WILLIAMSON CREEK AQUIFER SUMMARY, 2021
AQUIFER SAMPLING AND ASSESSMENT PROGRAM

DEQ
LOUISIANA

APPENDIX 11 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 freshwater 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, 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 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 Williamson Creek aquifer during the 2021 state fiscal year (July 1, 2020 - June 30, 2021). This summary will become Appendix II of ASSET Program Triennial Summary Report for 2021.

These data show that in FY2021, six wells were sampled which produce from the Williamson Creek aquifer. Four of the six are classified as public supply, and two are classified as industrial. The wells are located in four parishes in central and southwest areas of the state.

Figure 11-1 shows the geographic locations of the Williamson Creek aquifer and the associated wells, whereas Table 11-1 lists the wells in the aquifer along with their total depths, use made of produced waters and date sampled.

Well data, including well location and aquifer assignment, for registered water wells were obtained from the Louisiana Department of Natural Resources water well registration data file.

GEOLOGY

The Williamson Creek member consists of sands, silts, silty clays, and some gravel. The Williamson Creek member, along with the Carnahan Bayou and Dough Hills, are 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 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 Williamson Creek varies between 20-260 feet/day.

The maximum depths of occurrence of freshwater in the Williamson Creek range from 175 feet above sea level, to 2,450 feet below sea level. The range of thickness of the fresh water interval in the Williamson Creek is 50 to 1,250 feet. The depths of the Williamson Creek wells monitored in conjunction with the ASSET Program range from 355 to 1,657 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 11-2. The inorganic (total metals) parameters analyzed in the laboratory are listed in Table 11-3. 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 11-8, 11-9 and 11-10 list the target analytes for volatiles, semi-volatiles and pesticides/PCBs, respectively.

Tables 11-4 and 11-5 provide a statistical overview of field and conventional data, and inorganic data for the Williamson Creek aquifer, listing the minimum, maximum, and average results for these parameters collected in the FY 2021 sampling. Tables 11-6 and 11-7 compare these same parameter averages to historical ASSET-derived data for the Williamson Creek 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 11-1 through 11-18 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 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 MCLs (SMCLs), which are non-enforceable taste, odor, or appearance guidelines. Field and laboratory data contained in Tables 11-2 and 11-3 show that only five SMCLs were exceeded in four of the six wells sampled in the Williamson Creek aquifer.

Field and Conventional Parameters

Table 11-2 shows the field and conventional parameters for which samples are collected at each well and the analytical results for those parameters. Table 11-4 provides an overview of this data for the Williamson Creek aquifer, listing the minimum, maximum, and average results for these parameters.

Federal Primary Drinking Water Standards: A review of the analysis listed in Table 11-2 shows that no primary MCL was exceeded for field or conventional parameters for this reporting period. ASSET wells reporting turbidity level 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 11-2 shows that one well exceeded the SMCL for color:

Color (SMCL = 15 Color Units (PCU)):

V-420	15 PC

Inorganic Parameters

Table 11-3 shows the inorganic (total metals) parameters for which samples are collected at each well and the analytical results for those parameters. Table 11-5 provides an overview of inorganic data for the Williamson Creek aquifer, listing the minimum, maximum, and average results for these parameters.

Federal Primary Drinking Water Standards: A review of the analyses listed on Table 11-3 shows that no primary MCL was exceeded for total metals.

Federal Secondary Drinking Water Standards: Laboratory data contained in Table 11-3 shows that four wells exceeded the secondary MCL for iron

Iron (SMCL = 300 µg/L):

CO-163	424 µg/L
R-1099	302 µg/L
R-1362	1770 µg/L
V-420	7260 µg/L

Volatile Organic Compounds

Table 11-8 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 VOC detections at or above their respective detection limits during the FY 2021 sampling of the Williamson Creek aquifer.

Semi-Volatile Organic Compounds

Table 11-9 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 SVOC detections at or above its detection limit during the FY 2021 sampling of the Williamson Creek aquifer.

Pesticides and PCBs

Table 11-10 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 pesticide or PCB detections at or above its detection limit during the FY 2021 sampling of the Williamson Creek 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 Williamson Creek aquifer exhibit some changes when comparing current data to that of the seven previous sampling rotations. These comparisons can be found in Tables 11-6 and 11-7, and in Charts 11-1 to 11-18 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, three analytes have shown a general increase in average concentration. These analytes are: total Kjeldahl nitrogen, salinity, and pH. All other analyte averages have remained consistent, or have been non-detect for this period. The number of secondary exceedances in the Williamson Creek aquifer continue to remain low. The previous sampling in FY 2018 showed five SMCL exceedances, while there were five in the FY 2021 sampling.

SUMMARY AND RECOMMENDATIONS

In summary, the data show that the ground water produced from this aquifer is moderately hard[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 2021 monitoring of the Williamson Creek 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 five SMCL exceedances.

Comparison to historical ASSET-derived data shows some change in the quality or characteristics of the Williamson Creek aquifer, with three parameters showing consistent increases in concentration and the remaining parameters showing only slight to no consistent change.

It is recommended that the wells assigned to the Williamson Creek aquifer be re-sampled as planned, in approximately three years. In addition, several wells should be added to the six 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 11-1: List of Wells Sampled, Williamson Creek Aquifer – FY 2021

Well ID	Parish	Date	Owner	Depth (Feet)	Well Use
BE-407	Beauregard	06/22/2021	PCA	1,657	INDUSTRIAL
CO-163	Concordia	8/19/2020	U. S. ARMY CORPS OF ENG.	513	PUBLIC SUPPLY
R-932	Rapides	06/22/2021	CITY OF ALEXANDRIA	466	PUBLIC SUPPLY
R-1099	Rapides	06/24/2021	KOLIN-RUBY WISE	355	PUBLIC SUPPLY
R-1362	Rapides	06/24/2021	INTERNATIONAL PAPER CO	402	INDUSTRIAL
V-420	Vernon	06/22/2021	U.S. ARMY/FORT POLK	920	PUBLIC SUPPLY

Table 11-2: Summary of Field and Conventional Data, Williamson Creek Aquifer – FY 2021

Well ID	pH SU	Sal ppt	Sp Cond µmhos/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 mmhos/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												
BE-407	8.34	0.18	0.394	29.50	254	160	7.90	< DL	22	< DL	0.45	0.18	447	8.80	245	0.66	< DL	0.21
CO-163	7.41	0.30	0.614	23.00	399	142	93.90	< DL	24	< DL	0.48	0.17	684	< DL	165	0.67	< DL	2.70
R-1099	6.60	0.17	0.352	21.89	229	73.70	47	< DL	32	< DL	0.26	0.08	374	6.90	210	0.29	< DL	1.10
R-932	8.17	0.23	0.488	23.79	317	198	12.10	< DL	16	< DL	0.33	0.17	502	1.10	235	1.30	< DL	0.71
R-932*	8.17	0.23	0.488	23.84	317	207	12.10	< DL	14	< DL	0.29	0.12	502	1	235	0.35	< DL	0.20
R-1362	6.88	0.26	0.541	23.49	352	96.40	74.20	< DL	42	< DL	0.33	0.10	551	27	300	0.81	< DL	1
V-420	7.01	0.15	0.307	26.45	200	17	17.30	15	28	< DL	0.31	0.23	269	< DL	185	2.20	< DL	8

*Duplicate Sample

Shaded cells exceed EPA Secondary Standards

Table 11-3: Summary of Inorganic Data, Williamson Creek Aquifer – FY 2021

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**
BE-407	< DL	< DL	34.70	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
CO-163	< DL	< DL	88.50	< DL	< DL	< DL	< DL	424	2.20	< DL	< DL	< DL	< DL	< DL	417
R-1099	< DL	1.2	52.50	< DL	< DL	< DL	< DL	302	< DL	< DL	< DL	< DL	< DL	< DL	< DL
R-932	< DL	< DL	43.80	< DL	< DL	< DL	< DL	50	< DL	< DL	< DL	< DL	< DL	< DL	< DL
R-932*	< DL	< DL	45.20	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
R-1362	< DL	1.00	66.30	< DL	< DL	2.00	16.80	1770	< DL	< DL	1.90	< DL	< DL	< DL	8.70
V-420	< DL	< DL	54.20	< DL	< DL	< DL	< DL	7260	< DL	< DL	< DL	< DL	< DL	< DL	< DL

*Duplicate Sample

Shaded cells exceed EPA Secondary Standards

Table 11-4: FY 2021 Field and Conventional Statistics, ASSET Wells

	PARAMETER	MINIMUM	MAXIMUM	AVERAGE
FIELD	pH (SU)	6.60	8.34	7.51
	Salinity (ppt)	0.15	0.30	0.22
	Specific Conductance (mmhos/cm)	0.307	0.613	0.454
	Temperature (^{O}C)	21.89	29.50	24.56
	Total Dissolved Solids (g/L)	200	398	295.48
LABORATORY	Alkalinity (mg/L)	17.00	207.00	127.73
	Chloride (mg/L)	7.90	93.90	37.79
	Color (PCU)	< DL	15	< DL
	Hardness (mg/L)	14.00	42.00	25.43
	Nitrite - Nitrate, as N (mg/L)	< DL	< DL	< DL
	Ammonia, as N (mg/L)	0.26	0.48	0.36
	Total Phosphorus (mg/L)	0.08	0.23	0.15
	Specific Conductance (µmhos/cm)	269	684	475.86
	Sulfate (mg/L)	< DL	27	5.98
	Total Dissolved Solids (mg/L)	165	300	230
	Total Kjeldahl Nitrogen (mg/L)	0.29	2.20	0.90
	Total Suspended Solids (mg/L)	< DL	< DL	< DL
	Turbidity (NTU)	0.20	2.70	1.99

Table 11-5: FY 2021 Inorganic Statistics, ASSET Wells

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Antimony (µg/L)	< DL	< DL	< DL
Arsenic (µg/L)	< DL	1.10	< DL
Barium (µg/L)	34.70	88.50	55.03
Beryllium (µg/L)	< DL	< DL	< DL
Cadmium (µg/L)	< DL	< DL	< DL
Chromium (µg/L)	< DL	2.00	< DL
Copper (µg/L)	< DL	< DL	< DL
Iron (µg/L)	< DL	904	1415.14
Lead (µg/L)	< DL	2.20	< DL
Mercury (µg/L)	< DL	< DL	< DL
Nickel (µg/L)	< DL	33.40	6.74
Selenium (µg/L)	< DL	< DL	< DL
Silver (µg/L)	< DL	< DL	< DL
Thallium (µg/L)	< DL	< DL	< DL
Zinc (µg/L)	< DL	417	64.39

Table 11-6: Triennial Field and Conventional Statistics, ASSET Wells

	PARAMETER	AVERAGE VALUES BY FISCAL YEAR								
		FY 1997	FY 2000	FY 2003	FY 2006	FY 2009	FY 2012	FY 2015	FY 2018	FY 2021
FIELD	pH (SU)	6.86	7.83	7.54	No Data	7.68	7.58	7.40	7.26	7.51
	Salinity (ppt)	0.18	0.20	0.18	0.21	0.18	0.20	0.21	0.20	0.22
	Specific Conductance (mmhos/cm)	0.369	0.424	0.384	0.440	0.380	0.420	0.435	0.423	0.454
	Temperature (^{O}C)	23.82	23.12	24.00	25.27	24.19	22.84	24.38	20.78	24.56
	Total Dissolved Solids (g/L)	-	-	-	-	0.250	0.280	0.282	0.275	295.48
LABORATORY	Alkalinity (mg/L)	136	150	140	154	158	143	120	190	127.73
	Chloride (mg/L)	38.7	37.0	32.3	41.5	36.0	44.1	45.7	41.8	37.79
	Color (PCU)	12	< DL	< DL	15	< DL	3	5	6	< DL
	Hardness (mg/L)	31	40	35	34	39	31	40	51	25.43
	Nitrite - Nitrate, as N (mg/L)	< DL	0.15	< DL	< DL	< DL	0.02	0.31	0.05	< DL
	Ammonia, as N (mg/L)	0.36	0.19	0.25	0.33	0.31	0.32	0.28	0.26	0.36
	Total Phosphorus (mg/L)	0.30	0.20	0.18	0.15	0.15	0.18	0.18	0.17	0.15
	Specific Conductance (μmhos/cm)	386	399	370	441	411	505	428	416	475.86
	Sulfate (mg/L)	7.2	4.6	4.6	8.0	6.6	3.7	7.6	4.6	5.98
	Total Dissolved Solids (mg/L)	211	273	236	285	260	256	266	241	230
	Total Kjeldahl Nitrogen (mg/L)	0.32	0.40	0.39	0.70	0.30	0.43	0.48	0.55	0.90
	Total Suspended Solids (mg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
	Turbidity (NTU)	1.2	6.0	1.2	2.6	< DL	2.8	0.4	0.62	1.99

Table 11-7: Triennial Inorganic Statistics, ASSET Wells

PARAMETER	AVERAGE VALUES BY FISCAL YEAR								
	FY 1997	FY 2000	FY 2003	FY 2006	FY 2009	FY 2012	FY 2015	FY 2018	FY 2021
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)	48	112	90	92	90	98	98	94.8	55.03
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)	9.70	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Iron (μg/L)	466	115	380	642	162	364	226	328	1415.14
Lead (μg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Mercury (μg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Nickel (μg/L)	9.2	< DL	< DL	< DL	< DL	< DL	< DL	< DL	6.74
Selenium (μg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Silver (μg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Thallium (μg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Zinc (μg/L)	298	245	107	114	64	44	212	148	64.39

Table 11-8: 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 11-9: 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

SVOC ANAYTICAL PARAMETERS	METHOD	REPORTING LIMIT (µg/L)
HEXACHLOROBENZENE	625	5.0
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 11-10: 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 11-1: Location Plat, Williamson Creek Aquifer

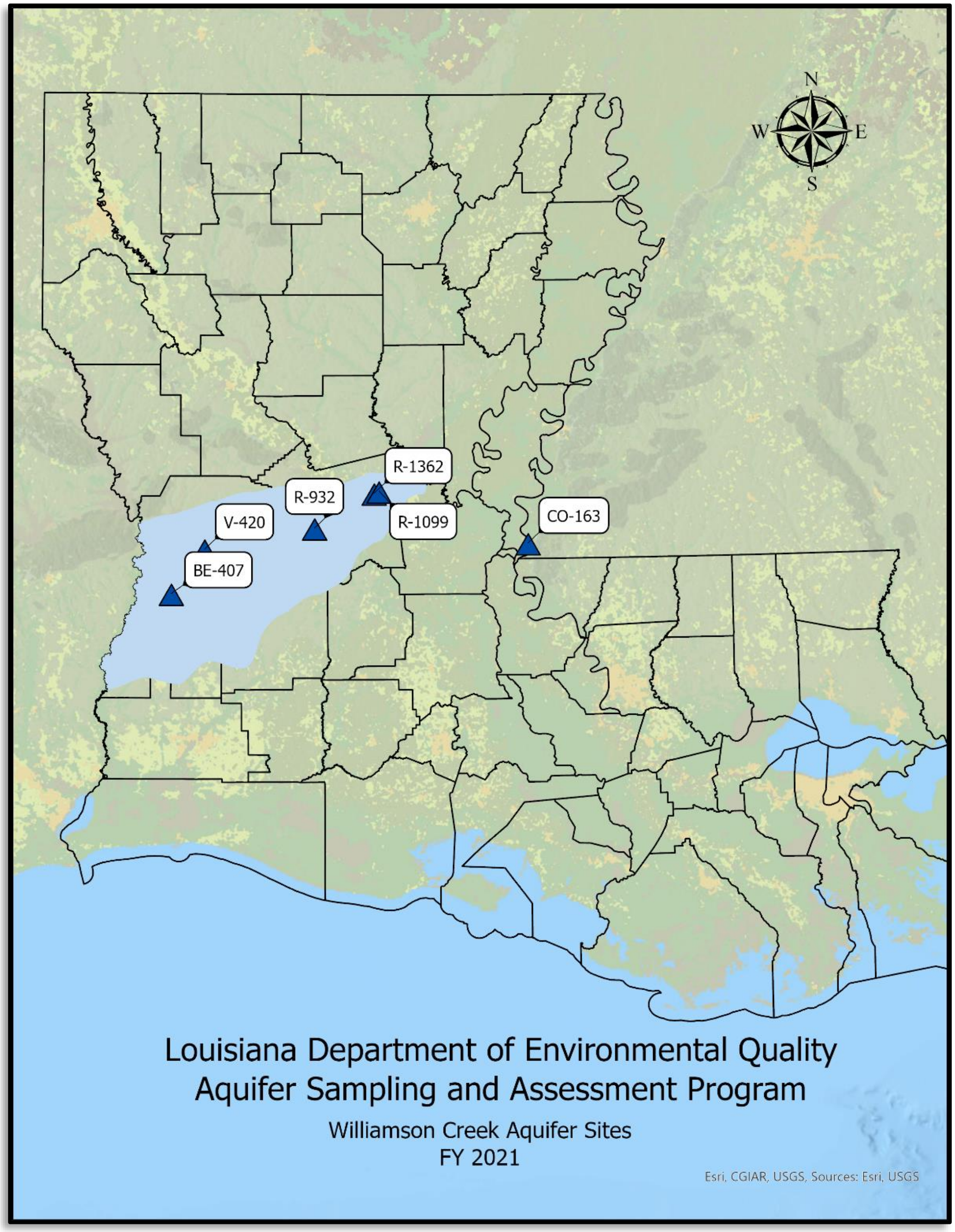
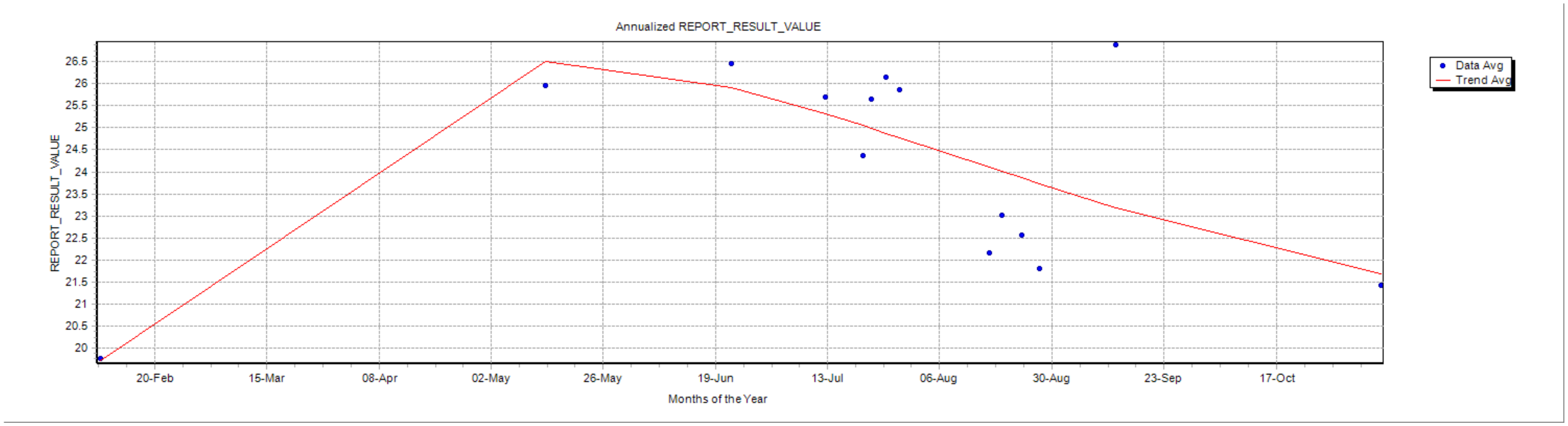


Chart 11-1: Field Temperature Trend



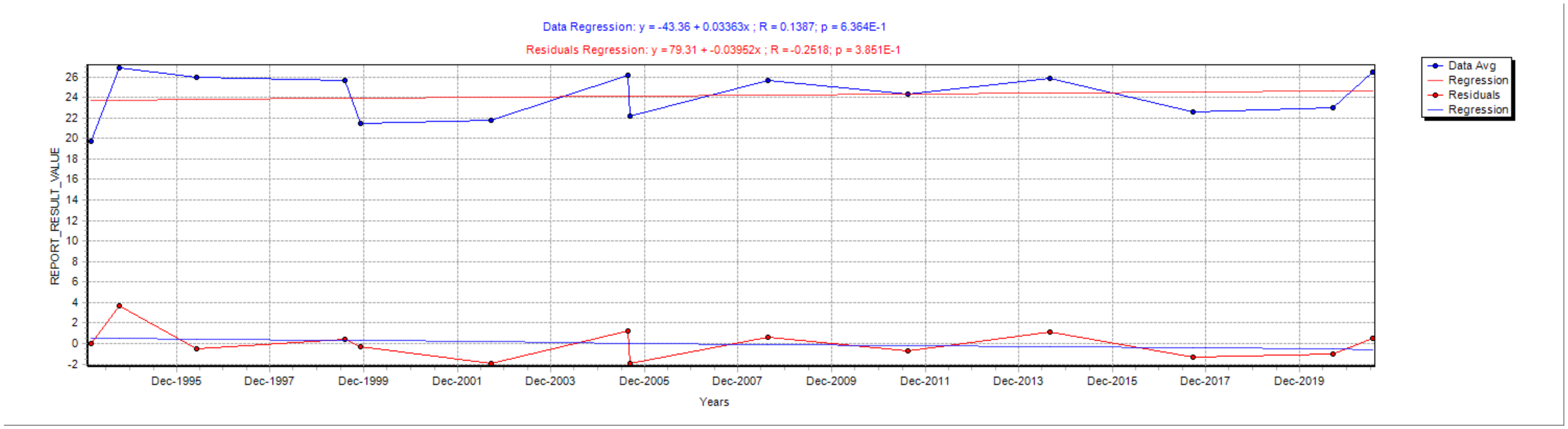
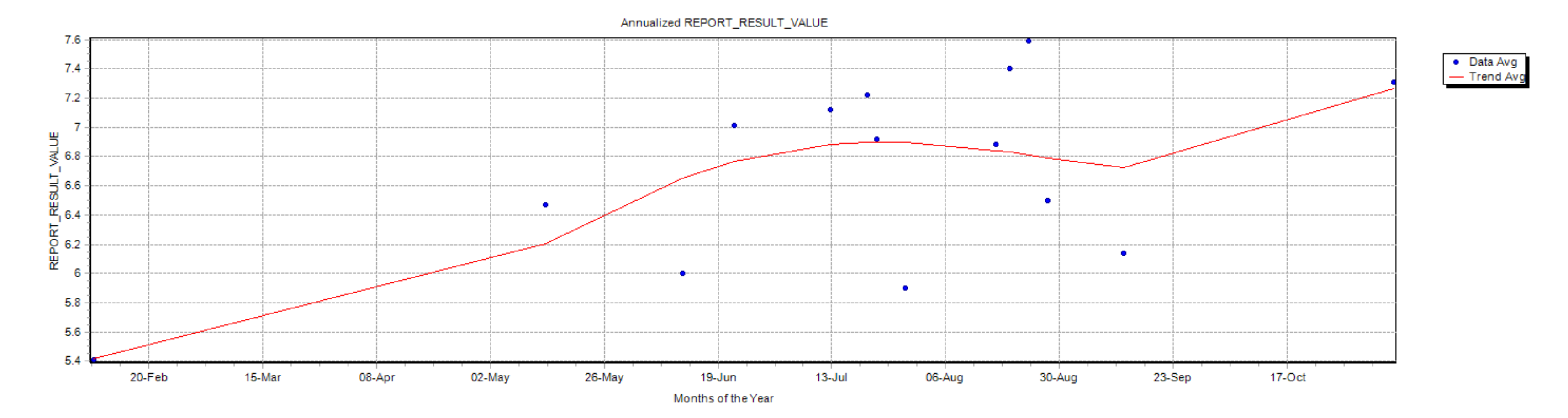


Chart 11-2: Field pH Trend



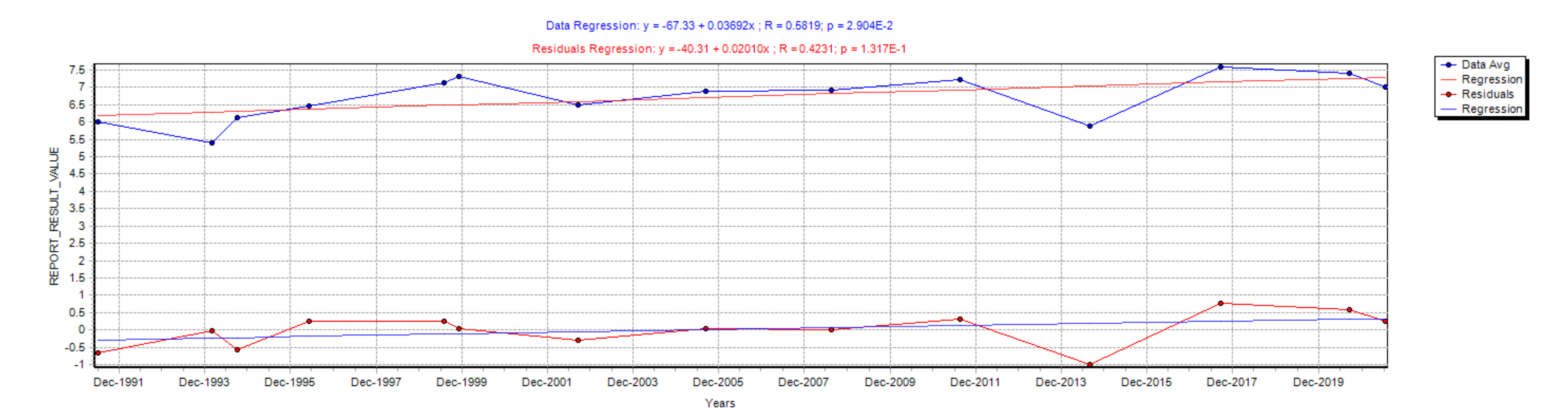
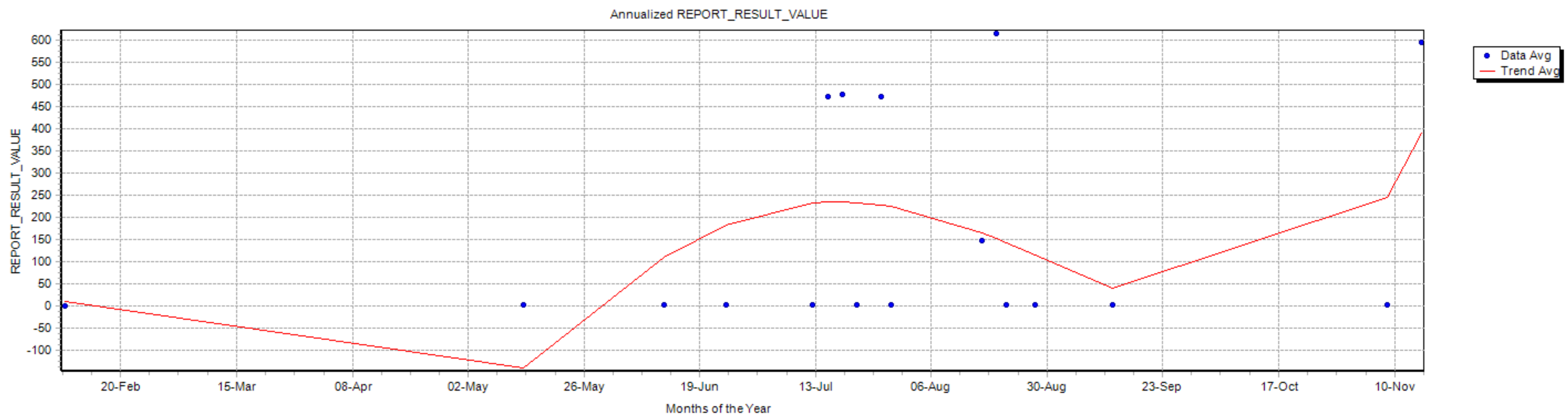


Chart 11-3: Specific Conductance Trend



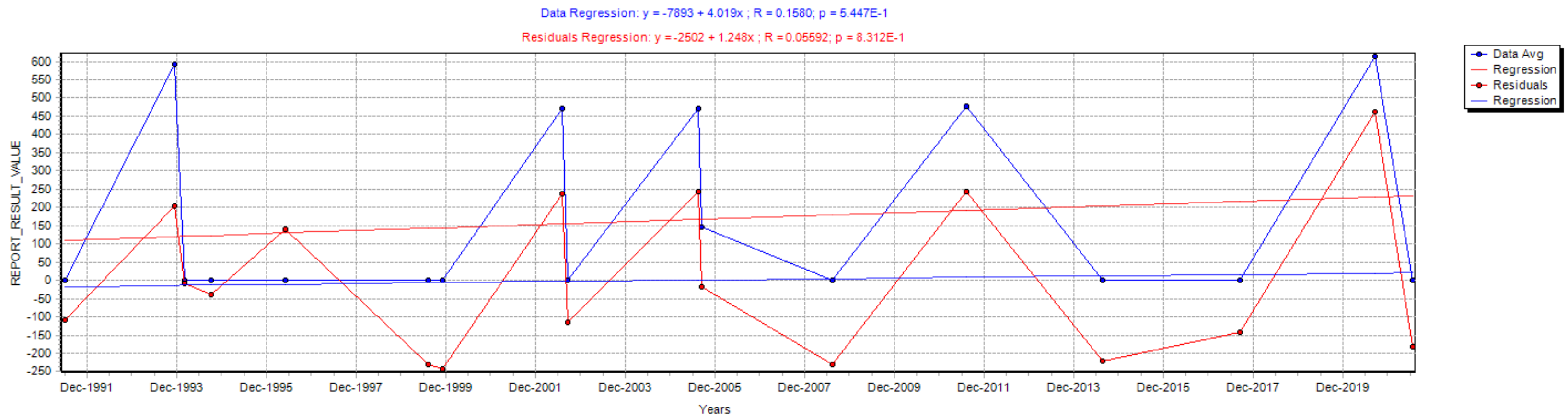
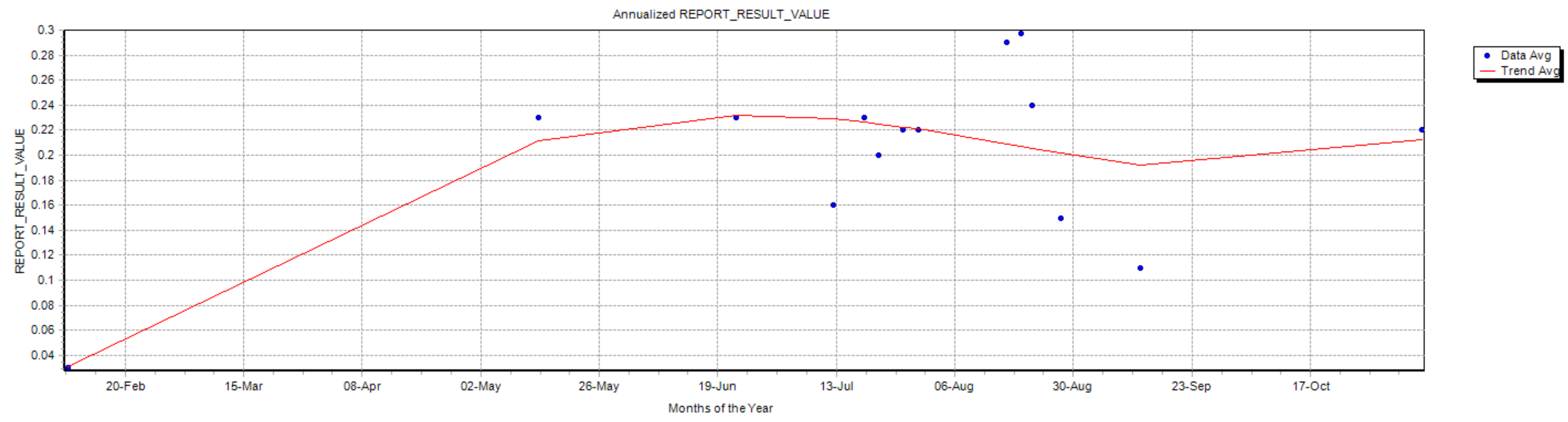


Chart 11-4: Field Salinity Trend



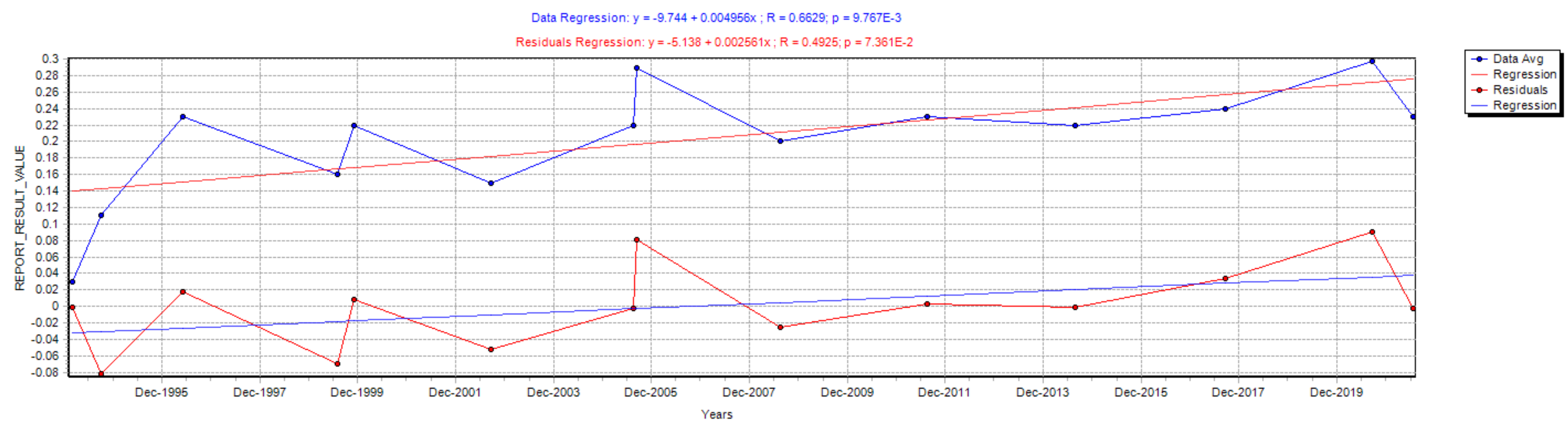
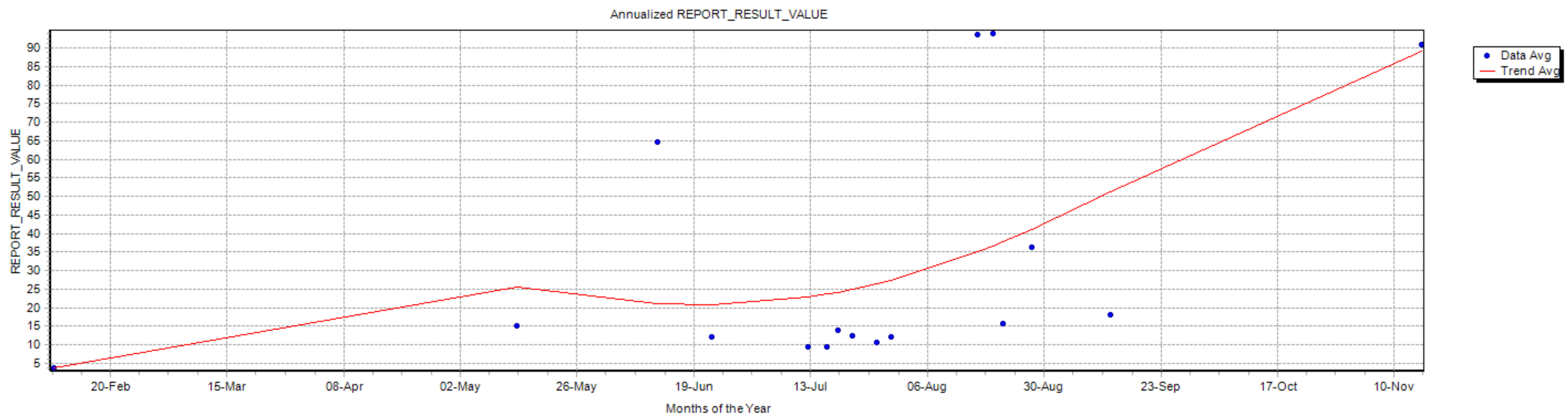


Chart 11-5: Chloride Trend



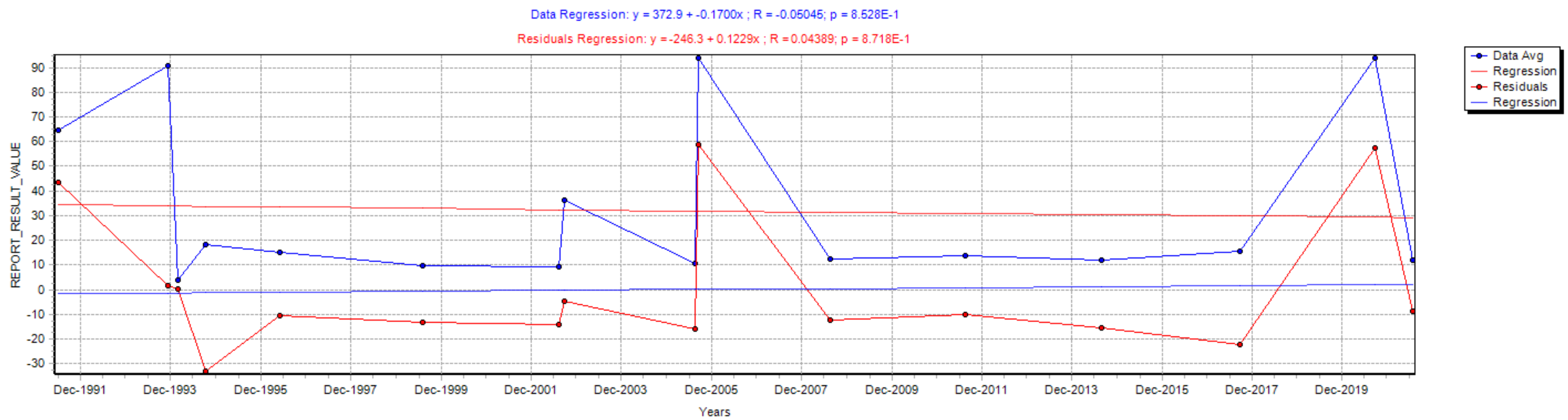
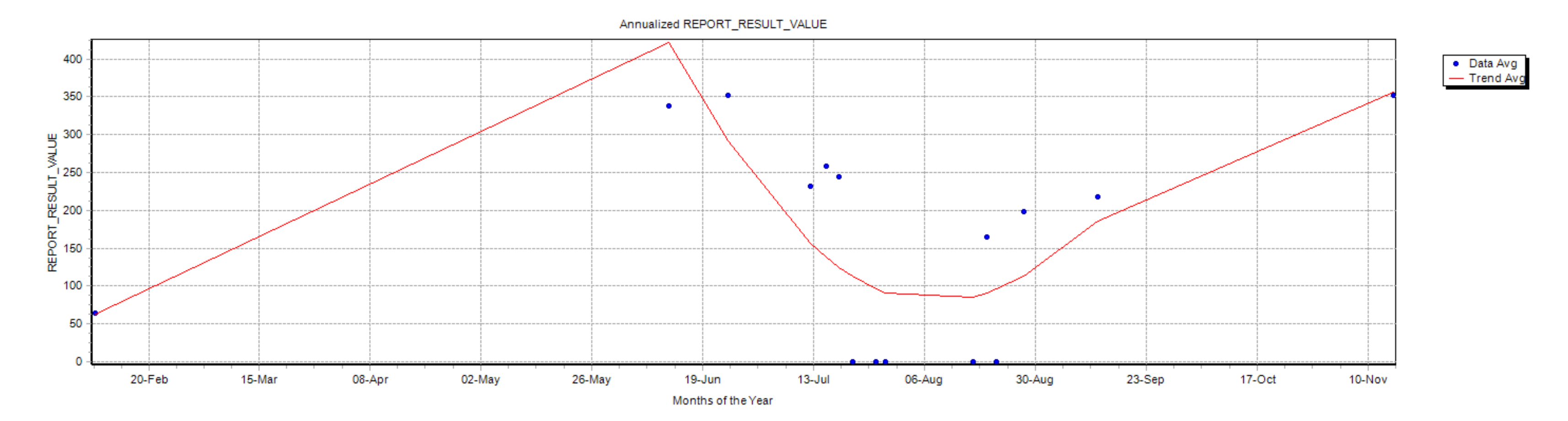


Chart 11-6: Total Dissolved Solids Trend



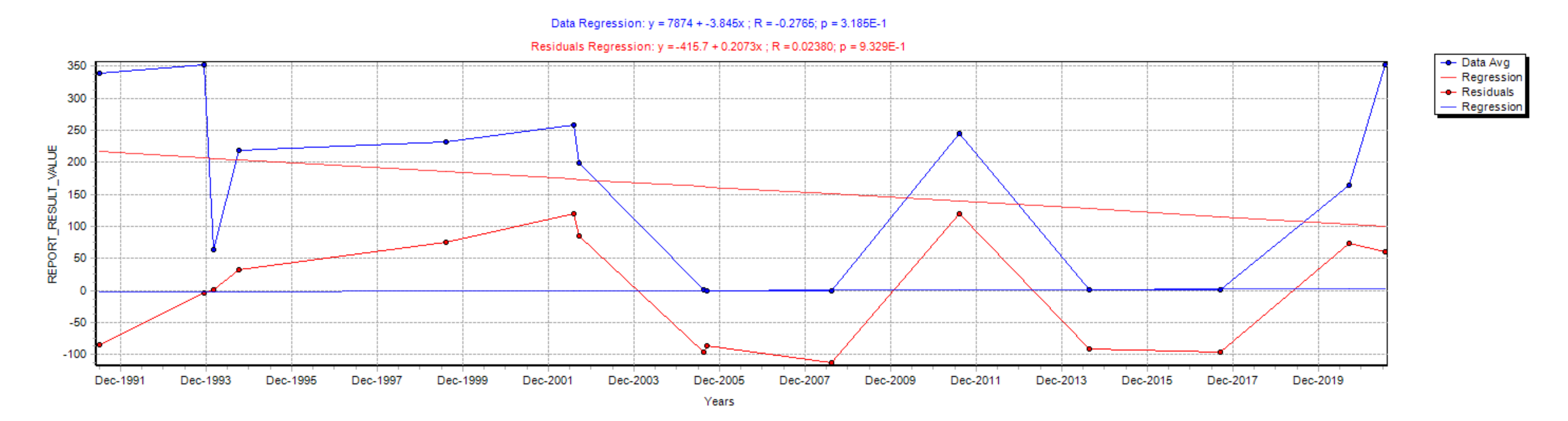
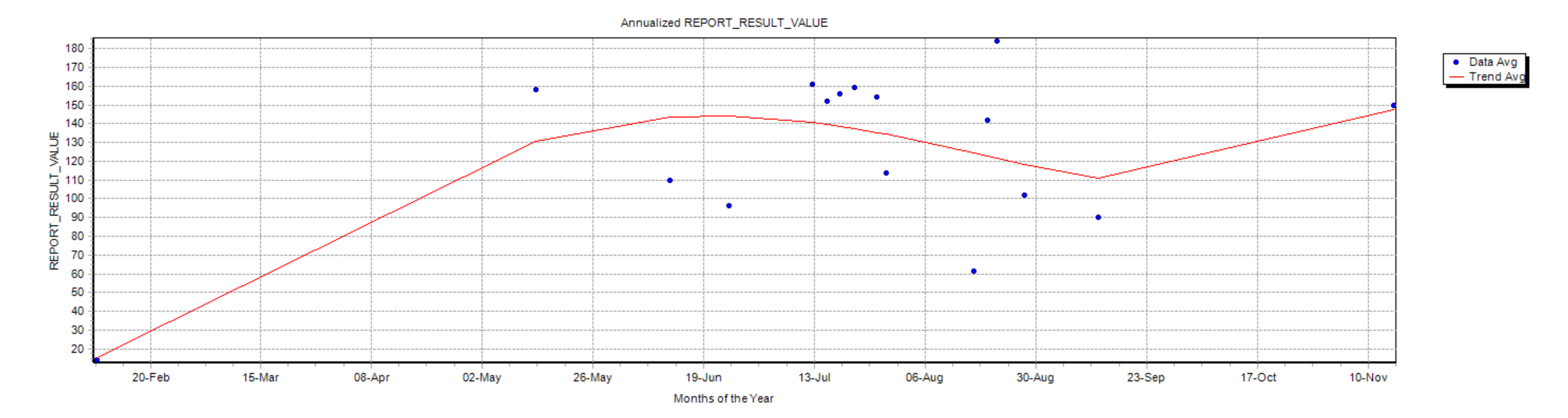


Chart 11-7: Alkalinity Trend



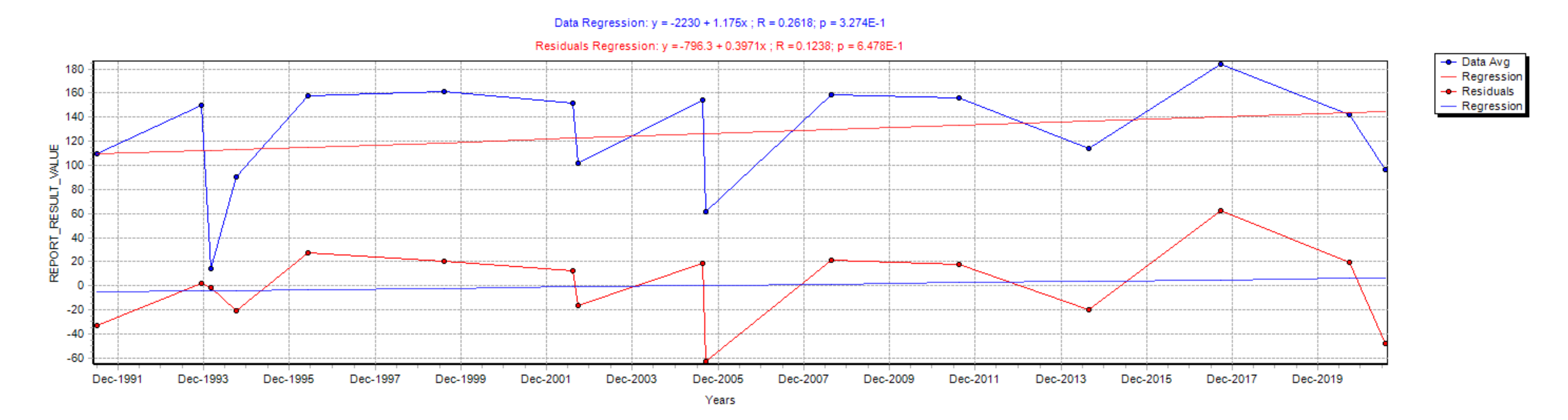
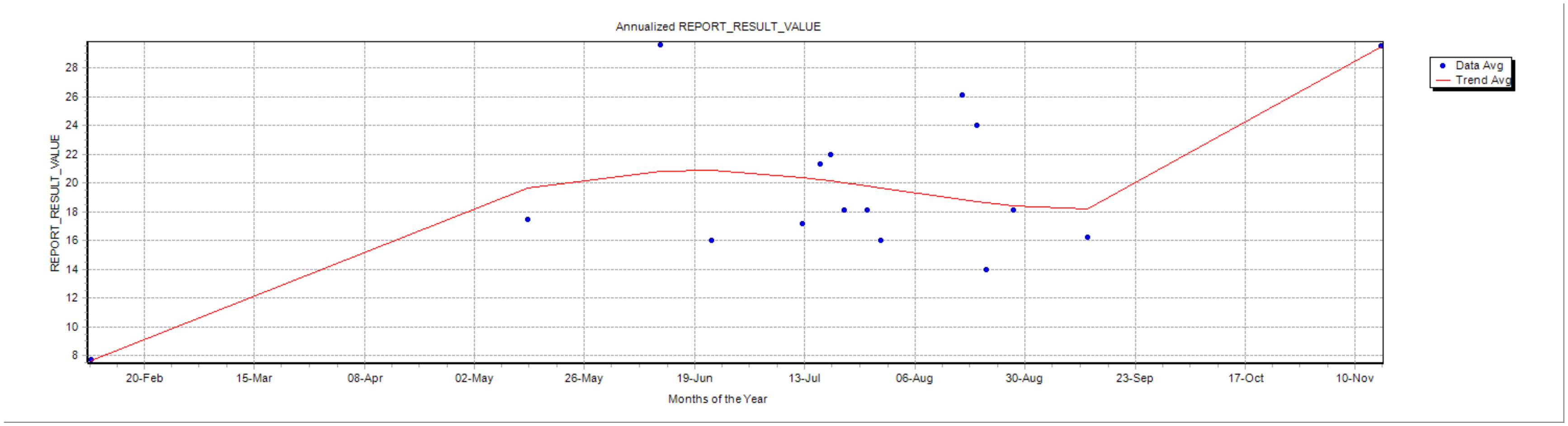


Chart 11-8: Hardness Trend



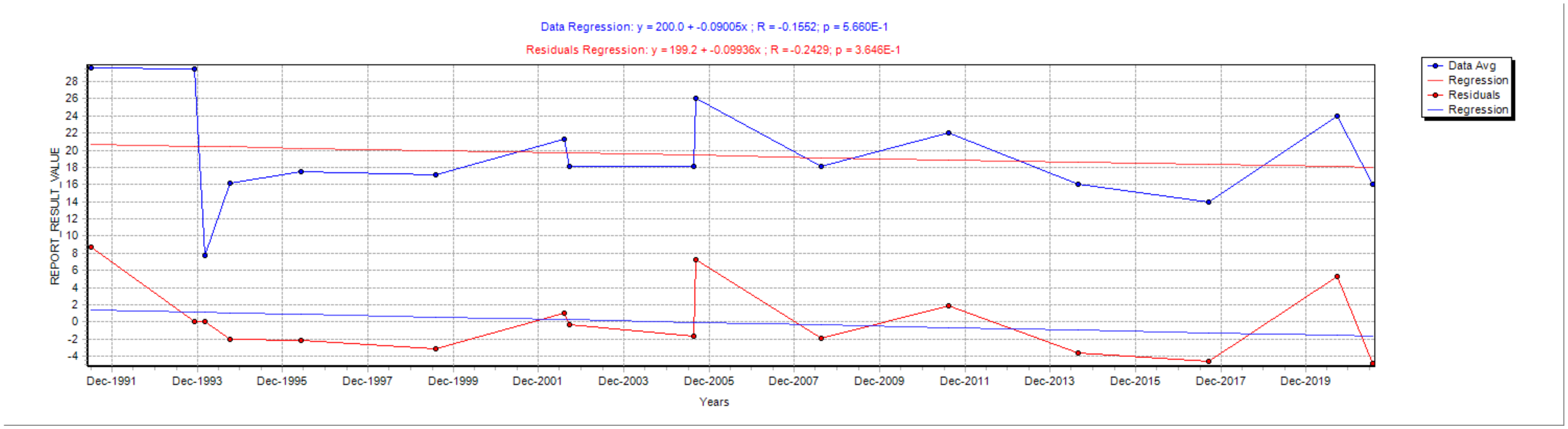
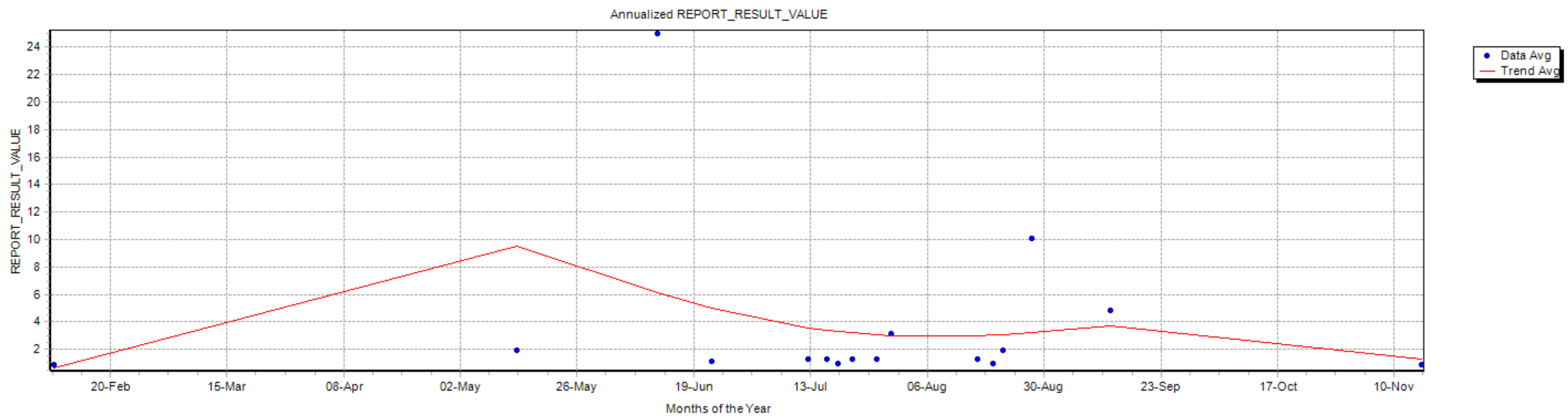


Chart 11-9: Sulfate Trend



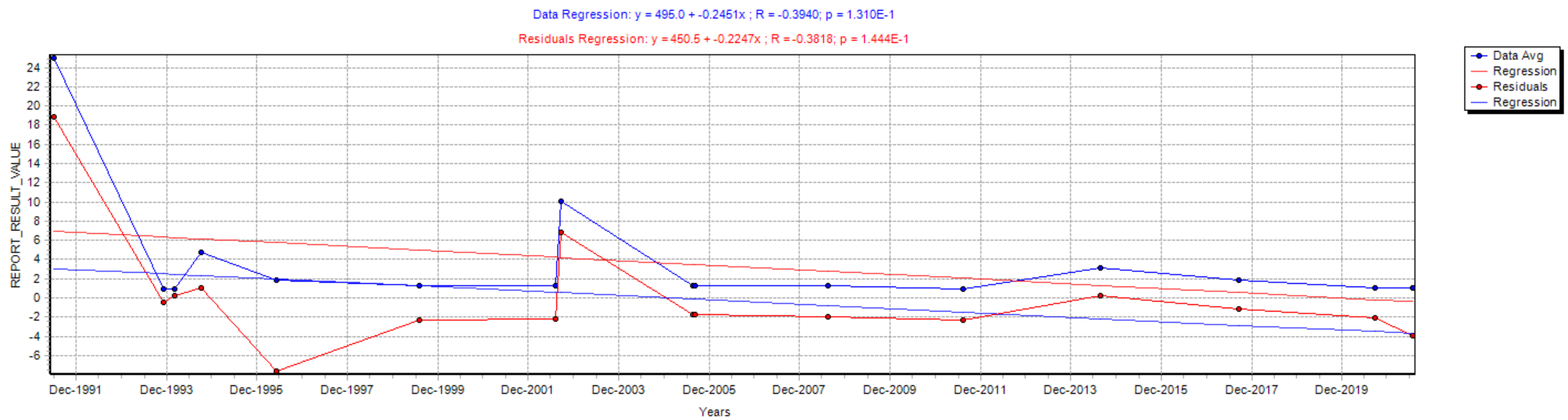
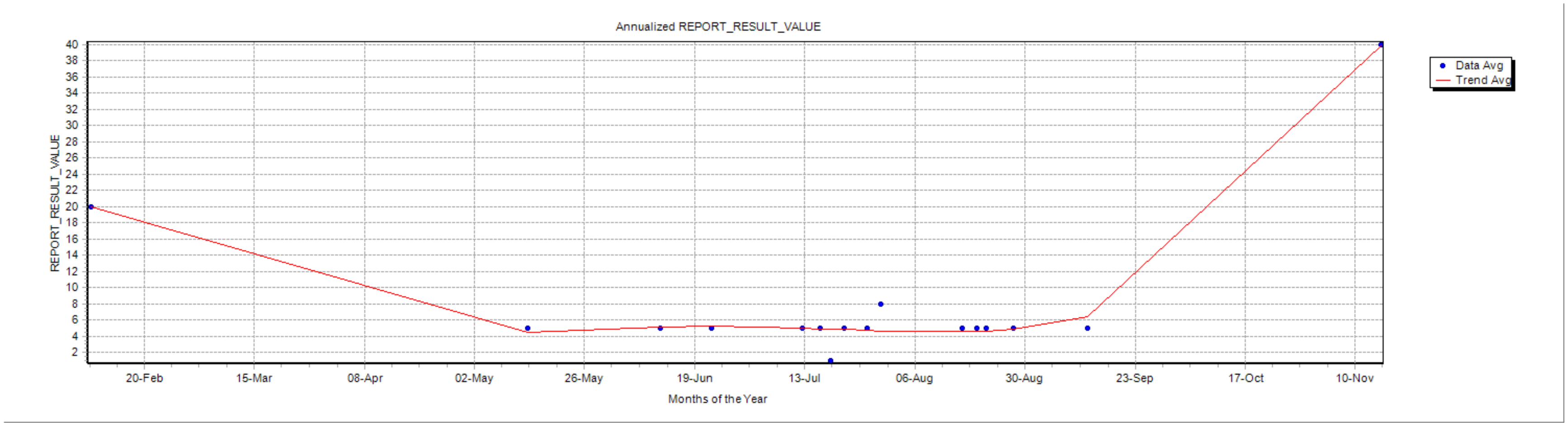


Chart 11-10: Color Trend



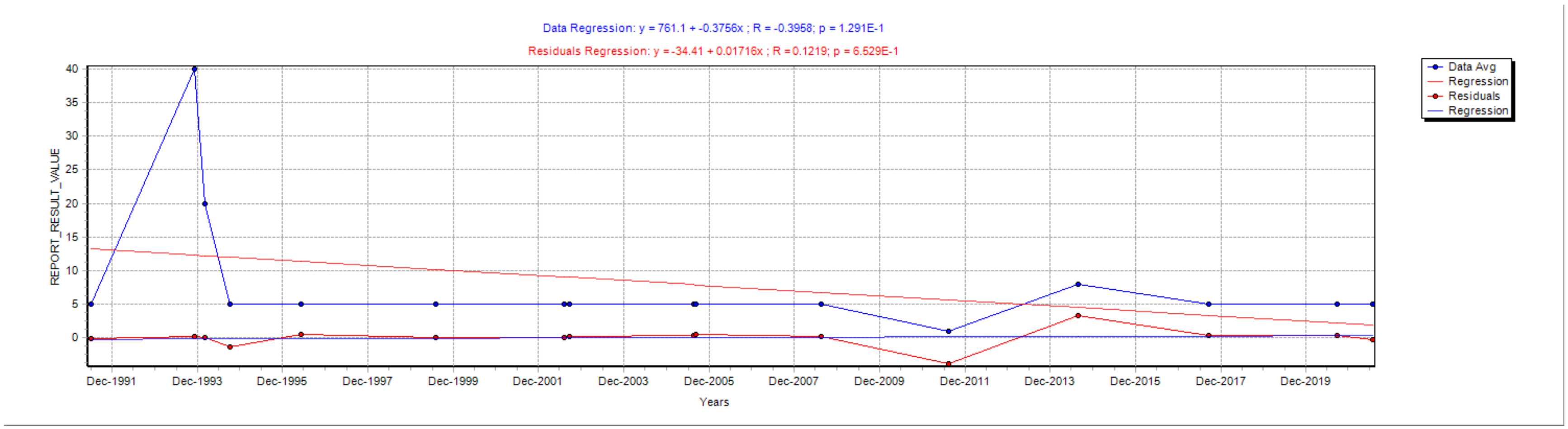
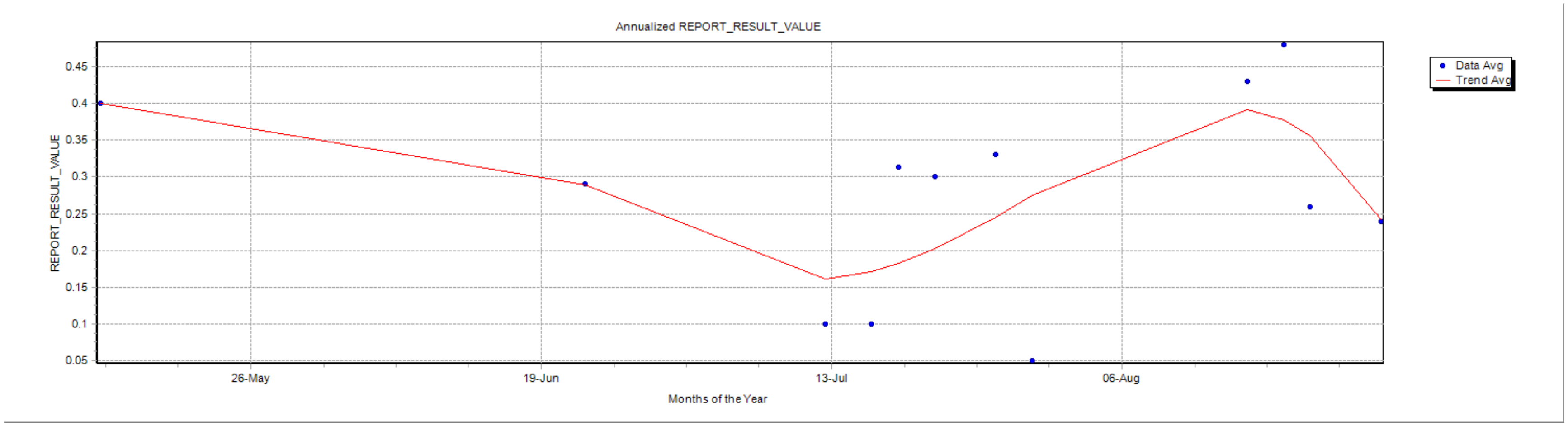


Chart 11-11: Ammonia Trend



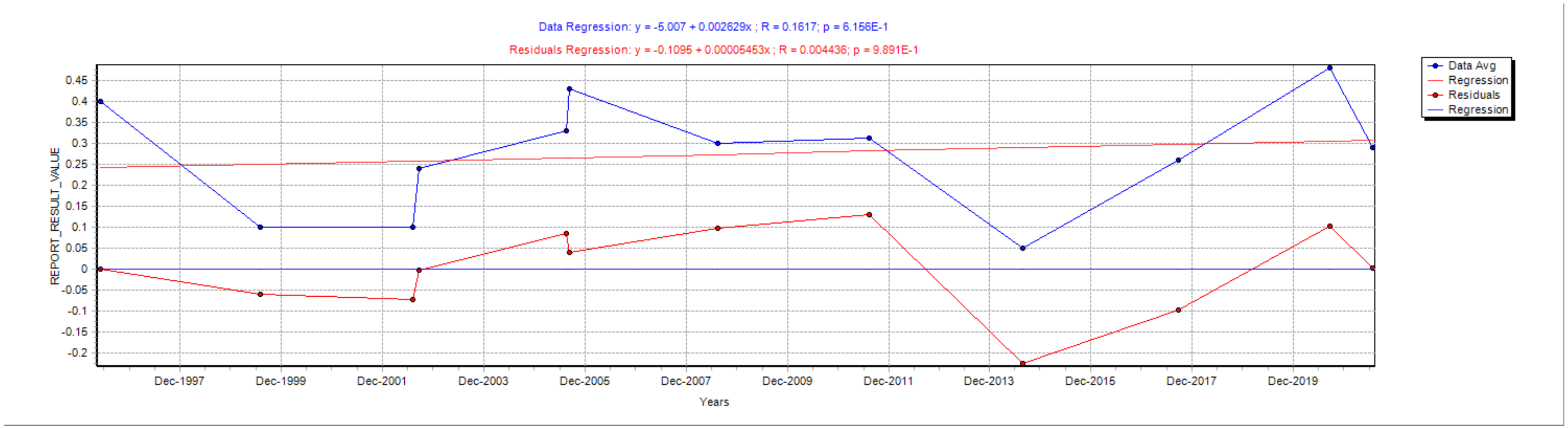
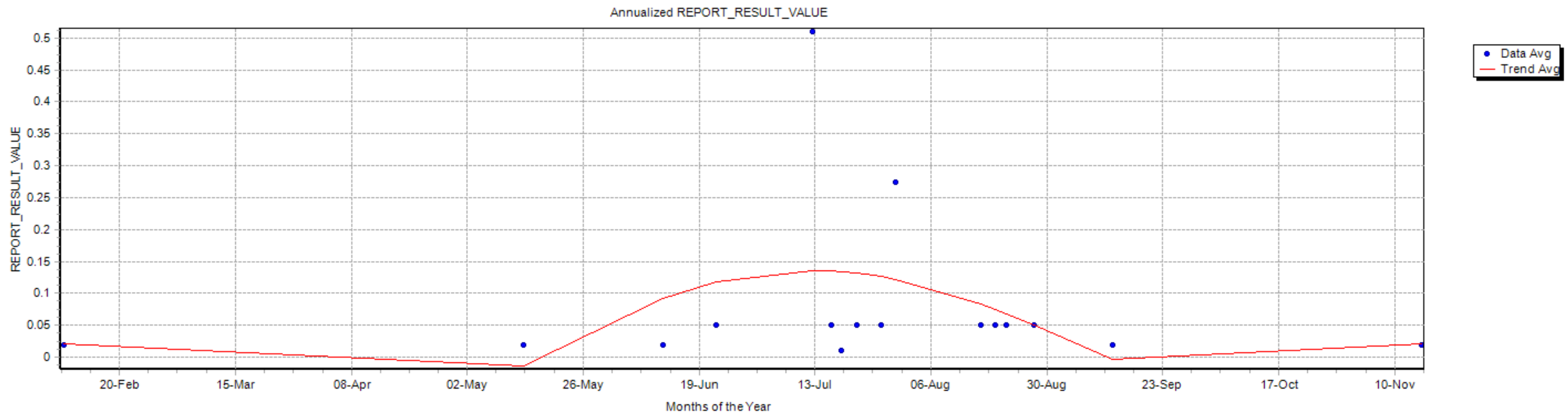


Chart 11-12: Nitrite – Nitrate Trend



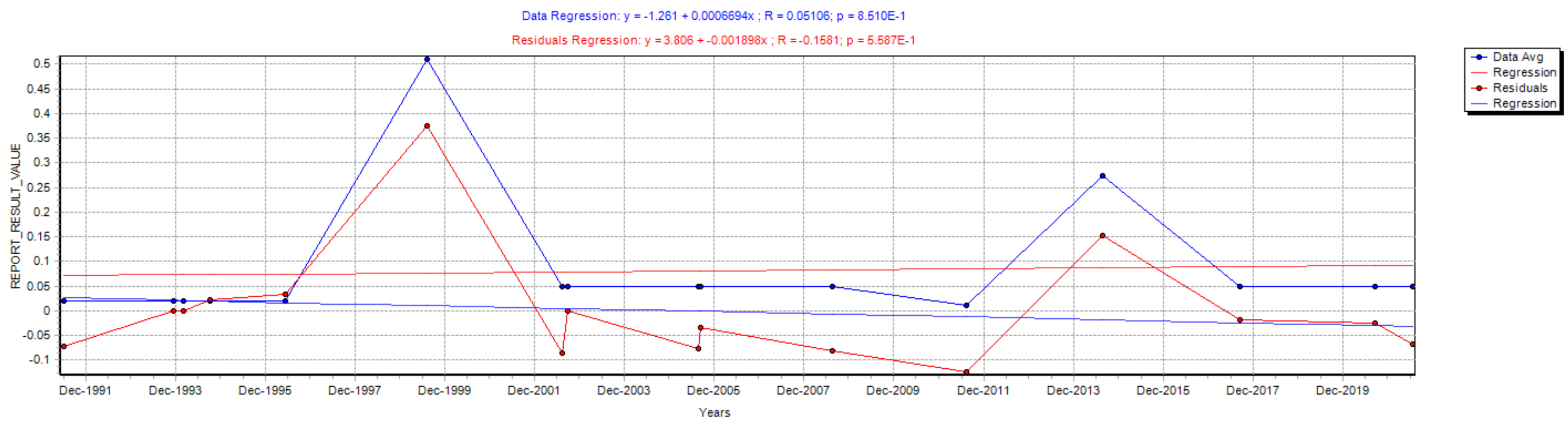
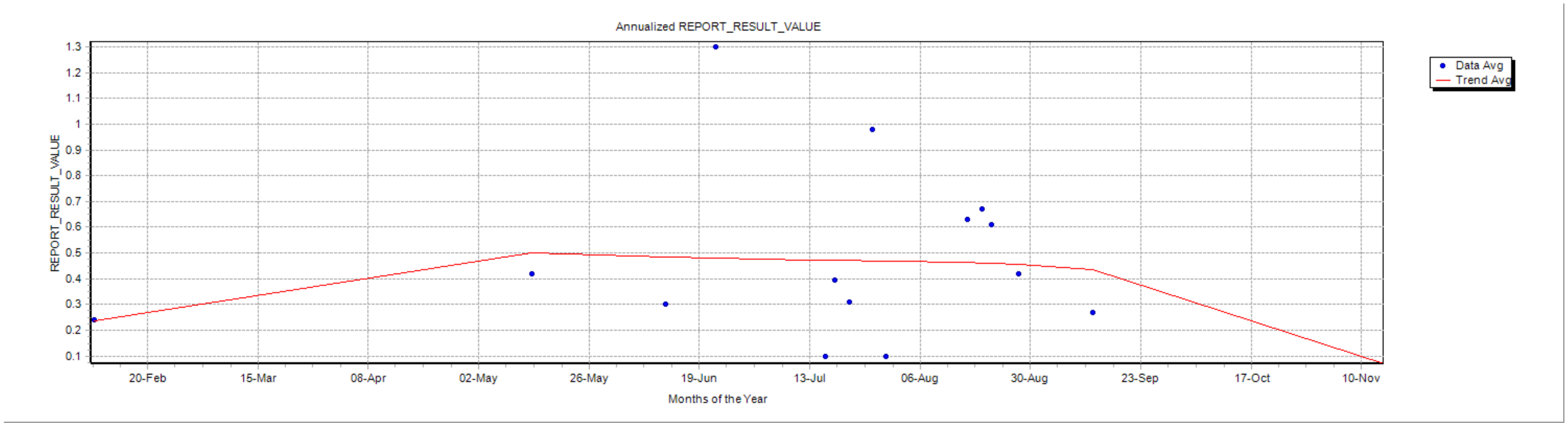


Chart 11-13: Total Kjeldahl Nitrogen Trend



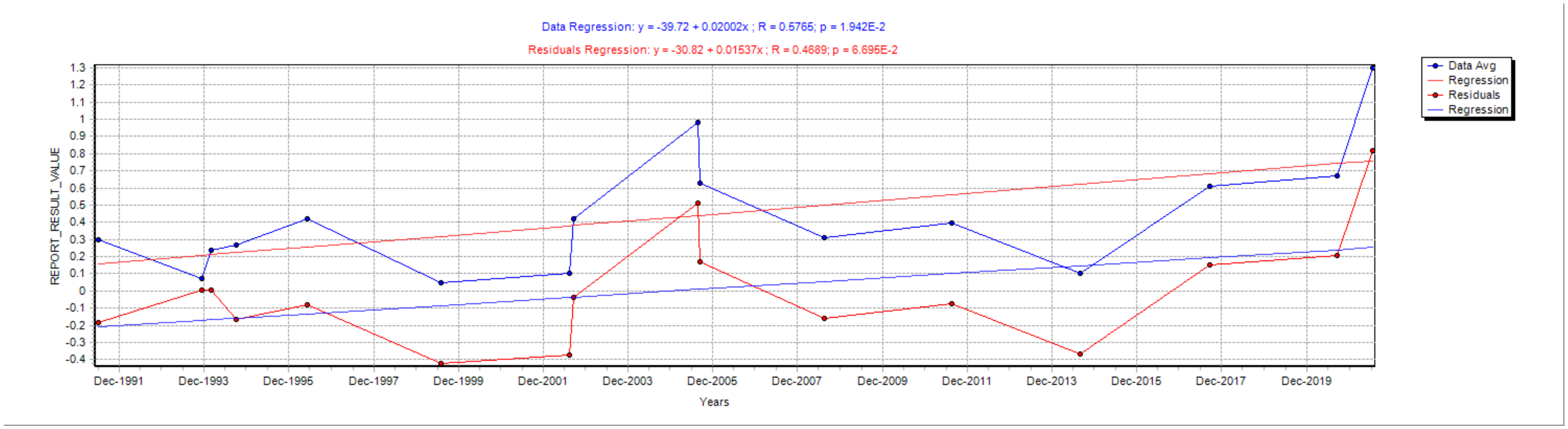
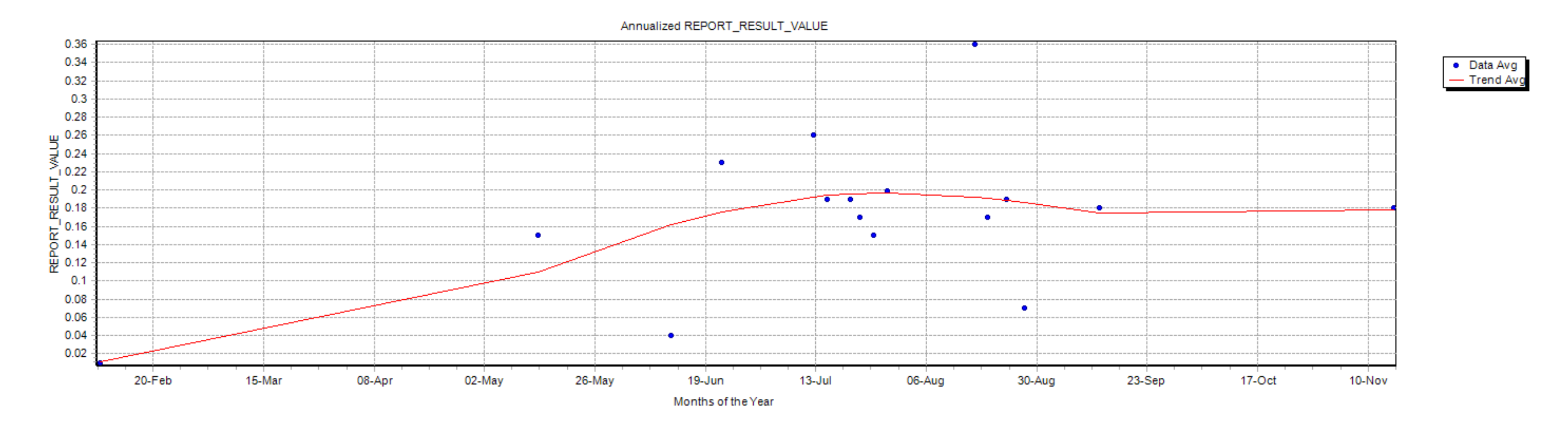


Chart 11-14: Total Phosphorus Trend



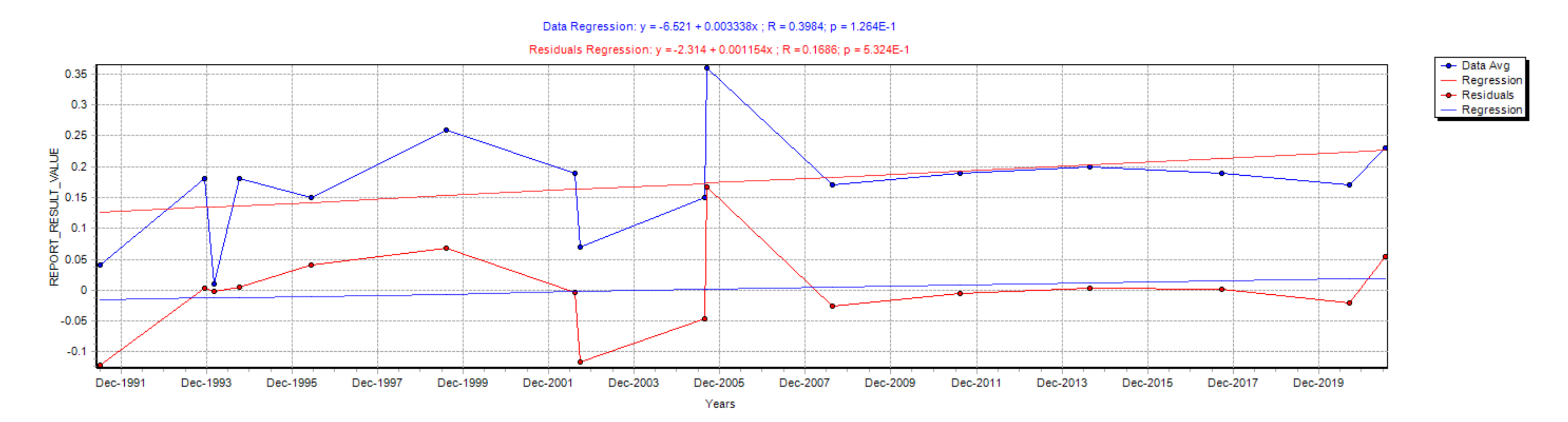
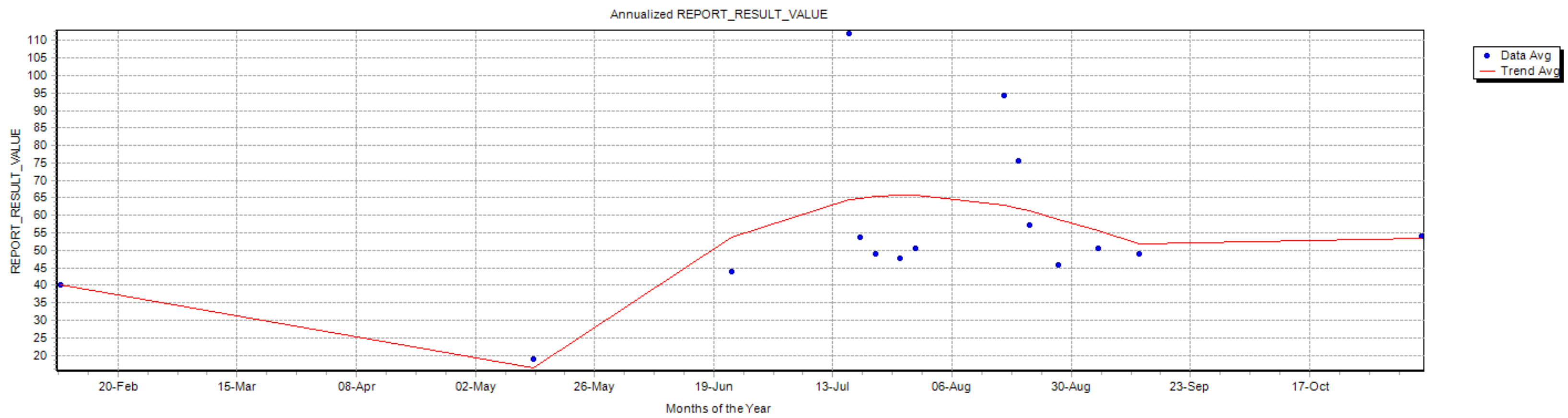


Chart 11-15: Barium Trend



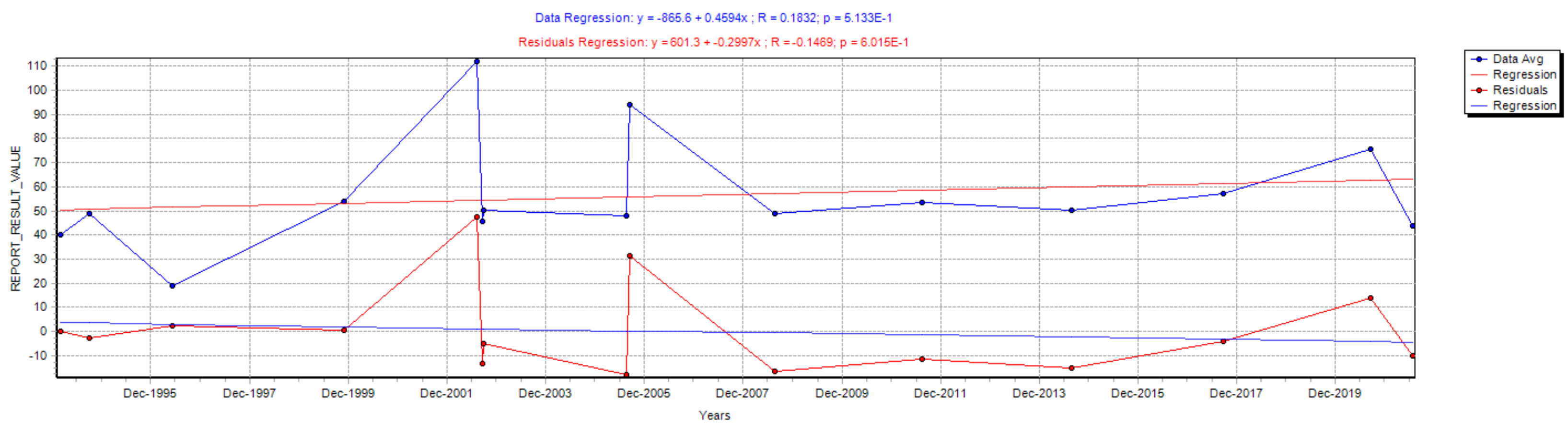
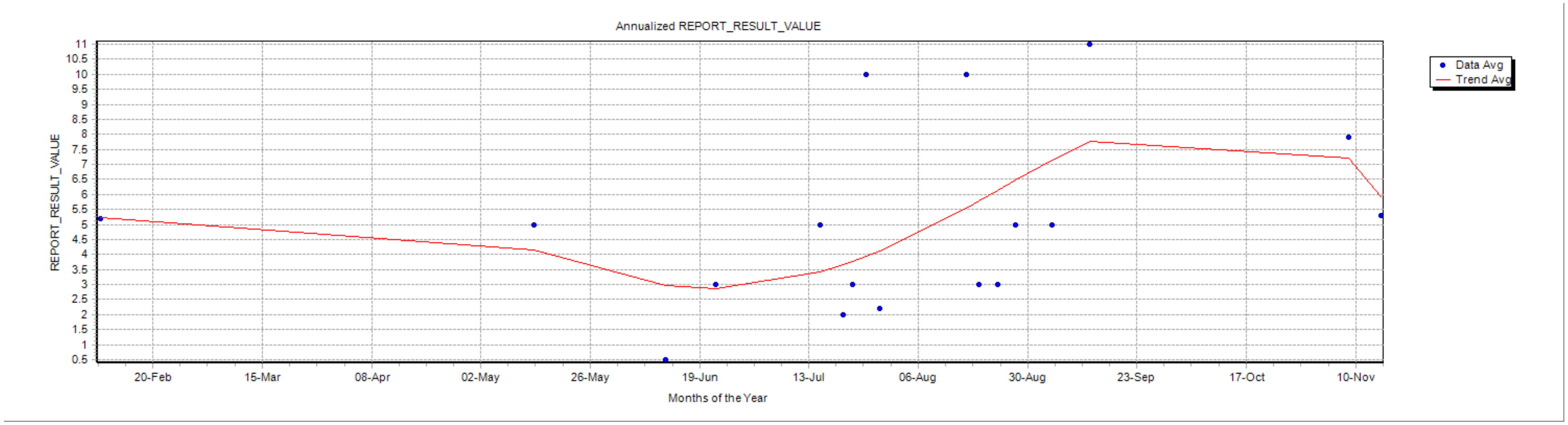


Chart 11-16: Copper Trend



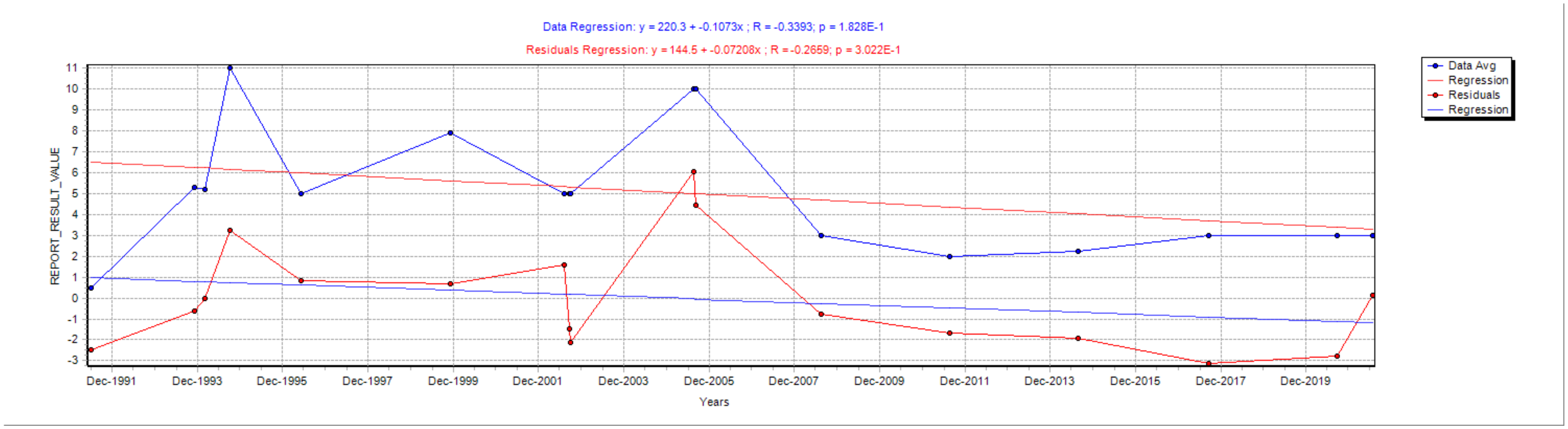
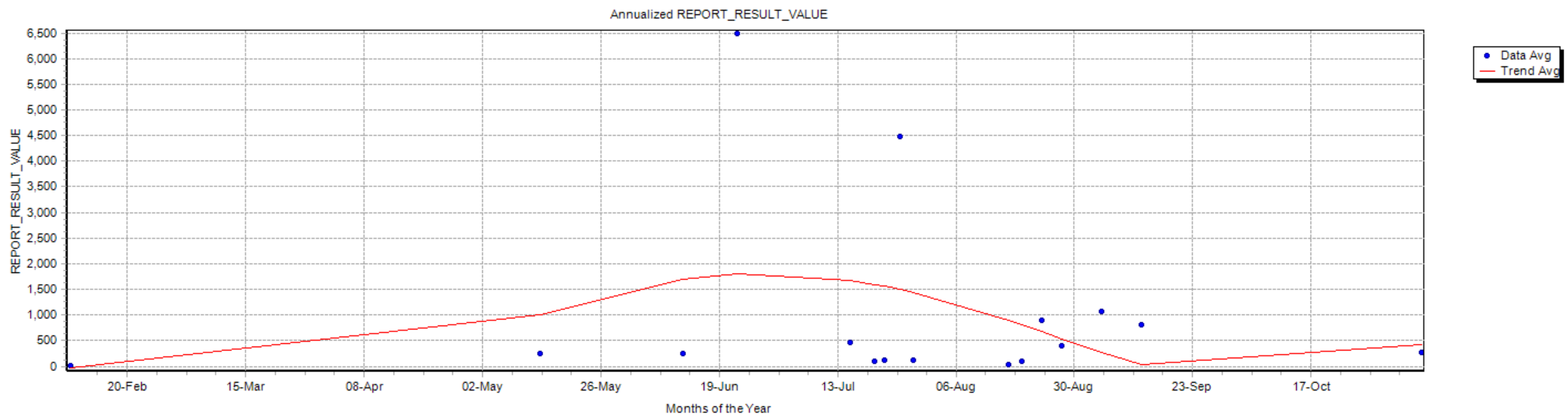


Chart 11-17: Iron Trend



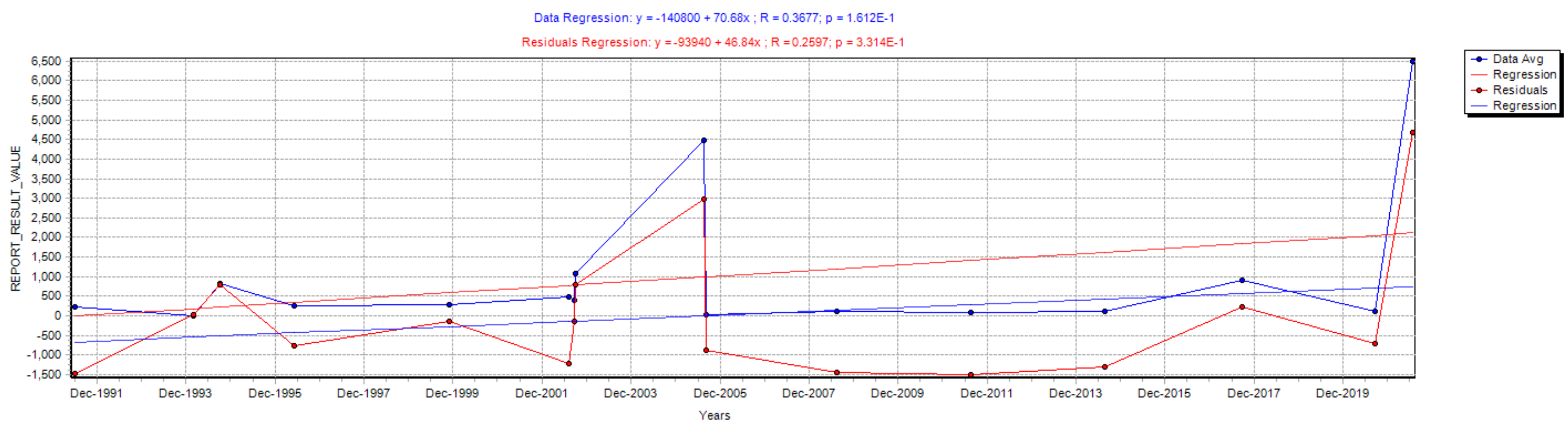


Chart 11-18: Zinc Trend