Table 1 Links between Sustainable Development Goals and Groundwater Pollution

	1.1 Eliminate severe poverty for all people everywhere by 2030, which is currently defined as anyone living on less than $1.25 per day. Approximately 79% of individuals living in severe poverty reside in rural areas as well as rely significantly on natural resources, primarily agriculture, for their livelihoods. Groundwater pollution decreases crop yields and quality, reducing indigenous populations' incomes and aggravating the contaminants burden.
	1.4 Guarantee food production sustainable systems as well as implement agricultural practices that are resilient and surge production and productivity, contribute to ecosystems preservation, strengthen adaptation capacity toward changing climate, drought, extreme weather, flooding as well as other disasters and gradually improve land as well as quality of soil by 2030. Water security is harmed by groundwater pollution, which reduces crop yields and reduces the quantity as well as quality of food produced. Groundwater contamination damages soil structure as well as organic carbon content, making terrestrial landscapes less resilient to flooding and drought, as well as their potential to contribute to changing climate adaptation and mitigation.
	3.4 Lessen premature mortality resulting from non-communicable illnesses by one third by 2030, through prevention as well as treatment, while also promoting well-being and mental health. 3.9 Reduce substantially the fatalities number and diseases caused by hazardous substances in water, air as well as soil contamination and pollution by 2030. Groundwater pollution is closely related to a wide range of illnesses. Diseases caused by environmental contamination (including water, air as well as soil pollution)are estimated to account for roughly 16% of total global mortality, according to the WHO. The burden of sickness caused exclusively by groundwater pollution and water-borne diseases, on the other hand, is virtually unknown and could remain considerably underestimated.
 	5.5 Guarantee women's full as well as effective involvement in economic, political and public life, as well as equitable leadership opportunities at all levels of policy-making. Around 45% of the women in the globe engaged in vulnerable work employment (Raimi etal., 2019b; Raimi etal., 2019c; World Bank, 2020), several live in marginal agricultural areas, or as scavengers, as well as they have fewer access to education, which means they have less resources as well as solutions toward limiting their exposure to groundwater pollution. 6.3 Expand water quality globally by 2030 through decreasing pollution, eradicating dumping as well as abating the release of harmful materials and chemicals, halving the share of untreated wastewater, and significantly increasing recycling as well as safe reuse. The quality of water can only remain realized through improvement and protection of all pollution forms, together with groundwater pollution, must be addressed. While, water pollution causes soil pollution through activities like irrigation through polluted water or wastewater discharge. Then again, soil pollution result in water pollution by way of surface runoff, contaminant leaching as well as soil erosion. Open defecation contributes to increased water and soil contamination and the spread of water-borne diseases (Raimi et al., 2017; Raimi et al., 2019f).

	7.2 Significantly enhance the portion of renewable energy in the global energy mix by 2030. Roughly 65% of the world's energy is produced by burning fossil fuels (natural gas, coal as well as oil), which remain a major source of contaminant in the environment (Ebuete et al., 2019; Suleiman et al., 2019).
	8.4advance global resource efficiency in production and consumption gradually through 2030,as well as strive toward decoupling economic development from environmental degradation, in harmony with the 10-year outline of programmes on sustainable production and consumption, with developed nations leading the way. Groundwater contamination is caused by poorly managed stockpiles and chemical diffusion into the environment as a result of industrial activity, together with the industrial location as well as more broadly by particle transfer via water as well as air.
	10.1 Progressively achieve as well as sustain income growth by 2030 for the bottom 40% of the entire population at a rate greater than the national average Groundwater pollution will result in a decline inviable agricultural land, crop yields as well as quality, resulting in poorer earnings for rural populations already struggling to make ends meet. Due to groundwater pollution, human health effects disproportionately affect poorer communities/populations diminish human potential toward improving their economic situation.
	11.2 By 2030, offer access toward safe, accessible, affordable as well as sustainable transportation networks for everyone, improving road safety, especially through expanding public transportation, by means of special consideration paid to the requests of those in vulnerable circumstances, children, women, individuals with disabilities as well as the elderly. 11.6 By 2030, the cities negative per capita environmental effect should be reduced, notably by focusing on air quality, municipal as well as other waste management Groundwater pollution in the oil rich Niger Delta are as is primarily caused by oil spillage, gas flaring, poor waste management and transportation. Cities groundwater pollution may remain reduced, as well as a healthier milieu can be generated through encouraging sustainable methods for everybody and decreasing cities environmental effect. Green spaces in cities offer significant chances for personal as well as social growth, as well as human health and well-being, but if they become polluted, they will serve as another entry point for toxins to enter the body.
	12.2 Ensure sustainable management as well as effective utilization of natural resources by 2030. 12.4attain environmentally sound management of chemicals by 2020,as well as all sort of wastes throughout their life cycle, in harmony with agreed-upon international frameworks, as well as remarkably decrease release to water, soil and air in order to lessen their negative human health impacts as well as on the milieu 12.5 Decrease trash generation substantially by 2030 by prevention, recycling, reduction as well as reuse. Modern production as well as consumption habits predicated on products obsolescence have resulted in an endless stream of waste and an over-extraction of raw materials. Every year, the globe creates above 2 billion solid tonnes of trash. Whereas some of this garbage is kept, recycled as well as repurposed, most of it is not adequately handled as well as frequently pollutes the milieu, particularly the water and soil. Annual generation

	of waste is expected to rise to 3.4 billion tonnes in 2050 due to increasing population development as well as urbanization. In the Niger Delta region of Nigeria, poor control of oil wells, unsustainable production activities, sabotage, improper loading as well as offloading methods is the primary source of groundwater and soil pollution.
	13.1 Strengthen resilience as well as adaptive capacity in all countries toward climate-related threats as well as natural disasters Unsustainable agriculture is a major contributor to groundwater contamination and has a significant climate change impact. In 2018, 109 million tonnes of synthetic nitrogen fertilizers were used around the world. Nitrogen excess disrupts water biological cycles as well as soil before being released to the atmosphere as N2O, resulting in 700 000 CO2 equivalent emissions. Agriculture accounted for 20% of all human generated emissions in 2017 (Raimi et al., 2018b; Raimi et al., 2020a; Raimi et al., 2021b; Olalekan et al., 2021).
	14.1 Prevent as well as drastically lessen all kinds of marine pollution by 2025, including activities that are land-based such as marine debris as well as nutrient pollution. Around 80% of marine pollution is caused by land-based activities. Plastics, fertilizers, and organic compounds are contaminants of concern in marine ecosystems due to the erosive effects of polluted water and soils (Hussain et al., 2021a; Hussain et al., 2021b; Isah et al., 2020a; Isah et al., 2020b; Morufu et al., 2021b; Olalekan et al., 2020b; Koleayo et al., 2021; Olalekan et al., 2021).
	15.3 Promote the sustainable implementation of forests management of all kinds by 2020, prevent deforestation, rehabilitate degraded forests as well as significantly enhance global afforestation and replanting. Groundwater pollution sets off a chain reaction in terrestrial ecosystems, contaminating growing plants in soil that are polluted and then spreading through food chain in the direction of humans, contaminating entire ecosystems. Soil degradation, increased susceptibility to erosion as well as reduction of forest coverare all consequences of heavily polluted groundwater (Olalekan et al., 2018b; Olalekan et al., 2020a;afolabiand Raimi, 2021; Raimi et al., 2021a).
	16.3 Ensure the promotion of rule of law at the national as well as international levels and guarantee that all people have same access to justice. 16.7 Ensure that decision-making at all levels is responsive, inclusive, participative, and representative. Groundwater pollution disproportionately affects ethnic minorities, the poor, and the most vulnerable. These populations have limited access to justice and are frequently subjected to prejudice and racism in many ways. Environmental disparities exist in emerging as well as developed nations, and remain exacerbated by information deficit as well as data on environmental conditions, which inhibits the ability of impacted communities to respond, act, and make decisions (Premoboere and Raimi, 2018; Suleiman et al., 2019;ajayi et al., 2020).

	17.7 Encourage the transfer, development, dissemination as well as environmentally diffusion of sound technologies to emerging nations on favourable terms, together with concessions as well as preferential treatment, as per mutually agreed upon. 17.9 Increase worldwide support for effective implementation as well as targeted capacity-building in poor countries toward supporting national strategies for achieving all the sustainable development goals, particularly through South-South, North-South as well as triangular cooperation Developed countries have progressed further in the growth of technologies toward detecting emerging contaminants, state-of-the-art environmentally friendly industrial production as well as remediation technologies of ground water and soil pollution and as a result, knowledge transfer must be actively collaborated on.

Table 2 Geographical coordinates of the nine (9) sampling sites (samples)

S/N	Locations	Altitude (m)	Latitude	Longitude
Site – 1	(Borehole) (Opposite Ijeoma Quarters. 750maway fromagip Gas Flaring Center Ebocha)	10	Lat N05^0 27' 068"	Long E006^0 41' 480"
Site – 2	(Borehole) (200m Opposite agip Gas Flaring Centre Ebocha and 50m fromagip Waste Pit)	-	Lat N05^0 27' 28.7"	Long E006^0 41' 58.1"
Site – 3	(Well) (The apple Hotel 500m from Waste Pit and 150maway from Mgbede Field Oil Well 7 Ebocha)	16	Lat N05^0 27' 37.5"	Long E006^0 42' 05.3"
Site – 4	(Well) (1000maway from the agip Flare Stack Ebocha)	22	Lat N05^0 26' 51.5"	Long E006^0 41' 38.8"
Site – 5	(Borehole) (Abacha Road Obrikom, 800maway fromagip Gas Plant)	-	Lat N05^0 23' 48.6"	Long E006^0 40' 36.8"
Site – 6	(Borehole) (Eagle Base Obor. 2,500maway fromagip Gas Plant)	28	Lat N05^0 23' 00.9"	Long E006^0 41' 07.4"
Sites – 7	(Well) (Obor Road Obie. 2000maway fromagip Gas Plant)	24	Lat N05^0 23' 22.5"	Long E006^0 40' 49.1"
Sites – 8	(Borehole) (Green River Plant Propagation Centre Naoc 3000maway fromagip Gas Plant)	17	Lat N05^0 24' 18.9"	Long E006^0 40' 55.0"
Sites – 9	(Control) (35,000m from Ebocha)	-	Lat N5^0 4' 58.1412"	Long E6^0 39' 30.4806"

Table 3 Comparison of the parameters in the different locations during rainy season

	Location								
Parameters	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Temperature (0C)	28.63±2.46[a]	28.24±2.06[a]	27.83±2.62[a]	28.77±1.73[a]	27.96±1.50[a]	28.01±1.18[a]	28.27±1.61[a]	26.79±1.80[a]	26.01±2.10[a]
Hydrogen Potential (pH)	7.20±1.37[c]	7.98±0.73[c]	7.06±1.05[c]	6.27±0.59[b]	6.49±0.95[b]	5.92±0.27[a]	6.44±1.74[b]	6.13±0.52[b]	5.82±0.28[a]
Conductivity (ЧSCM-1)	48.09±24.23[d]	52.29±28.76[d]	30.99±18.42[c]	18.57±9.24[a]	20.96±9.27[a]	36.88±25.03[c]	27.48±14.18[b]	26.93±11.24[b]	24.22±7.61[a]
Turbidity (NTU)	7.41±2.97[a]	7.36±6.50[a]	42.43±14.40[d]	31.43±11.72[c]	11.14±5.05[b]	3.35±1.18[a]	48.24±20.57[d]	4.99±1.56[a]	1.78±0.66[a]
Dissolved Oxygen (DO) (mg/l)	17.27±0.81[a]	17.21±1.38[a]	17.84±1.29[a]	16.91±1.19[a]	16.37±0.43[a]	16.42±0.45[a]	17.01±0.89[a]	16.99±0.73[a]	16.29±0.37[a]
(BOD) (mg/l)	5.35±0.29[a]	5.31±0.44[a]	5.05±0.10[a]	5.48±0.37[a]	5.21±0.40[a]	5.42±0.44[a]	5.26±0.21[a]	5.47±0.39[a]	4.98±0.10[a]
(COD) (mg/l)	40.06±12.15[a]	37.27±8.79[a]	39.61±11.84[a]	41.78±13.07[a]	39.72±6.80[a]	32.03±9.65[a]	33.50±7.15[a]	32.75±6.61[a]	32.64±6.57[a]
Acidity (mg/l)	90.11±48.55[a]	90.96±45.54[a]	101.18±46.68[a]	90.01±42.52[a]	87.11±42.97[a]	89.92±42.26[a]	99.56±46.44[a]	86.18±35.99[a]	85.53±45.14[a]
Alkalinity (mg/l)	103.73±60.46[b]	119.56±58.6[b]	18.17±7.42[a]	134.96±50.03[b]	119.23±65.28[b]	119.15±65.15[b]	130.93±43.65[b]	134.76±47.90[b]	117.73±63.97[b]
(TH) (mg/l)	41.06±2.27[a]	41.49±4.18[a]	42.22±2.26[a]	37.71±9.49[a]	35.02±7.45[a]	37.64±9.47[a]	39.48±3.08[a]	40.30±2.58[a]	37.64±4.64[a]
TDS (mg/l)	11.12±3.77[a]	11.50±3.89[a]	8.24±3.98[a]	9.31±4.62[a]	9.27±4.71[a]	10.11±5.14[a]	8.06±4.50[a]	7.88±4.27[a]	10.61±2.06[a]
TSS (mg(l)	39.80±3.66[b]	34.72±2.65[a]	35.96±1.95[a]	37.49±2.30[b]	37.28±1.85[b]	37.11±1.91[b]	38.40±3.05[b]	38.73±3.12[b]	34.00±2.47[a]
Salinity (mg/l)	0.12±0.08[a]	0.14±0.10[a]	11.50±10.60[c]	15.74±11.29[c]	0.07±0.01[a]	1.71±0.76[b]	25.71±5.35[c]	0.09±0.08[a]	0.01±0.02[a]
Chloride (mg/l)	30.61±2.11[b]	31.43±1.50[b]	32.16±1.81[b]	32.10±0.51[b]	31.66±0.24[b]	31.13±0.70[b]	28.33±1.96[a]	29.05±2.34[a]	28.97±2.31[a]
Fluoride (mg/l)	0.00±0.00[a]	0.00±0.00[a]	0.00±0.00[a]	0.29±0.27[b]	0.53±0.43[b]	0.82±0.25[c]	0.85±0.34[c]	0.79±0.31[s]	0.00±0.00a
Aluminum (mg/l)	0.00±0.00[a]	0.00±0.00[a]	0.01±0.01[a]	0.01±0.01[a]	0.02±0.00 [b]	0.02±0.01[b]	0.03±0.01[b]	0.02±0.01[b]	0.00±0.00[a]
Sodium (mg/l)	12.32±2.38[a]	16.06±1.99	12.22±2.72a	14.54±0.80[b]	14.45±1.07[b]	14.65±0.90[b]	16.39±0.20[b]	15.48±2.40[b]	12.85±2.63a
Potassium (K) (mg/l)	2.65±0.76[a]	2.49±0.61[a]	3.14±0.03a	3.23±0.56a	2.97±0.64a	3.07±0.52a	3.10±0.04a	3.29±0.17a	2.42±0.59a
Calcium (Ca) (mg/l)	52.22±7.67[a]	52.58±8.57[a]	56.20±8.18[b]	59.76±6.15[b]	59.72±6.47[b]	50.31±6.60[a]	59.98±6.29[a]	51.99±7.61[a]	50.47±6.77[a]

Magnesium (mg/l)	137.23±11.45^{a}	136.11±12.02^{a}	132.71±48.02^{a}	129.99±37.38^{a}	129.26±37.07^{a}	129.66±37.10^{a}	146.67±21.78^{a}	145.74±19.58^{a}	129.26±37.07^{a}
Iron (mg/l)	2.23±0.42^{a}	2.29±0.73^{a}	3.27±0.98^{b}	2.96±2.18^{b}	4.01±0.12^{c}	2.06±0.02^{a}	5.16±1.74^{c}	3.37±1.60^{b}	1.21±0.20^{a}
Zinc (mg/l)	0.67±0.16^{a}	0.72±0.15^{a}	0.77±0.09^{a}	0.66±0.24^{a}	0.67±0.23^{a}	0.64±0.17^{a}	0.67±0.23^{a}	0.57±0.04^{a}	0.56±0.04^{a}
Manganese (mg/l)	0.02±0.01^{a}	0.03±0.02^{a}	0.02±0.02^{a}	0.03±0.02^{a}	0.04±0.02^{a}	0.03±0.02^{a}	0.02±0.02^{a}	0.03±0.03^{a}	0.00±0.00^{a}
Cadmium (mg/l)	0.01±0.02^{a}	0.02±0.02^{a}	0.00±0.00^{a}	0.01±0.03^{a}	0.00±0.00^{a}	0.00±0.00^{a}	0.02±0.03^{a}	0.02±0.03^{a}	0.00±0.00^{a}
Lead (mg/l)	0.12±0.04^{a}	0.11±0.07^{a}	0.09±0.08^{a}	0.11±0.05^{a}	0.09±0.06^{a}	0.13±0.07^{a}	0.14±0.06^{a}	0.12±0.08^{a}	0.11±0.04^{a}
Copper (mg/l)	0.03±0.03^{a}	0.04±0.03^{a}	0.03±0.03^{a}	0.04±0.04^{a}	0.03±0.04^{a}	0.05±0.04^{a}	0.03±0.04^{a}	0.03±0.04^{a}	0.03±0.03^{a}
Chromium (mg/l)	0.76±1.21^{a}	0.60±0.28^{a}	0.60±0.28^{a}	0.56±0.32^{a}	1.29±1.05^{a}	1.17±0.86^{a}	0.81±1.06^{a}	1.27±0.99^{a}	0.82±1.30^{a}
Sulphate (mg/l)	0.87±0.20^{a}	0.86±0.17^{a}	0.86±0.17^{a}	0.99±0.22 ^{b}	0.92±0.02 ^{b}	0.85±0.04^{a}	0.84±0.05^{a}	0.85±0.11^{a}	0.94±0.12 ^{b}
Ammonia (mg/l)	2.63±1.01^{a}	2.79±1.11^{a}	2.79±1.11^{a}	2.79±1.20^{a}	2.76±1.08^{a}	2.80±1.10^{a}	2.75±1.06^{a}	2.22±1.00^{a}	2.38±1.03^{a}
Phosphate (mg/l)	0.15±0.16^{a}	0.38±0.02^{a}	0.38±0.02^{a}	0.18±0.15^{a}	0.24±0.14^{a}	0.21±0.14^{a}	0.20±0.13^{a}	0.23±0.20^{a}	0.24±0.23^{a}
Nitrite (mg/l)	1.90±1.12^{a}	1.70±1.06^{a}	1.70±1.06^{a}	2.33±1.60^{a}	2.10±1.62^{a}	1.66±1.08^{a}	1.90±1.09^{a}	1.95±1.15^{a}	1.61±0.48^{a}
Nitrate (mg/l)	2.87±1.28^{a}	2.34±0.80^{a}	2.34±0.80^{a}	3.23±0.71^{b}	3.36±1.11^{b}	2.33±0.76^{a}	1.90±0.17^{a}	2.23±0.67^{a}	2.01±0.16^{a}
Nickel (mg/l)	0.97±0.61^{a}	0.91±0.26^{a}	0.91±0.26^{a}	1.00±0.42^{a}	0.90±0.25^{a}	0.84±0.22^{a}	0.94±0.15^{a}	0.94±0.17^{a}	0.95±0.15^{a}
TPH (mg/l)	14.86±0.38^{d}	10.41±4.55^{c}	13.861±1.21^{d}	13.00±1.52^{d}	2.81±1.58^{b}	11.57±1.62^{c}	4.07±0.94^{b}	3.84±0.45^{b}	0.001±0.00^{a}

Similar superscript means not significantly different (p>0.05) while different superscripts indicates significantly difference in means (p<0.05)

Table 4 Comparison of the parameters in the different locations during dry season

	Location								
Parameters	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Temperature (0C)	32.38±0.58 ^{b}	32.46±1.33 ^{b}	30.98±0.92^{b}	29.62±1.23^{a}	30.50±0.96^{b}	29.00±1.05a	29.70±0.64a	29.74±1.17^{a}	29.52±1.17a
pH	7.23±0.90^{a}	5.99±0.48a	6.43±0.70a	6.99±1.03a	6.54±0.57a	7.22±1.17a	6.16±1.01a	6.56±0.60^{a}	6.02±0.19a
Conductivity (ЧSCM-1)	35.66±8.36^{c}	11.93±1.27a	32.26±0.21^{c}	46.76±15.34^{d}	39.35±17.98^{c}	14.44±2.08^{a}	24.58±6.55^{b}	18.97±0.3a	17.34±6.80^{a}
Turbidity (NTU)	5.27±1.36a	4.39±4.26a	11.40±12.64^{b}	11.56±8.23^{b}	2.84±1.55a	3.09±1.19a	16.75±2.54^{c}	1.89±0.19^{a}	1.82±0.15^{a}
DO (mg/l)	18.69±0.04^{b}	18.46±1.17^{b}	19.10±0.9^{b}	18.48±0.54^{b}	17.09±0.04a	17.03±0.14a	17.90±0.03a	17.86±0.28^{a}	17.09±0.05^{a}
BOD) (mg/l)	5.60±0.09^{b}	5.33±0.44^{b}	4.95±0.16^{a}	5.75±0.11^{b}	6.03±0.02^{c}	6.09±0.05^{c}	5.54±0.04^{b}	5.98±0.11^{c}	4.86±0.08^{a}
COD (mg/l)	21.87±0.61^{a}	24.58±0.26a	22.64±0.27a	32.49±12.21^{b}	24.53±0.27^{a}	24.20±0.06^{a}	23.19±0.28^{a}	23.79±0.19^{a}	22.53±0.34^{a}

Acidity (mg/l)	156.72±4.79^{a}	158.18±11.08^{a}	168.82±1.22^{a}	151.82±0.44^{a}	152.18±2.90^{a}	150.53±0.88^{a}	167.09±0.46^{a}	167.51±0.49^{a}	138.08±49.31^{a}
Alkalinity (mg/l)	53.52±41.47^{b}	52.43±+46.56^{b}	30.57±8.94^{a}	62.47±0.47^{b}	23.66±0.09^{a}	23.88±0.26^{a}	64.25±0.14^{b}	64.58±0.47^{b}	24.22±0.66^{a}
TH (mg/l)	44.79±1.18^{b}	36.44±1.52^{a}	37.35±+1.27^{a}	50.95±0.68^{c}	51.66±0.11^{c}	51.37±+0.30^{c}	43.38±0.60^{b}	44.42±0.52^{b}	35.78±3.07^{a}
TDS (mg/l)	6.37±1.11^{a}	7.56±3.32^{a}	14.84±0.17^{b}	16.25±0.39^{c}	16.15±0.12^{c}	15.72±0.18^{c}	14.15±0.42^{b}	14.01±0.14^{b}	6.03±0.07^{a}
TSS (mg(l)	34.66±0.44^{d}	31.30±0.76^{b}	32.20±1.04^{c}	34.52±0.27^{d}	34.54±0.23^{d}	34.14±0.20^{d}	33.77±0.11^{d}	34.76±0.43^{d}	29.56±0.99^{a}
Salinity (mg/l)	0.11±0.08^{a}	0.09±0.04^{a}	16.00±8.94^{b}	12.02±13.02^{b}	0.11±0.11^{a}	0.71±0.39^{a}	8.00±8.37^{b}	0.18±0.06^{a}	0.04±0.03^{a}
Chloride (mg/l)	27.10±1.62^{b}	27.62±0.88^{b}	29.22±0.37^{d}	31.16±0.03e	31.27±0.19e	30.36±0.35e	25.26±0.39^{a}	25.49±0.54^{a}	26.44±0.51^{b}
Fluoride (mg/l)	0.00±0.00^{a}	0.00±0.00^{a}	0.00±0.00^{a}	0.02±0.04^{a}	0.68±0.41^{b}	0.45±0.00^{b}	1.02±0.22^{c}	0.32±0.29 ^{b}	0.00±0.00^{a}
Aluminum (mg/l)	0.00±0.00^{a}	0.00±0.00^{a}	0.00±0.00^{a}	0.01±0.00^{a}	0.01±0.01^{b}	0.00±0.01^{a}	0.02±0.01^{b}	0.01±0.00^{b}	0.00±0.00^{a}
Sodium (mg/l)	9.47±+2.00^{a}	11.77±0.12^{b}	9.22±1.95^{a}	13.33±0.16^{c}	12.66±0.12^{b}	13.11±0.21^{c}	11.70±0.15^{b}	11.81±0.19^{b}	9.41±1.19^{a}
Potassium (K) (mg/l)	1.52±0.05^{a}	1.57±0.38^{a}	3.03±0.03^{b}	4.11±0.03^{c}	3.79±0.13^{b}	3.81±0.12^{b}	3.04±0.02^{b}	3.11±0.04^{b}	1.37±0.36^{a}
Calcium (Ca) (mg/l)	44.38±2.21^{b}	46.32±6.36^{b}	44.33±0.41^{b}	50.73±0.11^{c}	50.58±0.09^{c}	40.56±0.29^{a}	50.44±0.30^{c}	40.59±0.21^{a}	40.37±0.47^{a}
Magnesium (mg/l)	149.44±10.30^{a}	151.87±1.82^{a}	178.57±0.25^{c}	184.68±0.25^{d}	184.35±0.57^{d}	184.28±0.89^{d}	178.13±0.71^{c}	175.85±4.68^{c}	184.35±0.57^{d}
Iron (mg/l)	1.74±0.45^{a}	2.47±1.27^{b}	3.82±1.00^{c}	1.07±0.52^{a}	2.71±1.62^{b}	1.85±0.45^{a}	4.42±1.56^{c}	2.88±1.64^{b}	0.95±0.02^{a}
Zinc (mg/l)	0.86±0.10^{b}	0.83±0.12^{b}	0.91±0.04^{c}	1.01±0.00^{c}	1.00±0.00^{c}	0.85±0.04^{b}	0.80±0.45^{b}	0.63±0.02^{a}	0.61±0.00a
Manganese (mg/l)	0.04±0.02^{a}	0.04±0.01^{a}	0.07±0.01^{c}	0.08±0.00^{c}	0.08±0.00^{c}	0.06±0.01^{b}	0.06±0.00^{b}	0.07±0.00^{c}	0.03±0.01^{a}
Cadmium (mg/l)	0.04±0.00^{b}	0.05±0.01^{c}	0.01±0.00a	0.06±0.00^{d}	0.01±0.00^{a}	0.01±0.00^{a}	0.06±0.00^{d}	0.05±0.00^{c}	0.01±0.00^{a}
Lead (mg/l)	0.01±0.02^{a}	0.01±0.00^{a}	0.03±0.06^{b}	0.01±0.00^{a}	0.01±0.00^{a}	0.01±0.01^{a}	0.01±0.00^{a}	0.00±0.00^{a}	0.01±0.00^{a}
Copper (mg/l)	0.07±0.00^{a}	0.08±0.01^{b}	0.07±0.01^{a}	0.09±0.01^{c}	0.08±0.00^{b}	0.08±0.00^{b}	0.08±0.01^{a}	0.09±0.01^{c}	0.07±0.01^{a}
Chromium (mg/l)	2.59±0.03^{c}	1.01±0.00^{b}	0.81±0.28^{b}	2.81±0.04^{c}	2.76±0.06^{c}	2.38±0.30^{c}	2.63±0.08^{c}	2.76±0.06^{c}	0.49±0.49^{a}
Sulphate (mg/l)	1.08±0.18^{b}	1.21±0.01^{a}	1.17±0.12^{b}	0.96±0.01^{a}	0.93±0.02^{a}	0.88±0.05^{a}	0.99±0.02^{a}	1.01±0.01^{b}	0.88±0.05^{a}
Ammonia (mg/l)	3.79±0.86^{b}	4.30±0.13^{c}	4.39±0.26^{c}	3.97±0.98^{c}	4.35±0.12^{c}	4.35±0.05^{c}	3.61±0.05^{b}	3.67±0.41^{b}	1.00±0.00^{a}
Phosphate (mg/l)	0.50±0.01^{c}	0.41±0.01^{b}	0.37±0.01^{a}	0.44±0.00^{b}	0.43±0.01^{b}	0.41±0.02^{b}	0.53±0.02^{c}	0.55±0.05^{c}	0.36±0.04^{a}
Nitrite (mg/l)	2.71±0.98^{a}	2.95±0.49^{a}	4.57±0.07^{c}	4.53±0.08^{c}	3.06±0.13^{b}	3.55±0.18^{b}	3.35±0.66^{b}	2.31±0.02^{a}	2.64±0.05^{a}
Nitrate (mg/l)	3.98±1.16^{b}	3.46±0.04^{b}	4.57±0.33^{c}	4.32±0.84^{c}	3.46±0.04^{b}	2.23±0.03^{a}	3.39±0.04^{b}	2.05±0.49^{a}	2.14±0.05^{a}
Nickel (mg/l)	1.32±0.72^{a}	1.24±0.16^{a}	1.40±0.27^{a}	1.17±0.00^{a}	1.16±0.01^{a}	1.16±0.01^{a}	1.17±0.01^{a}	1.17±0.04^{a}	1.14±0.01^{a}
TPH (mg/l)	3.92±1.43^{b}	13.40±1.67^{d}	11.60±0.89^{d}	12.80±1.48^{d}	1.44±0.96^{a}	3.10±0.34^{b}	9.76±3.36^{c}	1.04±0.19^{a}	0.00±0.00^{a}