

Guntakal Municipality
Action Plan for reduction of Water losses

Introduction:

Guntakal is a class-I town in Anantapuramu District. It is an important Railway Junction in Rayalaseema region, for both Broad gauge and Meter gauge lines. It is located on the Chennai-Mumbai broad-gauge line. Many important trains pass through Guntakal Junction to places like Bangalore, Delhi, Hyderabad, Cochin, Trivandrum, Kanyakumari etc., Many goods trains pass through this station carrying iron ore up to the sea coasts National Highway (No.63) allowing large amount of vehicular traffic. The Tunga Badhra High Level Canal is passing through this town and serves as major drinking water source to the town.

Guntakal Municipality is situated at 77° 18' East longitude and 15° 6' North latitude. It is an important urban town in Anantapuramu District in Rayalaseema Region. STATE HIGH WAY PROJECT for the stretch from KADAPA to GUNTAKAL developed Road parallel to Broad Guage Railway track from Chennai - Mumbai which also pass across the town it is an important Railway Junction and is a Railway Divisional Head Quarters. Direct trains to the nook and corner of the country pass through the town resulting huge Railway passenger flow involving commercial activity there by prone to migration from rural areas. The town is extended over an extent of 40.87sq km. As per 1961 census report, the population of the town was 48093. The present population of the Municipality as per 2011 census is 126479 Based on the trend of the growth of the Population in previous years, The Projected Populations are calculated as per CPHEEO Manual and the same population is considered for the study is i.e 166847 and 201859 for Prospective (2032) and Ultimate (2047) which is as tabulated below.

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S.NO.	COMPONENT	BASE YEAR 2015	FOR YEAR 2017	FOR YEAR 2021	PROS PECTIVE YEAR 2032	ULTIMATE YEAR 2047
1	Population	133390	136983	144443	166847	201859
2	Prorata Supply	135	135	135	135	135
3	Clear Water requirement in MLD	18.01	18.49	19.50	22.52	27.25
4	UFW @ 15% in MLD	2.70	2.77	2.92	3.38	4.09
5	Raw Water Requirement in MLD	20.71	21.27	22.42	25.90	31.34
6	Raw Water Requirement in ML	7558.71	7762.31	8185.04	9454.59	11438.59
7	Raw Water Requirement in TMC	0.27 TMC	0.27 TMC	0.29 TMC	0.33 TMC	0.40 TMC

PRESENT WATER SUPPLY SYSTEM

SOURCE

Main Source of water for Guntakal Town is GBC canal which runs over a period of 6 months in a year. The two existing SS Tanks (1900+3800) =5700 ML capacity is utilized for balance 6 months period.

At present nearly 265 nos. of power bore wells with 1HP submersible pump sets at 0.40 MLD and 60 nos. of hand bore wells at 0.10 MLD in 37 wards of the Guntakal town.

Adequacy of SS Tanks

Existing Capacity of SS Tank (3800+1900)		5700.00	ML
Exclu. 33 1/3% Losses for Evaporation, Seepage and Dead Storage		3800.19	ML
Available Raw Water for SS Tank excluding losses		3800.19	ML
Canal Closure period including buffer=	6 Months + 15 days buffer	195 Days	

Adequacy of SS Tank				
Population		Per Capita Demand (including 15% of UFW)		
		135 lpcd	100 lpcd	90 lpcd
Present Population (2015)	133390	184 days	248 days	275 days
Projected Population (2021)	144443	169 days	229 days	254 days
Prospective Population (2032)	166847	147 days	198 days	220 days
Ultimate Population (2047)	201859	121 days	164 days	182 days

TREATMENT SYSTEM

The Total installation capacity of the water supply system is 17.0 MLD +4.83= 22.43 MLD, but the old filtration plant 4.83 MLD is not functioning properly due to frequently repairs, Hence 5.0 MLD filtration plant is proposed in place of 4.83 MLD.

Water Treatment Plants and Recommendations for Prospective and Ultimate Demands			
Type of Demand	Total Capacity of Filtration Plant in MLD	Existing Capacity of Filtration Plant in MLD	Additional Requirement of Water Treatment Plant in MLD
BASE YEAR 2015	18.01	17.00	1.01
FOR YEAR 2021	19.50	17.00	2.50
PROSPECTIVE YEAR 2032	25.90	17.00	8.90
ULTIMATE YEAR 2047	31.34	17.00	14.34

Old 4.83MLD Filtration Plant is not proper functioning due to repairs frequently. Hence 5.0 MLD Filtration Plant is proposed in place of 4.83 MLD Old Filtration Plant.

STORAGES

There are 17 Nos. storages of total capacity of 8.56 ML. Out of which only 15 Nos of storages are utilizing for distribution of town, the 2 Nos.

storages 250 KL each in Indiramma colony are recently handover to municipality from RWS Dept for distribution of Indiramma colony for which proposals are worked out for distribution pipelines and pumping main to the storages in Indiramma colony.

EXISTING RESERVOIRS IN GUNTAKAL MUNICIPALITY

S.No	Location	Capacity of ELSR in KL	Stagging	GL	LWL	MWL
1	Hampaiah Colony	225	15.0	448.000	463.000	466.000
2	Nay Brahmin Colony	225	15.0	457.500	472.500	475.500
3	MRO Office	450	8.0	454.670	462.670	467.670
4	Municipal Commissioners Quarters (2 Nos)	900	5.5	451.700	457.200	460.250
5	Boys High School	450	12.3	443.669	456.000	459.000
6	Tilak Nagar	700	15.0	437.000	452.000	456.000
7	Kathalakeri	450	10.1	437.430	447.500	452.500
8	Porters Lane	600	15.4	448.500	463.900	467.900
9	Benchikottala	450	11.9	451.445	463.300	466.350
10	Bhagyanagar	600	6.8	456.500	463.300	466.350
11	Hanumesh Nagar	750	14.8	450.180	464.970	469.970
12	60 feet road	750	17.3	439.470	456.730	460.730
13	Weavers Colony	565	15.0	428.000	443.000	447.000
14	Old Town	275	4.9	445.000	449.930	453.930
15	Housing Board	450	13.5	452.920	466.400	469.900
16	Indiramma Colony I	250	11.2	440.000	451.170	455.170
17	Indiramma Colony II	250	11.2	436.500	447.700	451.700
	Total	8340				

DISTRIBUTION

Under the study, proposed rezoning is made into 17 zones for the purpose of distribution, Supplying through 15 ELSRs and reallocating the areas as per the capacity of the ELSRs and to generate min. 7mts head.

The distribution pipelines are now proposed for Donamukkala road Indiramma Colony and non coverage and low pressures in the town.

The distribution for the Ultimate has been designed taking the peak factor of 3.0 as per CPHEEO at 135 lpcd and allowing 10% as UFW component to result 7.mts of terminal head. The use of HDPE PE100/6KSC for 110-250mm dia and above 250mm dia DIK7 are recommended for the Distribution pipes. The widely used Hazen Williams formula to describe the flow through the pipes is used. The well-known HARDY CROSS method is adopted for the analysis of the design of the distribution network.

Tariff Structure

The socio economic study on willingness to pay for better services, Existing and Proposed tariff structure keeping in view the investment plan.

The results of house hold survey reveals that the citizens are not satisfied with the present supply status and there is poor response for the willing ness to pay. However, there is positive response for the taking connections if the service is improved.

OPERATION AND MAINTENANCE PLAN

The ULB as a local body is responsible for the creation and maintenance of assets in municipality. The ULB is committed to provide safe and required quantity of water to the public of its town. The process of commitment involves the Operation and Maintenance of various types like electrical, mechanical systems to meet the required quality and quantity of water supplies. Good Operation and maintenance of systems will result in increased life of the assets, reduces recurrence in expenditure, avoid break down affects. The poor in O&M leads to the failures of the systems. Hence the importance of O&M planning is compulsory.

The main deficiencies in the O&M of existing situation in GUNTAKAL Municipality under water supply are enlisted as

1. The system does not possess any on line-metering system for monitoring the function of the system.
2. The staff is not equipped with tools like leakage detection equipment's, meggers and the jointing equipment for HDPE pipeline etc for better quality of work in maintenance.
3. Lack of adequate Skills and capacity to the maintenance staff
4. No attention to the preventive maintenance
5. Constraints in Finance and delegations for the advance planning to O&M

Therefore there is a need for the approval of the O&M plan with necessary budget allocations to have an advance planning for O&M to prevent the breakdown maintenance to the possible extent. Regular trainings for updating the skills of the staff is to be taken up in the operation and use of the latest techniques /latest tools for the better delivery of the service.

CAPACITY BUILDING PLAN

The present capacities of existing personnel and assesses the training needs and the methodologies for building and updating the capacity of the staff.

The limited availability of regular employees could not able to cope up with the O&M issues in the maintenance of the water supply in GUNTAKAL Municipality. Due to the shortage of staff, the Municipality is out sourcing from the service agencies as contract workers. The workers hired do not possess adequate academic/technical Skills in the operation of the systems. The keeping of unskilled personnel in the operation not only causes the defunct of the system but also leads to legal complications. Therefore, to achieve the safety of the staff and equipment the staff involved in the O&M is to be improved with required skills and tools to the O&M staff for the growth of the organization. An elaborate training programme by the expert agencies/institutions like DLTC, ITI or NAC can be offered at least on yearly basis in the activities of

pipe fitting Electrician, Pump Mechanic Filter bed Operation , winding of Motors **and NRW/UFW control** etc. till the O&M system is upgraded to reach a reliable and sustainable state.

Works done to arrest water losses at various locations in Guntakal Municipality:

To arrest the water losses for getting below 20% in the town Guntakal Municipality has taken up the initiatives like

- Replacement of old pipelines
- Arresting water pipe leakages by repairing and changing of pipes
- Repairs and replacement of Sluice Valves, pumpsets, motors etc

Photographs of few works done in arresting the water leakages in the Guntakal Municipality are placed below:



Arresting of leakage in 16th ward



Arresting of leakage at Travelers Bungalow road.



Arresting of water leakage at Acharam Kotala.

The above mentioned are the few works done to arrest the water losses in the town.