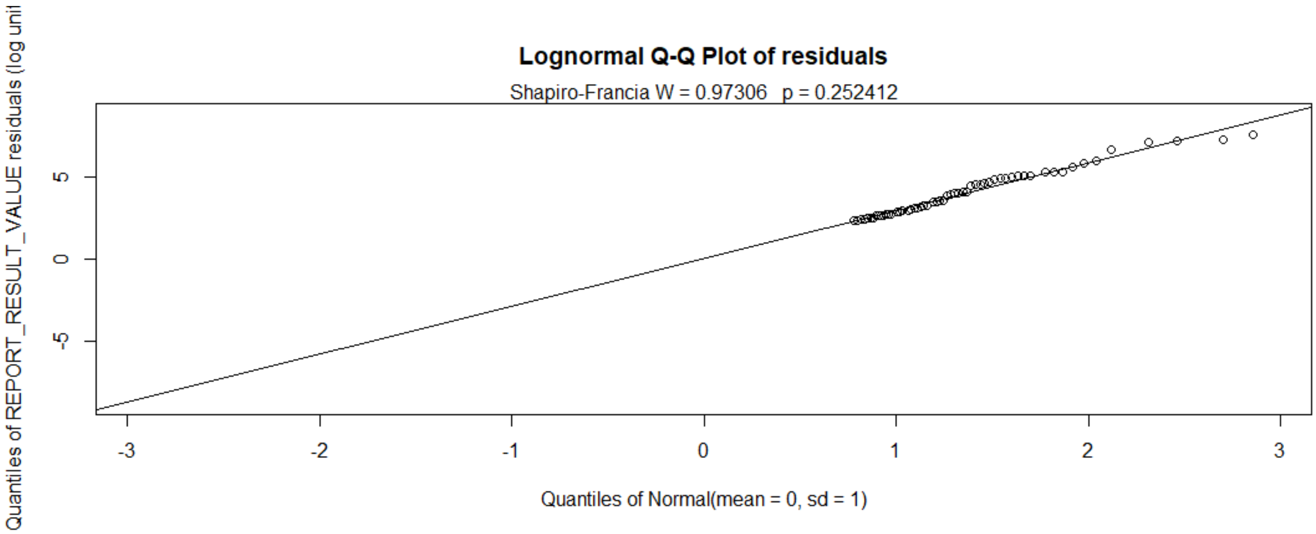




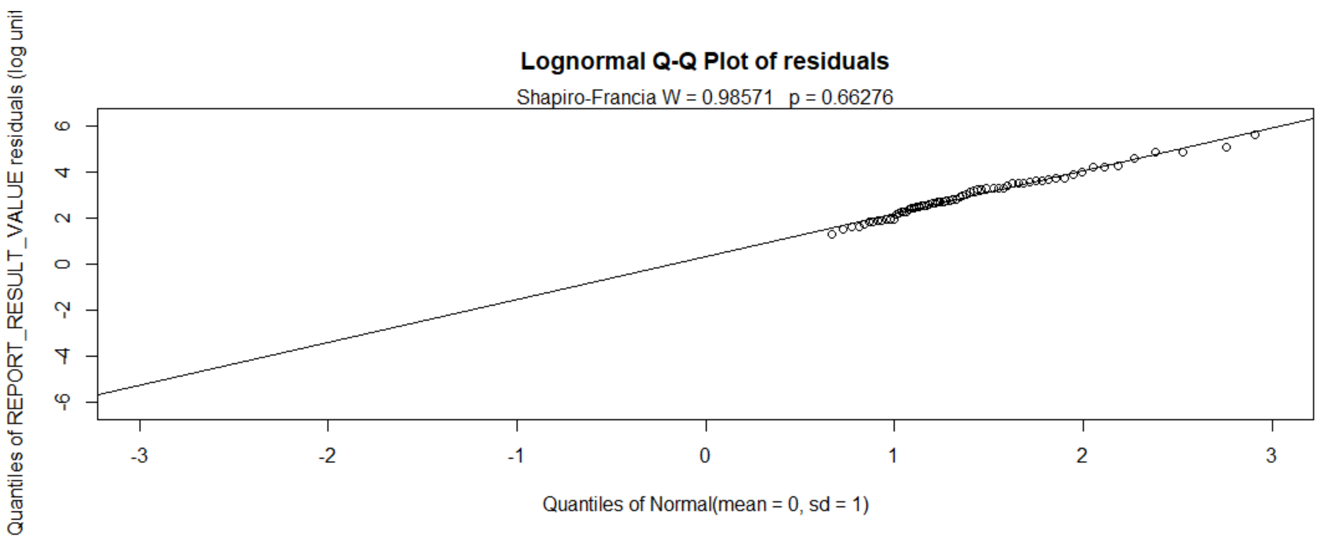


REGRESSION ANALYSIS OF PARAMETERS WITH <DL AVERAGES

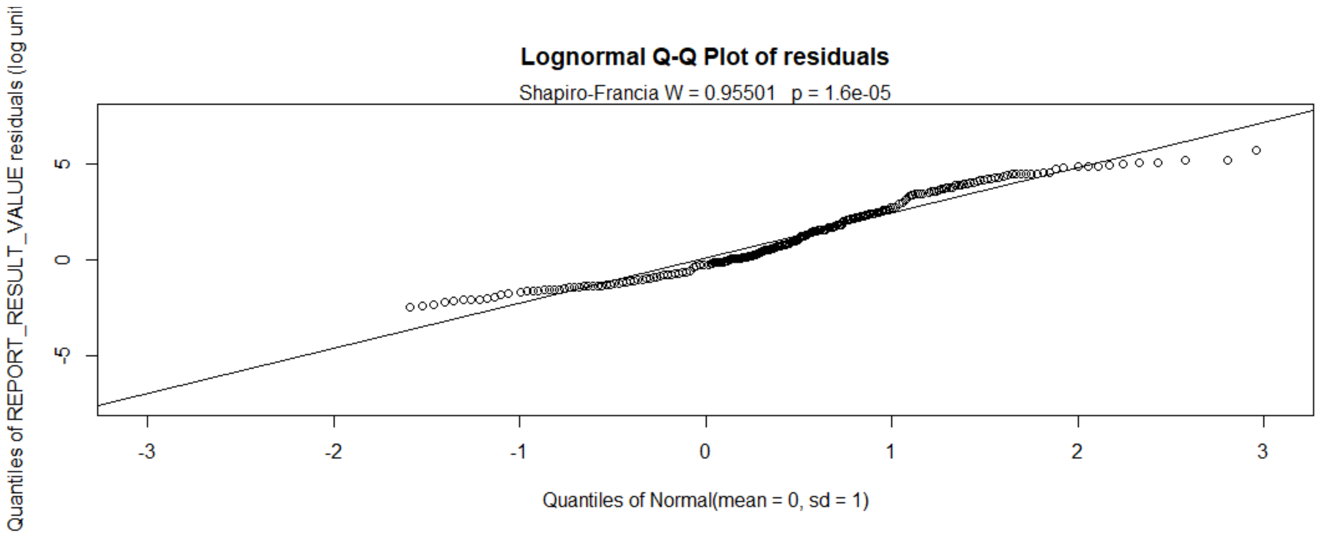
A. Nitrate-Nitrite



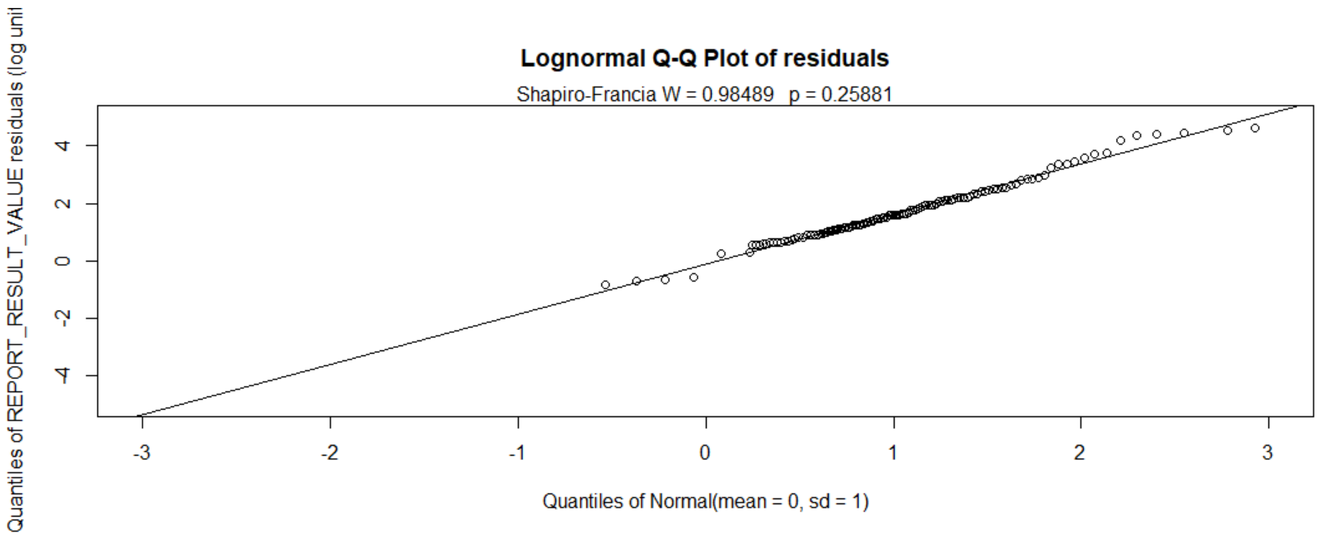
B. Total Suspended Solids



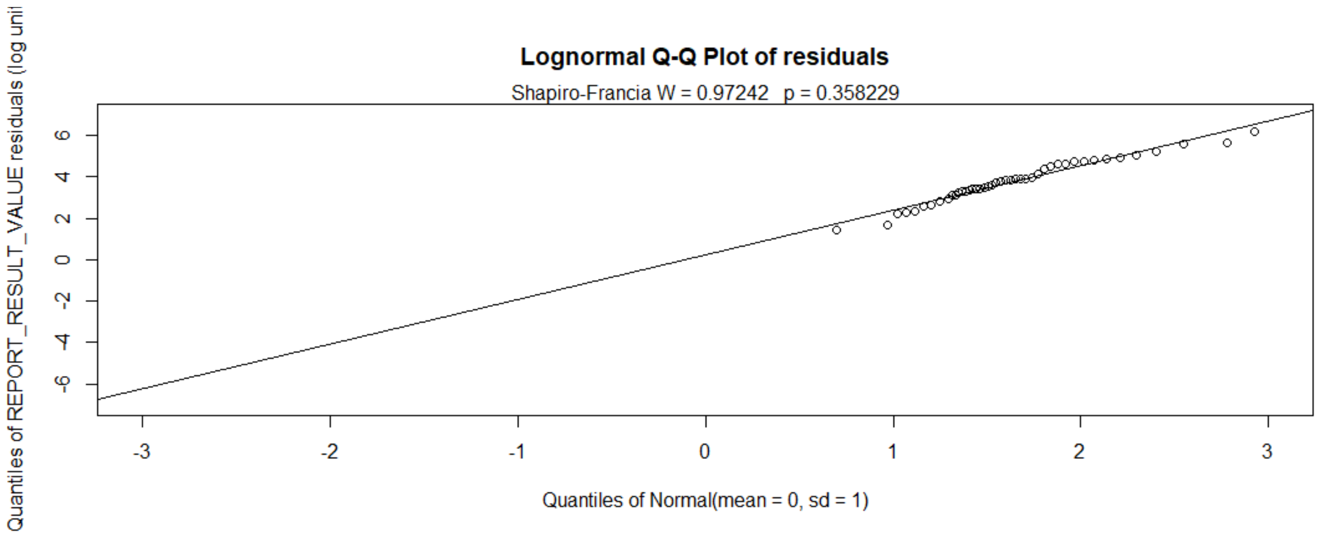
C. Turbidity



D. Copper



E. Nickel



F. Zinc

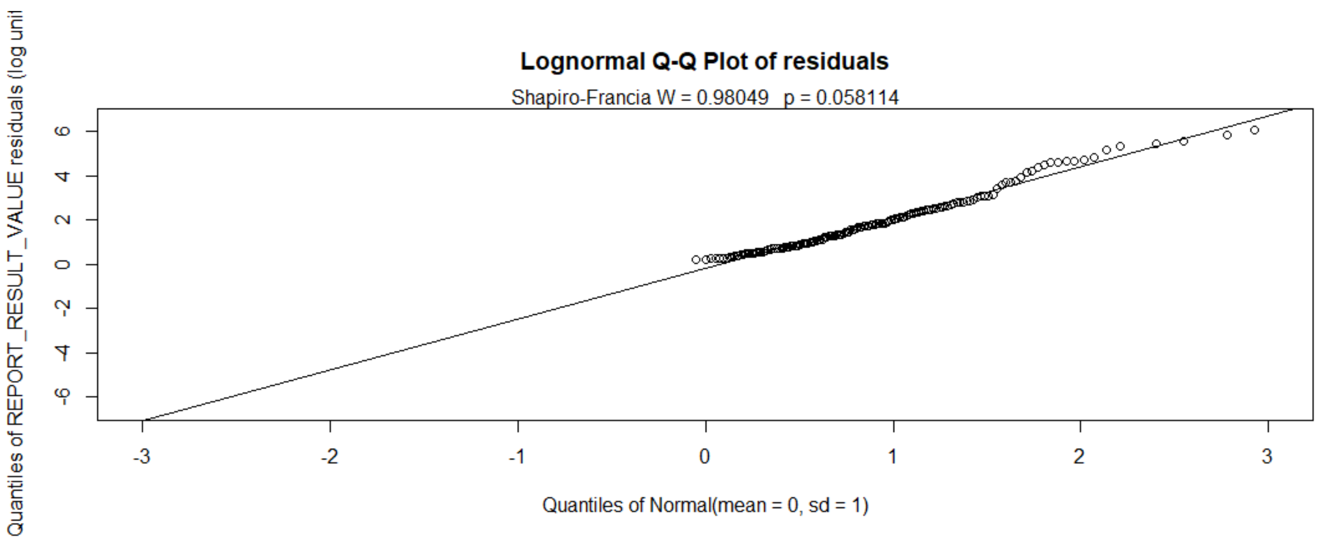


TABLE OF STATISTICAL MODEL VALUES FOR PARAMETERS WITH AVERAGES <DL

NITRATE-NITRITE	
RATIO	**VALUE**
Likelihood R	0.02144
McFadden's R	0.01656
P-Value	0.714
Intercept	-47.62
Time Value	0.0209
TOTAL SUSPENDED SOLIDS	
RATIO	**VALUE**
Likelihood R	0.1029
McFadden's R	0.08642
P-Value	0.0546
Intercept	-170.99
Time Value	0.0847
TURBIDITY	
RATIO	**VALUE**
Likelihood R	0.02141
McFadden's R	0.01142
P-Value	0.669
Intercept	-21.088
Time Value	0.0106
COPPER	
RATIO	**VALUE**
Likelihood R	0.007
McFadden's R	0.005
P-Value	0.892
Intercept	-7.51
Time Value	0.003

NICKEL	
RATIO	VALUE
Likelihood R	-0.03
McFadden's R	-0.03
P-Value	0.544
Intercept	60.10
Time Value	-0.03
ZINC	
RATIO	VALUE
Likelihood R	-0.03
McFadden's R	-0.0189
P-Value	0.564
Intercept	40.837
Time Value	-0.02

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