CARNAHAN BAYOU AQUIFER SUMMARY, 2007

AQUIFER SAMPLING AND ASSESSMENT PROGRAM

DEQ
LOUISIANA

APPENDIX 7 TO THE 2009 TRIENNIAL SUMMARY REPORT

PARTIAL FUNDING PROVIDED BY THE CWA

ASSET
AQUIFER SAMPLING AND ASSESSMENT PROGRAM

Contents

BACKGROUND

The Louisiana Department of Environmental Quality's (LDEQ) Aquifer Sampling and Assessment Program (ASSET) is an ambient monitoring program established to determine and monitor the quality of ground water produced from Louisiana's major freshwater aquifers. The ASSET Program samples approximately 200 water wells located in 14 aquifers and aquifer systems across the state. The sampling process is designed so that all fourteen aquifers and aquifer systems are monitored on a rotating basis, within a three-year period so that each well is monitored every three years.

In order to better assess the water quality of a particular aquifer, an attempt is made to sample all ASSET Program wells producing from it in a narrow time frame. To more conveniently and economically promulgate those data collected, a summary report on each aquifer is prepared separately. Collectively, these aquifer summaries will make up, in part, the ASSET Program's Triennial Summary Report for 2009.

Analytical and field data contained in this summary were collected from wells producing from the Carnahan Bayou aquifer, during the 2007 state fiscal year (July 1, 2006 - June 30, 2007). This summary will become Appendix 7 of ASSET Program Triennial Summary Report for 2009.

These data show that in February, May, and June 2007, 12 wells were sampled which produce from the Carnahan Bayou aquifer. Seven of the 12 are classified as public supply, 3 are classified as domestic, one is classified as an industrial use well and the remaining well is used in power generation. The wells are located in 5 parishes across the central area of the state.

Figure 7-1 shows the geographic locations of the Carnahan Bayou aquifer and the associated wells, whereas Table 7-1 lists the wells in the aquifer along with their total depths, use made of produced waters, and date sampled.

Well data for registered water wells were obtained from the Louisiana Department of Transportation and Development's Water Well Registration Data file.

GEOLOGY

The Carnahan Bayou member consists of sands, silts, and clays, with some gravel. The Carnahan Bayou member, along with the Williamson Creek and Dough Hills, is grouped into the Jasper aquifer. The aquifer unit consists of fine to coarse sand, which may grade laterally and vertically to silt and clay.

HYDROGEOLOGY

Recharge takes place primarily as a result of the direct infiltration of rainfall in interstream, upland outcrop areas, movement of water through overlying terrace deposits, and leakage from other aquifers. The hydraulic conductivity of the Carnahan Bayou aquifer varies between 20 and 260 feet/day.

The maximum depths of occurrence of freshwater in the Carnahan Bayou aquifer range from 250 feet above sea level, to 3,300 feet below sea level. The range of thickness of the fresh water interval in the Carnahan Bayou aquifer is 100 to 1,100 feet. The depths of the Carnahan Bayou aquifer wells that were monitored in conjunction with the ASSET Program range from 66 to 2,036 feet below land surface.

PROGRAM PARAMETERS

The field parameters checked at each ASSET well sampling site and the list of conventional parameters analyzed in the laboratory are shown in Table 7-2. The inorganic (total metals) parameters analyzed in the laboratory are listed in Table 7-3. These tables also show the field and analytical results determined for each analyte. For quality control, duplicate samples were taken for each parameter at wells R-1001 and R-1210.

In addition to the field, conventional and inorganic analytical parameters, the target analyte list includes three other categories of compounds: volatiles, semi-volatiles, and pesticides/PCBs. Due to the large number of analytes in these categories, tables were not prepared showing the analytical results for these compounds. A discussion of any detections from any of these three categories, if necessary, can be found in their respective sections. Tables 7-8, 7-9, and 7-10 list the target analytes for volatiles, semi-volatiles, and pesticides/PCBs, respectively.

Tables 7-4 and 7-5 provide a statistical overview of field and conventional data, and inorganic data for the Carnahan Bayou aquifer, listing the minimum, maximum, and average results for these parameters collected in the FY 2007 sampling. Tables 7-6 and 7-7 compare these same parameter averages to historical ASSET-derived data for the Carnahan Bayou aquifer, from fiscal years 1995, 1998, 2001 and 2004.

The average values listed in the above referenced tables are determined using all valid, reported results, including non-detects. Per Departmental policy concerning statistical analysis, one-half of the detection limit (DL) is used in place of zero when non-detects are encountered. However, the minimum value is reported as less than the DL, not one-half the DL. If all values for a particular analyte are reported as non-detect, then the minimum, maximum, and average values are all reported as less than the DL. For contouring purposes, one-half the DL is also used for non-detects in the figures and charts referenced below.

Figures 7-2, 7-3, 7-4, and 7-5, respectively, represent the contoured data for pH, total dissolved solids (TDS), chloride (Cl) and iron. Charts 7-1 through 7-16 represent the trend of the graphed parameter, based on the averaged value of that parameter for each three-year reporting period. Discussion of historical data and related trends is found in the **Water Quality Trends and Comparison to Historical ASSET Data** section.

INTERPRETATION OF DATA

Under the Federal Safe Drinking Water Act, EPA has established maximum contaminant levels (MCLs) for pollutants that may pose a health risk in public drinking water. An MCL is the highest level of a contaminant that EPA allows in public drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk. While not all wells sampled were public supply wells, the Office of Environmental Assessment does use the MCLs as a benchmark for further evaluation.

EPA has set secondary standards, which are defined as non-enforceable taste, odor, or appearance guidelines. Field and laboratory data contained in Tables 7-2 and 7-3 show that one or more secondary MCLs (SMCLs) were exceeded in 7 of the 12 wells sampled in the Carnahan Bayou aquifer, with a total of 7 SMCLs being exceeded.

Field and Conventional Parameters

Table 7-2 shows the field and conventional parameters for which samples are collected at each well and the analytical results for those parameters. Table 7-4 provides an overview of this data for the Carnahan Bayou aquifer, listing the minimum, maximum, and average results for these parameters.

Federal Primary Drinking Water Standards: A review of the analysis listed in Table 7-2 shows that no primary MCL was exceeded for field or conventional parameters for this reporting period. Those ASSET wells reporting turbidity levels greater than 1.0 NTU do not exceed the Primary MCL of 1.0, as this standard applies to public supply water wells that are under the direct influence of surface water. The Louisiana Department of Health and Hospitals has determined that no public water supply well in Louisiana was in this category.

Federal Secondary Drinking Water Standards: A review of the analysis listed in Table 7-2 shows that 3 wells exceeded the SMCL for pH and one well exceeded the SMCL for total dissolved solids. Laboratory results override field results in exceedance determinations, thus only laboratory results will be counted in determining SMCL exceedance numbers for TDS. Following is a list of SMCL parameter exceedances with well number and results:

pH (SMCL = 6.5 – 8.5 Standard Units):

R-FAIRCLOT – 8.54 SU	V-566 – 6.46 SU
V-8102Z – 5.63 SU	

Total Dissolved Solids (SMCL = 500 mg/L or 0.5 g/L):

	LAB RESULTS (in mg/L)	FIELD MEASURES (in g/L)
R-1210	790 mg/L, Duplicate – 782 mg/L	0.82 g/L (Original and Duplicate)

Analytical results for color were determined to be too irregular and unreliable to use in determining SMCL exceedances or for statistical calculations for this reporting period. Only three of the 10 wells reported a color value that was not estimated, and two of these are uncharacteristically high. The values are however, reported in Table 7-2, but are not used in any quality statements, graphs, or trends for this period.

Inorganic Parameters

Table 7-3 shows the inorganic (total metals) parameters for which samples are collected at each well and the analytical results for those parameters. Table 7-5 provides an overview of inorganic data for the Carnahan Bayou aquifer, listing the minimum, maximum, and average results for these parameters.

Federal Primary Drinking Water Standards: A review of the analyses listed on Table 7-3 shows that no primary MCL was exceeded for total metals.

Federal Secondary Drinking Water Standards: Laboratory data contained in Table 7-3 shows that 3 wells exceeded the secondary MCL for iron:

Iron (SMCL = 300 ug/L):

CO-47 – 1,630 ug/L
CO-71 – 10,100 ug/L
R-1172 – 527 ug/L

Volatile Organic Compounds

Table 7-8 shows the volatile organic compound (VOC) parameters for which samples are collected at each well. Due to the number of analytes in this category, analytical results are not tabulated; however any detection of a VOC would be discussed in this section.

No VOCs were detected at or above their respective detection limits during the FY 2007 sampling of the Carnahan Bayou aquifer.

Semi-Volatile Organic Compounds

Table 7-9 shows the semi-volatile organic compound (SVOC) parameters for which samples are collected at each well. Due to the number of analytes in this category, analytical results are not tabulated; however any detection of a SVOC would be discussed in this section.

No SVOC was detected at or above its detection limit during the FY 2007 sampling of the Carnahan Bayou aquifer.

Pesticides and PCBs

Table 7-10 shows the pesticide and PCB parameters for which samples are collected at each well. Due to the number of analytes in this category, analytical results are not tabulated; however any detection of a pesticide or PCB would be discussed in this section.

No pesticide or PCB was detected at or above its detection limit during the FY 2007 sampling of the Carnahan Bayou aquifer.

WATER QUALITY TRENDS AND COMPARISON TO HISTORICAL ASSET DATA

Analytical and field data show that the quality and characteristics of ground water produced from the Carnahan Bayou aquifer exhibit some changes when comparing current data to that of the four previous sampling rotations (three, six, nine and twelve years prior[1]). These comparisons can be found in Tables 7-6 and 7-7, and in Charts 7-1 to 7-16 of this summary. Over the twelve-year period, 4 analytes have shown a general increase in average concentration. These analytes are: pH, salinity, chloride (Cl), and TKN. For this same time period, 7 analytes have demonstrated a decrease in average concentration: temperature, alkalinity, ammonia (NH3), hardness, nitrite-nitrate, iron, and zinc. Specific conductance (field and lab), sulfate (SO4), TDS, total phosphorus, barium, and copper have remained consistent for this time period. The remaining inorganics (metals) have remained at or below their respective detection limits.

A comparison of the current number of wells with secondary MCL exceedances to the previous number of wells with secondary exceedances cannot be made due to the unreliability of the inorganics data from FY 2004. However, current sample results do show that 7 wells reported one or more secondary exceedances with a total of 9 SMCL exceedances.

[1] This comparison does not include current color data due to the unreliability of the reported laboratory data as noted at the bottom of page 6 of this summary. It also does not include inorganics data (total metals) from the FY 2004 sampling (three years prior), due to the data being determined to be invalid. For further discussion see the Inorganic Parameters section of the Carnahan Bayou Aquifer Summary for FY 2004.

SUMMARY AND RECOMMENDATIONS

In summary, the data show that the ground water produced from this aquifer is in the soft to moderately hard range[2] and is of good quality when considering short-term or long-term health risk guidelines. Laboratory data show that no ASSET well that was sampled during the Fiscal Year 2007 monitoring of the Carnahan Bayou aquifer exceeded a Primary MCL. The data also show that this aquifer is of good quality when considering taste, odor, or appearance guidelines, with only 9 Secondary MCLs exceeded in 7 wells.

Comparison to historical ASSET-derived data shows some change in the quality or characteristics of the Carnahan Bayou aquifer, with 5 parameters showing consistent increases in concentration, 7 parameters decreasing in concentration, and 6 parameters showing no consistent change over the previous twelve years.

It is recommended that the wells assigned to the Carnahan Bayou aquifer be re-sampled as planned, in approximately three years. In addition, several wells should be added to the 12 currently in place to increase the well density for this aquifer.

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

Table 7-1: List of Wells Sampled, Carnahan Bayou Aquifer–FY 2007

DOTD Well Number	Parish	Date	Owner	Depth (Feet)	Well Use
BE-405	BEAUREGARD	6/5/2007	BOISE CASCADE	1016	INDUSTRIAL
CO-47	CONCORDIA	5/8/2007	CITY OF VIDALIA	310	PUBLIC SUPPLY
CO-71	CONCORDIA	5/8/2007	CONCORDIA W.W. DIST. NO.1	305	PUBLIC SUPPLY
G-5178Z	GRANT	5/7/2007	PRIVATE OWNER	165	DOMESTIC
R-1001	RAPIDES	5/7/2007	GARDNER WATER SYSTEM	1080	PUBLIC SUPPLY
R-1172	RAPIDES	5/7/2007	CLECO-RODEMACHER	298	POWER GENERATION
R-1210	RAPIDES	6/4/2007	CITY OF ALEXANDRIA	2036	PUBLIC SUPPLY
R-FAIRCLOT	RAPIDES	5/8/2007	PRIVATE OWNER	270	DOMESTIC
V-496	VERNON	6/5/2007	U.S. ARMY/FORT POLK	1415	PUBLIC SUPPLY
V-566	VERNON	6/4/2007	ALCO-HUTTON VFD	143	PUBLIC SUPPLY
V-656	VERNON	2/27/2007	EAST CENTRAL VERNON WATER SYS.	1477	PUBLIC SUPPLY
V-8102Z	VERNON	6/5/2007	PRIVATE OWNER	66	DOMESTIC

Table 7-2: Summary of Field and Conventional Data, Carnahan Bayou Aquifer–FY 2007

DOTD Well Number	Temp Deg. C	pH SU	Sp. Cond. mmhos/cm	Sal. ppt	TDS g/L	Alk mg/L	Cl mg/L	Color PCU	Sp. Cond. umhos/cm	SO4 mg/L	TDS mg/L	TSS mg/L	Turb. NTU	NH3 mg/L	Hard. mg/L	Nitrite-Nitrate (as N) mg/L	TKN mg/L	Tot. P mg/L
	LABORATORY DETECTION LIMITS →					2.0	1.3	5	10	1.25/1.3	4	4	1	0.1	5.0	0.05	0.10	0.05
	FIELD PARAMETERS					LABORATORY PARAMETERS												
BE-405	27.00	8.40	0.384	0.18	0.25	176	6.7	No Data	359	8.4	239	<4	<1	0.23	27.4	<0.05	0.24	<0.05
CO-47	19.37	7.04	0.459	0.22	0.30	212	16.8	28	483	30.4	288	<4	9.5	0.57	175	<0.05	0.91	0.14
CO-71	20.15	7.17	0.708	0.35	0.46	374	9.5	†112	718	31.7	438	22.5	75.4	0.95	331	<0.05	1.16	1.22
G-5178Z	22.16	6.56	0.079	0.04	0.05	26.4	5.9	†<5	82.6	†6.2	94	<4	†<1	<0.1	6.4	<0.05	<0.1	<0.05
R-1001	27.57	8.22	0.416	0.20	0.27	201	12	†<5	412	14.4	296	<4	†<1	0.11	<5	<0.05	0.2	0.29
R-1001*	27.57	8.22	0.416	0.20	0.27	196	18.2	†<5	417	16.2	298	<4	†<1	0.11	<5	<0.05	0.16	0.29
R-1172	21.82	7.83	0.303	0.14	0.20	124	16.1	†10	302	19.6	221	<4	†1.1	0.3	9.3	<0.05	0.37	0.16
R-1210	36.28	8.04	1.263	0.62	0.82	299	†223	No Data	1348	5.2	790	<4	<1	0.47	7.8	<0.05	†0.57	0.47
R-1210*	36.28	8.04	1.263	0.62	0.82	301	†223		1348	5.2	782	<4	<1	0.48	8.3	<0.05	0.46	0.46
R-FAIRCLOT	22.19	8.54	0.308	0.15	0.20	151	11.3	27	314	7.0	223	27	19.2	0.28	<5	<0.05	0.3	0.42
V-496	29.26	7.83	0.421	0.20	0.27	169	19.4	No Data	385	6.7	252	<4	<1	0.56	105	<0.05	0.54	<0.05
V-566	22.22	6.46	0.213	0.10	0.14	52.2	18.1		194	12.8	189	<4	<1	0.23	29.5	<0.05	†0.24	0.55
V-656	30.46	8.50	0.42	0.20	0.27	155	8.7	7	307	<1.3	228	<4	<1	0.2	<5	<0.05	0.28	0.37
V-8102Z	21.47	5.63	0.027	0.01	0.02	4.8	3.4	No Data	27.5	<1.25	33.3	<4	<1	<0.1	5.3	0.15	<0.1	<0.05

*Denotes Duplicate Sample †Estimated Value Shaded cells exceed EPA Secondary Standards Color data determined to be unreliable

Table 7-3: Summary of Inorganic Data, Carnahan Bayou Aquifer–FY 2007

DOTD Well Number	Antimony ug/L	Arsenic ug/L	Barium ug/L	Beryllium ug/L	Cadmium ug/L	Chromium ug/L	Copper ug/L	Iron ug/L	Lead ug/L	Mercury ug/L	Nickel ug/L	Selenium ug/L	Silver ug/L	Thallium ug/L	Zinc ug/L
Laboratory Detection Limits	1	3	2	1	0.5	3	3	20	3	0.05	3	4	0.5	1	10
BE-405	<1	<3	49.8	<1	<0.5	<3	<3	<20	<3	<0.05	<3	<4	<0.5	<1	<10
CO-47	<1	<3	325	<1	<0.5	<3	<3	1,630	<3	<0.05	<3	<4	<0.5	<1	<10
CO-71	<1	<3	750	<1	<0.5	<3	19.2	10,100	<3	<0.05	<3	<4	<0.5	<1	20.2
G-5178Z	<1	<3	14.2	<1	<0.5	<3	5.9	110	<3	<0.05	<3	<4	<0.5	<1	33.4
R-1001	<1	<3	11	<1	<0.5	<3	3.9	148	<3	<0.05	<3	<4	<0.5	<1	<10
R-1001*	<1	<3	10.7	<1	<0.5	<3	3.4	28.6	<3	<0.05	<3	<4	<0.5	<1	<10
R-1172	<1	<3	19.2	<1	<0.5	<3	10.4	527	<3	<0.05	<3	<4	<0.5	<1	<10
R-1210	<1	<3	34.4	<1	<0.5	<3	4.1	94	<3	<0.05	<3	<4	<0.5	<1	10
R-1210*	<1	<3	33.8	<1	<0.5	<3	3.8	115	<3	<0.05	<3	<4	<0.5	<1	<10
R-FAIRCLOT	<1	<3	7.6	<1	<0.5	<3	<3	220	<3	<0.05	<3	<4	<0.5	<1	996
V-496	<1	<3	117	<1	<0.5	<3	<3	119	<3	<0.05	<3	<4	<0.5	<1	<10
V-566	<1	<3	74.7	<1	<0.5	<3	10.2	256	<3	<0.05	<3	<4	<0.5	<1	<10
V-656	<1	<3	2.9	<1	<0.5	<3	<3	60.2	<3	<0.05	<3	<4	<0.5	<1	<10
V-8102Z	<1	<3	27.7	<1	<0.5	<3	14.3	<20	<3	<0.05	<3	<4	<0.5	<1	<10

*Denotes Duplicate Sample. Shaded cells exceed EPA Secondary Standards

Table 7-4: FY 2007 Field and Conventional Statistics, ASSET Wells

	PARAMETER	MINIMUM	MAXIMUM	AVERAGE
FIELD	Temperature (^{O}C)	19.37	36.28	25.99
	pH (SU)	5.63	8.54	7.61
	Specific Conductance (mmhos/cm)	0.027	1.263	0.480
	Salinity (ppt)	0.01	0.62	0.23
	TDS (g/L)	0.018	0.821	0.31
LABORATORY	Alkalinity (mg/L)	4.8	374	174.4
	Chloride (mg/L)	3.4	223	42.3
	Color (PCU)	-	-	-
	Specific Conductance (umhos/cm)	27.5	1348	478.4
	Sulfate (mg/L)	<1.25	31.7	11.79
	TDS (mg/L)	33.3	790	312.2
	TSS (mg/L)	<4	27	5.3
	Turbidity (NTU)	<1	75.4	9.1
	Ammonia, as N (mg/L)	<0.1	0.95	0.33
	Hardness (mg/L)	<5	331	51.1
	Nitrite - Nitrate, as N (mg/L)	<0.05	0.15	<0.05
	TKN (mg/L)	<0.1	1.16	0.40
	Total Phosphorus (mg/L)	<0.05	1.22	0.32

Table 7-5: FY 2007 Inorganic Statistics, ASSET Wells

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Antimony (ug/L)	<1	<1	<1
Arsenic (ug/L)	<3	<3	<3
Barium (ug/L)	2.9	750	105.57
Beryllium (ug/L)	<1	<1	<1
Cadmium (ug/L)	<0.5	<0.5	<0.5
Chromium (ug/L)	<3	<3	<3
Copper (ug/L)	<3	19.2	5.91
Iron (ug/L)	<20	10,100	959.13
Lead (ug/L)	<3	<3	<3
Mercury (ug/L)	<0.05	<0.05	<0.05
Nickel (ug/L)	<3	<3	<3
Selenium (ug/L)	<4	<4	<4
Silver (ug/L)	<0.5	<0.5	<0.5
Thallium (ug/L)	<1	<1	<1
Zinc (ug/L)	<10	996	79.26

Table 7-6: Triennial Field and Conventional Statistics, ASSET Wells

	PARAMETER	FY 1995 AVERAGE	FY 1998 AVERAGE	FY 2001 AVERAGE	FY 2004 AVVERAGE	FY 2007 AVERAGE
FIELD	Temperature (^{O}C)	27.54	24.53	23.58	23.76	25.99
	pH (SU)	6.90	7.11	7.66	7.57	7.61
	Specific Conductance (mmhos/cm)	0.468	0.389	0.346	0.480	0.480
	Salinity (Sal.) (ppt)	0.21	0.19	0.17	.23	0.23
	TDS (Total dissolved solids) (g/L)	-	-	-	0.31	0.31
LABORATORY	Alkalinity (Alk.) (mg/L)	202.7	186.3	175.6	201.9	174.4
	Chloride (Cl) (mg/L)	41.5	13.0	33.9	27.1	42.3
	Color (PCU)	16.4	9.2	5.3	6.8	-
	Specific Conductance (umhos/cm)	492.3	405.5	443.0	470.9	478.4
	Sulfate (SO4) (mg/L)	12.77	10.22	8.64	12.45	11.79
	TDS (Total dissolved solids) (mg/L)	326.9	246.7	325.7	302.8	312.2
	TSS (Total suspended solids) (mg/L)	5.1	<4	<4	<4	5.3
	Turbidity (Turb.) (NTU)	4.79	11.57	5.81	4.27	9.1
	Ammonia, as N (NH3) (mg/L)	0.41	0.38	0.32	0.43	0.33
	Hardness (mg/L)	62.7	70.1	48.0	66.9	51.1
	Nitrite - Nitrate , as N (mg/L)	<0.05	0.11	<0.05	0.06	<0.05
	TKN (mg/L)	0.29	0.65	0.50	0.63	0.40
	Total Phosphorus (P) (mg/L)	0.27	0.33	0.36	0.25	0.32

Table 7-7: Triennial Inorganic Statistics, ASSET Wells

PARAMETER	FY 1995 AVERAGE	FY 1998 AVERAGE	FY 2001 AVERAGE	FY 2004 AVERAGE	FY 2007 AVERAGE
Antimony (ug/L)	<5	<5	<5	No inorganic statistics for this period. Program QC limits were exceeded.	<1
Arsenic (ug/L)	<5	<5	<5		<3
Barium (ug/L)	110.90	197.09	80.86		105.57
Beryllium (ug/L)	<5	<5	<5		<1
Cadmium (ug/L)	<5	<5	<5		<0.5
Chromium (ug/L)	<5	<5	<5		<3
Copper (ug/L)	5.47	7.47	5.72		5.91
Iron (ug/L)	1,067.91	1,542.48	531.49		959.13
Lead (ug/L)	<10	<10	<10		<3
Mercury (ug/L)	<0.05	<0.05	<0.05		<0.05
Nickel (ug/L)	<5	<5	<5		<3
Selenium (ug/L)	<5	<5	<5		<4
Silver (ug/L)	<5	<5	<5		<0.5
Thallium (ug/L)	<5	<5	<5		<1
Zinc (ug/L)	560.57	607.83	26.48		79.26

Table 7-8: VOC Analytical Parameters

COMPOUND	METHOD	DETECTION LIMIT (ug/L)
1,1-Dichloroethane	624	2
1,1-Dichloroethene	624	2
1,1,1-Trichloroethane	624	2
1,1,2-Trichloroethane	624	2
1,1,2,2-Tetrachloroethane	624	2
1,2-Dichlorobenzene	624	2
1,2-Dichloroethane	624	2
1,2-Dichloropropane	624	2
1,3- Dichlorobenzene	624	2
1,4-Dichlorobenzene	624	2
Benzene	624	2
Bromoform	624	2
Carbon tetrachloride	624	2
Chlorobenzene	624	2
Dibromochloromethane	624	2
Chloroethane	624	2
trans-1,2-Dichloroethene	624	2
cis-1,3-Dichloropropene	624	2
Bromodichloromethane	624	2
Methylene chloride	624	2
Ethyl benzene	624	2
Bromomethane	624	2
Chloromethane	624	2
o-Xylene	624	2
Styrene	624	2
Methylt-butyl ether	624	2
Tetrachloroethene	624	2
Toluene	624	2
trans-1,3-Dichloropropene	624	2
Trichloroethene	624	2
Trichlorofluoromethane	624	2
Chloroform	624	2
Vinyl chloride	624	2
Xylenes, m & p	624	4

Table 7-9: SVOC Analytical Parameters

COMPOUND	METHOD	DETECTION LIMIT (ug/L)
1,2-Dichlorobenzene	625	10
1,2,3-Trichlorobenzene	625	10
1,2,3,4-Tetrachlorobenzene	625	10
1,2,4-Trichlorobenzene	625	10
1,2,4,5-Tetrachlorobenzene	625	10
1,3-Dichlorobenzene	625	10
1,3,5-Trichlorobenzene	625	10
1,4-Dichlorobenzene	625	10
2-Chloronaphthalene	625	10
2-Chlorophenol	625	20
2-Methyl-4,6-dinitrophenol	625	20
2-Nitrophenol	625	20
2,4-Dichlorophenol	625	20
2,4-Dimethylphenol	625	20
2,4-Dinitrophenol	625	20
2,4-Dinitrotoluene	625	10
2,4,6-Trichlorophenol	625	20
2,6-Dinitrotoluene	625	10
3,3'-Dichlorobenzidine	625	10
4-Bromophenyl phenyl ether	625	10
4-Chloro-3-methylphenol	625	20
4-Chlorophenyl phenyl ether	625	10
4-Nitrophenol	625	20
Acenaphthene	625	10
Acenaphthylene	625	10
Anthracene	625	10
Benzidine	625	20
Benzo[a]pyrene	625	10
Benzo[k]fluoranthene	625	10
Benzo[a]anthracene	625	10
Benzo[b]fluoranthene	625	10
Benzo[g,h,i]perylene	625	10
Bis(2-chloroethoxy)methane	625	10
Bis(2-ethylhexyl)phthalate	625	10
Bis(2-chloroethyl)ether	625	10
Bis(2-chloroethyl)ether	625	10
Bis(2-chloroisopropyl)ether	625	10

Table 7-9: SVOCs (Continued)

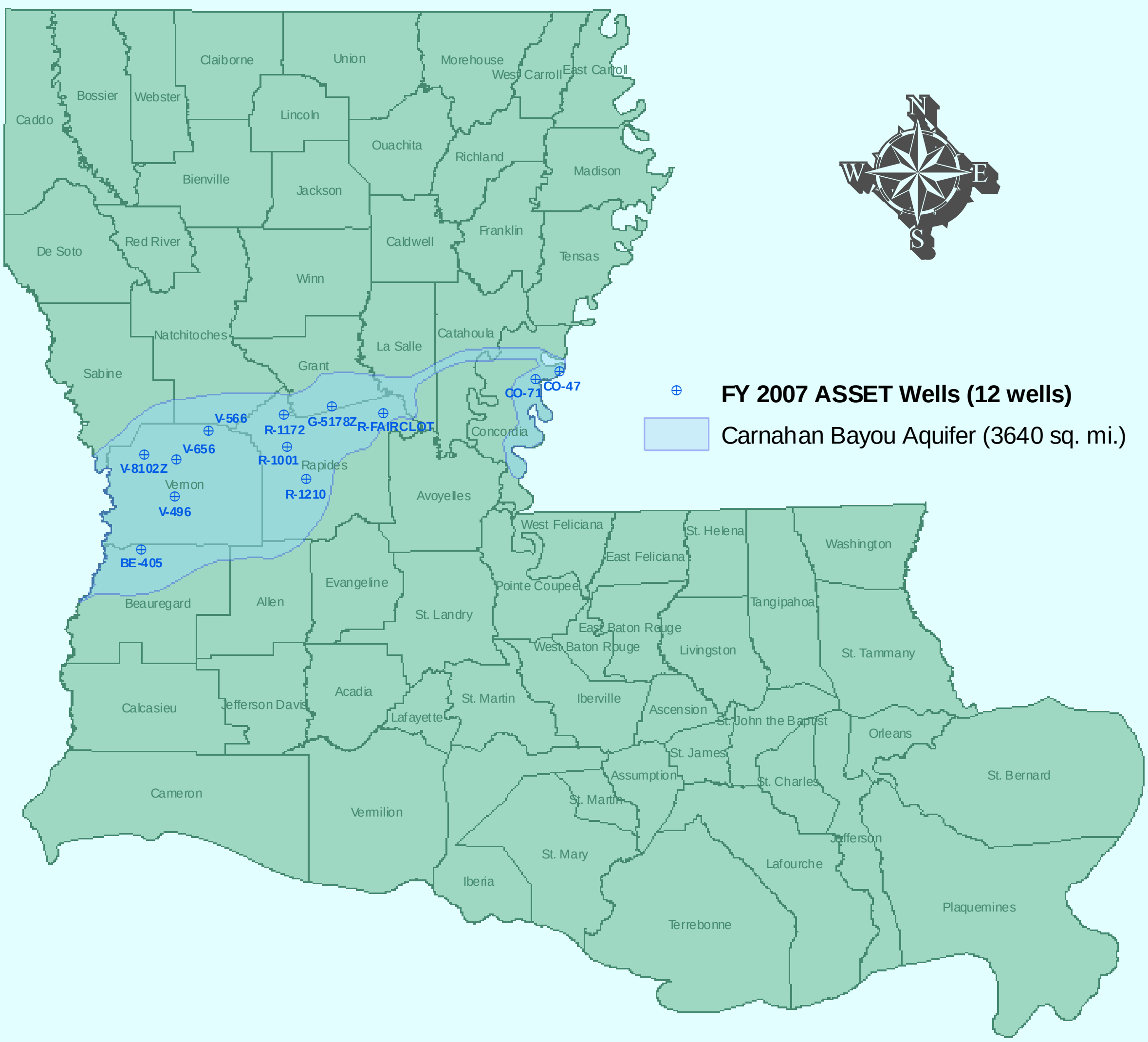
COMPOUND	METHOD	DETECTION LIMIT (ug/L)
Butylbenzylphthalate	625	10
Chrysene	625	10
Dibenzo[a,h]anthracene	625	10
Diethylphthalate	625	10
Dimethylphthalate	625	10
Di-n-butylphthalate	625	10
Di-n-octylphthalate	625	10
Fluoranthene	625	10
Fluorene	625	10
Hexachlorobenzene	625	10
Hexachlorobutadiene	625	10
Hexachlorocyclopentadiene	625	10
Hexachloroethane	625	10
Indeno[1,2,3-cd]pyrene	625	10
Isophorone	625	10
Naphthalene	625	10
Nitrobenzene	625	10
N-Nitrosodimethylamine	625	10
N-Nitrosodiphenylamine	625	10
N-nitroso-di-n-propylamine	625	10
Pentachlorobenzene	625	10
Pentachlorophenol	625	20
Phenanthrene	625	10
Phenol	625	20
Pyrene	625	10

Table 7-10: Pesticides and PCBs

COMPOUND	METHODS(S)*	DETECTION LIMITS* (ug/L)
4,4'-DDD	608 / 8081	0.05 / 0.1
4,4'-DDE	608 / 8081	0.05 / 0.1
4,4'-DDT	608 / 8081	0.05 / 0.1
Aldrin	608 / 8081	0.05 / 0.05
alpha-Chlordane	608 / 8081	0.05 / 0.05
alpha-BHC	608 / 8081	0.05 / 0.05
beta-BHC	608 / 8081	0.05 / 0.05
delta-BHC	608 / 8081	0.05 / 0.05
gamma-BHC	608 / 8081	0.05 / 0.05
Chlordane	608	0.2
Dieldrin	608 / 8081	0.05 / 0.1
Endosulfan I	608 / 8081	0.05 / 0.05
Endosulfan II	608 / 8081	0.05 / 0.1
Endosulfan sulfate	608 / 8081	0.05 / 0.1
Endrin	608 / 8081	0.05 / 0.1
Endrin aldehyde	608 / 8081	0.05 / 0.1
Endrin ketone	608 / 8081	0.05 / 0.1
Heptachlor	608 / 8081	0.05 / 0.05
Heptachlor epoxide	608 / 8081	0.05 / 0.05
Methoxychlor	608 / 8081	0.05 / 0.5
Toxaphene	608 / 8081	2 / 2
gamma-Chlordane	608 / 8081	0.05 / 0.05
Aroclor 1016	608 / 8081	1 / 1
Aroclor 1221	608 / 8081	1 / 1
Aroclor 1232	608 / 8081	1 / 1
Aroclor 1242	608 / 8081	1 / 1
Aroclor 1248	608 / 8081	1 / 1
Aroclor 1254	608 / 8081	1 / 1
Aroclor 1260	608 / 8081	1 / 1

*Multiple methods/detection limits due to multiple labs performing analyses.

Figure 7-1: Location Plat, Carnahan Bayou Aquifer



Aquifer Boundary digitized from Louisiana Hydrologic Map No. 2: Areal Extent of Freshwater In Major Aquifers of Louisiana, Smoot, 1986; USGS/LDOTD Report 86-4150.

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Figure 7-2: Map of pH Data

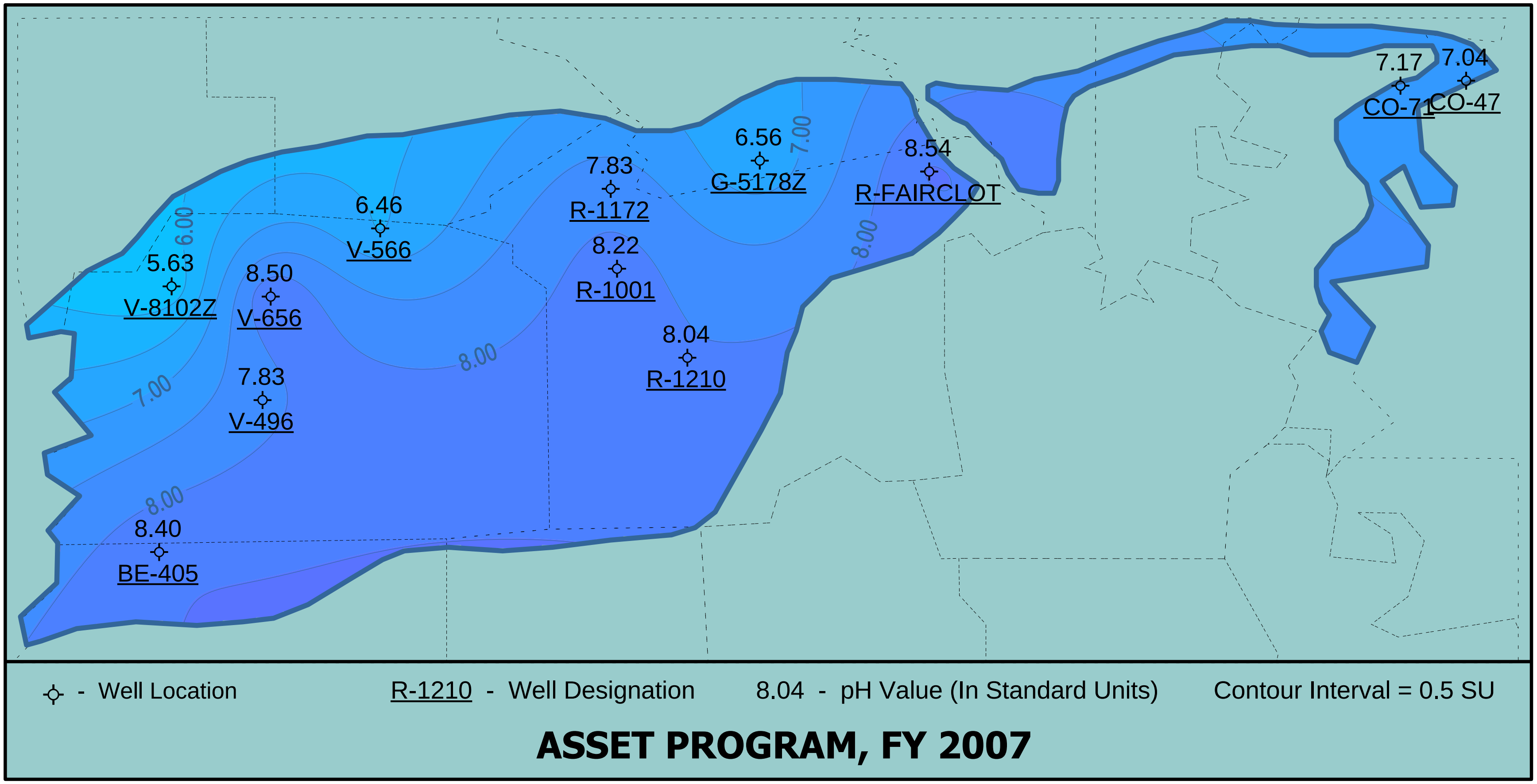

Figure 7-3: Map of TDS Lab Data

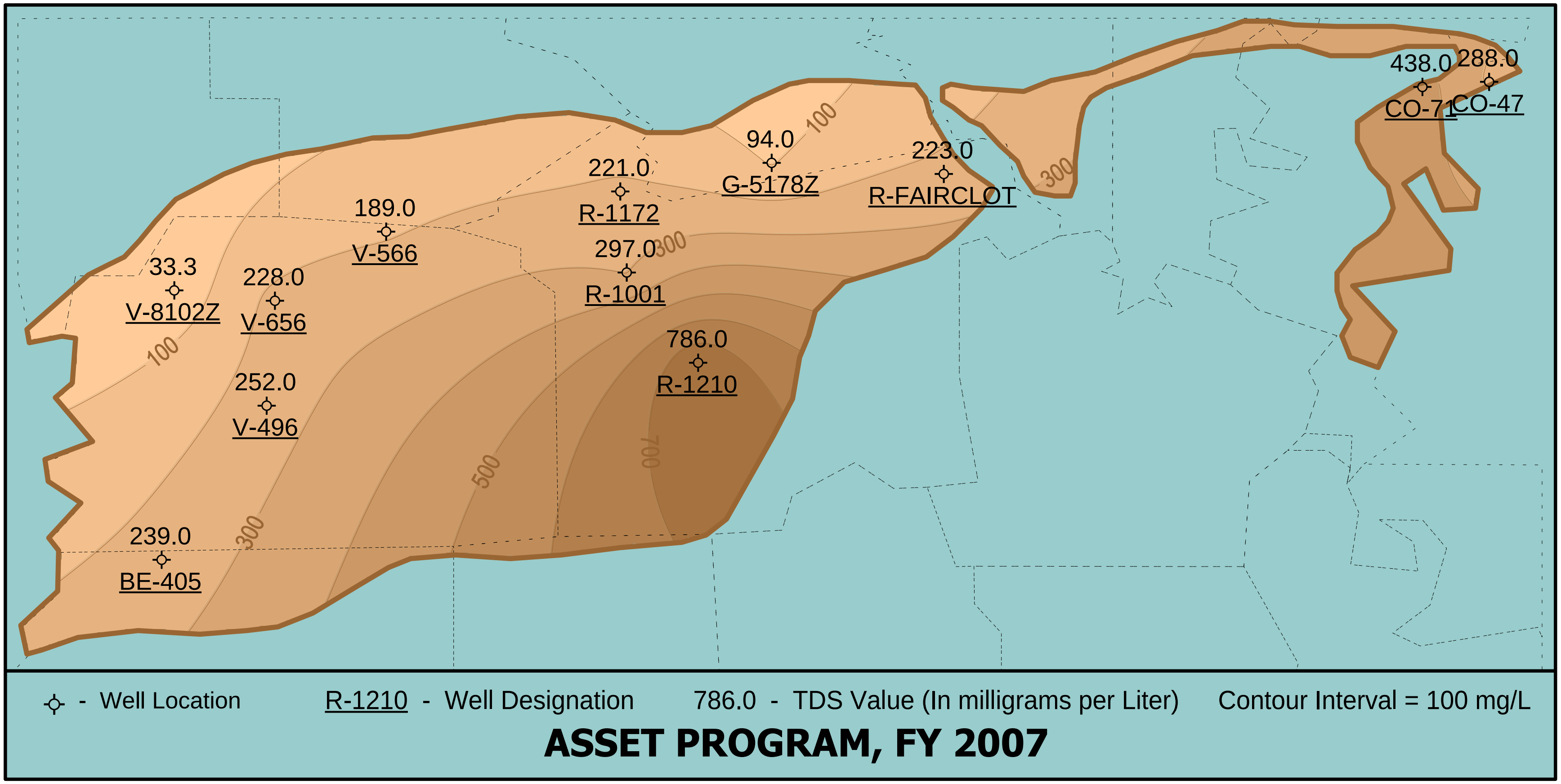

Figure 7-4: Map of Chloride Data

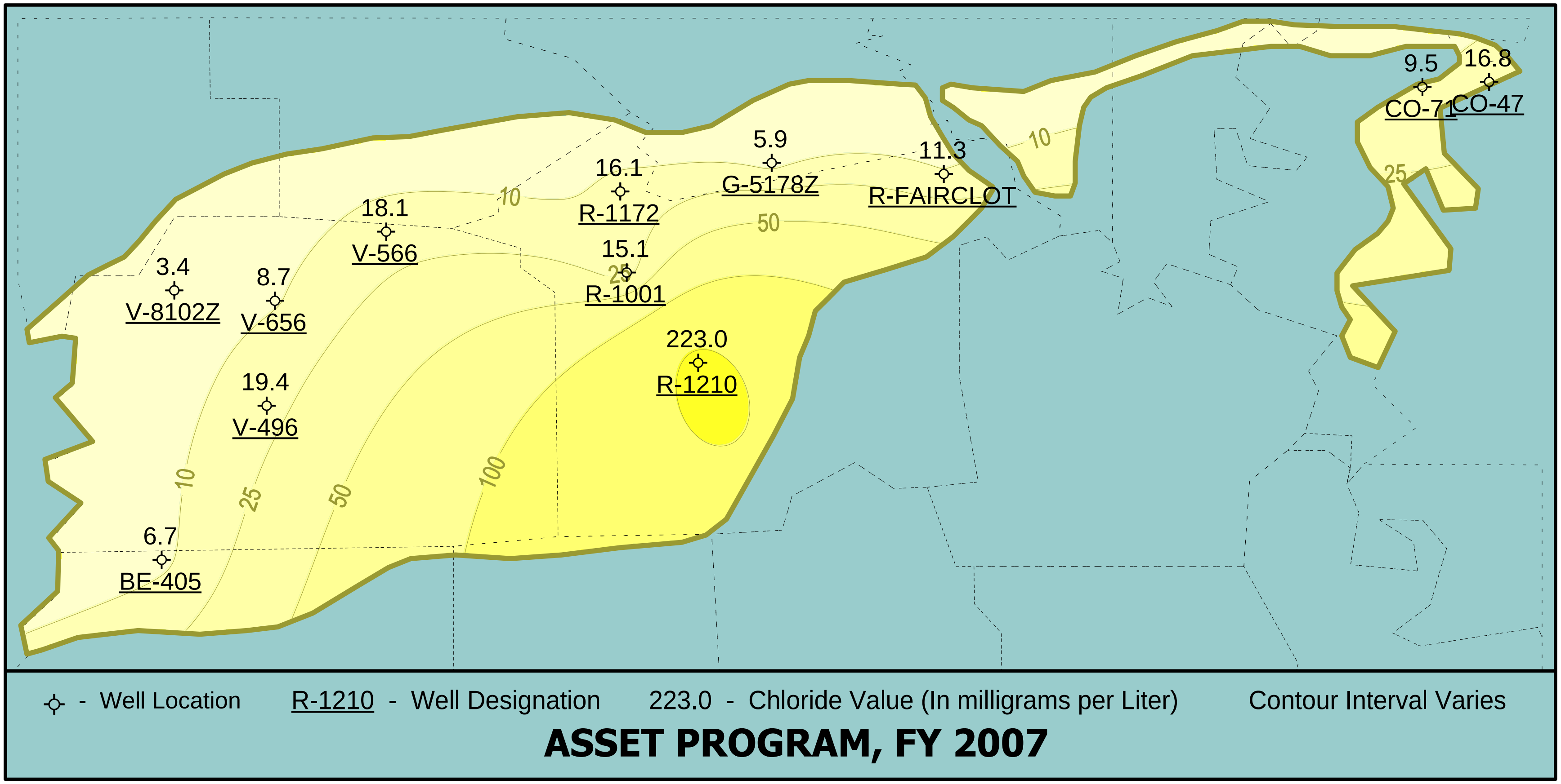

Figure 7-5: Map of Iron Data

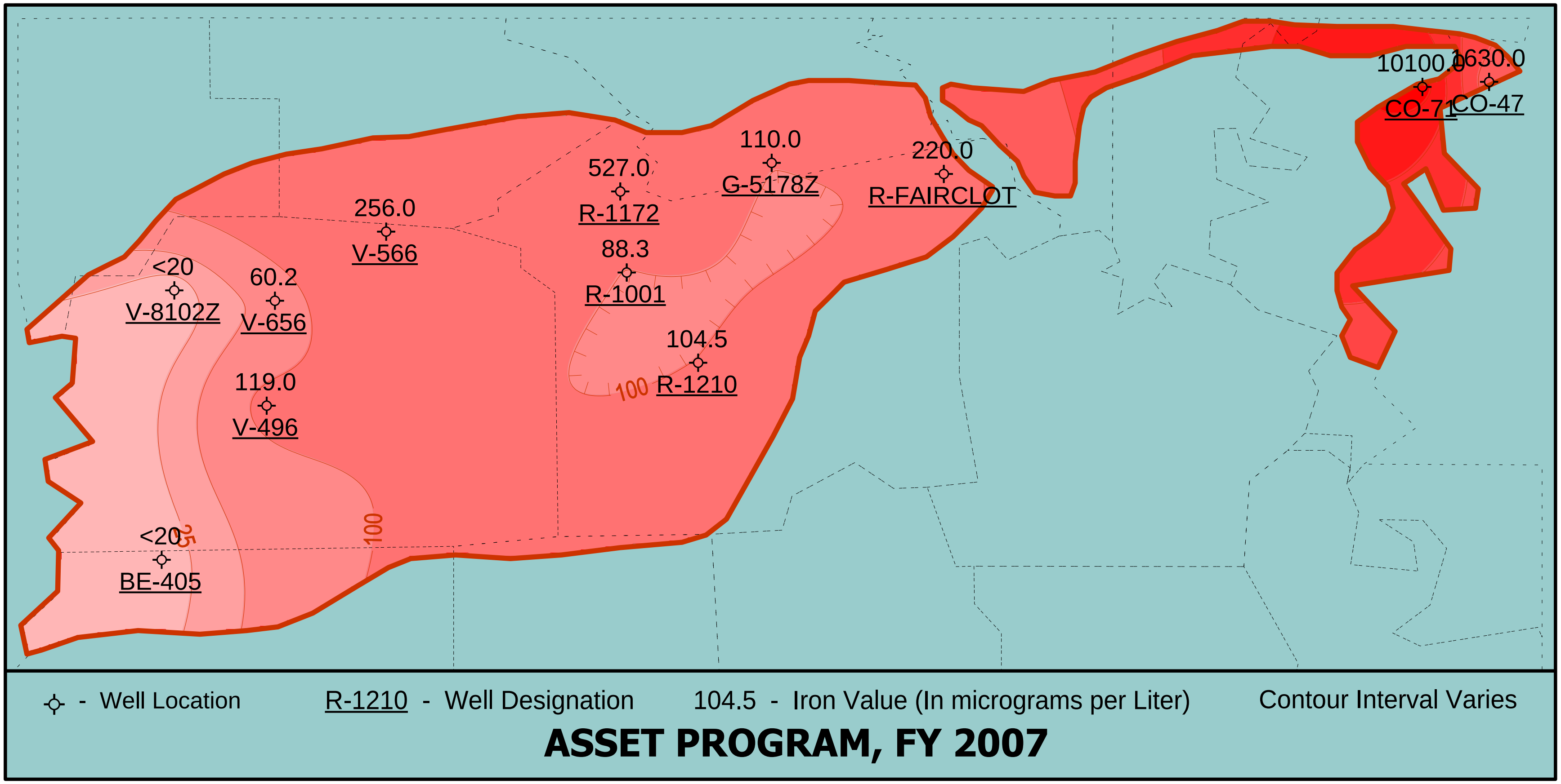

Chart 7-1: Temperature Trend

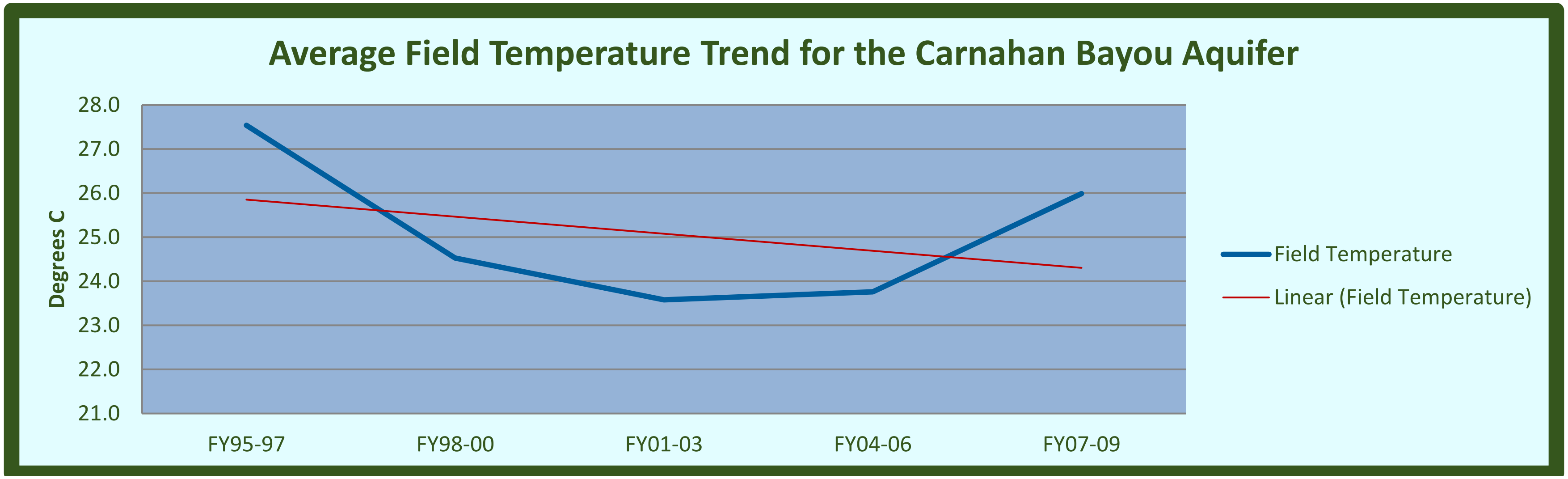

Chart 7-2: pH Trend

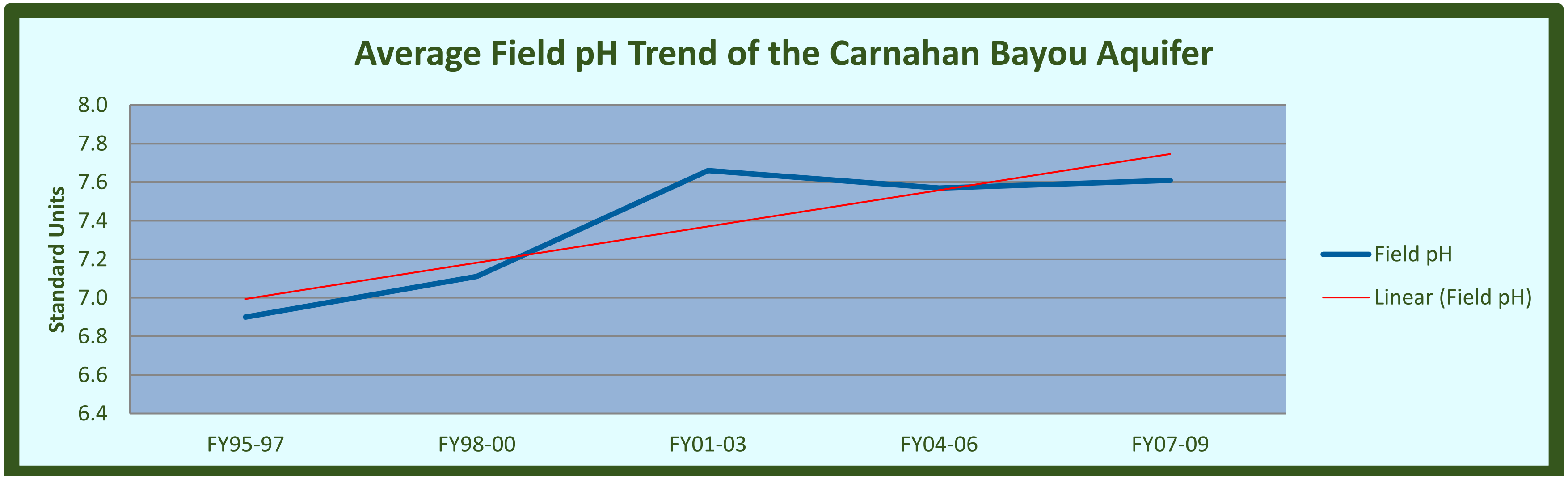

Chart 7-3: Field Specific Conductance Trend

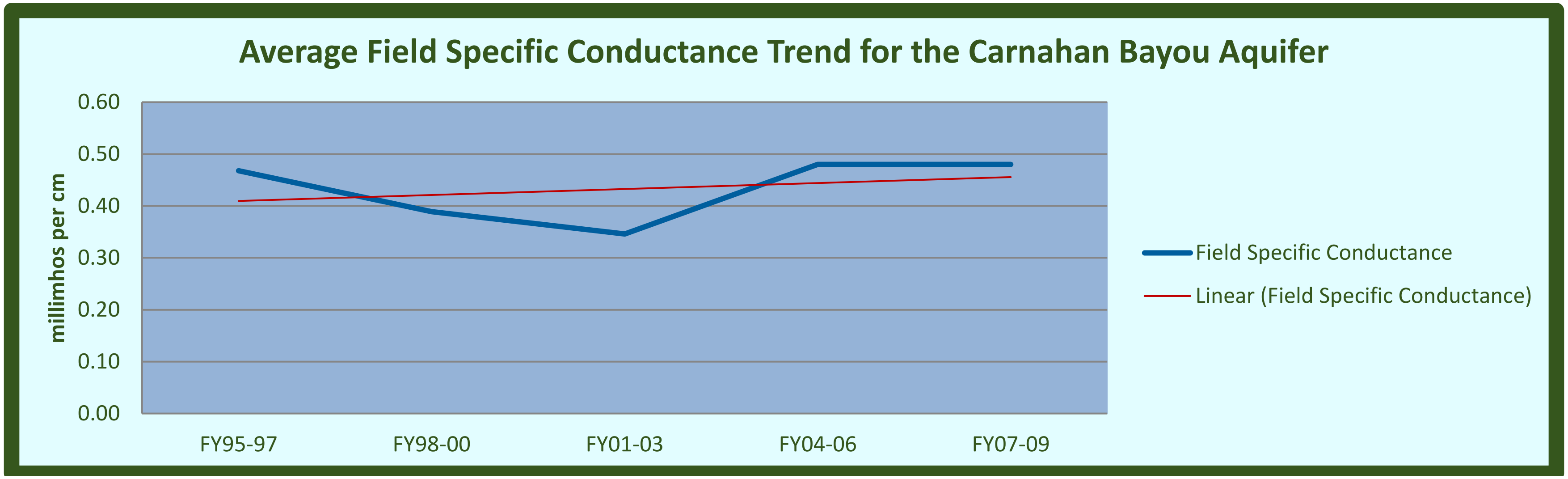

Chart 7-4: Lab Specific Conductance Trend

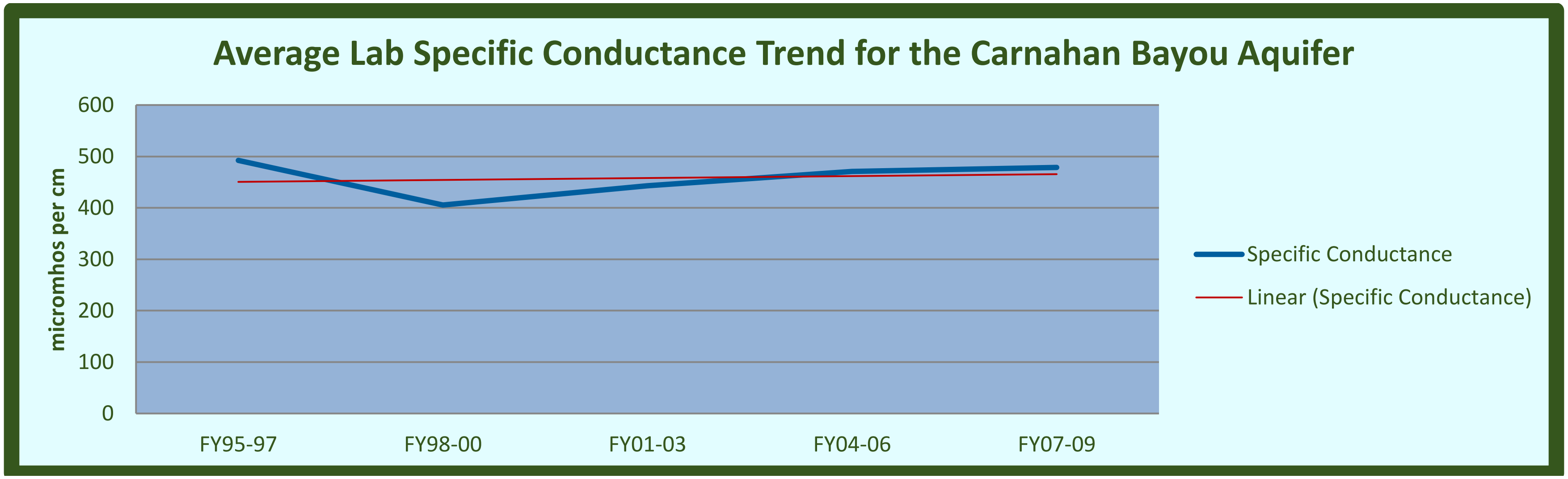

Chart 7-5: Field Salinity Trend

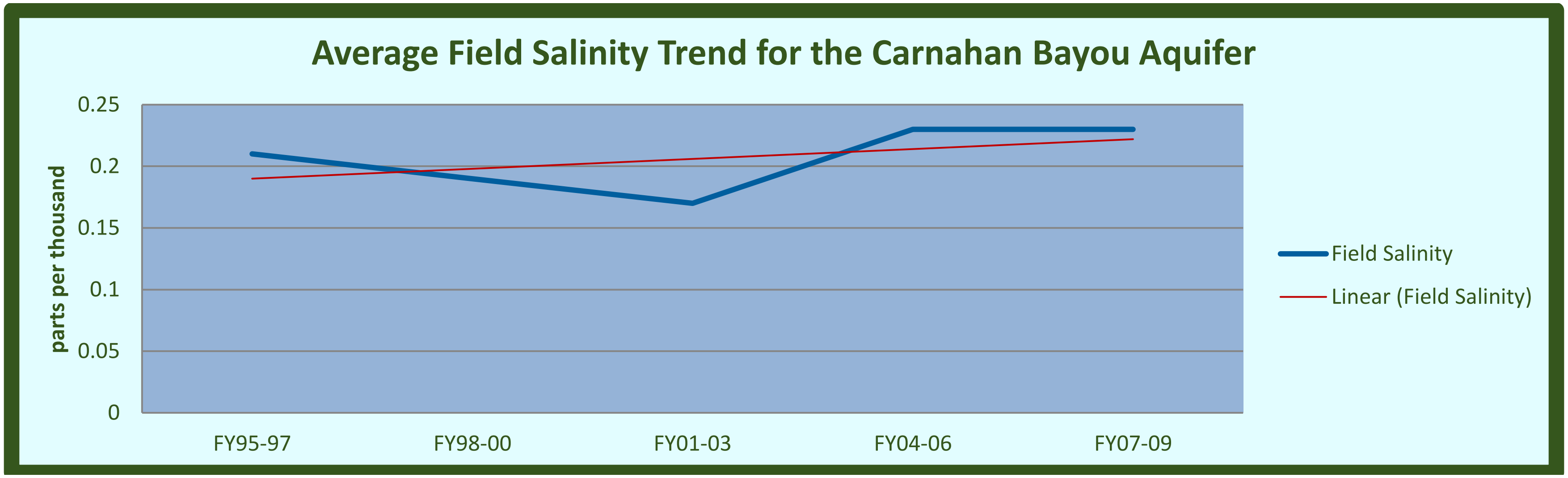

Chart 7-6: Alkalinity Trend

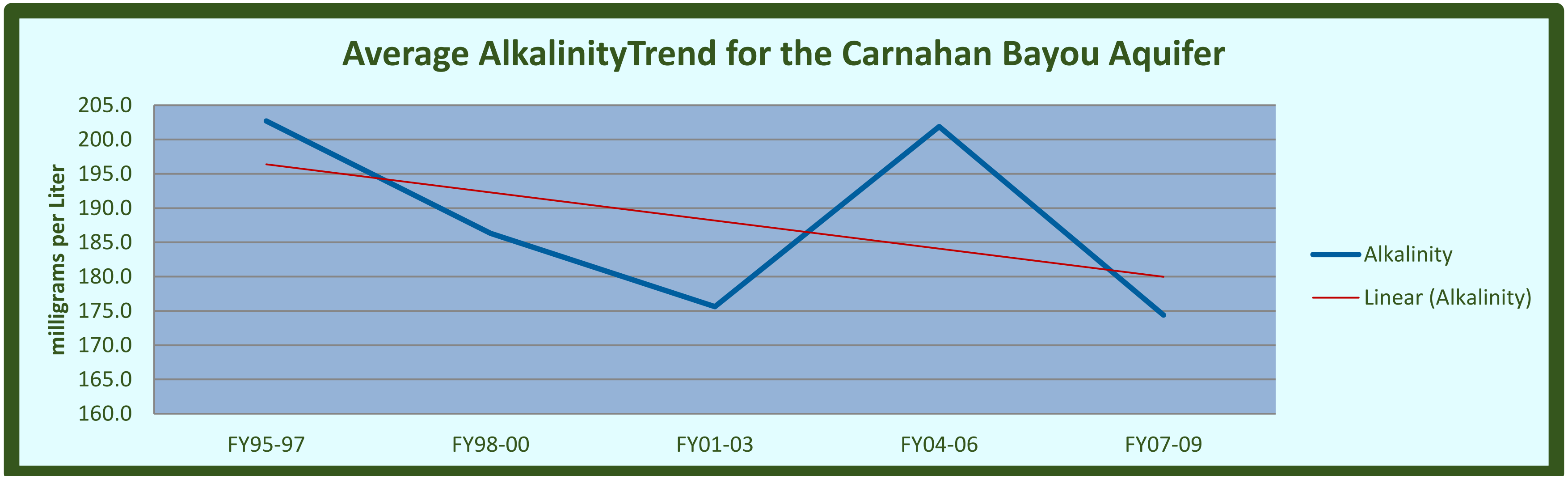

Chart 7-7: Chloride Trend

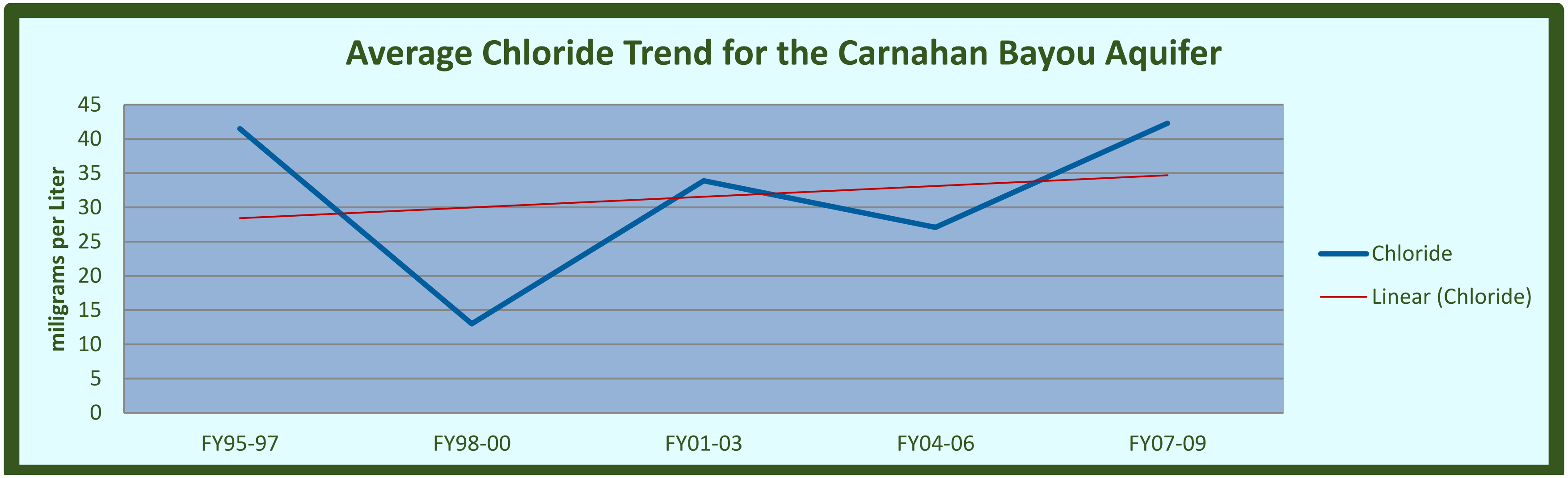

Chart 7-8: Color Trend

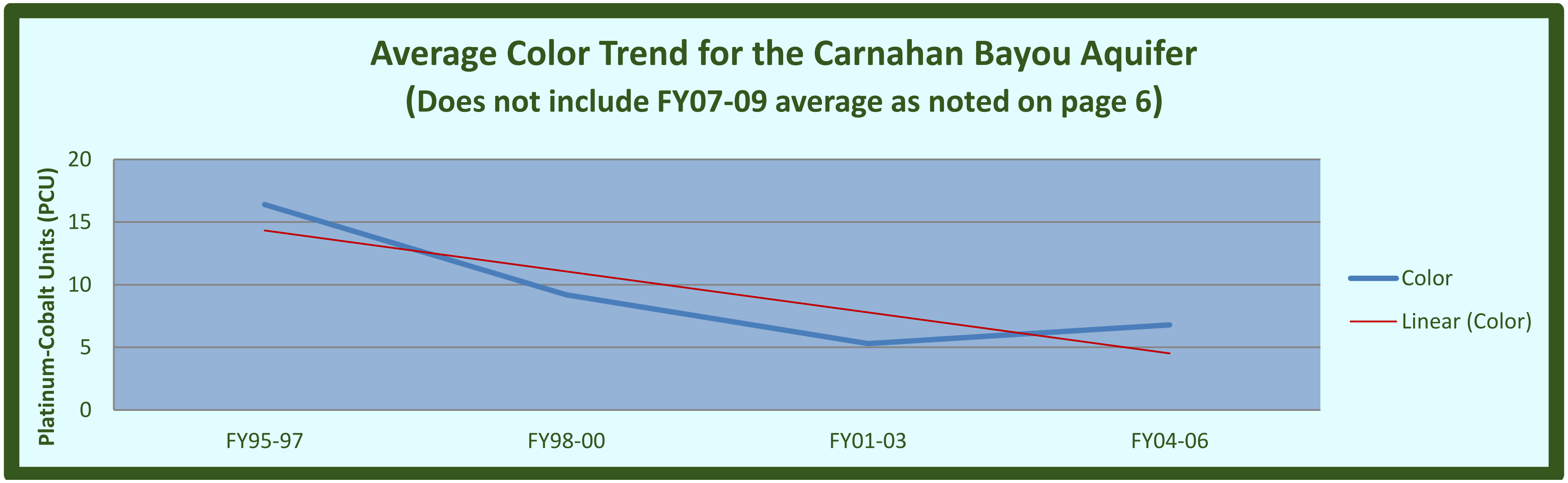

Chart 7-9: Sulfate (SO4) Trend

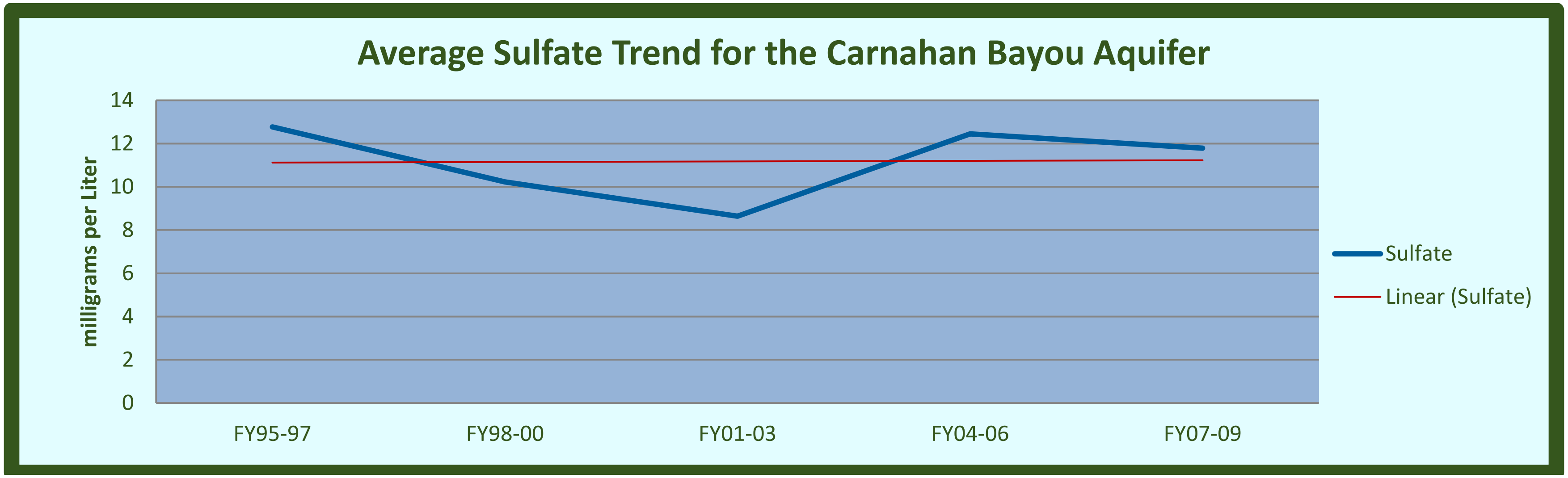

Chart 7-10: Total Dissolved Solids (TDS) Trend

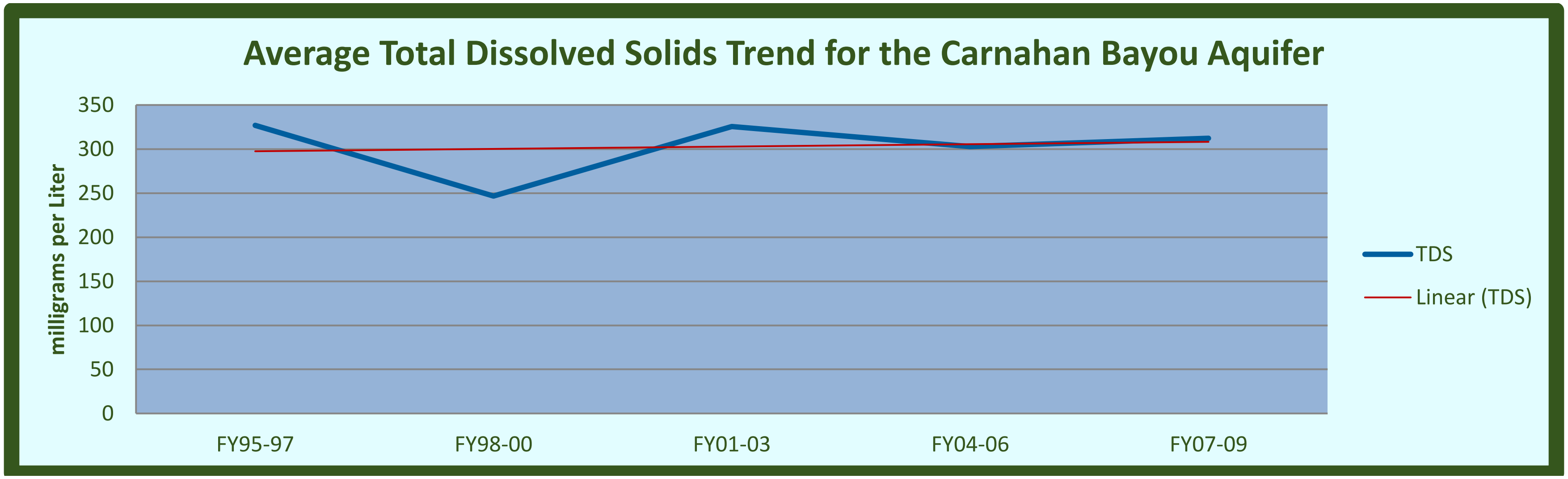

Chart 7-11: Ammonia (NH3) Trend

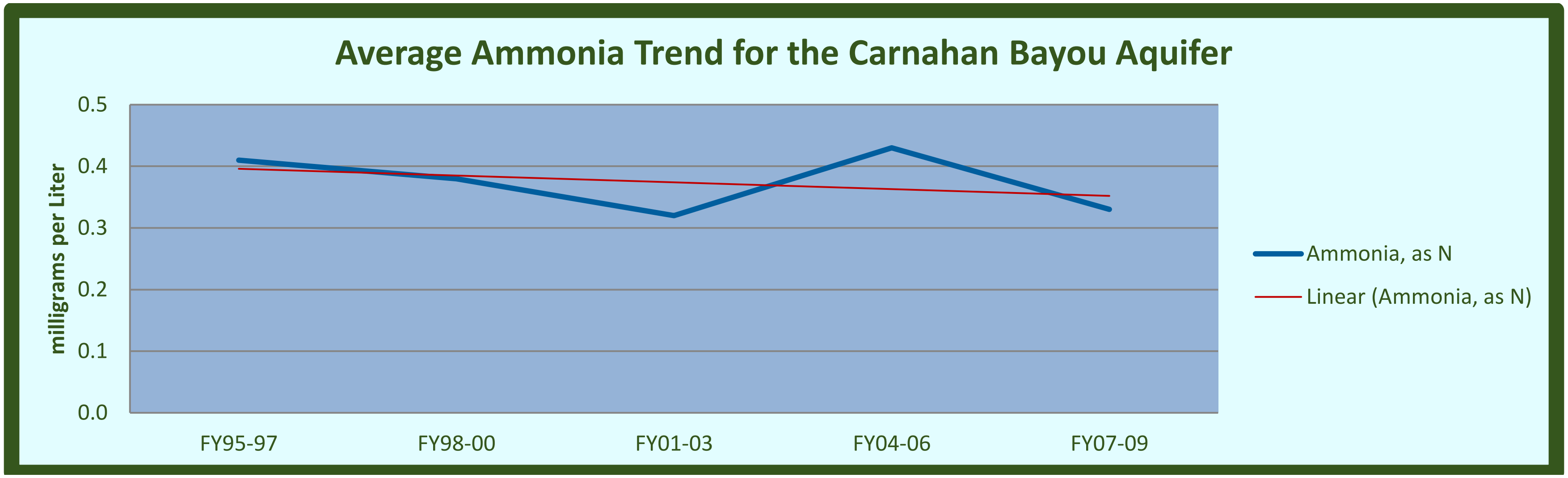

Chart 7-12: Hardness Trend

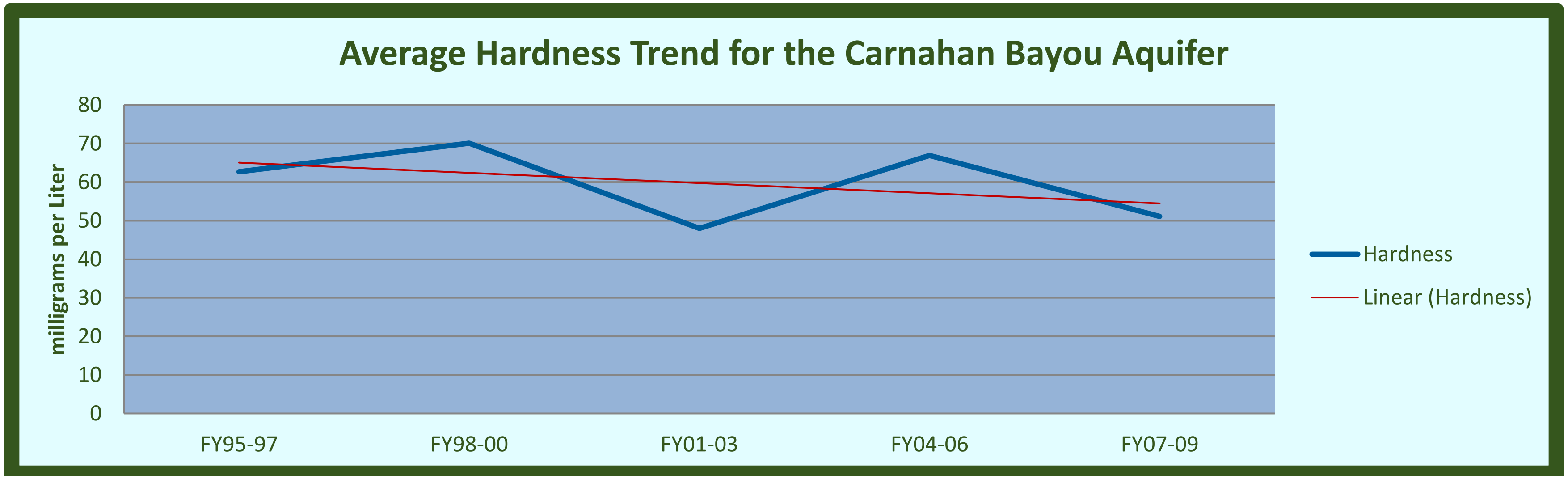

Chart 7-13: Nitrite – Nitrate Trend

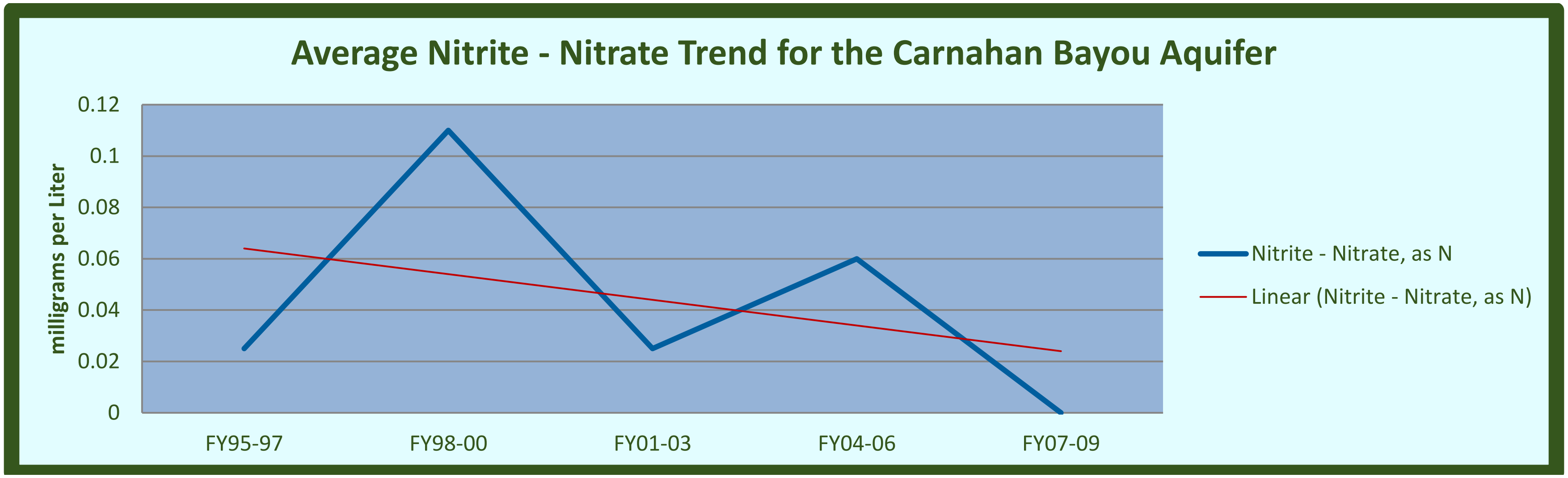

Chart 7-14: TKN Trend

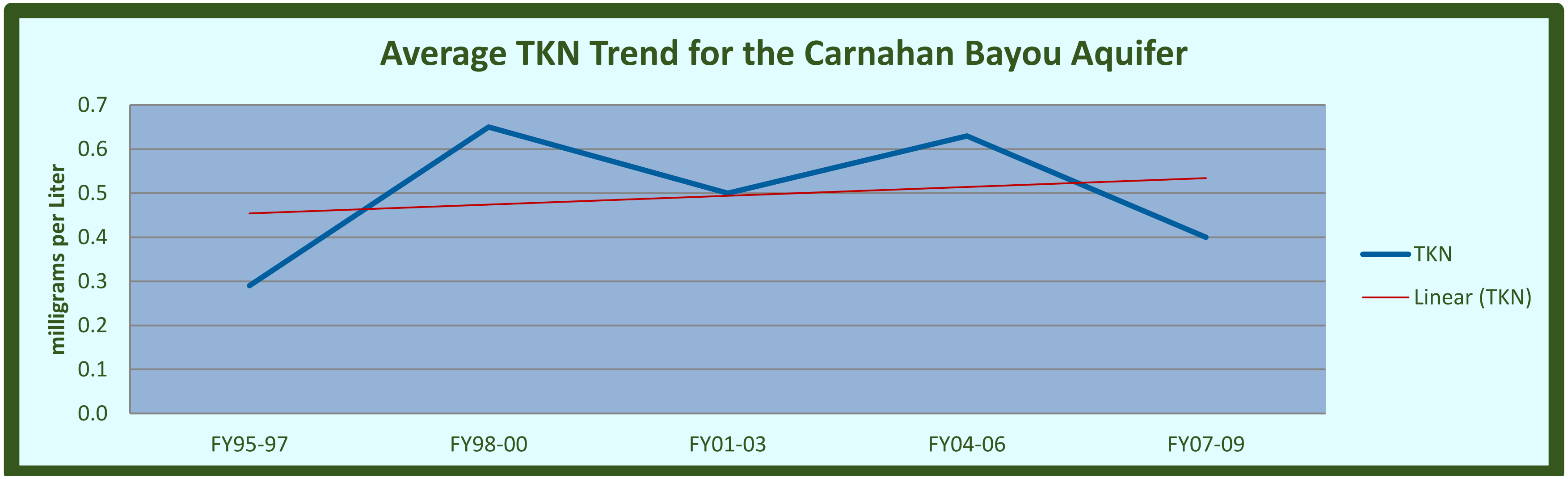

Chart 7-15: Total Phosphorus Trend

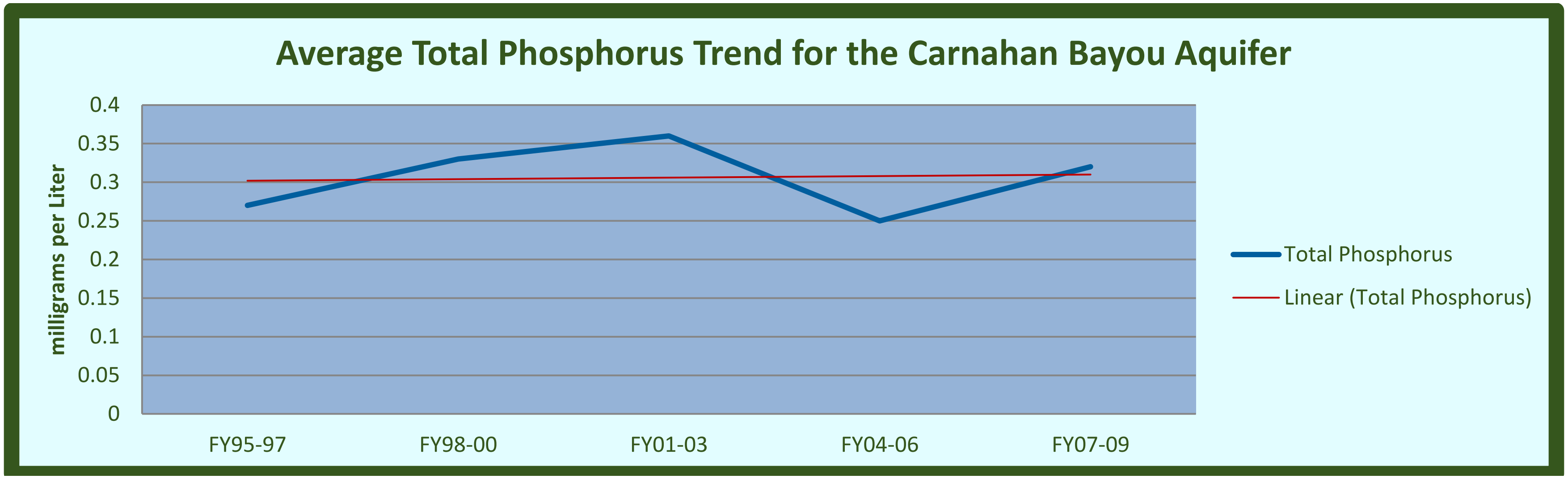

Chart 7-16: Iron Trend