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Drinking Water Analysis of the Urapakkam Town At South Chennai City

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ABSTRACT

Water is the primary source for drinking purpose..Due to industrialization the purity of water critically threatened. To investigate the water quality parameters of four sampling stations are taken from Urapakkam Town at the South of the Chennai City of the state of Tamil Nadu.. The standard methods of sampling and estimation is done for the ground water samples. The quality of water shows high values of electrial conductivity

Keywords: *Physical and chemical parameters*

INTRODUCTION

The Industrial transfer of effluents ashore and the ensuing contamination of the groundwater and soil of the encompassing terrains is a pragmatic issue confronting creating India. The Environmental and financial parts of mechanical emanating watering system have not been considered as widely as local sewage based watering system hones, at any rate in creating nations like India. The transfer of treated and untreated modern effluents ashore has turned into a standard practice for a few commercial enterprises. Commercial enterprises situated in the Study Area arrange their effluents ashore and accordingly the close-by shallow open wells get dirtied, furthermore the salt substance of the dirt has begun expanding gradually. This study endeavors to catch through essential overviews and optional data the natural effect on ground water sources in and around the modern regions because of the release of mechanical effluents. (Yadav et al., 2010) The tainting of ground water by substantial metals and pesticides has likewise expected extraordinary centrality amid late years because of their poisonous quality and collective conduct. These components, in spite of most contaminations, are not biodegradable and experience a worldwide eco-organic cycle, in which common waters are the primary pathways. The determination of the focus levels of overwhelming metals and pesticides in these waters, and additionally the explanation of the compound structure

The issue of ground water contamination in a few sections of the nation has turned out to be acute to the point that unless critical strides for itemized recognizable proof and reduction are taken, broad ground water assets may be harmed. The nature of ground water relies on upon countless hydrological, physical, substance and organic variables. By and large, higher extents of 2 broke down constituents are found in ground water than in surface water, due to the more noteworthy cooperation of the ground water with different materials in geologic strata. The water utilized for drinking purposes ought to be free from any harmful components, living and nonliving life forms and inordinate measures of minerals that may be perilous to wellbeing. A portion of the substantial metals are to a great degree vital to people, for instance, cobalt, copper, and so on., yet huge amounts of them may bring about physiological issue. (CPCB, 2007)

The strong waste is dumped into the gorges of streams, as fill in for town lakes, and spread over the touching or waste terrains. These toxicants have dirtied our dirt, water and air enormously. The exploration completed amid the previous quite a few years has distinguished potential risky chemicals, the length of time and measurements of which can bring about harmfulness, furthermore the groupings of their chemicals which are admissible for the arrival of poisons into the earth. (Vengateswaralu et al., 2011)

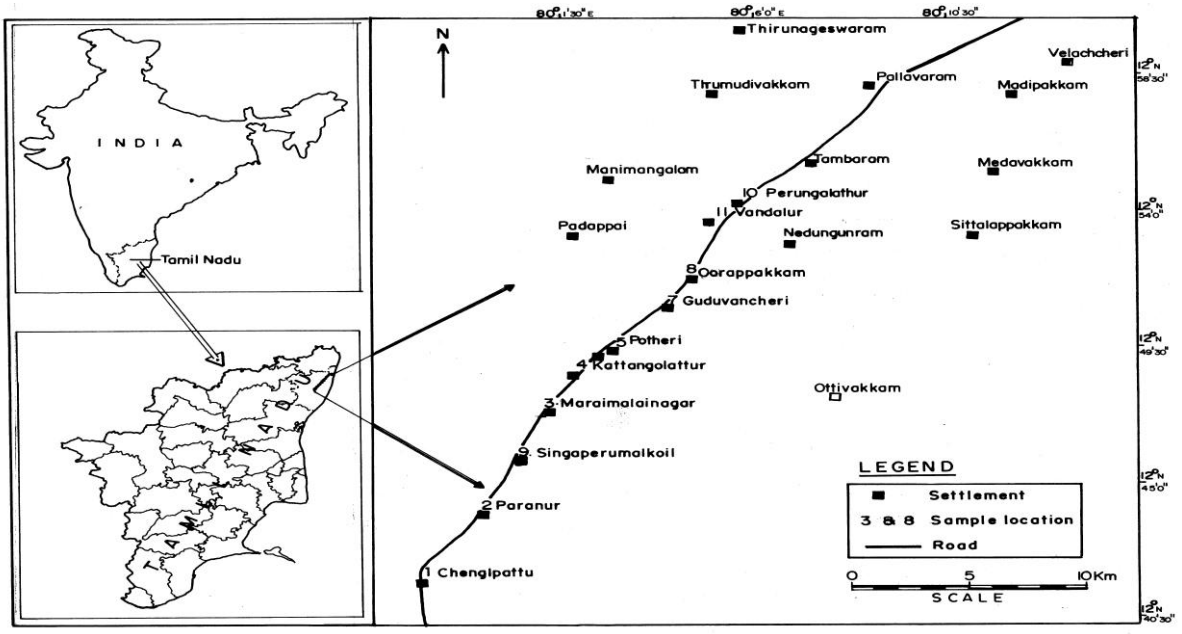
MATERIALS AND METHODS:

STUDY AREA

Chennai, earlier known as Madras, is the capital city of the condition of Tamilnadu, and India's fourthbiggest metropolitan city. It is situated on the Coromandel bank of the Bay of Bengal. The scope of the city is 13.04o N and longitude 80.17o E. The city covers a zone of 174 Km2. It is 368 years of age and the 31st biggest metropolitan territory on the planet. There are three water bodies viz., Adayar waterway, Cooum stream and the Buckingham Canal. The Chennai Metropolitan region comprises of three areas, to be specific, Chennai city and the regions of Kancheepuram and Thiruvallur. The city is isolated on the premise of its sythesis into four noteworthy parts, North, South, West and Central ChennaiA

URAPAKKAM

This is a Southern Suburb of Chennai in Kanchipuram District. It is arranged on the National Highway – 45, which is a piece of the "Brilliant Quadrilateral" National Highway Project. It is arranged 35km from Chennai Central Railway station, and lies in the middle of Tambaram and Chengalpattu. It is arranged at $12^{o}52102^{o}$ N 80o 0418^{o}



PICTURE NO.1 LOCATION SITE OF THE STUDY AREA

The sampling sites are selected from four important places at Urapakkam near by the Inustries.

TABLE NO 1. SAMPLING STATIONS SELECTED IN THE STUDY AREA

Station	Description of the station
Station 1	Bore well, Selva Nagar Extn – V
Station 2	Bore well, on GST Road Hotel
Station 3	Bore well, Near chock late Industies
Station 4	Bore well, opp to Railway station

SAMPLE COLLECTION AND PRESERVATION:

Criteria for the selection of Bore Wells / Tube Wells / Hand pumps

For the choice of the groundwater quality study area, the accompanying criteria were remembered:

- Drinking water wells
- Wells closer to the contaminating sources, similar to commercial enterprises, urban wastewater channels, trash, dumpsites and so forth.
- Wells associated with regular contaminants like fluoride, iron, arsenic or such toxins.

Test accumulation, transport, protection and examination

Tests were gathered from one of the follo0wing three sorts of wells

i. Open delved wells being used for household or watering system water supply,
ii. Tube wells fitted with a hand-pump or a force driven pump for local water supply or watering system
iii. Hand Pumps, utilized for drinking. (CPCB, 2007).

Open burrowed wells, which are not being used or have been surrendered, were not utilized for testing. For the accumulation of tests, a weighted specimen jug or sampler was utilized to gather the example from an open well. Tests from the creation tube were gathered subsequent to running the well for around 5 minutes. For bacteriological specimens, when gathered from tube wells/hand pump, the spout/outlet of the source was sanitized under fire by a soul light, before the accumulation of the example in the compartment. From open wells the specimens were gathered straightforwardly into pre-cleaned glass bottles. (Ranjana Agarwal, 2010). The specimens were transported to the research center. The specimens were dissected instantly for parameters like Coliform, BOD, COD and supplements. Different parameters were broke down inside of a week's chance. An aggregate of 16 ground water tests were gathered, amid the mid year, post-storm and winter, from different deliberation sources at different profundities, covering broadly populated zone, business, mechanical and private states, in order to acquire a decent ethereal and vertical representation, and protected by including suitable reagents as and when required. The hand pumps were persistently pumped before the testing, to guarantee that the ground water to be examined was illustrative of the ground water aquifer. The water tests for the follow component investigation were gathered in corrosive filtered polyethylene bottles, and safeguarded by including ultra immaculate nitric corrosive (2 mL/lit.). (Hariharan, 2011), (CPCB, 2007)

Tests for the pesticides examination were gathered in glass bottles, while tests for bacteriological investigations were gathered in disinfected high-thickness polypropylene/Glass jugs secured with aluminum foils. Every one of the specimens were put away in inspecting units kept up at 4oC and conveyed to the lab for definite concoction and bacteriological examinations. (CPCB)

TABLE NO2 .METHODS USED FOR ESTIMATION OF PHYSICAL & CHEMICAL PARAMETER

S.No	Parameter	Method
1	Colour	a. Visible Comparison Method (Only Potable water)
2	Electrical conductivity	Conductivity Meter
3	pH Value	pH Meter
4	Temperature	Thermometer
5	Turbidity	Nephelometric
7	Alkalinity	Colour Indicator Titration

8	Barium	Atomic Absorption Spectrophotometer
9	Calcium	Titrimetic (EDTA)
10	Chloride	Titrimetic (Argentomatric or Mercuric Nitrate)
11	Fluoride	Distillation followed by colorimetric
12	Magnesium	By difference (between total hardness & calcium determined titrimetrically)

TABLE NO.3 WATER QUALITY STANDARDS AS PER IS 10500

S.No	Parameter	**Unit**	**IS0500 Norms**
1	Alkalinity to methyl orange	mg/l	200
2	Barium	mg/l	-
3	Calcium	mg/l	75
4	Chloride	mg/l	250
5	Colour	Hazen units	10
6	Conductivity	µmhos/cm	-
7	Fluoride	mg/l	1.0
8	Magnesium	mg/l	
9	Temperature	oC	-
10	pH Value	-	6.5-8.5

TABLE NO.4 OBSERVED PHYSICO-HEMICAL PARAMETERS TAKEN IN THE STUY AREA

S.No	Parameter	Unit	Station 1	Station 2	Station 3	Station 4
1	Alkalinity	mg/l	344	368	396	168
2	Barium	mg/l	<0.01	<0.01	<0.01	<0.01
3	Calcium (as ca)	mg/l	132	168	84	38
4	Chloride (as cl)	mg/l	470	468	242	156
5	Colour	Hazen units	4	4	4	5
6	Electrical Conductivity	µmhos/cm	2000	2350	1680	1240
7	Fluoride (as F)	mg/l	0.04	0.04	0.08	0.08
8	Magnesium (as Mg)	mg/l	52	42	62	24
9	pH	-	7.94	7.45	7.84	7.28
10	Temperature	oC	26.0	26.0	25.0	25.0

RESULTS & DISCUSSION

pH

Every one of the estimations of pH fall inside of the scope of 6.5 – 8.5. The most extreme worth is seen in station 1

Shade of the Water:

The water is drab, unscented in every one of the stations.

Temperature of the water:

The temperature of the testing stations was seen as either 26^{o}C or 25^{o}C in every one of the stations. The temperature of stations 1 and 2 is 26^{o}C and in station 3 and 4 it is 25^{o}C.

Electrical conductivity:

The conductivity quality is the most extreme in station 2 (2350 µhmos/cm) and other the estimations of conductivity is higher.

Alkalinity:

The estimations of alkalinity are the most astounding in three stations viz, stations 1, 2 and 3. The most reduced worth is found in station 4.

Barium:

The estimation of barium is within the prescribed limit .

Chloride:

The estimations of chloride is the most elevated in the station 1 with the estimation of 470mg/l took after by the station 2 with the estimation of 468 mg/l. The qualities are lower than the allowed esteem in the station 3 and in the station 4 (242)

Magnesium:

The values are within the nomal range.

Fluoride:

The estimation of fluoride is within the nomal prescribed limit.

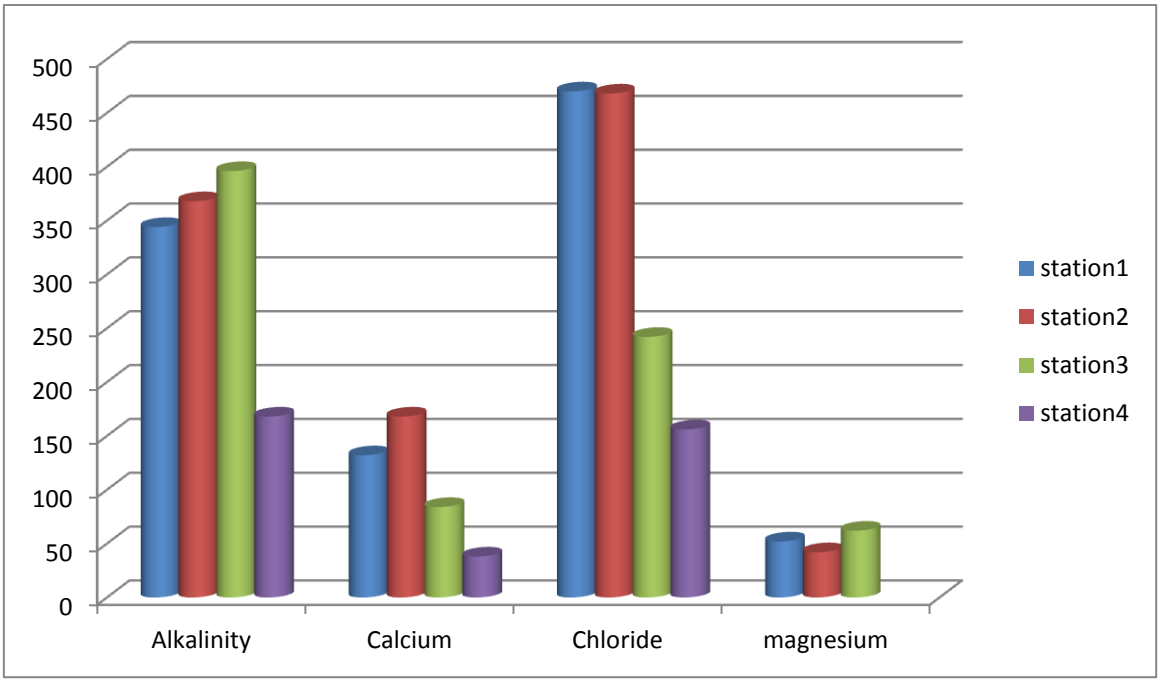


Figure 1 Alkalinity,calcium,chloride and magnesium of the sampling stations

Unit in Y-axis is mg/l and in x-axis represents the sampling stations

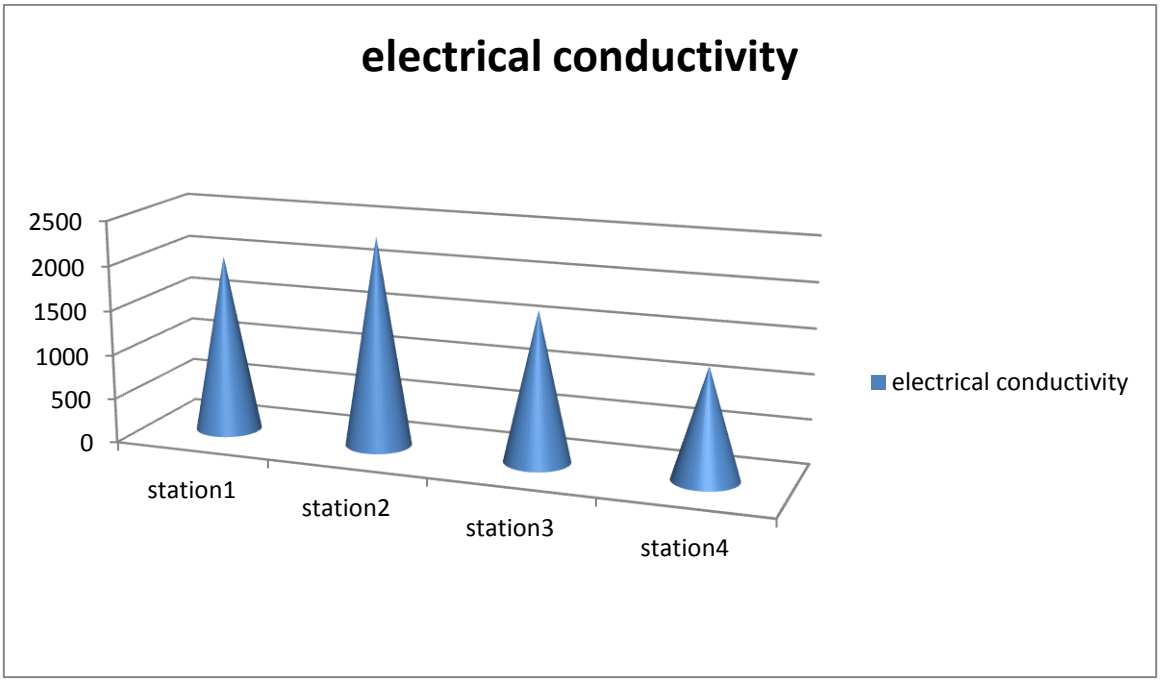


Figure 2. Electrical onductivity of the sampling stations
Unit in y-axis is µmhos/cm and in x-asis is sampling stations

CONLUSION

The above study indicates that the values from the analysis of the ground water a well within the prescribed limits as per the standards and specific water treatment is not required.

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