



Study of ground water for domestic utilities. A case study in greater Visakhapatnam

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A specific place's ground water region is typically a delicate portion of the ecosystem. For various quality metrics, water from the 75 wells in the larger Visakhapatnam area was obtained. On the basis of chemical analysis, the samples were categorized into distinct groups based on the study's findings on numerous water quality criteria that are above the acceptable level for residential use.

Ground water, chemical analysis, quality parameter, water quality

I. INTRODUCTION

Standard scientific method have been followed for field and laboratory work as well as in the process of analyzing and interpolating the findings. A total of 75 wells were sampled during pre monsoon and post monsoon period and the water level depths were measured. The laboratory work consists of water samples by different analytical methods. Determination of pH, specific conductance and total dissolved solids, determination of alkalinity, determination of total hardness, estimation of calcium, determination of magnesium, determination of sodium and potassium, determination of chloride, determination of sulphide (gravimetric method), determination of nitrate and fluoride, determination of trace elements, reaction error

the chemistry of ground water in present area of investigation with respect to major and trace elements as well as their chemical related properties have been determined using standard laboratory procedure. The major consists of calcium(Ca), magnesium(Mg), sodium(Na), potassium(K), and anions such as carbonate(Co₃), bicarbonate(HCO₃), chloride(Cl), sulphate (So₄), fluoride(F) and nitrate(No₃) the trace elements such as copper(Cu), lead(Pb), zinc(Zn) and iron(Fe) are also determine. Beside these, chemical related properties such as hydrogen ion activity, total dissolved salts(TDS), total alkalinity (TA) and total hardness (TH) were also determined while carrying out hydro chemical analysis, the values are taken in Mg/lit units in order to ake it easy in comparing them with standards given by ICMR / ISI

NEED OF STUDY:

Wells in plain area are predominantly showing very shallow to moderate depth of water table while the wells confined to hilly terrains are more of moderately or deep to deeper water levels. The ground water fluctuations have shown an increase with increase in depth of wells line amounts are found to have an impact on ground water occurrence. The ground water configurations and fluctuations the influence of high density lineament



CITY ZONE													
Area	pH	TDS	TH	Ca	Mg	Na	K	Cl	So4	F	NO3	Zn	Fe
Gnanapuram	HD L	MP L	MP L	HD L	MP L	HD L	HD L	HD L	HD L	HD L	HD L	MPL	MP L
Dwarakanagar	HD L	MP L	HD L	HD L	MP L	HD L	HD L	HD L	HD L	HD L	HD L	MPL	MP L
Nakkavanipalem	HD L	HD L	HD L	HD L	MP L	HD L	HD L	HD L	HD L	HD L	HD L	MPL	MP L
Soldierpeta	HD L	MP L	MP L	MP L	HD L	HD L	HD L	HD L	HD L	HD L	MP L	MPL	MP L
Rk beach	HD L	MP L	HD L	HD L	MP L	HD L	HD L	HD L	HD L	HD L	HD L	MPL	MP L
Lanson's bay colony	HD L	MP L	HD L	HD L	MP L	HD L	HD L	HD L	HD L	HD L	MP L	MPL	MP L
EAST ZONE													
Rushikonda	HD L	MP L	EL	HD L	EL	HD L	MP L	MP L	HD L	HD L	HD L	MPL	MP L
WEST ZONE													
Jerripothulapalem	HD L	MP L	MP L	HD L	EL	HD L	MP L	MP L	HD L	HD L	HD L	MPL	MP L
NORTH ZONE													
Pm palem	HD L	EL	MP L	HD L	EL	HD L	MP L	MP L	HD L	HD L	MP L	MPL	MP L
SOUTH ZONE													
vadlapudi	HD L	MP L	MP L	HD L	MP L	HD L	MP L	EL	HD L	EL	MP L	MPL	MP L

is prominent as the wells of plain areas. The low density lineaments are associated with moderately deep and deep wells with poor ground water occurrence. Lithology also played a major role in ground water conditions and also the quality distribution of pH with reference to lithology suggest that wells in the charnockite areas have striking low pH values (<8) and those in the khondalite areas have moderate to high pH values been identified in vishakapatnam and surrounding areas. Basing on lithology and lineament alignments, left of well, water table fluctuations, well density and aquifer. The area of present study has been categorized into the following zones.

- a. Excellent ground water potential zone
- b. Very good potential zone
- c. Good potential zone
- d. Moderate ground water potential zone
- e. Poor to moderate ground water potential zone
- f. Poor to nil ground water potential zone



In this study ground water potential zones have

HDL-Highly Desirable Limit

MPL-Maximum Permissible Limit

EL-Exceeding Limit

Conclusion:

The ground water in steady area has been influenced by various factors such as pH, lithology depths , seasonal fluctuation , lineament pattern and distance from industrial zone. Significant and positive co relation has been observed between trace elemental concentrations with parametric ratio narrowly. So₄/TDS indicating the occurrence of other metals in these ground waters. Field information and pollution zone map indicate the sources of pollution of ground water in chemical industries, which are situated in southern side and northern side . The area old town although far away from the chemical industries the pollution may be due to sources of contamination in poor sewage, organic waste and sea water intrusion.

References

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