

COMPARATIVE STUDY OF GROUND WATER QUALITY OF LUCKNOW WITH STANDARD VALUES OF IS-CODE 10500:2012

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ABSTRACT

Without water life isn't feasible on the planet. Essentially the ground water was protected to drink however after the time was elapsed it became dirtied because of immense release of untreated modern emanating and other human exercises. Contaminated water is generally answerable for infections like hepatitis, jaundice, typhoid looseness of the bowels and the runs and so forth. Surface water and Groundwater both are the wellspring of savoring water the Lucknow city, the capital of Uttar Pradesh. The point of this study is to know the momentum circumstance of ground water nature of Lucknow city. In this concentrate on 5 stations at Lucknow city have been chosen for gathering ground water tests and exhaustive physico-substance investigation was led. Physico-compound Parameters like temperature, turbidity, conductivity, TDS, chloride, fluoride, all out hardness, alkalinity, nitrate and phosphate were estimated by the standard technique. The outcomes were contrasted and IS drinking water standard 10500 and saw that a large portion of boundaries at all inspecting station were found inside satisfactory breaking point while not many boundary like TDS, all out hardness, alkalinity and sulfate were viewed as higher than standard cutoff at a portion of the stations.

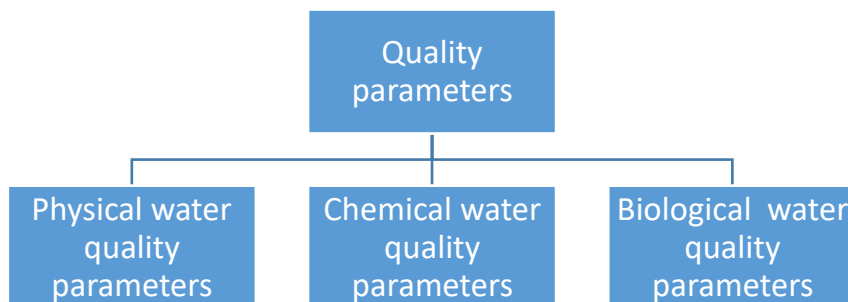
Keywords: Ground Water, Physico-Chemical, Pollution, Lucknow.

I. INTRODUCTION

Water is a characteristic asset for earth planet. The ¾th region [75%] of earth is covered by water. Water is one of the greatest basic regular resources for all life being on the planet. The accessibility and top notch of water generally have played significant part in sorting out now not most straightforward wherein individuals can reside, yet furthermore their nature of ways of life.

India is wealthy in water assets. In any case, with expansion in populace, man has taken advantage of water hotspots for its own advantages and throughout timeframe the accessibility of unadulterated water has begun contracting. Groundwater is the water put away underground in rock cracks and pores that lay underneath the outer layer of the earth Ground water is a critical part of water assets and it is essential piece of hydrological cycle

Water is the second most significant requirement for life to exist after air. Therefore, water quality has been portrayed broadly in the logical writing. The most well known meaning of water quality is "it is the physical, compound, and organic attributes of water" [1, 2]. Water quality is a proportion of the state of water comparative with the prerequisites of at least one biotic animal varieties as well as to any human need or reason.



Flow Chart 1.1: Water Quality Parameter

II. CASE STUDY

2.1 Status of ground water quality of lucknow

Lucknow area is a piece of Central Ganga Plain in the province of Uttar Pradesh and lies between North scopes 26°30' and 27°10' and East longitudes 80°30' and 81°13'[1]. Lucknow is a significant spot from old times. Lucknow tries to be a focal point of social and the travel industry in view of the set of experiences related with the city.. The environment of Lucknow area is subtropical sort with three region seasons in particular summer, rainstorm and winter. (Arun Kumar, 2008-09). Individuals of Lucknow get drinking water from both surface water source (Gomati River) and subsurface water sources. Subsurface water is made accessible through two sources. The primary source is profound drag well. One more wellspring of groundwater is hand siphons. (Annapurna Singh, 2012).

The examination led by Annapurna Singh (2012) on drinking water of Lucknow uncovered that the characteristics of a greater part of water tests were satisfactory as indicated by the BIS and WHO rules for homegrown purposes aside from the beginning of Telibagh and the ground water of Charbagh and Chintah. Ground Water of Chintah, Charbagh, Telibagh were found polluted[2].

In focal district of Uttar Pradesh Lucknow is impacted with nitrate contamination in ground water.(Neelam Nigam).The aftereffect of investigation of shallow ground water led by Arun Kumar uncover that ground water is dirtied and convergence of Nitrate in excess of 100 mg/l (most extreme passable cutoff) has been seen at Khajauli in Mohanlalganj block, and Kathwara in Bakshi-Ka-Talab block, any remaining constituents are well inside admissible cutoff points. Arsenic content in the locale ranges between nd to 23 ppb and well inside admissible cutoff points. The convergence of Pesticide Residue in Lucknow region is well inside reasonable cutoff (P.F.A. 0.1 mg/l) [2].

Table 2.1.1: Types Of Pollutant Detected In Ground Water Of Lucknow.

Place	Types of pollutant(mg/l)	Reference
Nishatganj	Nitrate-31.1 Chloride-35.5 Alkalinity-180 Total hardness-160 Sulphate--	Annapurna singh et al.2012[3]
Charbagh	Nitrate-37.9 Chloride-70.9 Alkalinity-234 Total hardness-220 Sulphate--	Annapurna singh et al.2013[3]
Telibagh	Nitrate-53.2 Chloride-28.4 Alkalinity-192 Total hardness-180 Sulphate--	Annapurna singh et al.2014[3]
Chinhatt	Nitrate-12.7 Chloride-21.3 Alkalinity-228 Total hardness-180 Sulphate--	Annapurna singh et al.2015[4]
Indira Nagar	Nitrate-118 Chloride-71 Alkalinity- Total hardness Bicarbonate-317 Sulphate-29	Annapurna singh et al.2016[3]
Gomti Nagar	Nitrate-19 Chloride-28 Alkalinity- Total hardness bicarbonate-317 sulphate-43	Annapurna singh et al.2017[3]

2.2 Drinking water specification recommended as per IS-Code 10500:2012

These parameters defined the quality of water. As per IS-Code 10500:2012 DRINKING WATER SPECIFICATION recommended allowable standard for domestic use. IS CODE 10500:2012 foreword and clause 4.

Table 2.2.2: Physical parameters as per IS-Code 10500:2012

S. No.	Parameters	Acceptable Limits	Cause of Rejection Limits	Principles	Units	Effects
1.	Suspended Solids	500 mg/l	2000mg/l	Gravimetric Technique	ppm mg/l	Reduce Dissolved Oxygen
2.	Turbidity	1 NTU	10 NTU	Absorption of light	STU,JTU NTU,FTU	Aquatic life

3.	Colour	5 TCU	25 TCU	Colour matching	TCU	Psycho logical
4.	Taste & Odour	1 TON	3 TON	(A+B)/A =TON	TON	Lungs stomach
5.	Temperature	10°C	20°C	-----	/*C	Biological chemical

Table 2.2.3: Chemical parameters as per IS-Code 10500:2012

S. No.	Parameters	Acceptable Limits	Cause of Rejection Limits	Principles	Units	Effects
1.	Dissolved Solid	500 mg/l	2000mg/l	[ECx0.65] =TDS	mg/l	Skin problems
2.	Alkalinity	200mg/l as CaCO3	600mg/l As CaCO3	Titration method	mg/l	Leads Incrustation
3.	pH	7 to 8.5	pH<6.5 pH>9.2	Using various Indicators	—	Effect nature of water[acid/base]
4.	Hardness	200mg/l as CaCO3	600mg/l as CaCO3	Titration with EDTA using EBT	mg/l	Lexative effects Incrustation Corrosion
5.	Nitrogen content					
i.	Free Ammonia	0.15mg/l	No relaxation	By simple by boiling	mg/l	
ii.	Organic Ammonia	0.30mg/l	No relaxation	By adding KMnO4 in preheated sample	mg/l	
iii.	Nitrite	0mg/l	No relaxation	Colour matching technique by Sulphonic acid + Nephthamine	mg/l	It causes of lack of hemoglobin in blood
iv.	Nitrate	45mg/l	No relaxation	Complete decomposition of organic matter by colour matching technique by Di-sulphonic acid + KOH	mg/l	If it is present in excess amount causes effect on Infants & infant have disease Methemoglo-binemia.
v.	Metals Fe Mn Cu	0.1mg/l 0.05mg/l 0.05mg/l	1mg/l 0,5mg/l 1.5mg/l		Mg/l Mg/l Mg/l	

III. CONCLUSION

All above impacts have brought about the decay of water nature of stream and lakes. It provides the insight into foster suitable administration techniques by civil specialists. The temperature variety is principally related with the temperature of barometrical and atmospheric condition . The decrease in the pH of Water of Lucknow might have been because of the released modern effluents. This outcome concurs with the reports by past researcher . The expansion in hardness can be credited to the lessening in water volume in the pace of dissipation at high temperature, high stacking natural substances, cleanser, chlorides and other pollutants[7] .

Without water life can't be envision on the planet. Clean water is the fundamental nessesity of sound life. From above conversation obviously with time ground water of Lucknow city is getting contaminated day by day.Polluted water will cause shortage of drinking water. To get unpolluted water it is vital to evaluate its quality and check the degree of contamination in ground water every now and then.

This paper is survey on assortment of boundaries of water quality, every boundary which have a particular measure of alluring and unwanted substance present in water. For utilizing reason homegrown and industry water have give explicit information before use, which is given by Indian standard DRINKING WATER SPECIFICATION second update IS Code 10500:2012 have referenced every boundary impediments. This report looks at quality boundary concerning IS code detail for homegrown use in city of lucknow[7]

IV. REFERENCES

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