CATAHOULA AQUIFER SUMMARY, 2019

AQUIFER SAMPLING AND ASSESSMENT PROGRAM

DEQ
LOUISIANA

APPENDIX 5 TO THE 2021 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 groundwater produced from Louisiana's major fresh water aquifers. The ASSET Program samples approximately 200 water wells located in 14 aquifers across the state. The sampling process is designed so that all 14 aquifers are monitored on a rotating basis, 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 make up, in part, the ASSET Program's Triennial Summary Report.

Analytical and field data contained in this summary were collected from wells producing from the Catahoula aquifer during the 2019 state fiscal year (July 1, 2018 - June 30, 2019). This summary will become Appendix 5 of ASSET Program Triennial Summary Report for 2021.

These data show that five wells were sampled which produce from the Catahoula aquifer. All five wells are public supply wells are located in five parishes across the central area of the state.

Figure 5-1 shows the geographic locations of the Catahoula aquifer and the associated wells, whereas Table 5-1 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 Natural Resources water well registration data file.

GEOLOGY

The Catahoula formation consists primarily of sands with some silty to sandy clays and overlies the regional confining clays of the Vicksburg and Jackson groups. Within the Catahoula, fine to coarse sands are discontinuous and interbedded with silt and clay.

HYDROGEOLOGY

Recharge takes place primarily as a result of the direct infiltration of rainfall in interstream, upland outcrop area, movement of water through overlying terrace deposits, and leakage from other aquifers. Salt water ridges under the Red River and Little River valleys in central Louisiana divide the Catahoula aquifer. The hydraulic conductivity of the Catahoula varies between 20 and 260 feet/day.

The maximum depths of occurrence of fresh water in the Catahoula range from 250 feet above sea level, to 2,200 feet below sea level. The range of thickness of the fresh water interval in the Catahoula is 50 to 450 feet. The depths of the Catahoula wells that were monitored in conjunction with the ASSET Program range from 352 to 910 feet.

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 5-2. The inorganic (total metals) parameters analyzed in the laboratory are listed in Table 5-3. These tables also show the field and analytical results determined for each analyte.

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 5-8, 5-9 and 5-10 list the target analytes for volatiles, semi-volatiles and pesticides/PCBs, respectively.

Tables 5-4 and 5-5 provide a statistical overview of field and conventional data, and inorganic (total metals) data for the Catahoula aquifer, listing the minimum, maximum, and average results for these parameters collected in the FY 2019 sampling. Tables 5-6 and 5-7 compare these same parameter averages to historical ASSET-derived data for the Catahoula aquifer, from previous fiscal years.

The average values listed in the above referenced tables are determined using all valid, reported results, including those reported as non-detect, or less than the detection limit (< DL). The average values listed in the above referenced tables are determined using all valid, reported results, including those reported as non-detect, or less than the detection limit (< DL). The method used to generate the descriptive statistics varies, depending on the dataset and the proportion of values that are <DL. When estimating a dataset with more than 50 observations, the Maximum Likelihood Estimation (MLE) method is used. This is used to describe Upper and Lower confidence intervals or historical descriptive statistics. For datasets of less than 50 observations, the Kapan-Meier method is used. This is used to calculate descriptive statistics of a single sampling round. If all values for a particular analyte are reported as < DL, then the minimum, maximum, and average values are all reported as < DL.

Charts 5-1 through 5-17 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 ASSET Program uses 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 5-2 and 5-3 show that one secondary MCL (SMCL) was exceeded in three of the five wells sampled in the Catahoula aquifer.

Field and Conventional Parameters

Table 5-2 shows the field and conventional parameters for which samples are collected at each well and the analytical results for those parameters. Table 5-4 provides an overview of this data for the Catahoula aquifer, listing the minimum, maximum, and average results for these parameters.

Federal Primary Drinking Water Standards: A review of the analysis listed in Table 5-2 shows that one 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 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 5-2 shows that no secondary MCL was exceeded for field or conventional parameters for this reporting period. Following is a list of SMCL parameter exceedances with well number and results.

pH (SMCL = 6.5 – 8.5 Standard Units):

G-493	6.00 SU

Inorganic Parameters

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

Federal Primary Drinking Water Standards: A review of the analyses listed in Table 5-3 shows that no primary MCL was exceeded for total metals.

Federal Secondary Drinking Water Standards: A review of the analyses listed in Table 5-3 shows that two wells exceeded the SMCL for iron.

Iron (SMCL = 300 µg/L):

CT-118	412 µg/L
LS-278	429 µg/L

Volatile Organic Compounds

Table 5-8 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.

There were no confirmed detections of a VOC at or above its detection limit during the FY 2019 sampling of the Catahoula aquifer.

Semi-Volatile Organic Compounds

Table 5-9 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.

There were no confirmed detections of a SVOC at or above its detection limit during the FY 2019 sampling of the Catahoula aquifer.

Pesticides and PCBs

Table 5-10 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.

There were no confirmed detections of a pesticide or PCB at or above its detection limit during the FY 2019 sampling of the Catahoula aquifer.

WATER QUALITY TRENDS AND COMPARISON TO HISTORICAL ASSET DATA

Analytical and field data show that the quality and characteristics of groundwater produced from the Catahoula aquifer exhibit some changes when comparing current data to that of the seven previous sampling rotations. These comparisons can be found in Tables 5-6 and 5-7, and in Charts 5-1 to 5-17 of this summary. Increasing or decreasing trend statements made here are based on an R-square value of 0.03 or greater and a p-value of < 0.05.

Over the 24-year period, four analytes have shown a general increase in their average concentrations. These analytes are: pH, specific conductivity, hardness, and total kjedahl nitrogen. All other analytes have remained stable or below their respective detection limits.

The current number of wells with SMCL exceedances, and the current total number of SMCL exceedances have increased when comparing to the sampling event in FY 2016. Historical data show that in the FY 2016 sampling of the Catahoula aquifer there was only one SMCL exceedance in one well. The FY 2019 data show that there were three exceedances in three wells.

SUMMARY AND RECOMMENDATIONS

In summary, the data show that the groundwater produced from this aquifer is soft[1] 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 2019 monitoring of the Catahoula aquifer exceeded an MCL. The data also show that this aquifer is of good quality when considering taste, odor or appearance guidelines, with only three SMCLs exceeded in three wells.

Comparison to historical ASSET-derived data show only some change in the quality or characteristics of the Catahoula aquifer with four parameters showing consistent increases in average concentration. Remaining parameters exhibited stable concentrations or remained below detection limits.

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

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

Table 5-1: List of Wells Sampled, Catahoula Aquifer–FY 2019

Well ID	Parish	Date	Owner	Depth (Feet)	Well Use
CT-118	Catahoula	1/22/2019	City of Jonesville	762	Public Supply
G-493	Grant	1/24/2019	Pollock Area Water System	642	Public Supply
LS-278	La Salle	1/24/2019	Rogers Water System	352	Public Supply
R-1311	Rapides	5/22/2019	Lena Water System, Inc.	514	Public Supply
V-434	Vernon	7/1/2019	Town of Anacoco	910	Public Supply

Table 5-2: Summary of Field and Conventional Data, Catahoula Aquifer–FY 2019

Well ID	pH SU	Sal ppt	Sp Cond mmhos/cm	Temp Deg C	TDS mg/L	Alk mg/L	Cl mg/L	Color PCU	Hard mg/L	Nitrite-Nitrate (as N) mg/L	NH3 mg/L	Tot P mg/L	Sp Cond µmhos/cm	SO4 mg/L	TDS mg/L	TKN mg/L	TSS mg/L	Turb NTU
	Laboratory Reporting Limits →					2	1	5	5	0.05	0.1	0.05	1	1	10	0.1	4	0.1
	Field Parameters					Laboratory Parameters												
CT-118	7.22	0.16	ND	21.87	216	105	21.10	10	< DL	< DL	< DL	0.14	377	6.90	205	1.20	< DL	0.44
G-493	6.00	0.04	ND	17.50	60	107	33.00	12	< DL	< DL	< DL	0.25	160	< DL	85	0.31	< DL	0.19
LS-278	7.34	0.10	ND	21.07	141	86	2.50	10	12	< DL	< DL	0.49	307	4.00	180	0.47	4.00	0.99
R-1311	7.40	0.14	0.294	20.65	210	98	14.20	< DL	10	< DL	0.23	ND	303	16.00	260	0.46	< DL	0.20
V-434	8.20	0.15	0.312	23.22	240	155	9.60	< DL	< DL	< DL	0.24	ND	305	7.00	220	0.56	< DL	4.00

*Denotes Duplicate Sample   Shaded cell exceed EPA Secondary Standards   ND = No Data

Table 5-3: Summary of Inorganic (Total Metals) Data, Catahoula Aquifer–FY 2019

Well ID	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 Reporting Limits	1	1	1	0.5	1	1	3	50	1	0.2	1	1	0.5	0.5	5
CT-118	< DL	< DL	7.40	< DL	< DL	< DL	< DL	412	< DL	< DL	< DL	< DL	< DL	< DL	18.60
G-493	< DL	< DL	2.50	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	5.30
LS-278	< DL	< DL	2.90	< DL	< DL	< DL	< DL	429	< DL	< DL	< DL	< DL	< DL	< DL	5.10
R-1311	< DL	< DL	13.40	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
V-434	< DL	< DL	1.10	< DL	< DL	< DL	< DL	69.50	< DL	< DL	< DL	< DL	< DL	< DL	< DL

*Denotes Duplicate Sample

Table 5-4: FY 2019 Field and Conventional Statistics, ASSET Wells

	PARAMETER	MINIMUM	MAXIMUM	AVERAGE
FIELD	pH (SU)	6.00	8.20	7.23
	Salinity (ppt)	0.10	0.16	0.12
	Specific Conductance (mmhos/cm)	0.29	0.31	0.30
	Temperature (^{O}C)	17.50	23.22	20.86
	Total Dissolved Solids (mg/L)	59.83	239.89	173.37
LABORATORY	Alkalinity (mg/L)	85.80	155.00	110.12
	Chloride (mg/L)	2.50	33.00	16.08
	Color (PCU)	< DL	12.00	8.40
	Hardness (mg/L)	< DL	12.00	7.40
	Nitrite - Nitrate, as N (mg/L)	< DL	< DL	< DL
	Ammonia, as N (mg/L)	< DL	0.24	0.15
	Total Phosphorus (mg/L)	0.49	0.14	0.29
	Specific Conductance (μmhos/cm)	160	377	290.40
	Sulfate (mg/L)	< DL	16.00	6.98
	Total Dissolved Solids (mg/L)	85	260	190.00
	Total Kjeldahl Nitrogen (mg/L)	1.20	0.31	0.60
	Total Suspended Solids (mg/L)	< DL	< DL	< DL
	Turbidity (NTU)	0.19	4.00	1.16

Table 5-5: FY 2019 Inorganic (Total Metals) Statistics, ASSET Wells

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Antimony (μg/L)	< DL	< DL	< DL
Arsenic (μg/L)	< DL	< DL	< DL
Barium (μg/L)	1.10	13.40	5.46
Beryllium (μg/L)	< DL	< DL	< DL
Cadmium (μg/L)	< DL	< DL	< DL
Chromium (μg/L)	< DL	< DL	< DL
Copper (μg/L)	< DL	< DL	< DL
Iron (μg/L)	< DL	429.00	202.10
Lead (μg/L)	< DL	< DL	< DL
Mercury (μg/L)	< DL	< DL	< DL
Nickel (μg/L)	< DL	< DL	< DL
Selenium (μg/L)	< DL	< DL	< DL
Silver (μg/L)	< DL	< DL	< DL
Thallium (μg/L)	< DL	< DL	< DL
Zinc (μg/L)	< DL	14.8	6.6

Table 5-6: Triennial Field and Conventional Statistics, ASSET Wells

	PARAMETER	FY 1995	FY 1998	FY 2001	FY 2004	FY 2007	FY 2010	FY 2013	FY 2016	FY 2019
		AVERAGE VALUES BY FISCAL YEAR								
FIELD	pH (SU)	8.03	6.31	7.78	7.59	7.93	7.61	7.74	7.74	7.23
	Salinity (ppt)	0.16	0.11	0.18	0.12	0.20	0.14	0.14	0.14	0.12
	Specific Conductance (mmhos/cm)	0.370	0.230	0.280	0.250	0.430	0.292	0.293	0.293	0.30
	Temperature (°C)	23.71	22.45	22.47	23.46	24.58	22.98	18.64	18.64	20.86
	Total Dissolved Solids (g/L)	-	-	-	0.160	0.280	0.190	0.190	0.190	173.37
LABORATORY	Alkalinity (mg/L)	123	110	136	132	134	118	117	117	110.12
	Chloride (mg/L)	13.9	14.7	10.9	12.8	22.8	14.6	10.9	10.9	16.08
	Color (PCU)	7	5	6	6	< DL	7	10	10	8.40
	Hardness (mg/L)	< DL	< DL	< DL	< DL	< DL	< DL	7	7	7.40
	Nitrite - Nitrate, as N (mg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
	Ammonia, as N (mg/L)	0.22	0.16	0.20	0.27	0.16	0.25	0.29	0.29	0.15
	Total Phosphorus (mg/L)	0.25	0.22	0.37	0.55	0.33	0.50	0.34	0.34	0.29
	Specific Conductance (µmhos/cm)	289	269	302	291	334	280	297	297	290.40
	Sulfate (mg/L)	8.7	4.6	4.5	6.2	9.5	9.0	9.0	9.0	6.98
	Total Dissolved Solids (mg/L)	245	265	258	195	240	236	305	305	190.00
	Total Kjeldahl Nitrogen (mg/L)	0.50	0.18	0.38	0.41	0.22	0.65	0.51	0.51	0.60
	Total Suspended Solids (mg/L)	< DL	5.7	< DL	< DL	< DL	< DL	< DL	< DL	< DL
	Turbidity (NTU)	6.4	< DL	1.7	1.5	1.1	< DL	2.1	2.1	1.16

Table 5-7: Triennial Inorganic (Total Metals) Statistics, ASSET Wells

PARAMETER	FY 1995	FY 1998	FY 2001	FY 2004	FY 2007	FY 2010	FY 2013	FY 2016	FY 2019
	AVERAGE VALUES BY FISCAL YEAR								
Antimony (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Arsenic (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Barium (µg/L)	8.1	63.6	4.6	< DL	29.0	7.0	6.3	5.7	5.46
Beryllium (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Cadmium (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Chromium (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Copper (µg/L)	84.1	< DL	5.5	< DL	3.3	3.2	3.8	< DL	< DL
Iron (µg/L)	1076	413	232	268	327	< DL	< DL	919	202.10
Lead (µg/L)	23.2	< DL	46.7	< DL	< DL	< DL	< DL	< DL	< DL
Mercury (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Nickel (µg/L)	6.1	< DL	6.9	< DL	< DL	4.2	< DL	< DL	< DL
Selenium (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Silver (µg/L)	< DL	< DL	< DL	-	< DL	< DL	< DL	< DL	< DL
Thallium (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Zinc (µg/L)	177.4	42.2	64.9	< DL	329.5	20.3	10.7	6.6	6.6

Table 5-8: Volatile Organic Compound List

VOC ANAYTICAL PARAMETERS	METHOD	REPORTING LIMIT (µg/L)
1,1,1-TRICHLOROETHANE	624	0.50
1,1,2,2-TETRACHLOROETHANE	624	0.50
1,1,2-TRICHLOROETHANE	624	0.50
1,1-DICHLOROETHANE	624	0.50
1,1-DICHLOROETHENE	624	0.50
1,2-DICHLOROBENZENE	624	0.50
1,2-DICHLOROETHANE	624	0.50
1,2-DICHLOROPROPANE	624	0.50
1,3-DICHLOROBENZENE	624	0.50
1,4-DICHLOROBENZENE	624	0.50
BENZENE	624	0.50
BROMODICHLOROMETHANE	624	0.50
BROMOFORM	624	0.50
BROMOMETHANE	624	1.0
CARBON TETRACHLORIDE	624	0.50
CHLOROBENZENE	624	0.50
CHLOROETHANE	624	0.50
CHLOROFORM	624	0.50
CHLOROMETHANE	624	1.0
CIS-1,3-DICHLOROPROPENE	624	1.0
DIBROMOCHLOROMETHANE	624	0.50
ETHYL BENZENE	624	0.50
METHYLENE CHLORIDE	624	1.0
O-XYLENE (1,2-DIMETHYLBENZENE)	624	0.50
STYRENE	624	0.50
TERT-BUTYL METHYL ETHER	624	0.50
TETRACHLOROETHYLENE (PCE)	624	0.50
TOLUENE	624	0.50
TRANS-1,2-DICHLOROETHENE	624	0.50
TRANS-1,3-DICHLOROPROPENE	624	0.50
TRICHLOROETHYLENE (TCE)	624	0.50
TRICHLOROFLUOROMETHANE (FREON-11)	624	0.50
VINYL CHLORIDE	624	0.50
XYLENES, M & P	624	1.0

Table 5-9: Semi-Volatile Organic Compound List

SVOC ANAYTICAL PARAMETERS	METHOD	REPORTING LIMIT (µg/L)
1,2,4-TRICHLOROBENZENE	625	5.0
2,4,6-TRICHLOROPHENOL	625	5.0
2,4-DICHLOROPHENOL	625	5.0
2,4-DIMETHYLPHENOL	625	5.0
2,4-DINITROPHENOL	625	20.0
2,4-DINITROTOLUENE	625	5.0
2,6-DINITROTOLUENE	625	5.0
2-CHLORONAPHTHALENE	625	5.0
2-CHLOROPHENOL	625	5.0
2-NITROPHENOL	625	5.0
3,3'-DICHLOROBENZIDINE	625	5.0
4,6-DINITRO-2-METHYLPHENOL	625	10.0
4-BROMOPHENYL PHENYL ETHER	625	5.0
4-CHLORO-3-METHYLPHENOL	625	5.0
4-CHLOROPHENYL PHENYL ETHER	625	5.0
4-NITROPHENOL	625	20.0
ACENAPHTHENE	625	0.20
ACENAPHTHYLENE	625	0.20
ANTHRACENE	625	0.20
BENZIDINE	625	20.0
BENZO(A)ANTHRACENE	625	0.20
BENZO(A)PYRENE	625	0.20
BENZO(B)FLUORANTHENE	625	0.20
BENZO(G,H,I)PERYLENE	625	0.20
BENZO(K)FLUORANTHENE	625	0.20
BENZYL BUTYL PHTHALATE	625	5.0
BIS(2-CHLOROETHOXY) METHANE	625	5.0
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	625	5.0
BIS(2-ETHYLHEXYL) PHTHALATE	625	5.0
CHRYSENE	625	0.20
DIBENZ(A,H)ANTHRACENE	625	0.20
DIETHYL PHTHALATE	625	5.0
DIMETHYL PHTHALATE	625	5.0
DI-N-BUTYL PHTHALATE	625	5.0
DI-N-OCTYLPHTHALATE	625	5.0
FLUORANTHENE	625	0.20
FLUORENE	625	0.20
HEXACHLOROBENZENE	625	5.0

SVOC ANAYTICAL PARAMETERS	METHOD	REPORTING LIMIT (µg/L)
HEXACHLOROBUTADIENE	625	5.0
HEXACHLOROCYCLOPENTADIENE	625	10.0
HEXACHLOROETHANE	625	5.0
INDENO(1,2,3-C,D)PYRENE	625	0.20
ISOPHORONE	625	5.0
NAPHTHALENE	625	0.20
NITROBENZENE	625	5.0
N-NITROSODIMETHYLAMINE	625	5.0
N-NITROSODI-N-PROPYLAMINE	625	5.0
N-NITROSODIPHENYLAMINE	625	5.0
PENTACHLOROPHENOL	625	5.00
PHENANTHRENE	625	0.20
PHENOL	625	5.0
PYRENE	625	0.20

Table 5-10: Pesticide and PCB List

Pest/PCB Analytical Parameters	METHOD	REPORTING LIMIT (µg/L)
ALDRIN	608	0.025
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	608	0.025
ALPHA ENDOSULFAN	608	0.025
ALPHA-CHLORDANE	608	0.025
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	608	0.025
BETA ENDOSULFAN	608	0.025
CHLORDANE	608	0.20
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	608	0.025
DIELDRIN	608	0.025
ENDOSULFAN SULFATE	608	0.025
ENDRIN	608	0.025
ENDRIN ALDEHYDE	608	0.025
ENDRIN KETONE	608	0.025
GAMMA-CHLORDANE	608	0.025
HEPTACHLOR	608	0.025
HEPTACHLOR EPOXIDE	608	0.025
METHOXYCHLOR	608	0.25
P,P'-DDD	608	0.025
P,P'-DDE	608	0.025
P,P'-DDT	608	0.025
PCB-1016 (AROCHLOR 1016)	608	0.80
PCB-1221 (AROCHLOR 1221)	608	0.80
PCB-1232 (AROCHLOR 1232)	608	0.80
PCB-1242 (AROCHLOR 1242)	608	0.80
PCB-1248 (AROCHLOR 1248)	608	0.80
PCB-1254 (AROCHLOR 1254)	608	0.80
PCB-1260 (AROCHLOR 1260)	608	0.80
TOXAPHENE	608	1.0

Figure 5-1: Location Plat, Catahoula Aquifer

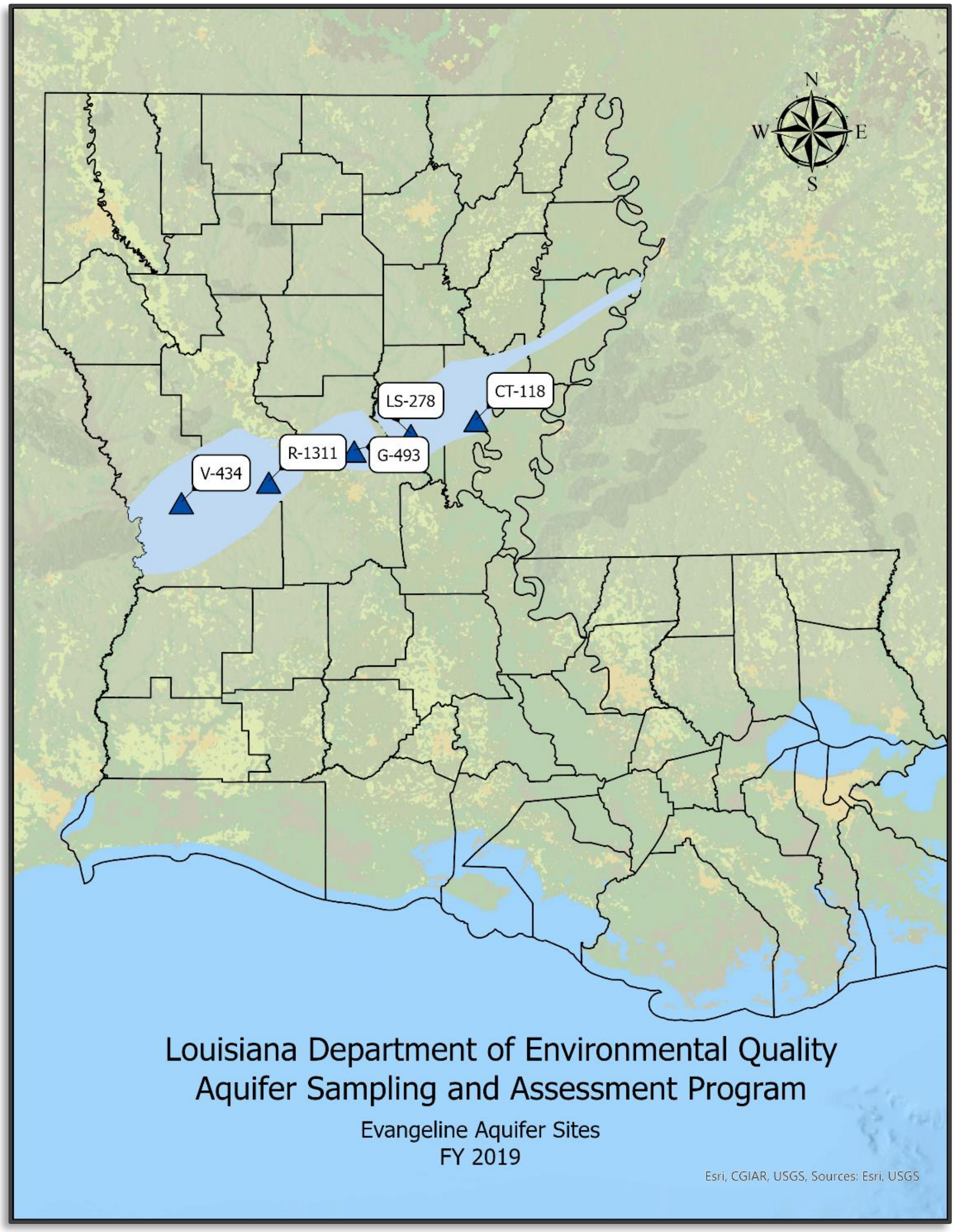
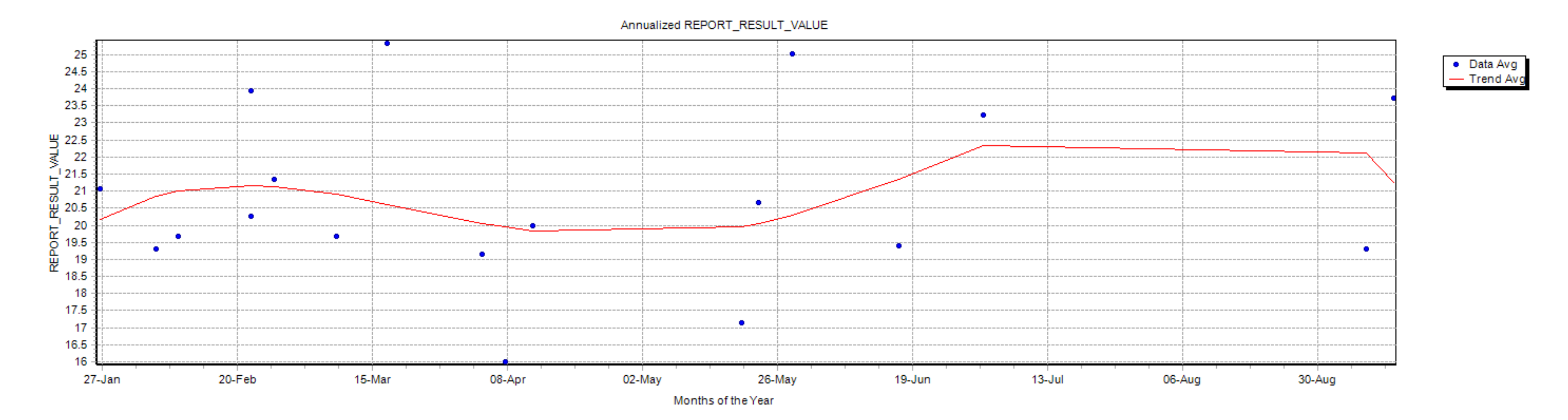


Chart 5-1: Temperature Trend



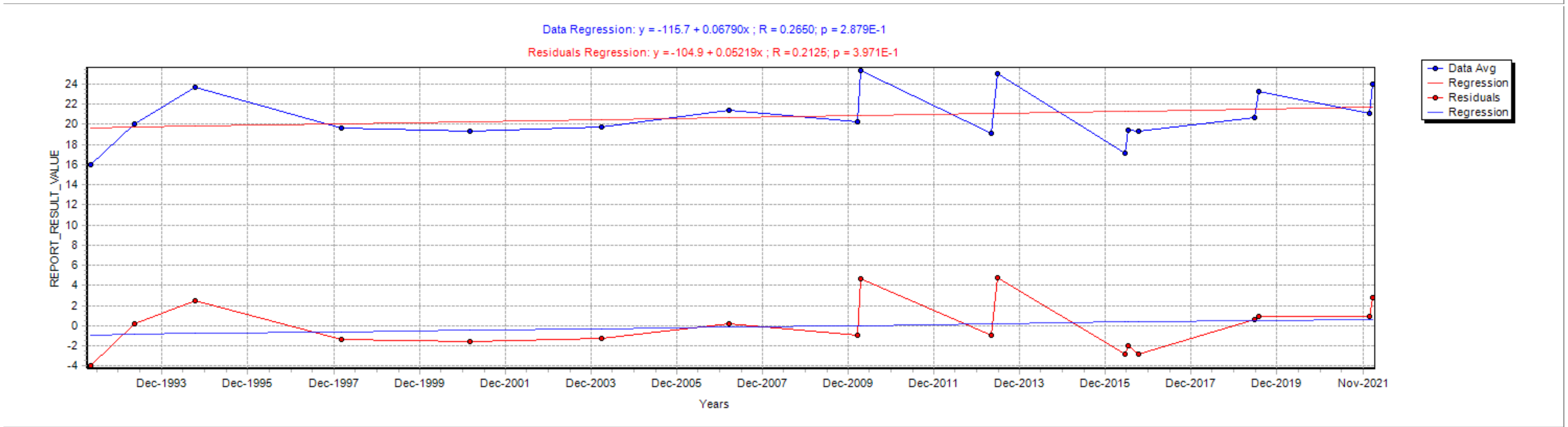
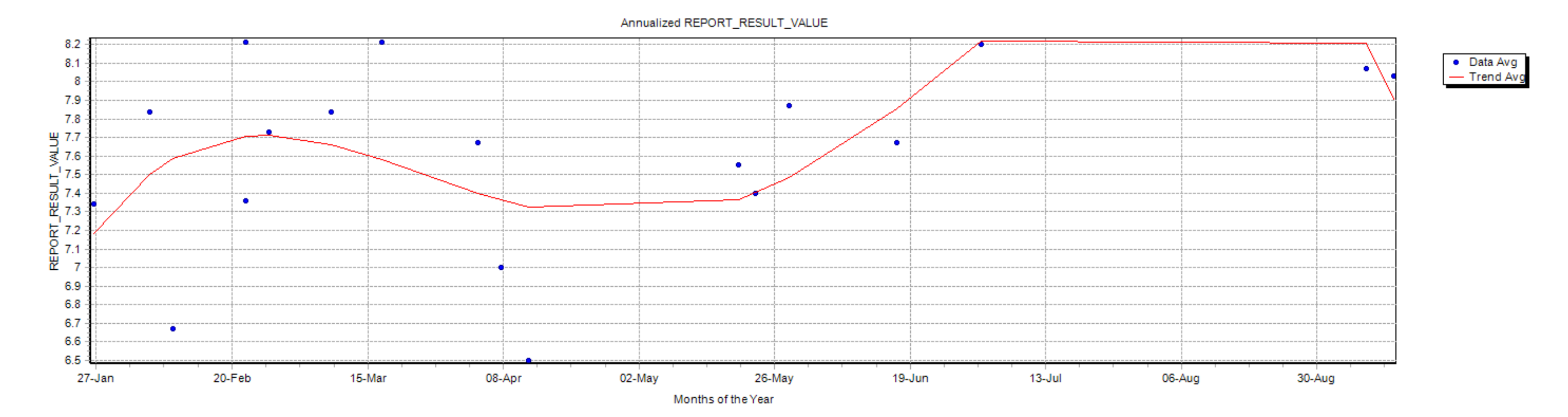


Chart 5-2: pH Trend



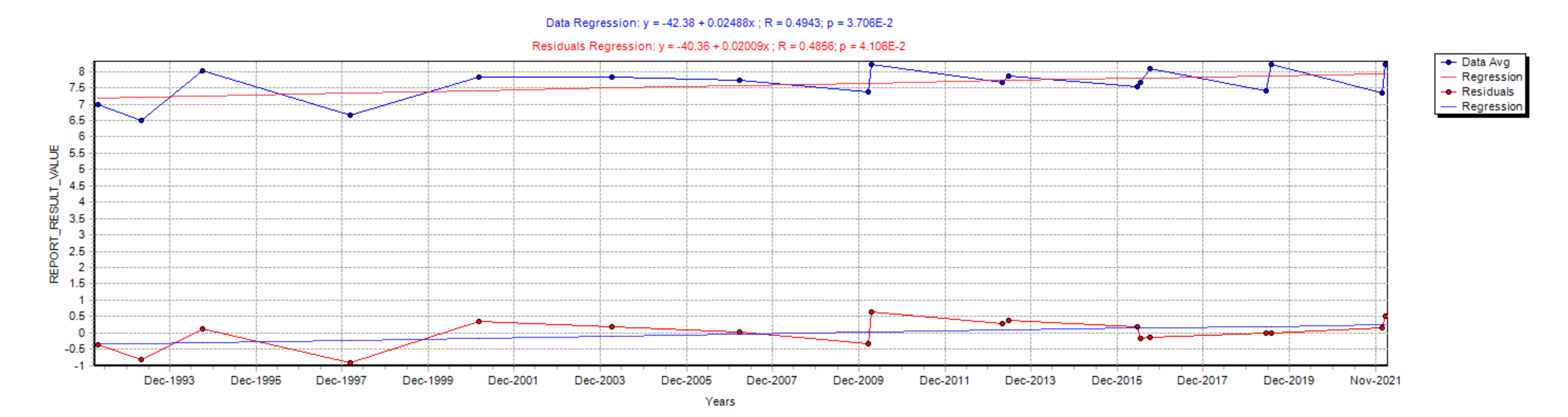
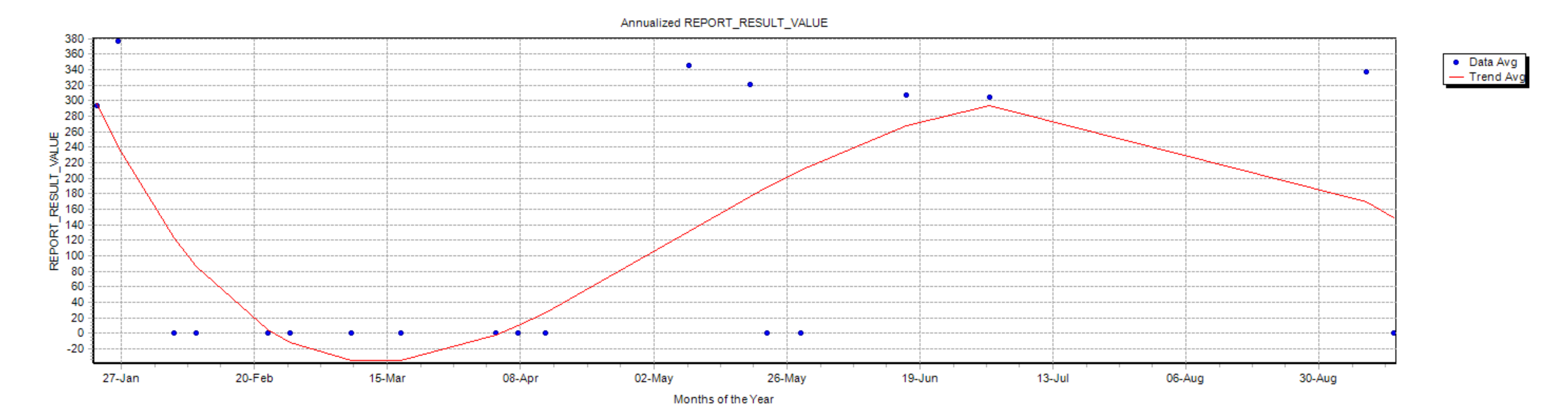


Chart 5-3: Specific Conductance Trend



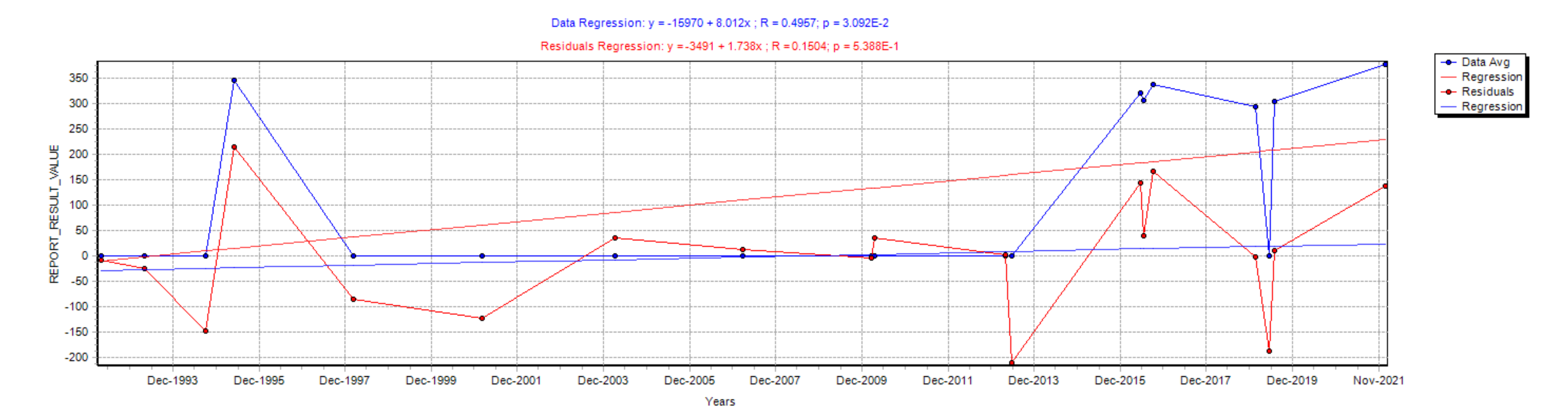
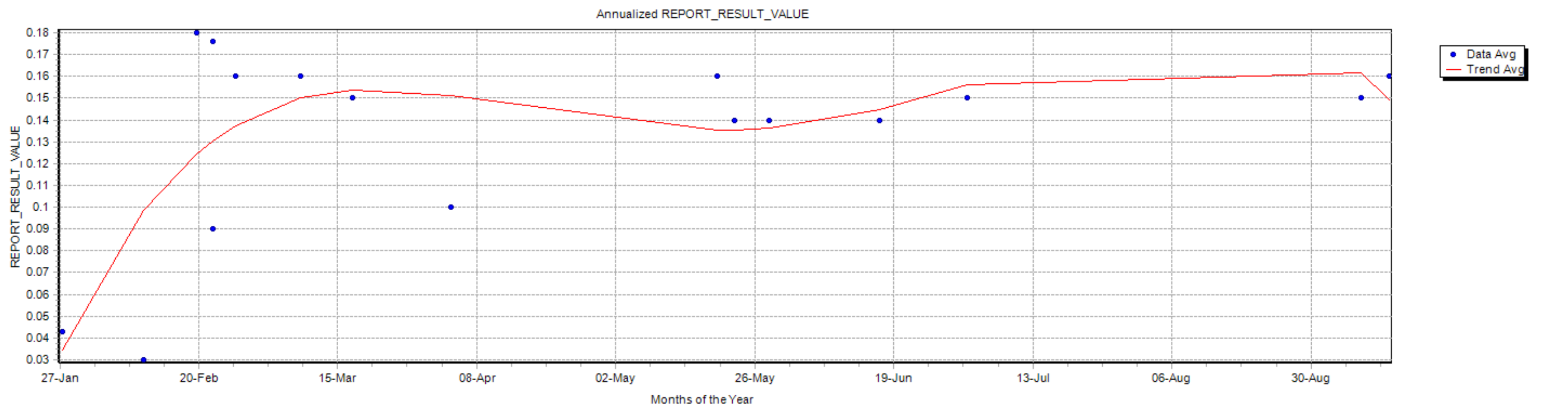


Chart 5-4: Field Salinity Trend



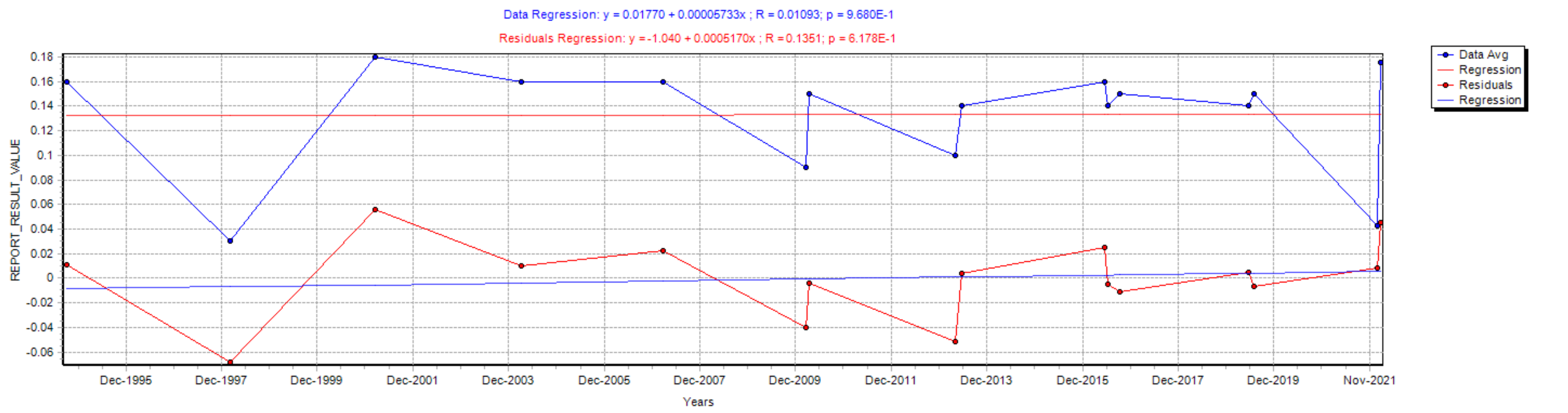
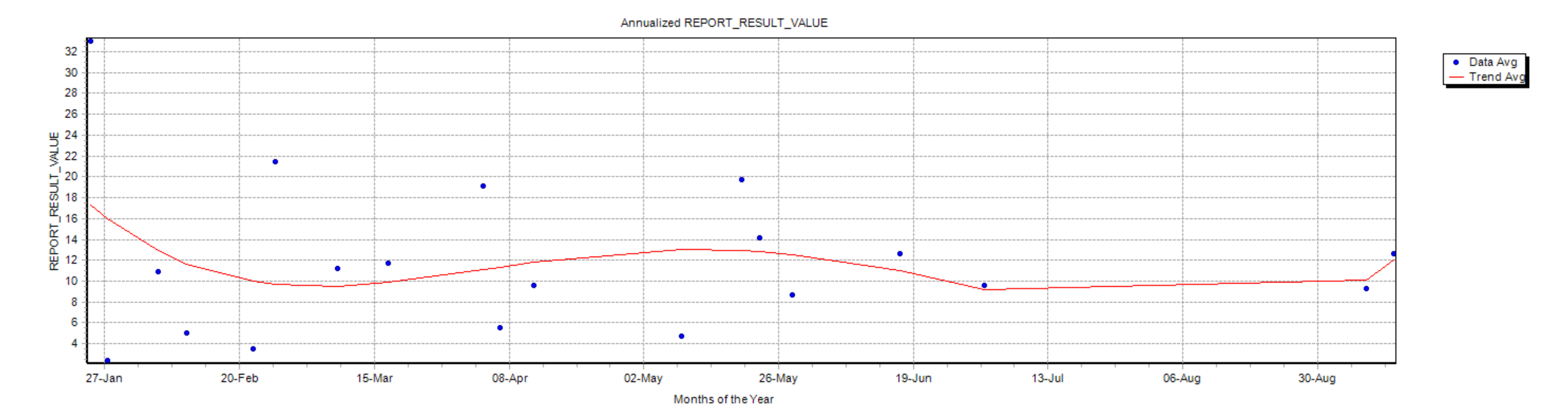


Chart 5-5: Chloride Trend



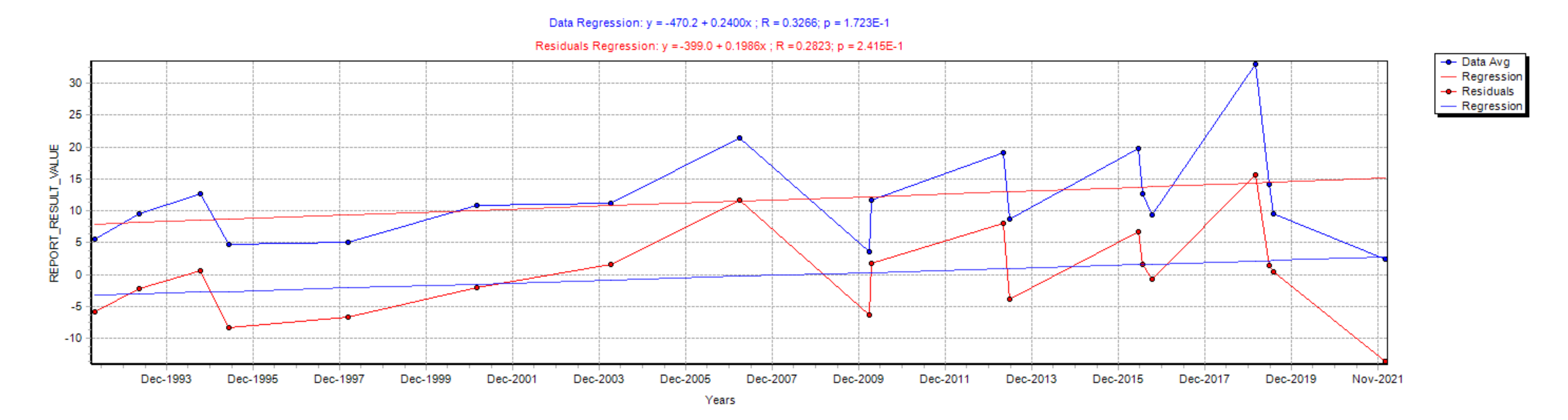
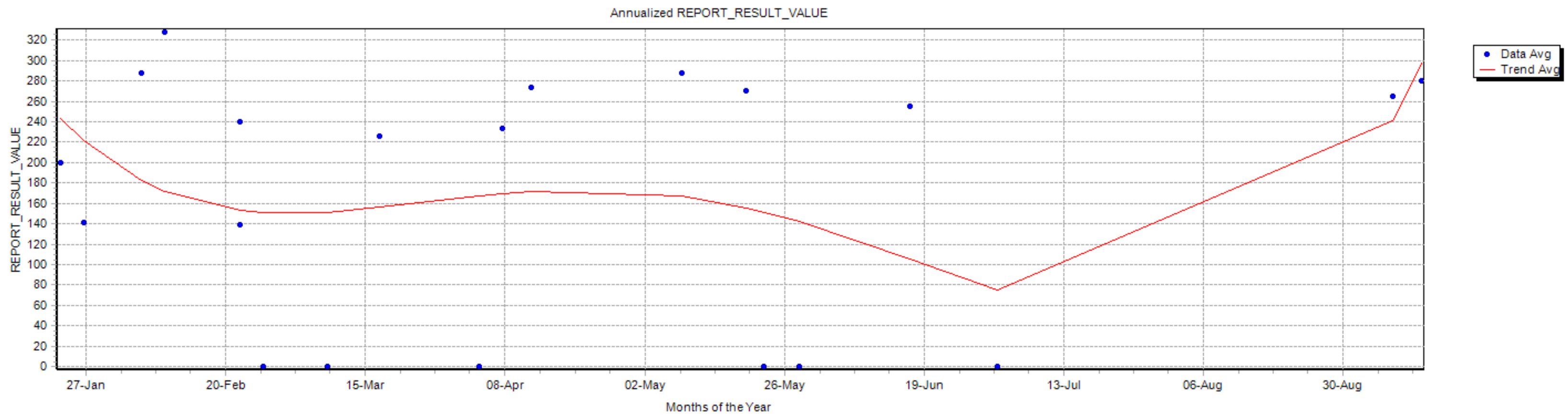


Chart 5-6: Total Dissolved Solids Trend



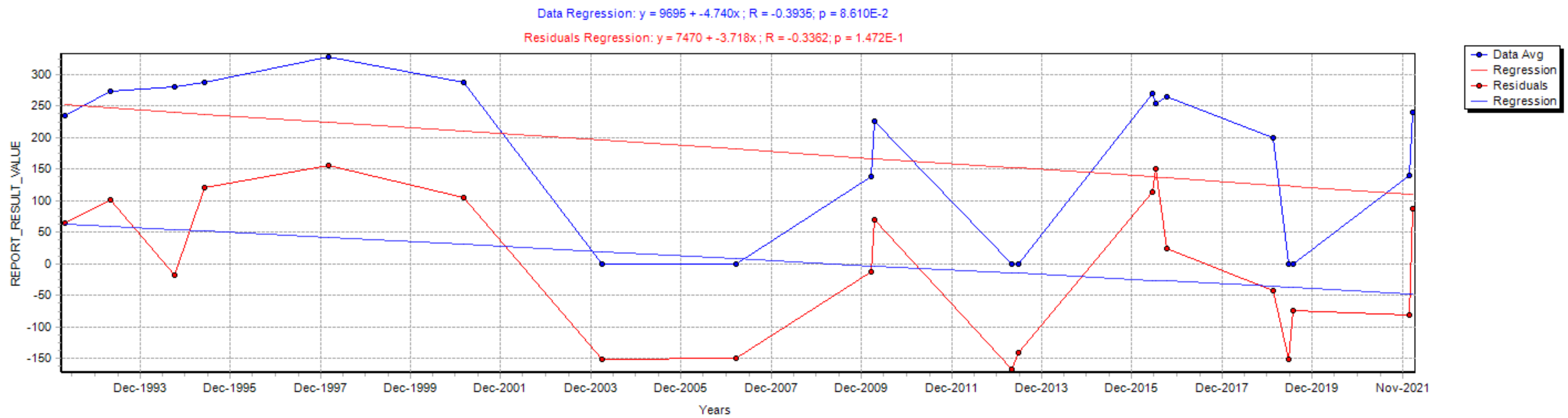
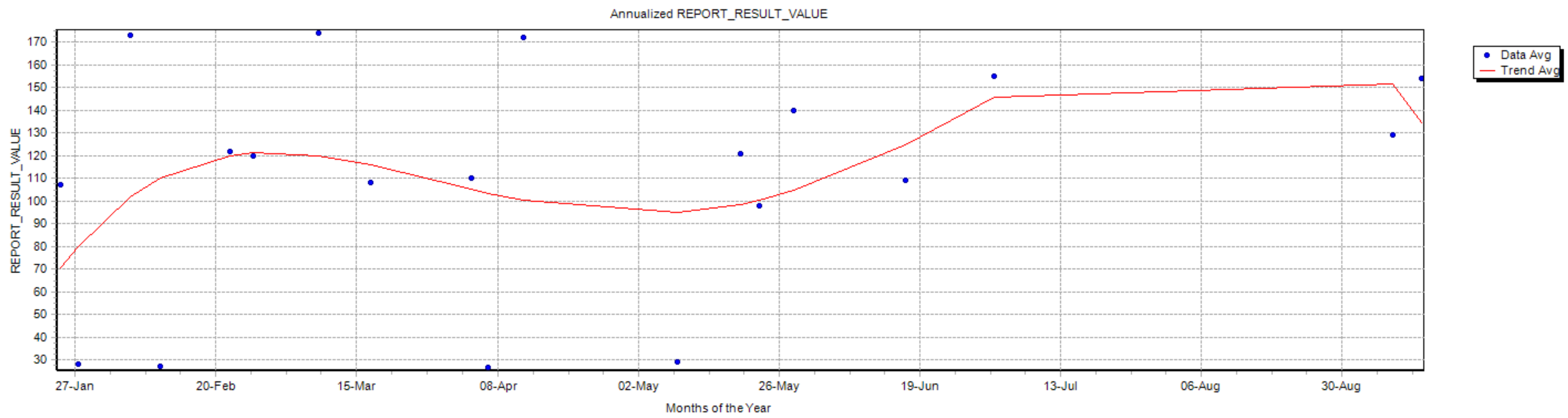


Chart 5-7: Alkalinity Trend



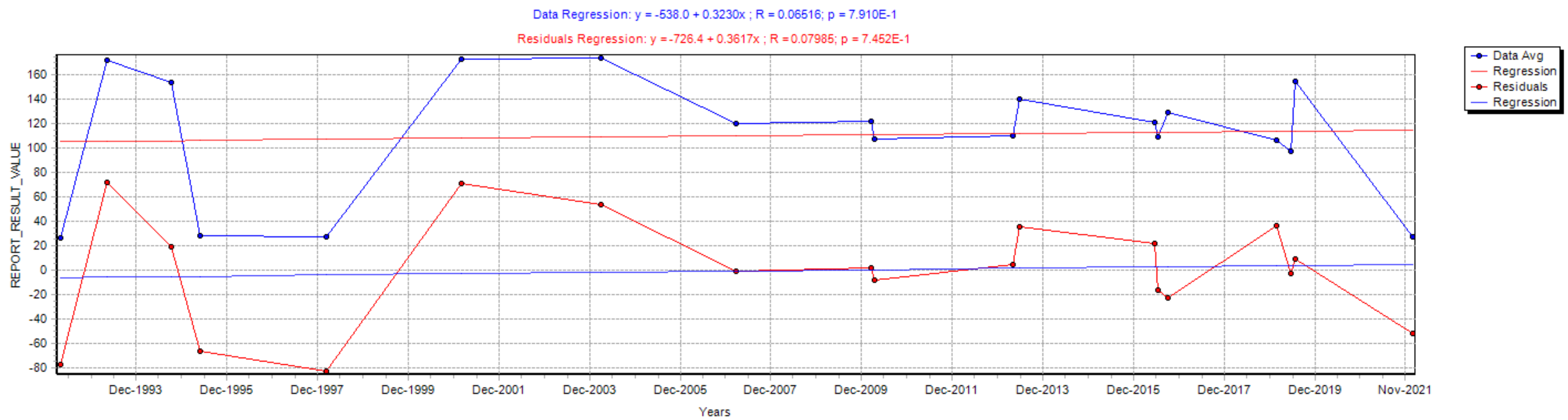


Chart 5-8: Hardness Trend

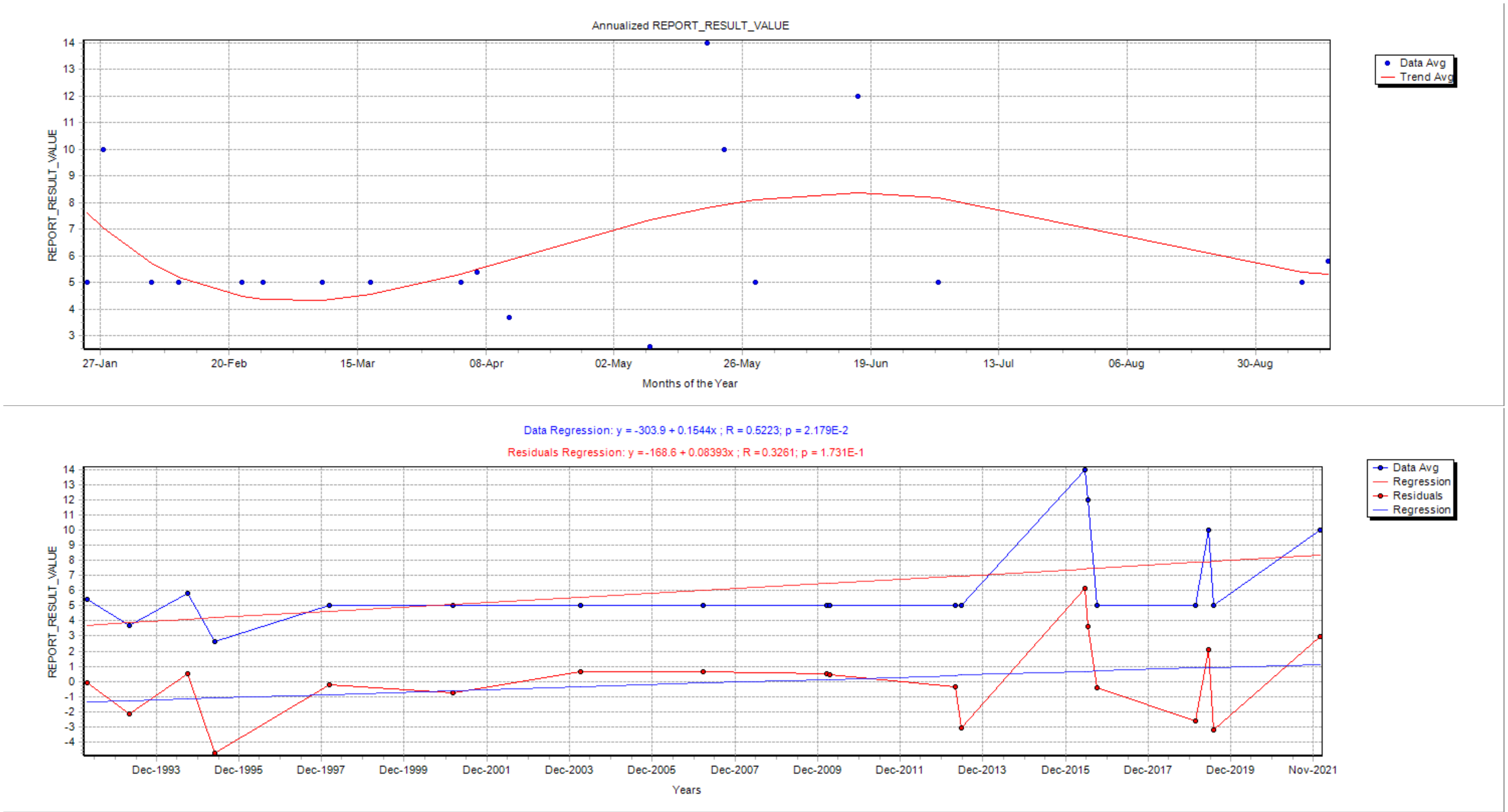
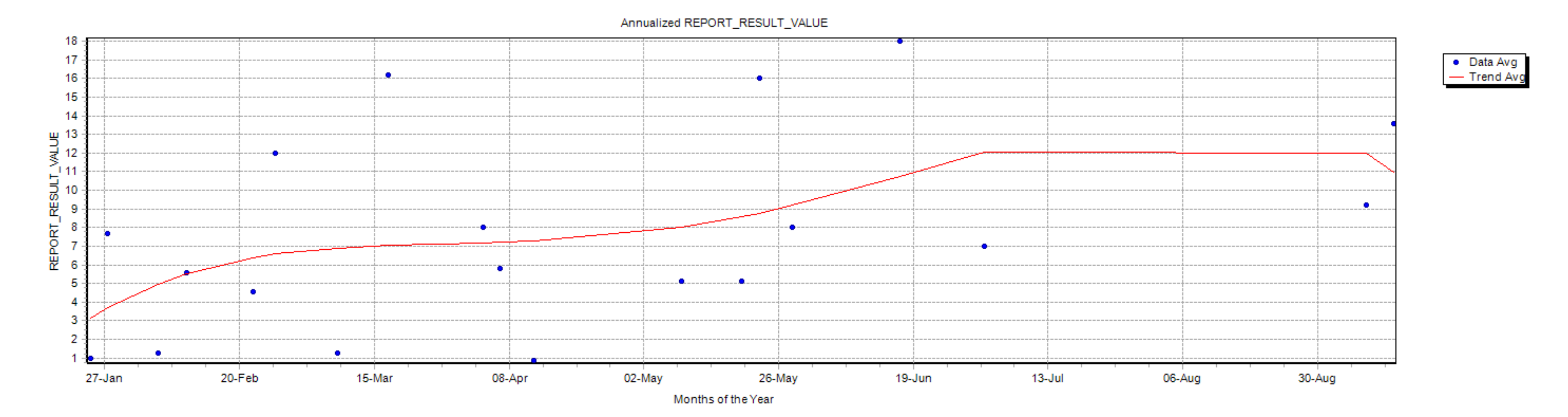


Chart 5-9: Sulfate Trend



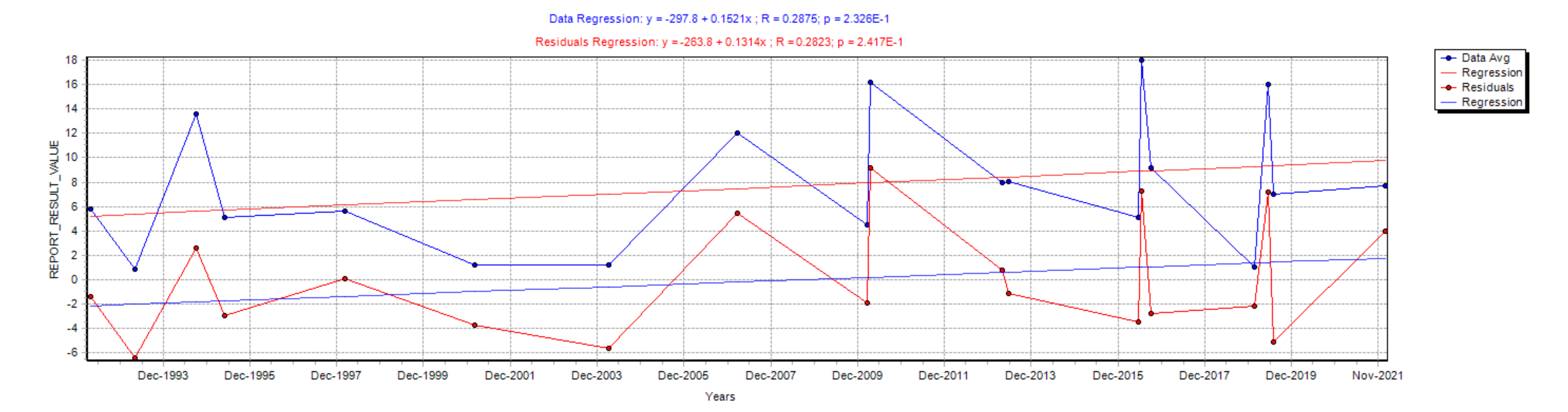
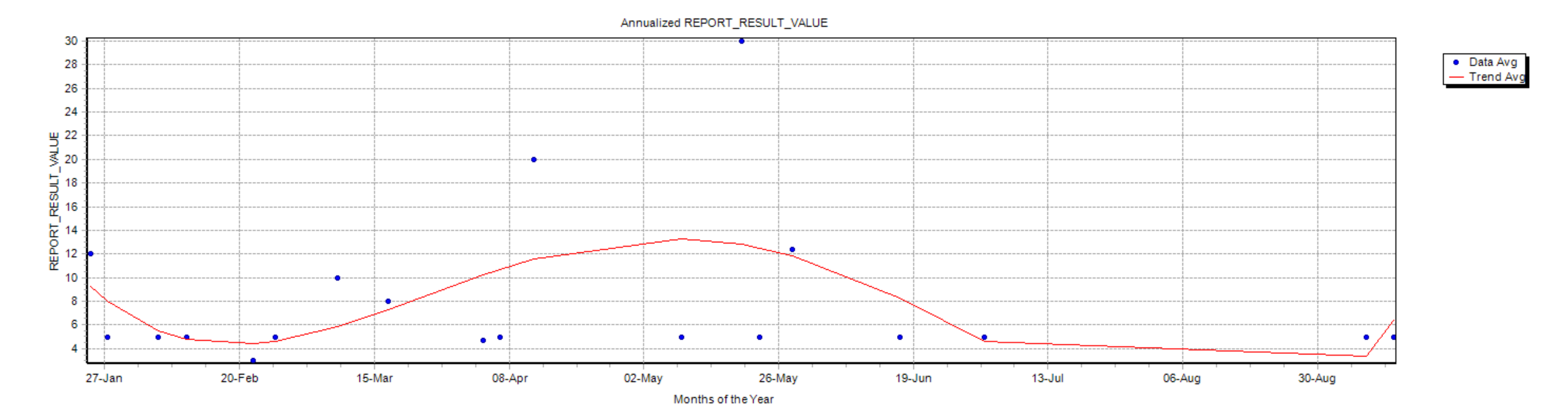


Chart 5-10: Color Trend



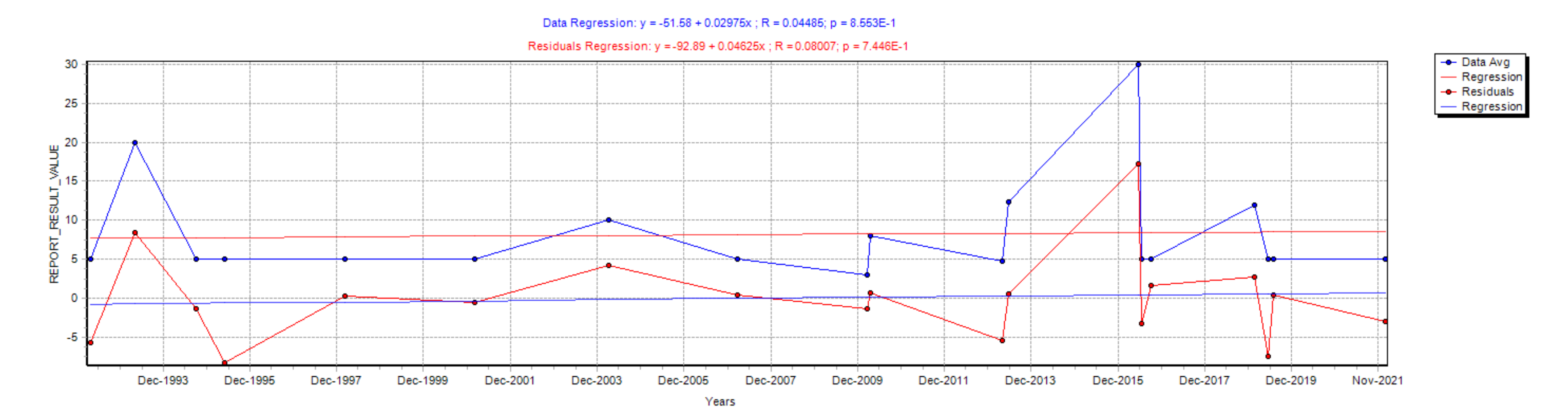


Chart 5-11: Ammonia Trend

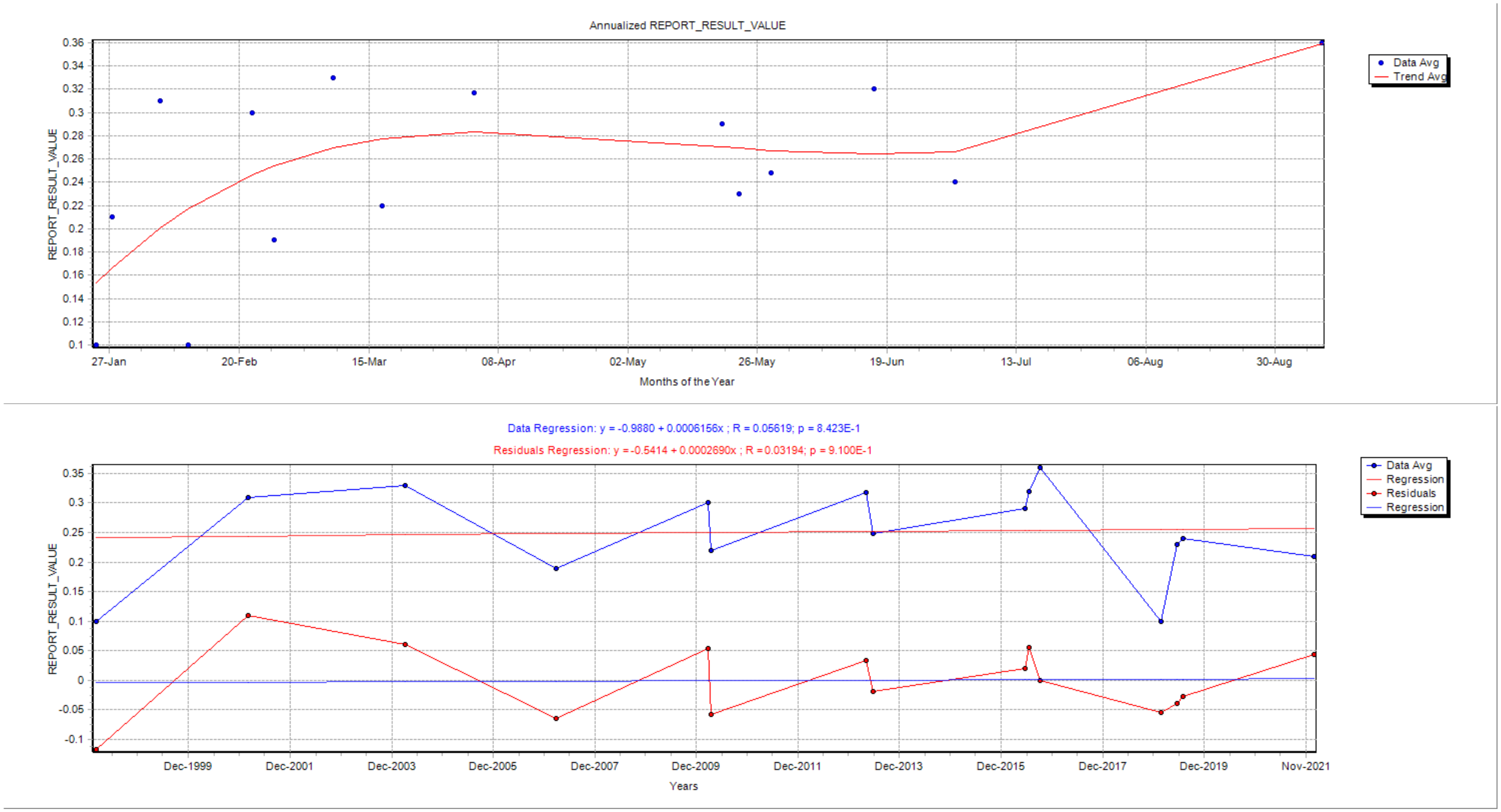
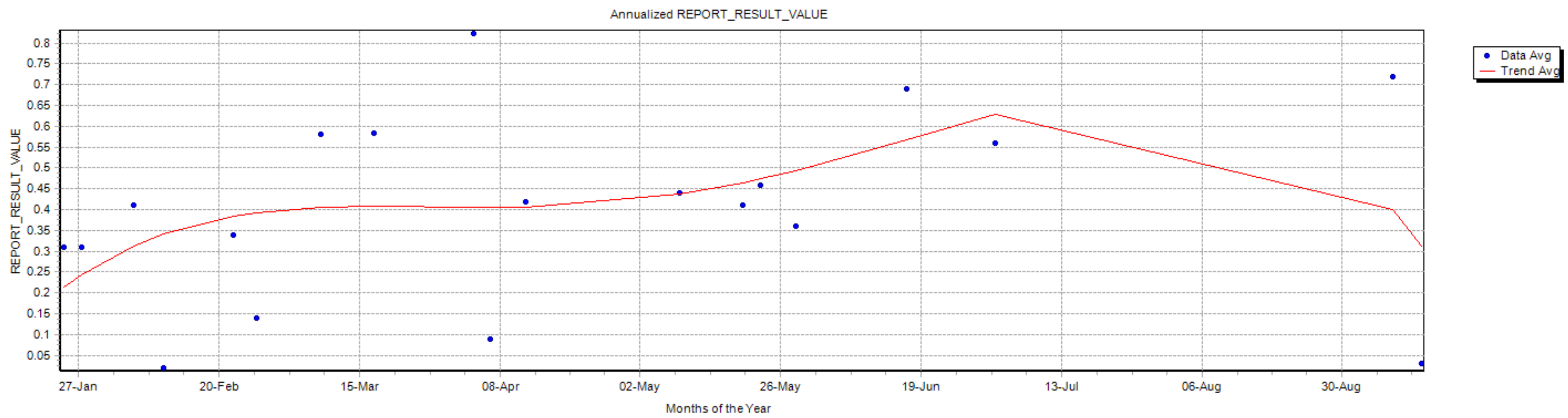


Chart 5-12: TKN Trend



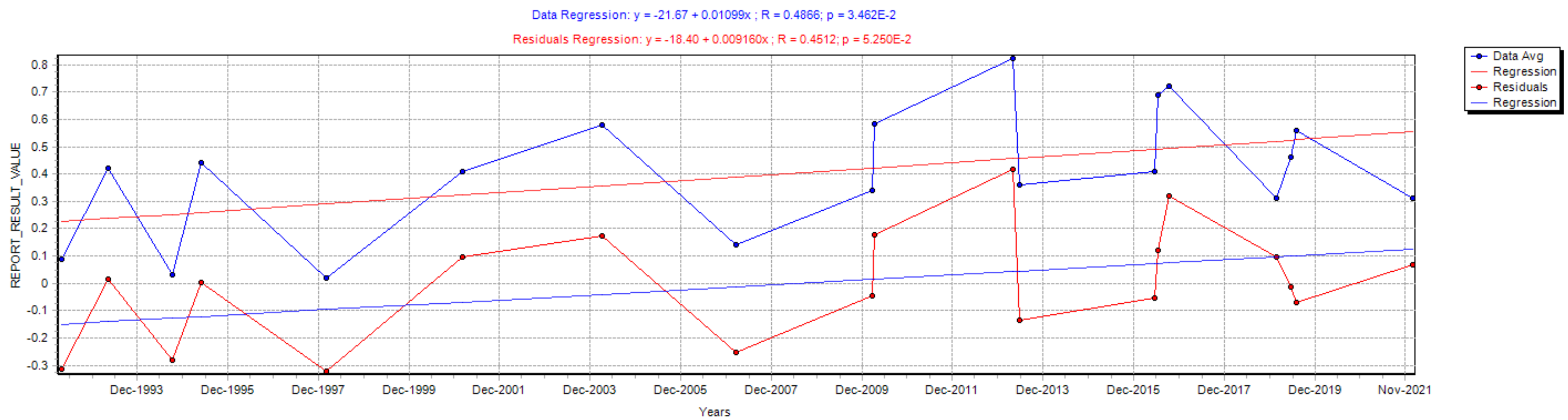


Chart 5-13: Total Phosphorus Trend

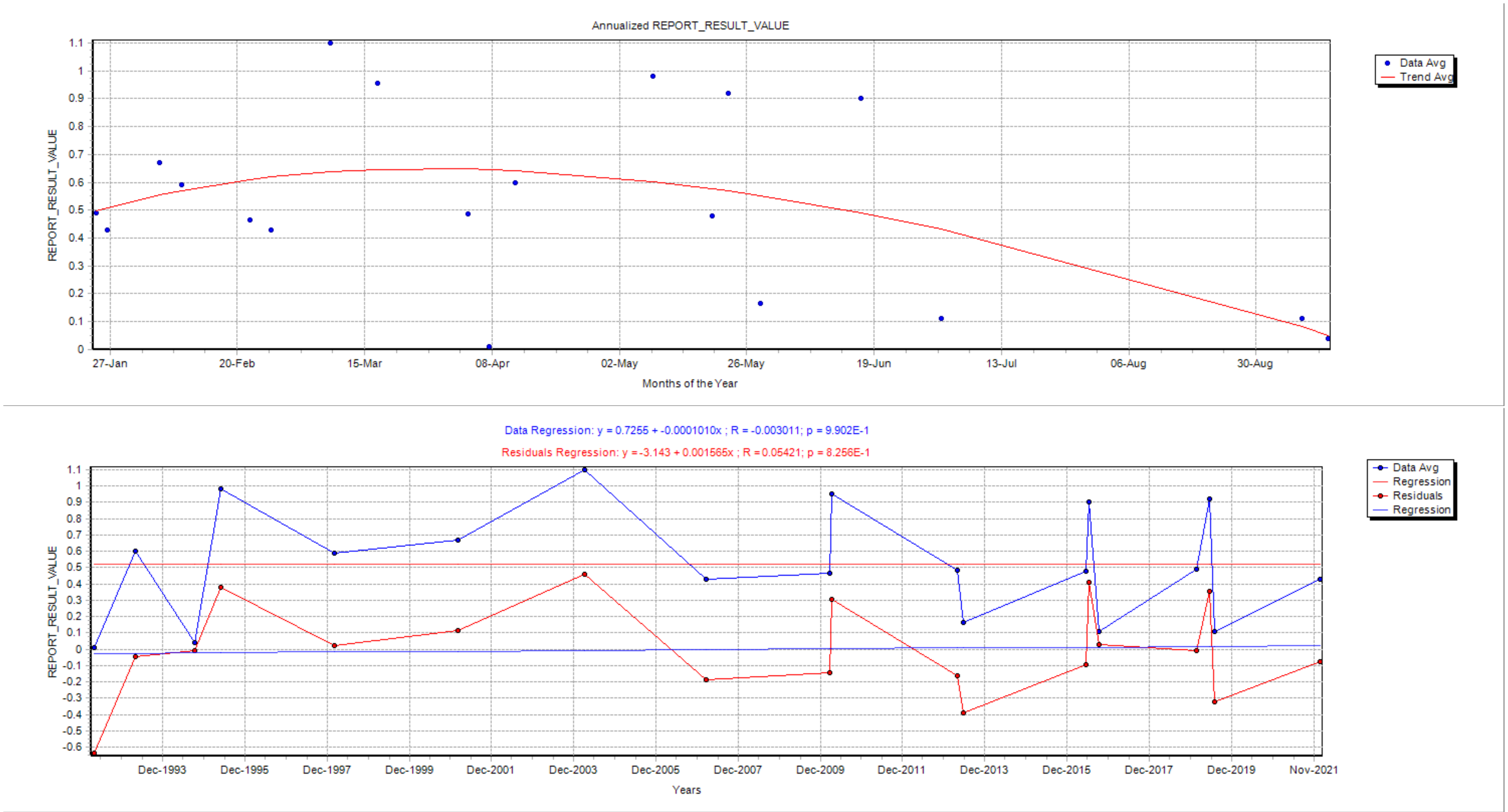
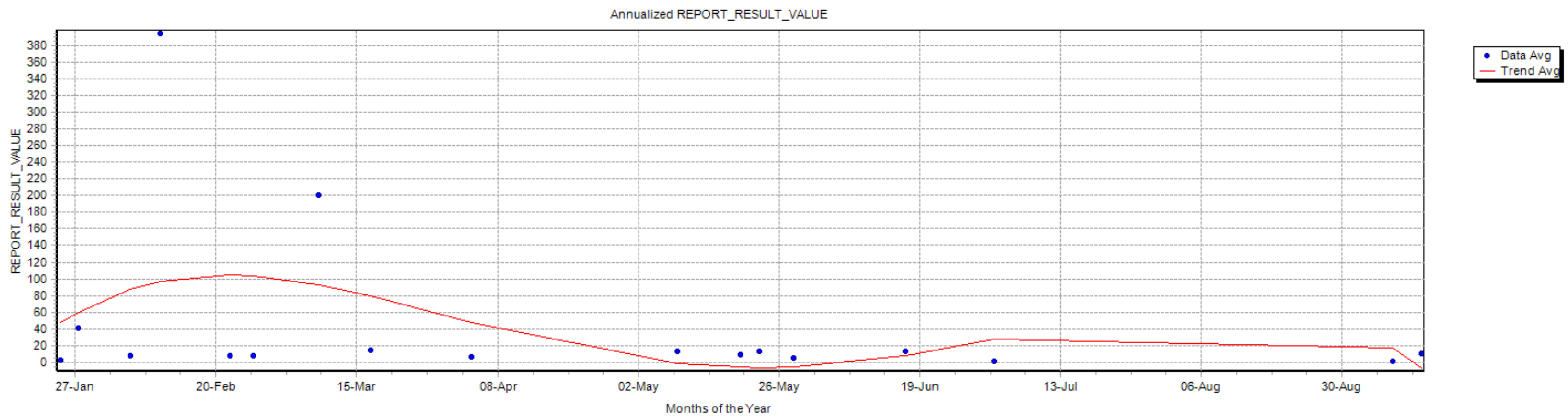


Chart 5-14: Barium Trend



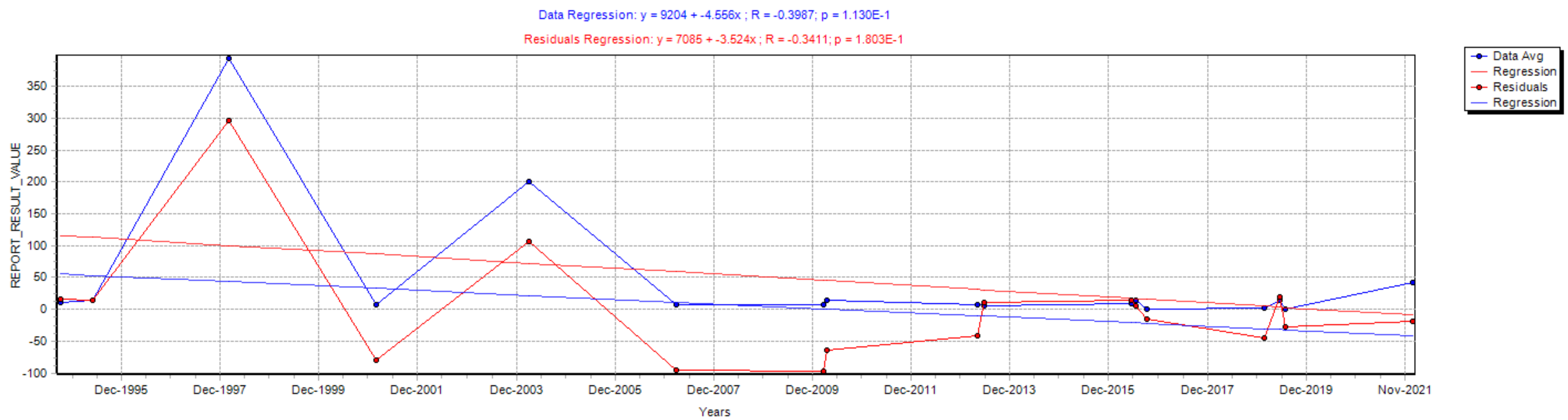
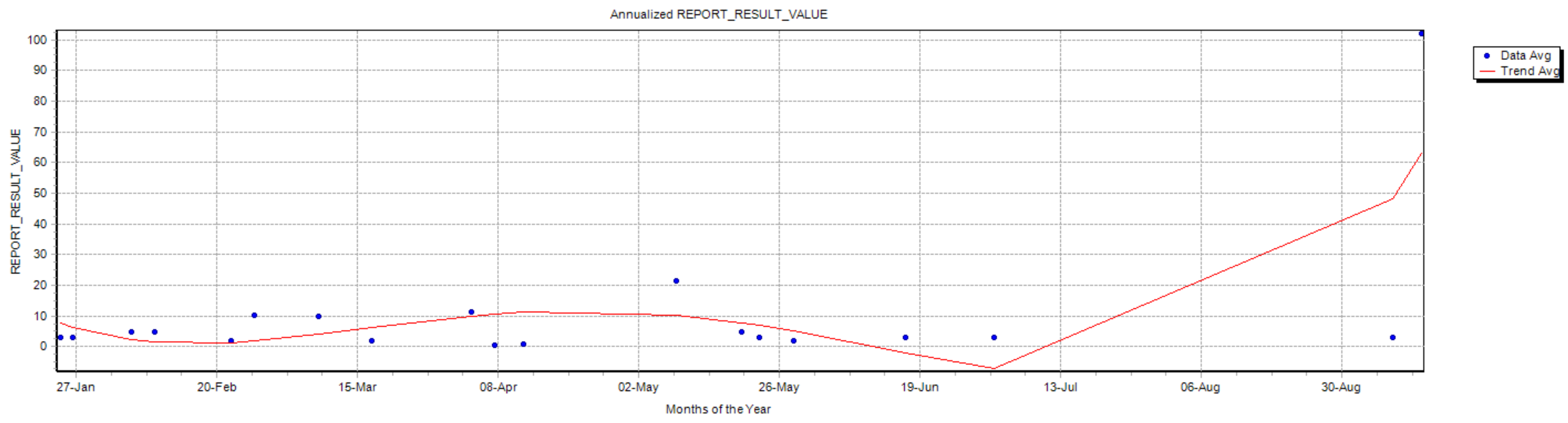


Chart 5-15: Copper Trend



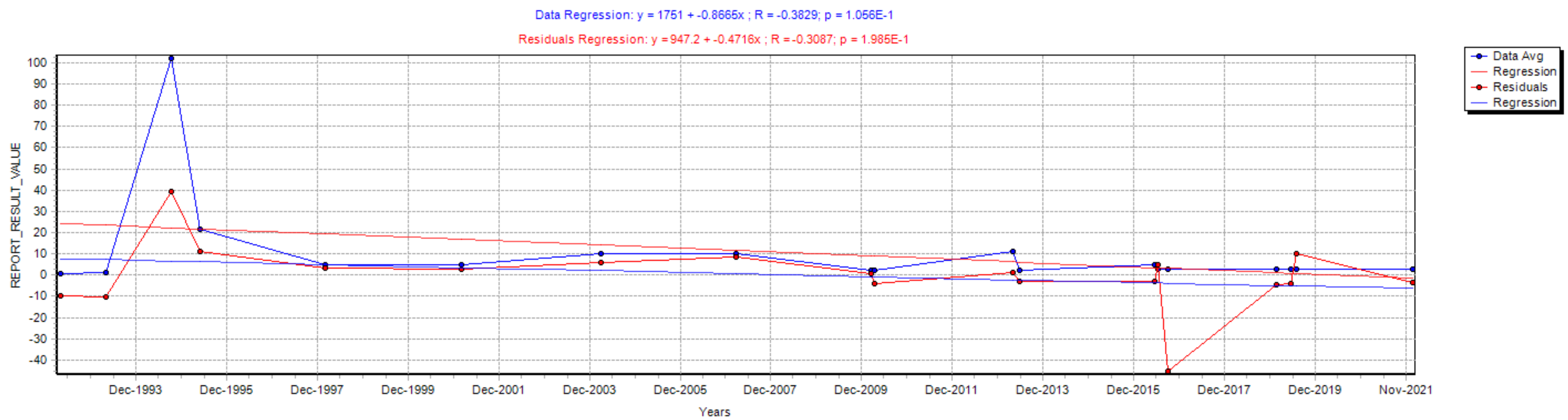
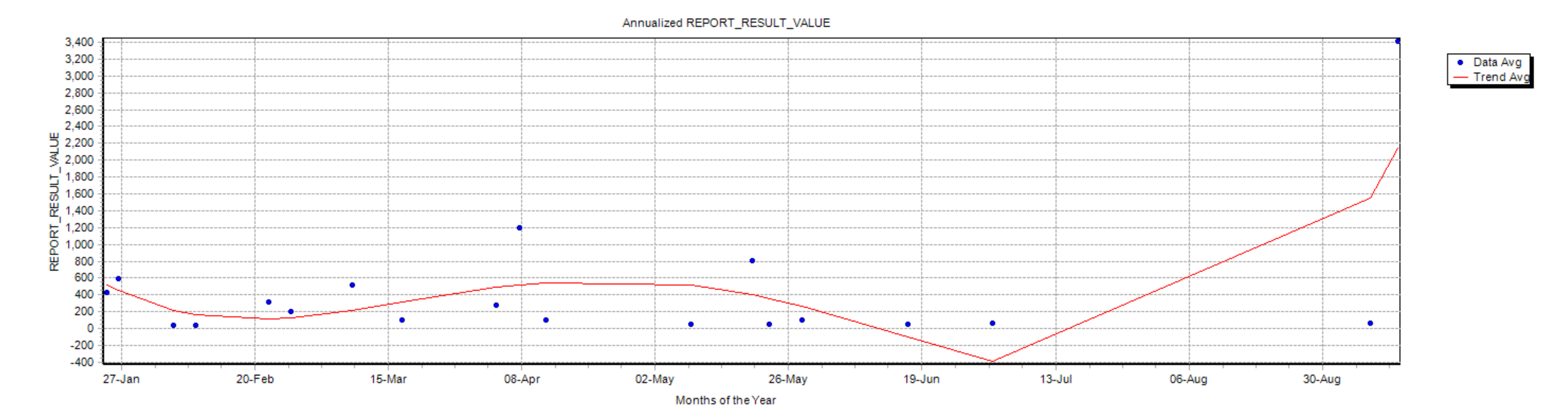


Chart 5-16: Iron Trend



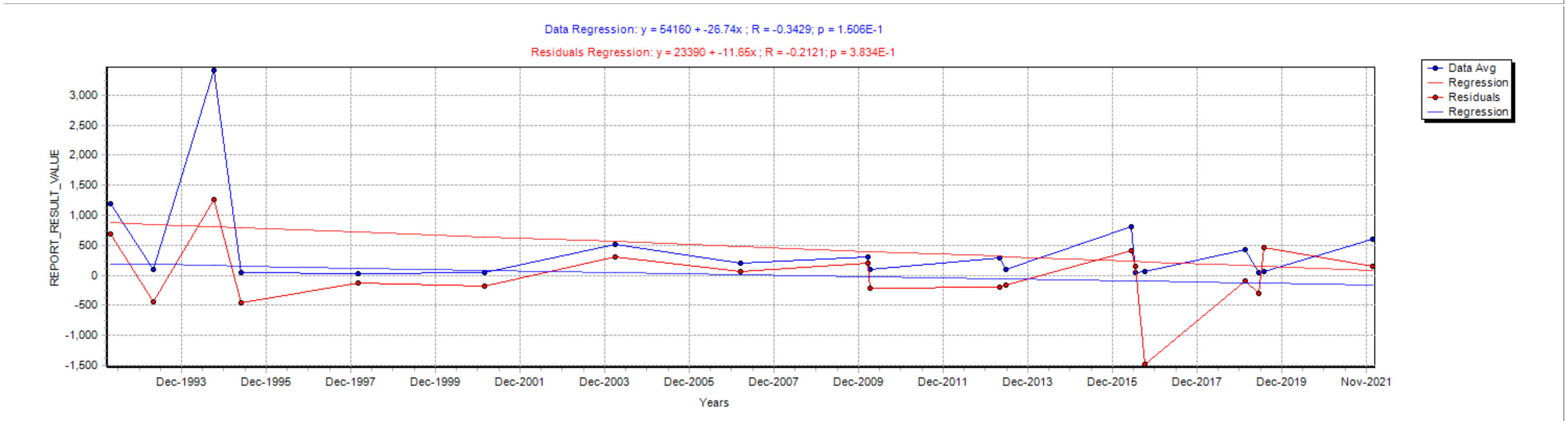


Chart 5-17: Zinc Trend