

GEOSMART INDIA 2021

**THEME ADVANCING THE ROLE OF GEOSPATIAL
KNOWLEDGE IN INDIAN ECONOMY**



24-26 August 2021



HICC Hyderabad, India

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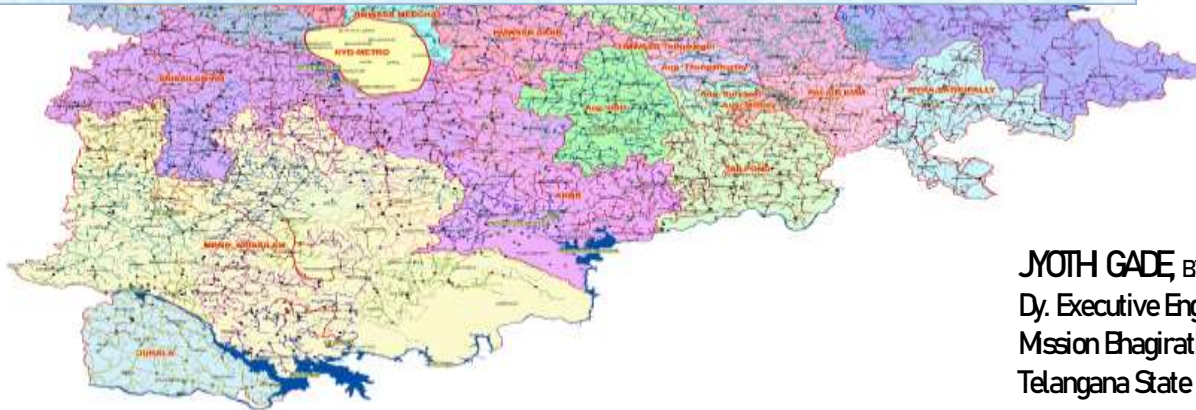


GOVERNMENT OF TELANGANA

MISSION BHAGIRATHA DEPARTMENT



GEOSPATIAL APPLICATION FOR MISSION BHAGIRATHA PROJECT



JYOTH GADE, BTech (Civil), MTech (TE)
Dy. Executive Engineer
Mission Bhagiratha Dept.
Telangana State



SCENARIO & NEED



- Chronic Drought conditions - Scarcity of Drinking water
- Recurring failure of Schemes and Huge O&M costs
- Productivity loss due to time spent on fetching water
- Loss of human lives due to water borne diseases
- GOI (NRDWP guidelines) – Ground water to perennial surface sources





VISION OF THE PROJECT



- ❖ Flagship programme of the State to provide safe, adequate, sustainable and equitable treated drinking water for the entire rural and urban areas of the State.
- ❖ Envisaged to bring down disease burden due to contaminated water and improve health standards as well as family's economic status.
- ❖ To ensure Per capita supply:
 - 100 LPCD (litres per capita per day) for rural areas
 - 135 LPCD for Municipalities
 - 150 LPCD for Municipal Corporations
 - 10% to meet Industrial requirements
- ❖ To provide tap connection to each household.
- ❖ Integration of existing assets with Mission Bhagiratha





WATER SUPPLY SYSTEM



Source



Intake Structure



Treatment Plant



House Hold Connection



Sump



OHSR



OHBR/BPT

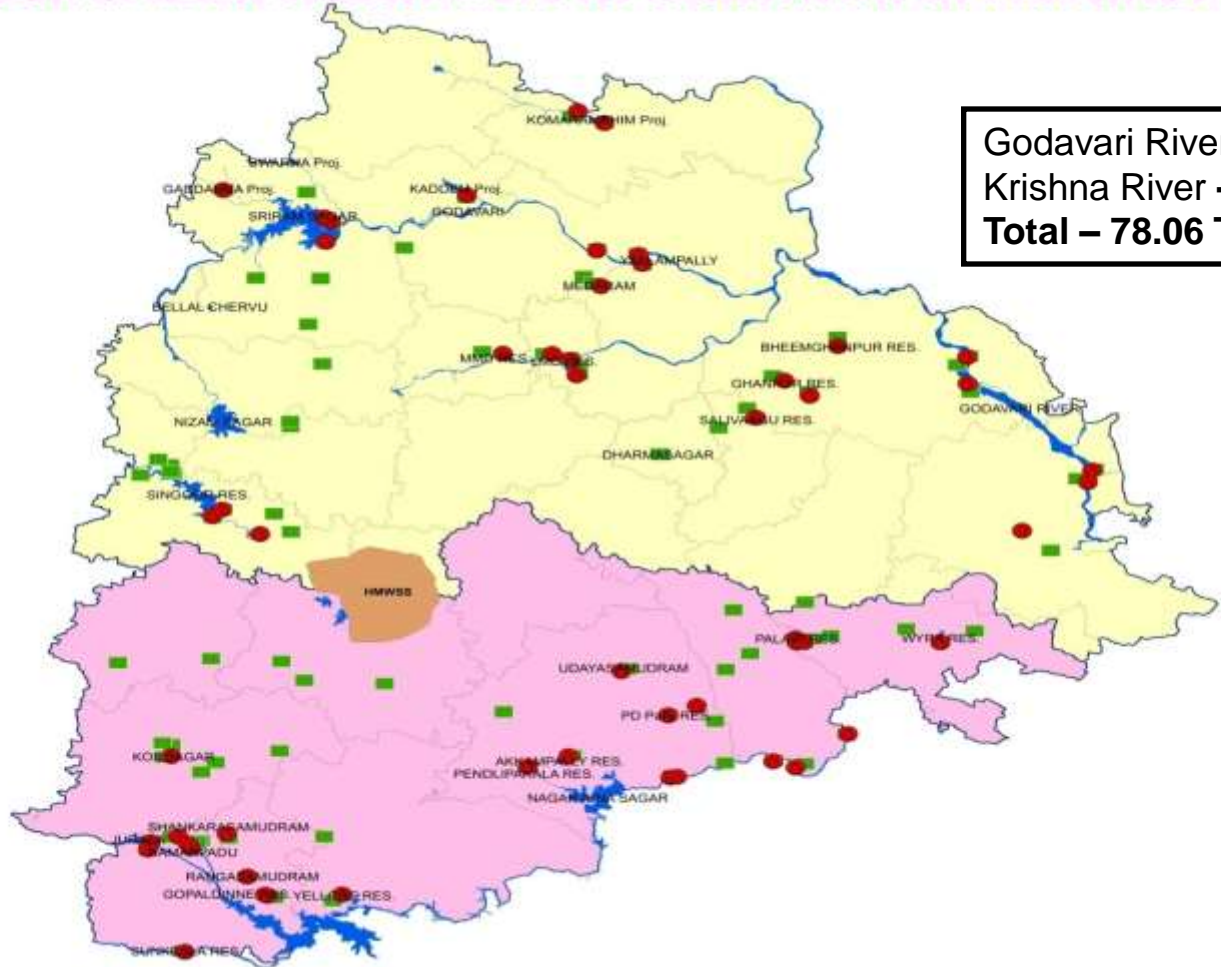


GLBR

COVERAGE UNDER KRISHNA AND GODAVARI RIVER BASINS



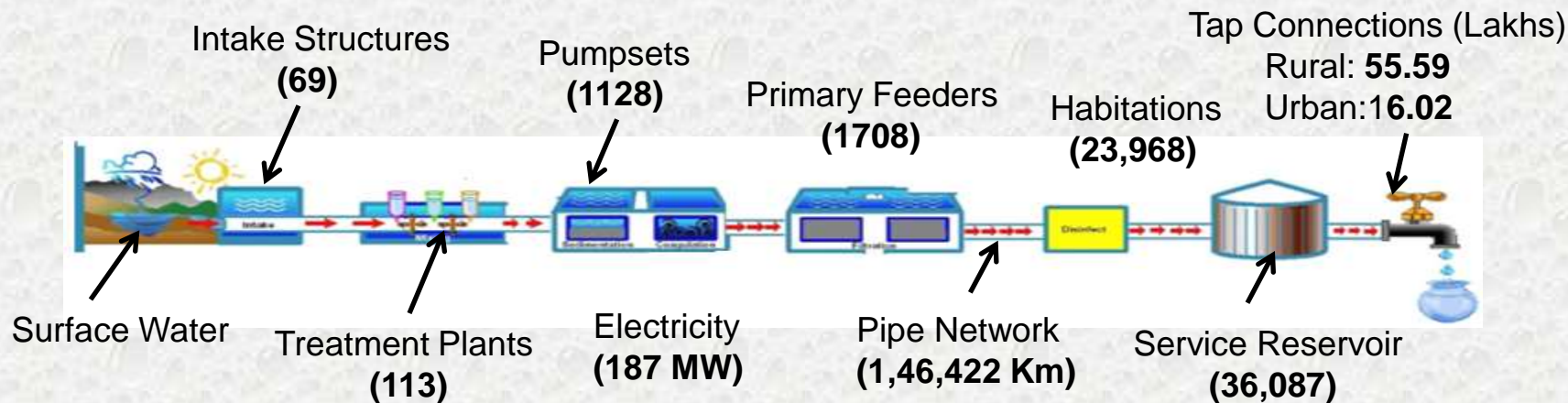
Godavari River – 48.20 TMC
Krishna River – 29.86 TMC
Total – 78.06 TMC



● Intake Well
■ WTP

MISSION BHAGIRATHA - SEGMENTS





➤ Service Crossings - 13901



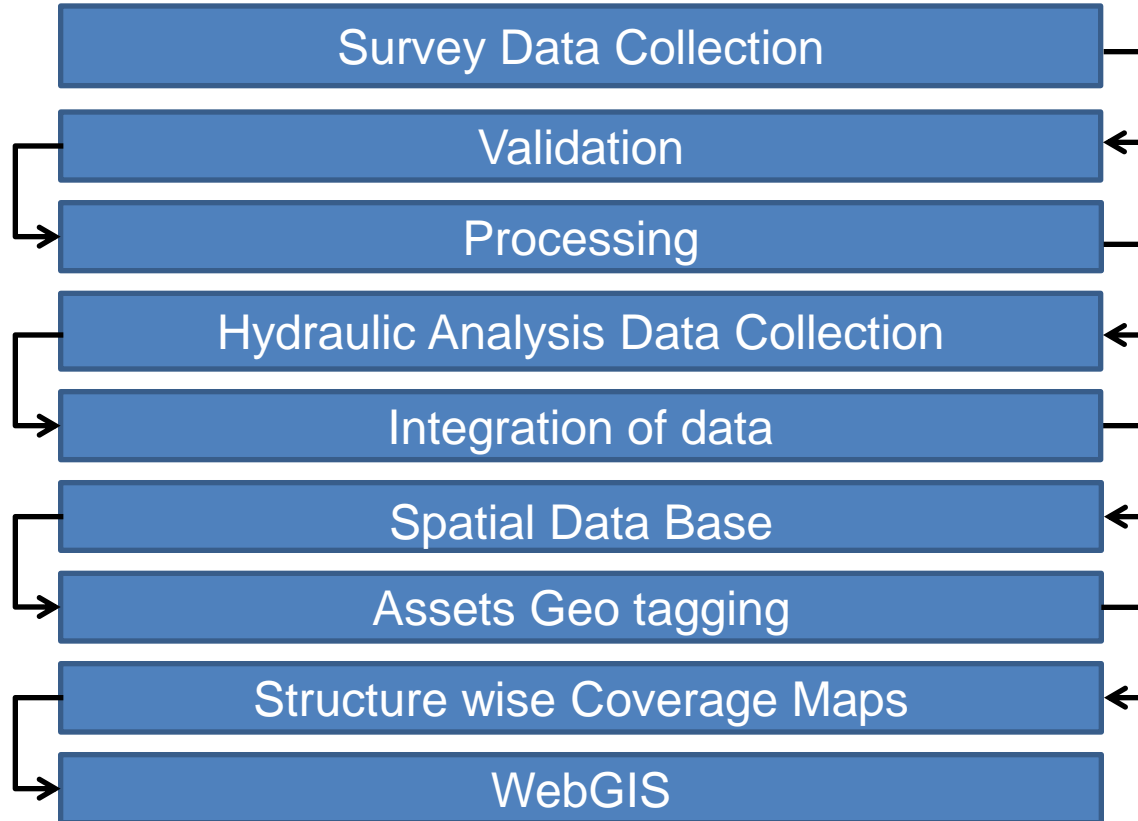
INFRASTRUCTURE



- Optic fiber cable duct is laid along the pipelines upto the household point, to ensure internet connectivity.
- This **Smart Grid** in future can be effectively used to push relevant content from Government to every household.
- **The Department developed an inhouse application by identifying the Department Engineers who had previous experience for developing and utilising the software.**

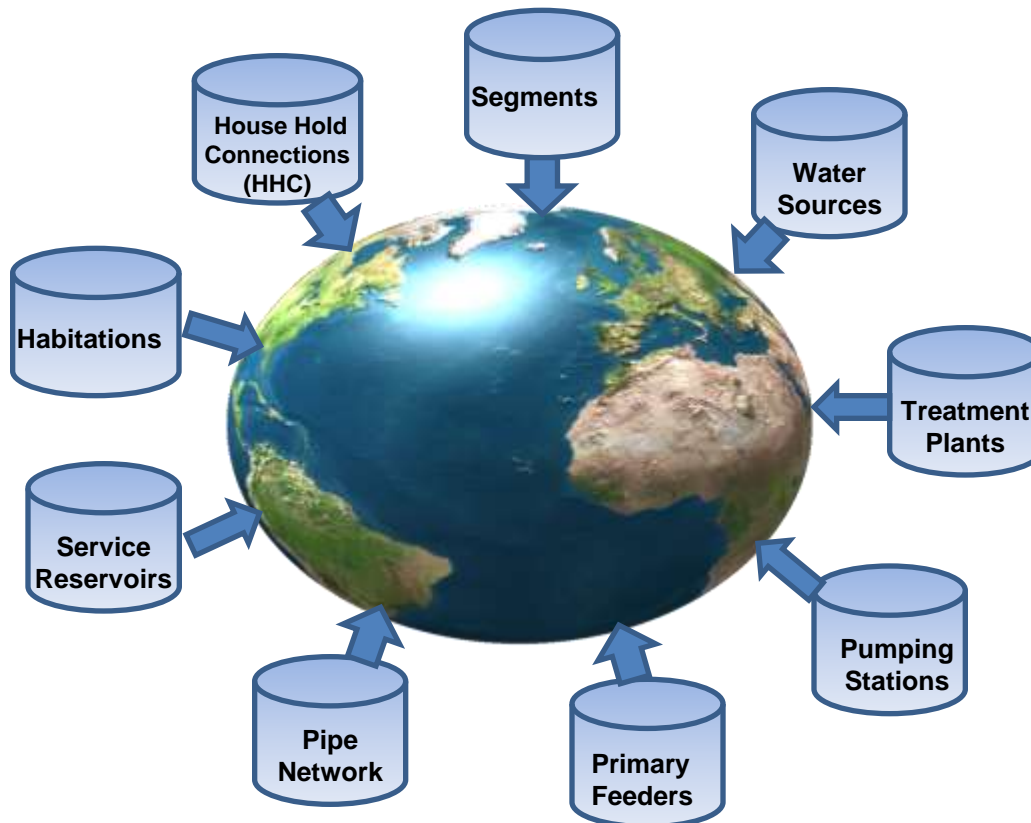


METHODOLOGY

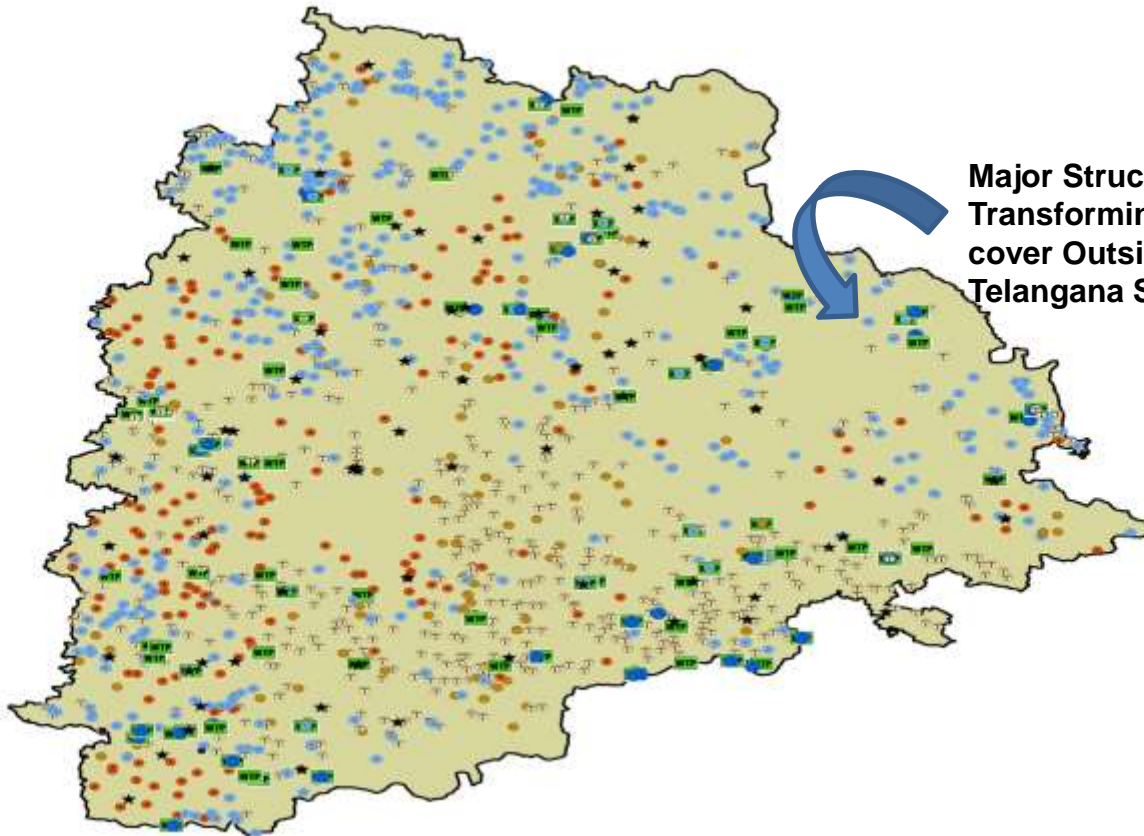




DATA BASE LAYERS



PRIMARY FEEDERS



Major Structures
Transforming water to
cover Outside ORR of
Telangana State

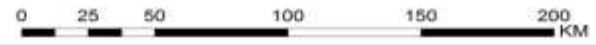
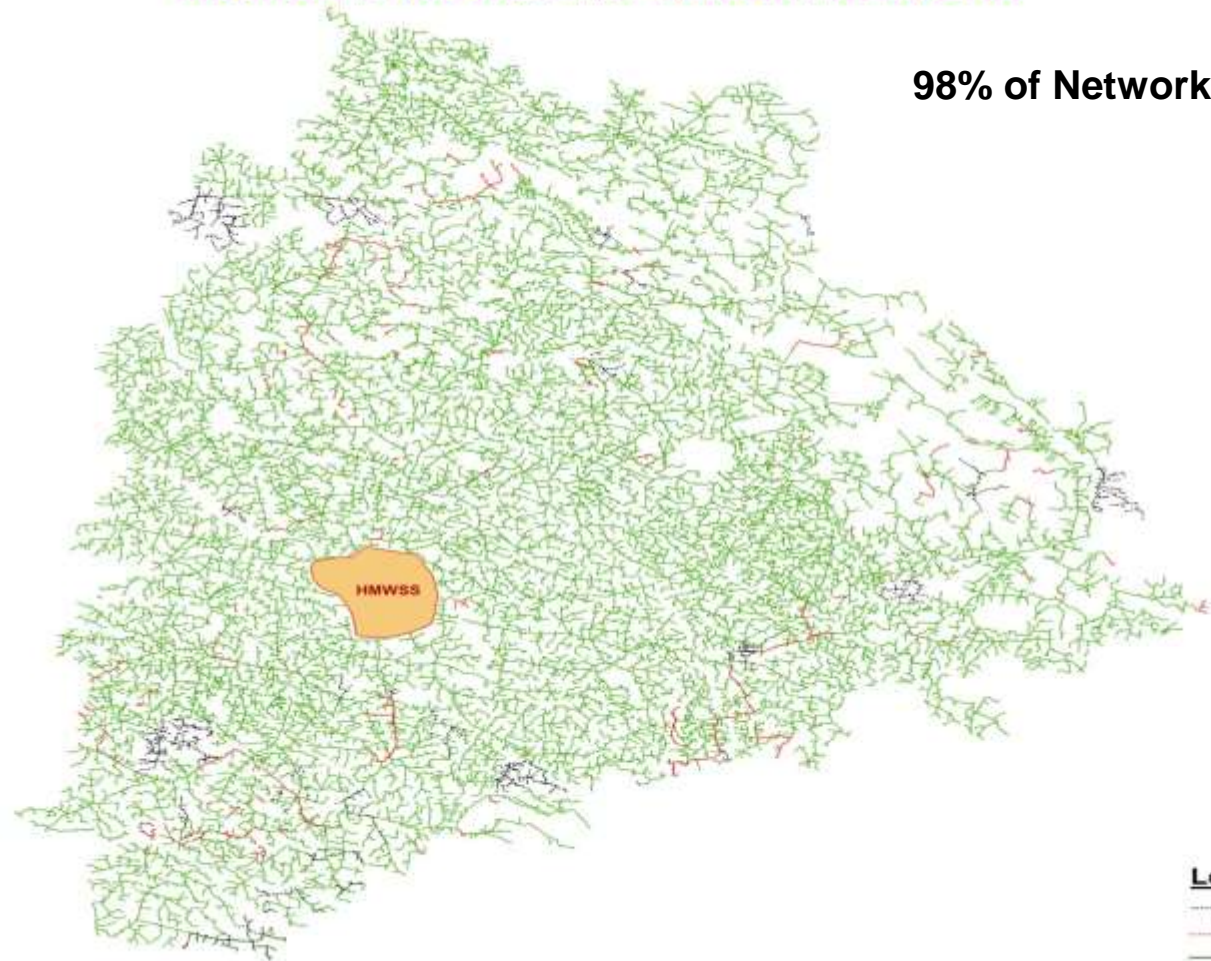
Legend

- ★ ULB
- BPT
- GLBR
- IW
- OHBR
- SUMP
- WTP

MISSION BHAGIRATHA - WATER NETWORK

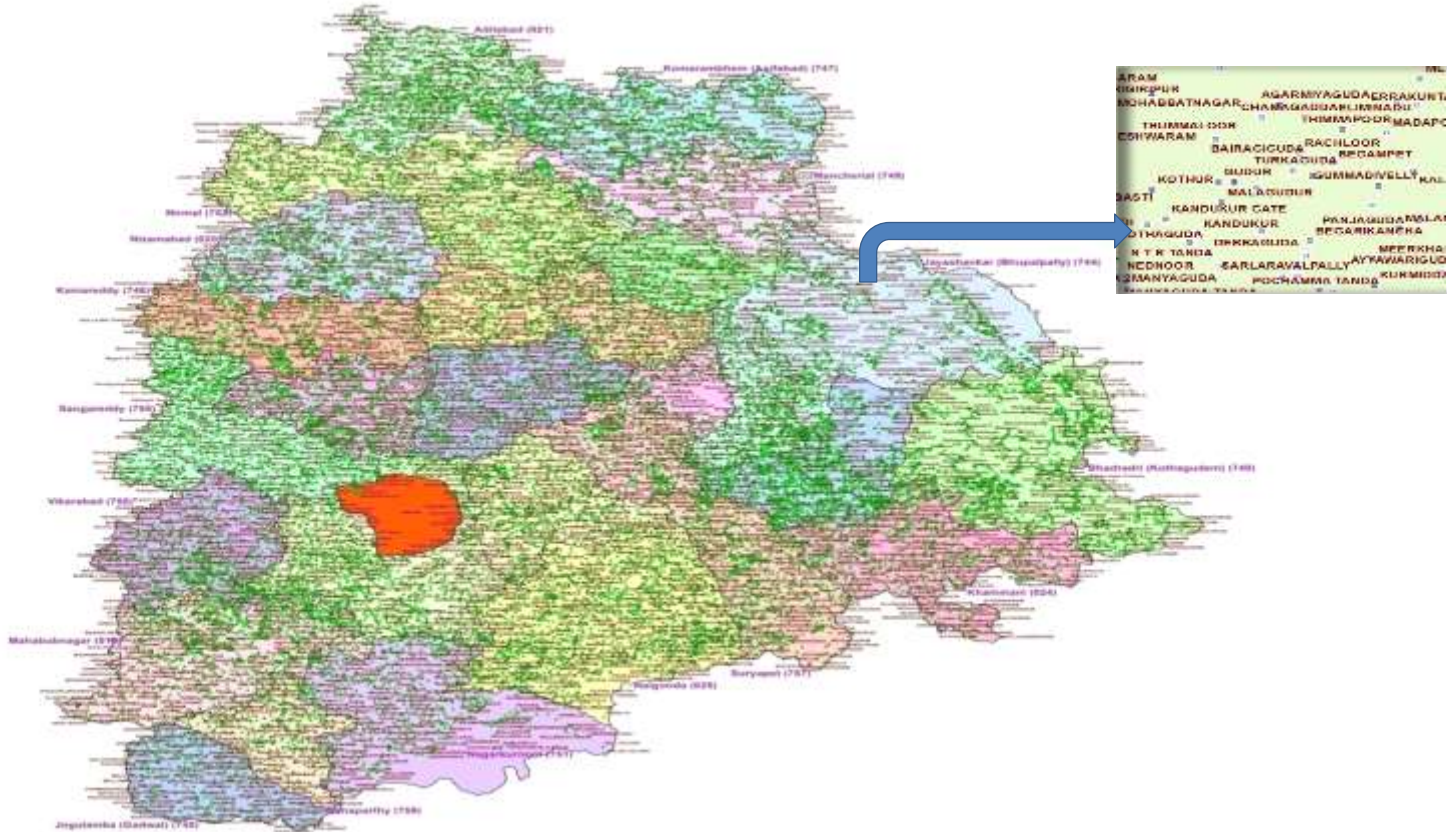


98% of Network under gravity

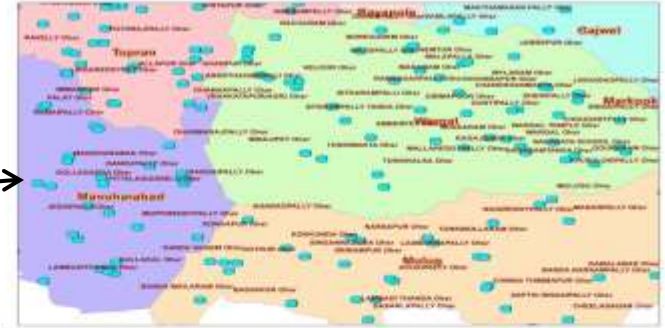
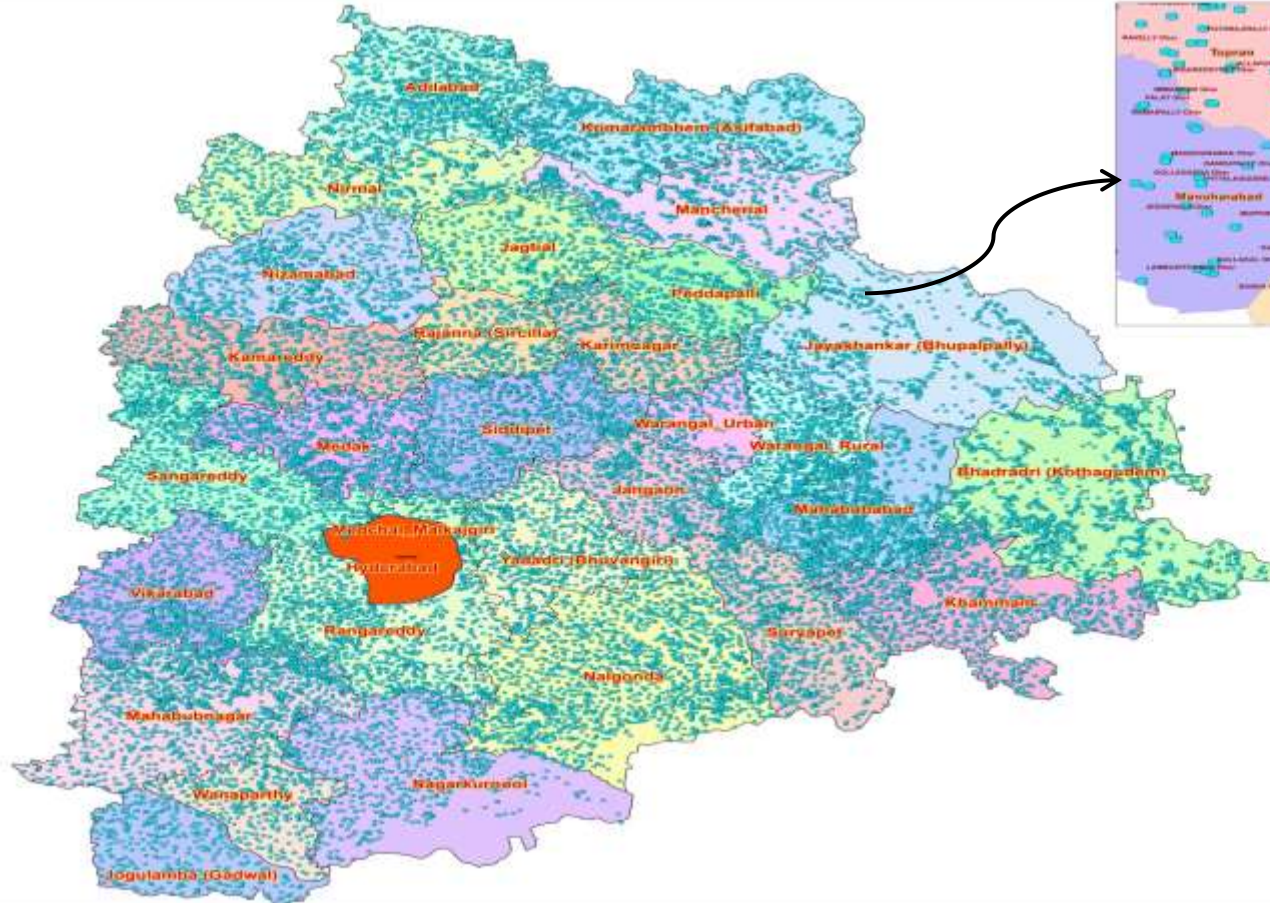


- Legend**
- Existing Gravity Network
 - Existing Pumping Network
 - Proposed Gravity Network
 - Proposed Pumping Network

HABITATIONS

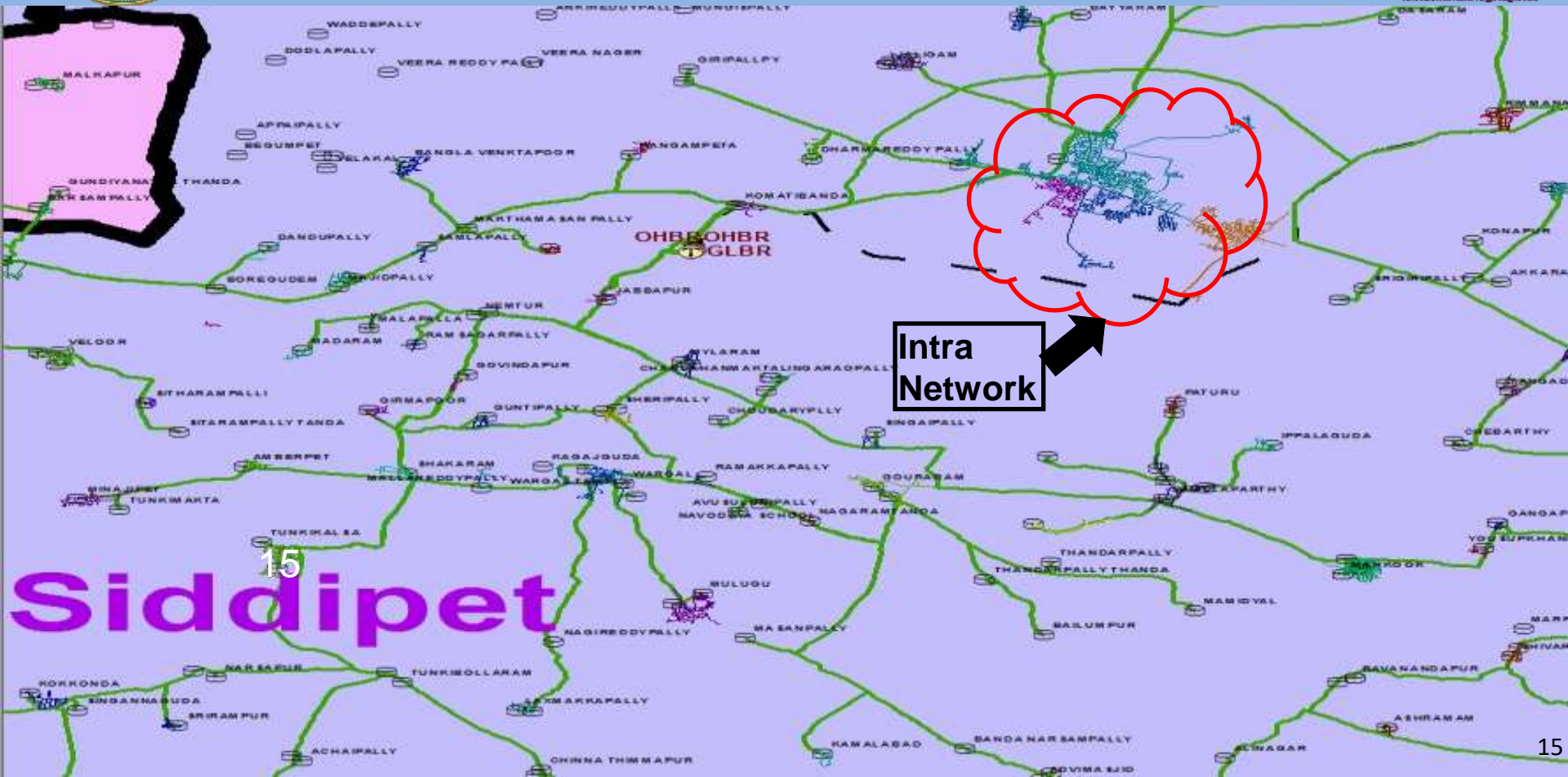


SERVICE RESERVOIRS





INTEGRATION OF GRID & INTRA



15

Siddipet



ASSET INFORMATION DISPLAY



One click Details in GIS Interface

Identify

Identify from: <Top-most layer>

- Gajwel_Struct
 - Gajwel

Location: 78.630091 17.828348 Decimal Degrees

| Field | Value |
|------------|--------------------------|
| FID | 1 |
| Shape | Point |
| Longitude | 78.630015 |
| Latitude | 17.828374 |
| Location | GLBR @ Komatibanda Gutta |
| Str_Code | G-GGLBR |
| GL_m_ | 617 |
| Hab_code | 17222210250100 |
| Capacity | 14000 KL |
| Staging | 0 |
| Ex_Prop | Proposed |
| Plain_Hill | hillock |
| Seg_Name | Gajwel |
| Division | Gajwel |
| District | Medak |
| New_Distri | Siddipet |
| Sub_Div | Gajwel |
| Str_Type | GLBR |

Identify

Identify from: <Top-most layer>

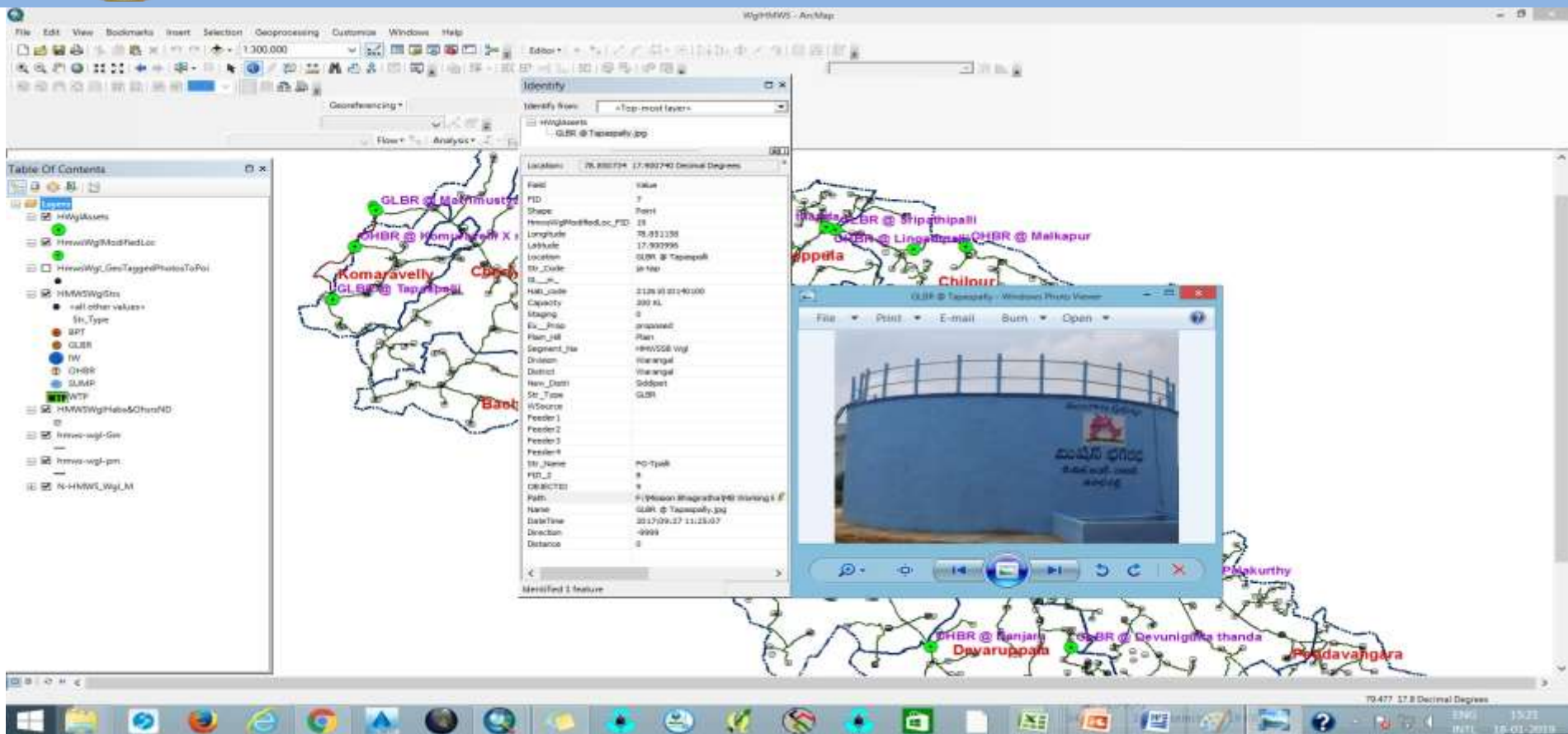
- DubbakPmWE
 - DUB-PM-211

Location: 78.525499 17.965751 Decimal Degrees

| Field | Value |
|------------|-------------------|
| FID | 7 |
| Shape | Polyline |
| GM_LAYER | LINKS |
| NAME | DUB-PM-211 |
| LAYER | LINKS |
| GM_TYPE | Unknown Line Type |
| CODE | DUB-PM-211 |
| SL_No | 62 |
| From_JN | Gollapalli SUMP |
| To_JN | Regya Thanda Jn |
| Cum_Pop | 986 |
| LPM | 100.30303 |
| Length_k | 0.495 |
| Type | HDPE |
| Dia | 110 |
| Inner_Dia | 100.7 |
| Class | 6Kg/Cm2 |
| Rate_km | |
| Est_Cost | |
| Contract_A | |
| Fric_Loss | 0.33 |
| HGL_Start | 610 |
| HGL_End | 609.67 |
| GL_End | 569.5 |
| LowestGL | 568.381 |
| HighestGL | 569.5 |

Identified 1 feature

GEOTAGGED ASSETS



The screenshot displays the ArcGIS interface with a map showing geotagged assets. A photo viewer window is open, showing a blue water tank with the text 'Water for People' and 'పానీయం' (Water) on it. The photo viewer title is 'GLBR @ Tapasipally - Windows Photo Viewer'.

The Identity window shows the following table:

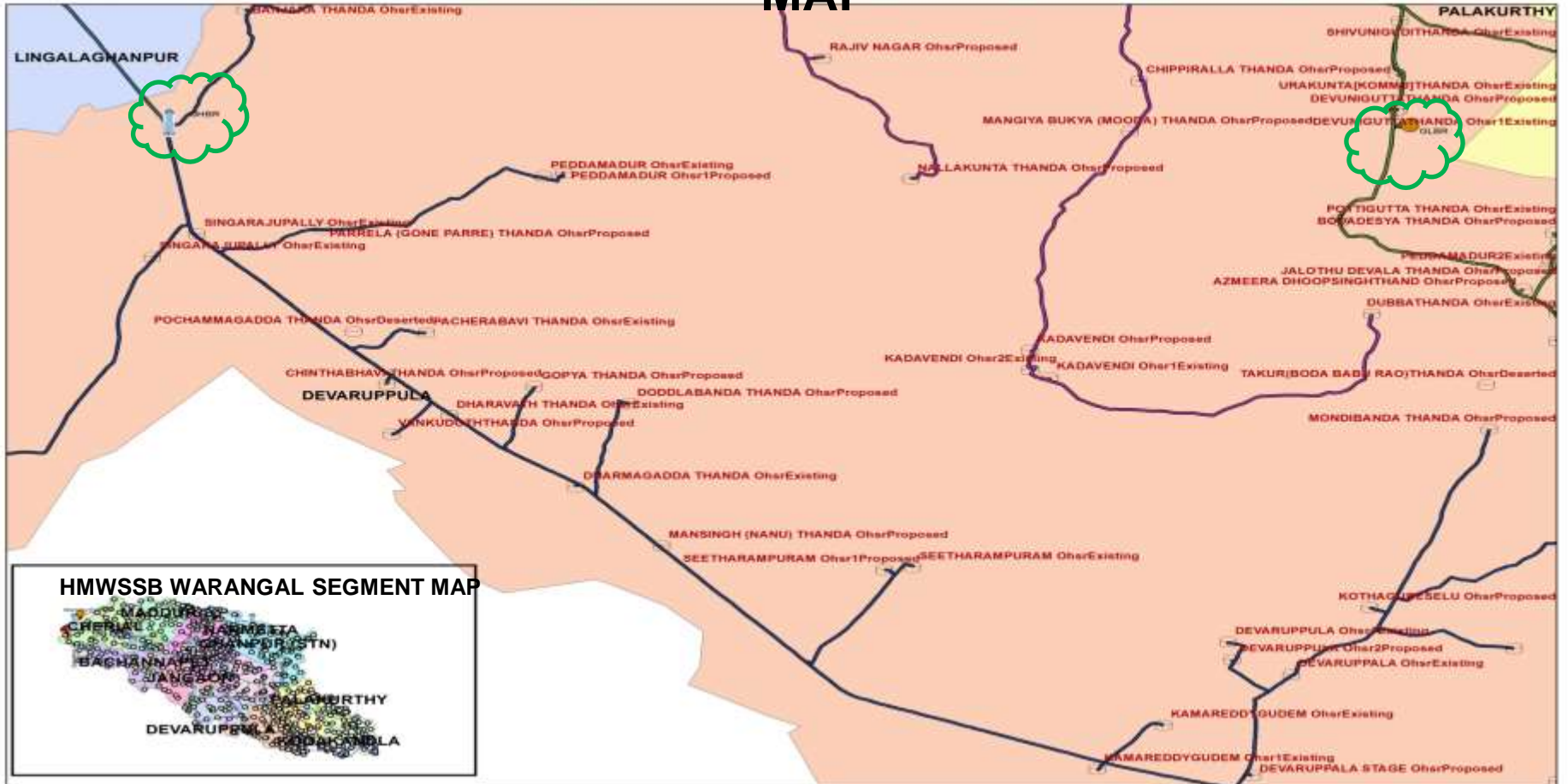
| Field | Value |
|--------------------|---------------------------------------|
| FID | 7 |
| Shape | Point |
| HWWSigPhotoLoc_FID | 28 |
| Longitude | 78.931358 |
| Latitude | 17.997995 |
| Location | GLBR @ Tapasipally |
| Str_Chain | 30-HR |
| Str_ID | |
| HLR_Code | 128 @ 014000 |
| Capacity | 200 KL |
| Staging | 0 |
| Str_Insta | Installed |
| Plan_ID | Plan |
| Segment_ID | 990028 Wgl |
| Division | Warangal |
| District | Warangal |
| Hex_Data1 | 0ddpnt |
| Str_Type | GLBR |
| WSource | |
| Feeder1 | |
| Feeder2 | |
| Feeder3 | |
| Feeder4 | |
| Str_Name | PO-Tyab |
| FID_2 | 8 |
| OBJECTID | 8 |
| Path | F:\Mission\Bhadrachala\Wgl\Warangal\G |
| Name | GLBR @ Tapasipally.jpg |
| DateTime | 2017/09/27 11:25:07 |
| Direction | 9999 |
| Distance | 0 |

The Table Of Contents on the left shows the following layers:

- Layers
- HWWSigs
- HWWSigModFedLoc
- HWWSig_GeoTaggedPhotosToPol
- HMWSWg_Geo
 - all other values
 - Str_Type
- BPT
- GLBR
- HW
- QHBR
- SLMP
- WTP
- HMWSWgHubs&ChenFD
- HWWSig-Geo
- HWWSig-pm
- N-HMWS_Wgl_M



STRUCTUREWISE COVERAGE MAP

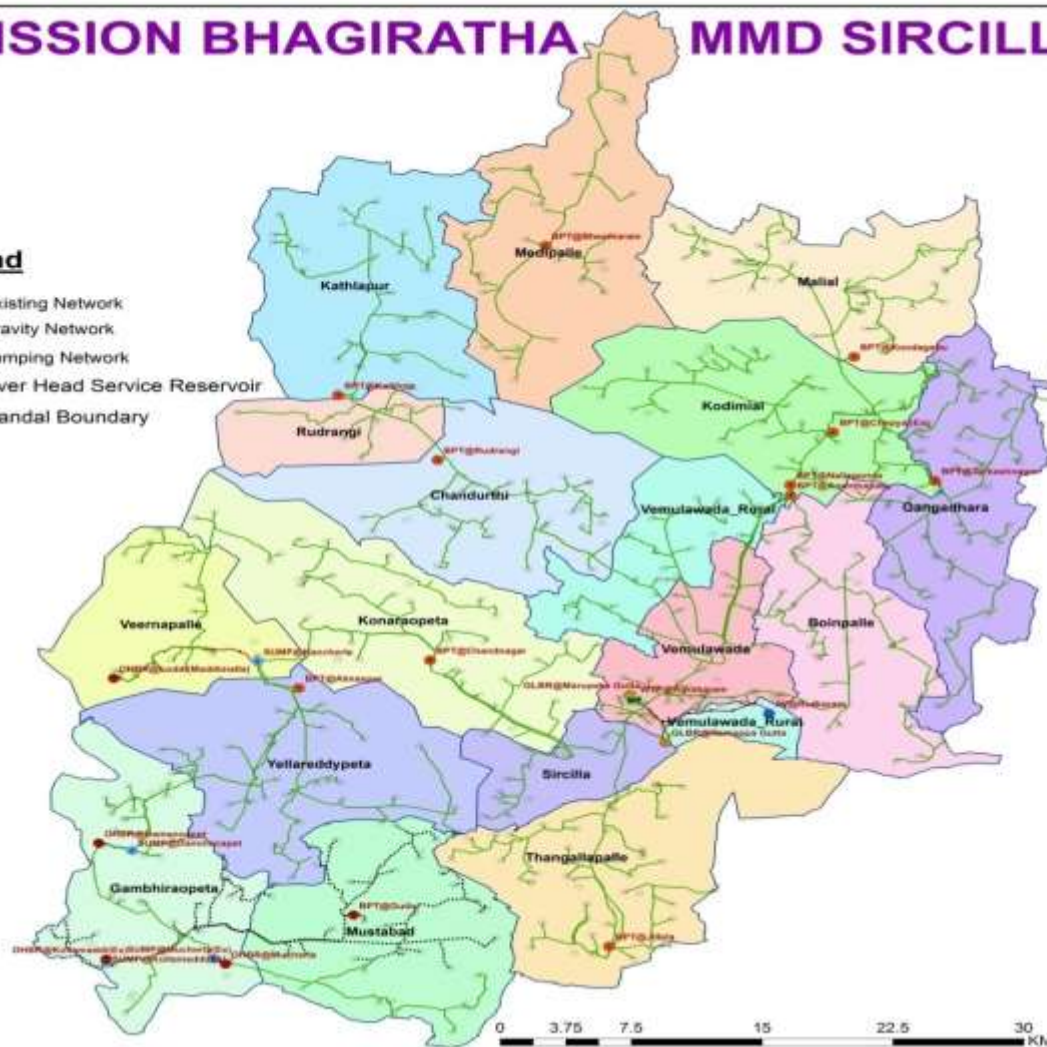


MISSION BHAGIRATHA MMD SIRCILLA SEGMENT



Legend

- Existing Network
- Gravity Network
- Pumping Network
- Over Head Service Reservoir
- Mandal Boundary



Structure wise Pumping Network Length

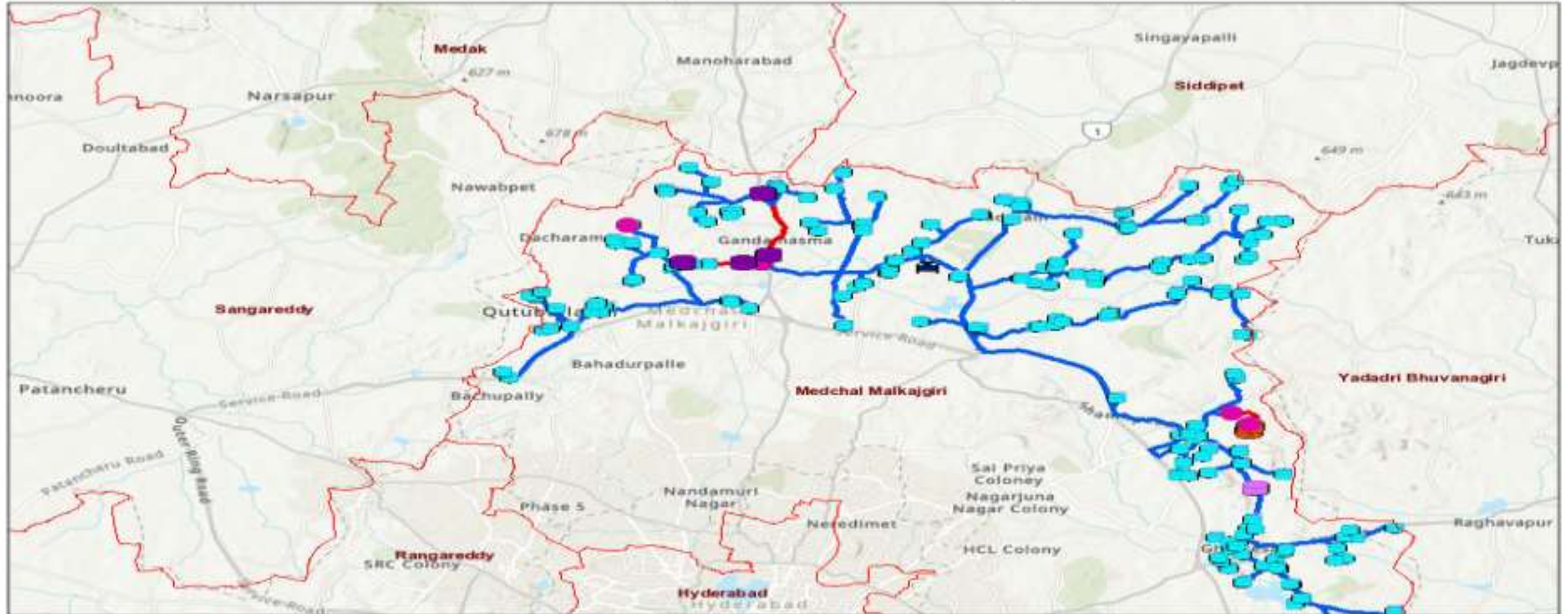
| Sl. No. | Structure Name | DI | MS | Length (in km) |
|---------------------|------------------|--------------|--------------|----------------|
| 1 | PIW-Rudram | 0 | 8.825 | 8.83 |
| 2 | ESump-Kmaddi | 0.1 | 0 | 0.1 |
| 3 | PSump-Kancherla | 10.3 | 0 | 10.3 |
| 4 | PSump-Dammanapet | 1.95 | 0 | 1.95 |
| 5 | PWTP-Agraharam | 0 | 0.85 | 0.85 |
| 6 | PWTP-Agraharam | 0 | 4.2 | 4.2 |
| Grand Total: | | 12.35 | 13.88 | 26.23 |

Structure wise Gravity Network length & Habitations Covered










| Sl. No. | Structure Name | DI | GI | HDPE | MS | Length (in km) | Habs Covered |
|--------------------|-----------------|---------------|-------------|---------------|--------------|----------------|--------------|
| 1 | PB-Ananthapally | 19.41 | 0 | 53.29 | 0 | 72.70 | 29 |
| 2 | PB-Kondagattu | 27.83 | 0.04 | 38.17 | 0 | 66.03 | 29 |
| 3 | PB-Nallagonda | 35.14 | 0 | 49.49 | 0 | 84.63 | 35 |
| 4 | EB-Chepyal | 0.00 | 0 | 15.56 | 0 | 15.56 | 9 |
| 5 | PB-Turkashnagar | 52.11 | 0 | 45.24 | 0 | 97.35 | 45 |
| 6 | EO-Kmaddi | 27.60 | 0 | 64.10 | 0 | 91.70 | 28 |
| 7 | PG-Marupaka | 32.03 | 0.77 | 73.63 | 3.77 | 110.26 | 62 |
| 8 | PB-Almaspur | 44.33 | 0.02 | 50.46 | 0 | 94.82 | 34 |
| 9 | PG-Ramappa | 212.03 | 0.56 | 92.06 | 14.35 | 319.00 | 80 |
| 10 | PB-Chandanagar | 0.00 | 0 | 21.59 | 0 | 21.59 | 10 |
| 11 | PB-Jillela | 0.40 | 0.43 | 36.13 | 0 | 36.97 | 17 |
| 12 | PO-Loddi | 20.78 | 0.03 | 20.53 | 0 | 41.34 | 14 |
| 13 | PO-Mucherla | 11.19 | 0 | 18.76 | 0 | 29.96 | 10 |
| 14 | PO-Dpet | 9.92 | 0 | 20.47 | 0 | 30.39 | 12 |
| 15 | PB-Kallikota | 75.22 | 0 | 26.96 | 0 | 102.18 | 35 |
| 16 | PB-Bheemaram | 9.20 | 0 | 19.03 | 0 | 28.23 | 10 |
| 17 | PB-Rudrangi | 6.32 | 0 | 24.59 | 0 | 30.92 | 7 |
| Grand Total | | 583.52 | 1.85 | 670.05 | 18.12 | 1273.60 | 466 |

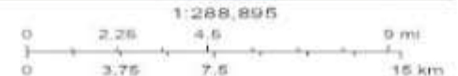
0 3.75 7.5 15 22.5 30 KM

mission-bhagiratha-Medchal-Segment



November 23, 2019

- | | | | | |
|--|--|--|---|--|
|  Districts |  GLBR |  SUMP |  OHSRs |  Gravity Main |
|  Structures |  OHBR |  Tapping Pt |  Habitations |  Pumping Main |
|  BPT | | | | |



Source: Esri, Arthur D. Little, USGS, NOAA, NASA, IGN, NITEN, NCEAS.



WebGIS INTERFACE



Mission Bhagiratha



Search Segment: Medchal
 Search Mainline Type: BPT
 Search Structure Location: BPT @ Bogaram

Table of Content

NETWORK COVERAGE DETAILS FOR : Medchal

| OHSR coverage | Habitation Coverage | Gravity Main Coverage | Pumping Main Coverage |
|---------------------|---------------------|-----------------------|-----------------------|
| SR NAME | District | Existing/Proposed | |
| Shivareddy Guda OHR | Medchal, Malkajgiri | | |
| SurajGudem OHR | Medchal, Malkajgiri | | |

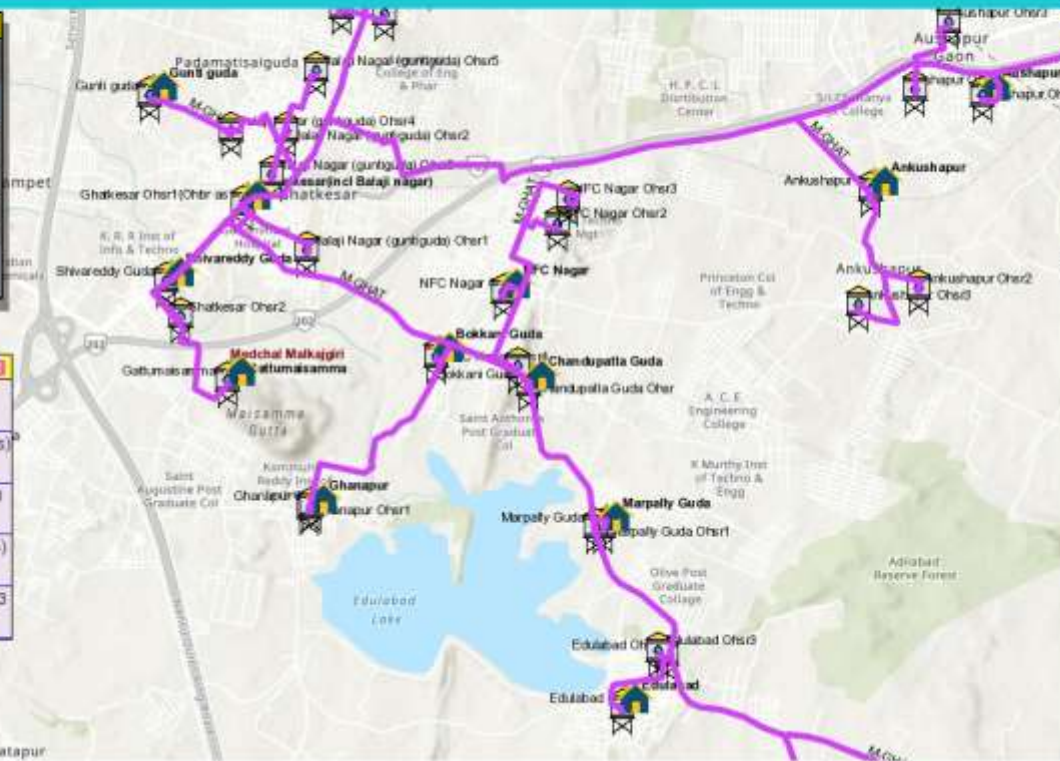
Layout Map Only

STRUCTURE DETAILS: Medchal

| | |
|--------------------------------------|--|
| Location : BPT @ Bogaram | |
| Total Pipe length 46.89 Kms | (DI:23.83kms,HDPE:23.07kms) |
| GM Length: 46.89 Kms | PM Length: 0.00kms Max.Dia: 1000 Min.Dia: 10 |
| No of Service Reservoirs (OHSRs): 36 | (Existing:22,New:14) |
| No of Habitations covered : 36 | No of House Hold Connections: 10613 |

Exported Files

Your exported files will appear here.



- Medchal
- Structures
- BPT
- GLBR
- OHSR
- SUMP
- Tapping Pt
- OHSRs
- Habitations
- Gravity Main
- Pumping Main
- Narsapur



WebGIS INTERFACE



GOVERNMENT OF TELANGANA
MISSION BHAGIRATHA

RESULT

Select Segment : HMWS MedchalWE C
 Select Structure : M-GHMDCL
 Select Type : DI
 Generate Result

Identify Tool (M B)

| Field | Value |
|-----------|--------------------------|
| FID | 100 |
| Shape | Polyline |
| NAME | M-GHMDCL-28 |
| CODE | M-GHMDCL-28 |
| From_JN | Gudemgadda Thanda X Road |
| To_JN | Gudemgadda Thanda In |
| Cum_Pop | 159 |
| LPM | 25 |
| Length_k | 2.496 |
| Type | HDPE |
| Dia | 75 |
| Inner_Dia | 67 |
| Class | 6 |
| Fric_Loss | 0.85 |
| HGL_Start | 615 |
| HGL_End | 613.81 |
| GL_End | 595.03 |

Segment : Medchal, Structure :M-GHMDCL, Type :DI

Total Lenth of Pipe (km): 20.51

| SI No | FID | NAME | CODE | From_JN | To_JN | Cum_Pop | LPM | Length |
|-------|-----|-------------|-------------|---------------------|------------------------------|---------|-----|--------|
| 1 | 80 | M-GHMDCL-1 | M-GHMDCL-1 | HMWS Reservoir | Ghanapur Gutta bottom X ROAD | 13378 | 0 | 0.94 |
| 2 | 82 | M-GHMDCL-11 | M-GHMDCL-11 | Rajabollaram X ROAD | GANPUR X ROAD | 12575 | 0 | 0.05 |
| 3 | 86 | M-GHMDCL-15 | M-GHMDCL-15 | GANPUR X ROAD | PUDURU X road | 10672 | 0 | 1.007 |

OHSRS Report, Segment : Medchal, Structure :M-GHMDCL

| SI No | FID | Constituen | Mandal | Panchayat | Hab_Name | Hab_Code | Pla |
|-------|-----|------------|---------|---------------|---------------------|-------------------|-----|
| 1 | 2 | Medchal | Medchal | Raja bollaram | Akbarji pet | 1.52190801101E+15 | 18- |
| 2 | 52 | Medchal | Medchal | Raja bollaram | Ghanpur Thanda | 1.52190802302E+15 | 11E |
| 3 | 57 | Medchal | Medchal | Pudur | Gosaiguda | 1.52190802401E+15 | 32E |
| 4 | 58 | Medchal | Medchal | Raja bollaram | Gubbadi Thanda | 1.52190802204E+15 | 0 |
| 5 | 59 | Medchal | Medchal | Revalkole | Gudem Gadda Thanda | 1.52190800703E+15 | 0 |
| 6 | 84 | Medchal | Medchal | Revalkole | Kasonibai Thanda | 1.52190800702E+15 | 0 |
| 7 | 103 | Medchal | Medchal | Revalkole | Lethamamilla Thanda | 1.52190800704E+15 | 0 |



TAP CONNECTIONS



Identify

Identify from: <Top-most layer>

Location: 78.373390 17.564331 De

| Field | Value |
|------------|------------------------|
| FID | 12 |
| Shape | Point |
| OBJECTID | 13 |
| New_Distri | Medchal- Malkajgiri |
| New_Mandal | Dundigal Gandimaisamma |
| Panchayat | Bowrampet |
| Habitation | Shambipur |
| Head_Of_Fa | K.Rangamma |
| Father_Or_ | K.Adavaiah |
| Category | SC |
| No_Of_Fami | 4 |
| Aadhar | '939715746949' |
| Address | '2-49' |
| MB_CAN_No | 216040401010013 |
| Latitude | 17.56217 |
| Longitude | 78.375368 |



Identify

Identify from: <Top-most layer>

Location: 78.372641 17.565066 De

| Field | Value |
|------------|------------------------|
| New_Distri | Medchal- Malkajgiri |
| New_Mandal | Dundigal Gandimaisamma |
| Panchayat | Bowrampet |
| Habitation | Shambipur |
| Head_Of_Fa | M.Narsing Rao |
| Father_Or_ | Mohan Rao |
| Category | OC |
| No_Of_Fami | 5 |
| Aadhar | '839228867965' |
| Address | '2-82' |
| MB_CAN_No | 216040401020001 |
| Latitude | 17.56264 |
| Longitude | 78.375415 |





SCADA



WTP OVERVIEW

17/02/2019 15:07:58

95 MLD MANCHERIAL GUDIPET

HOME

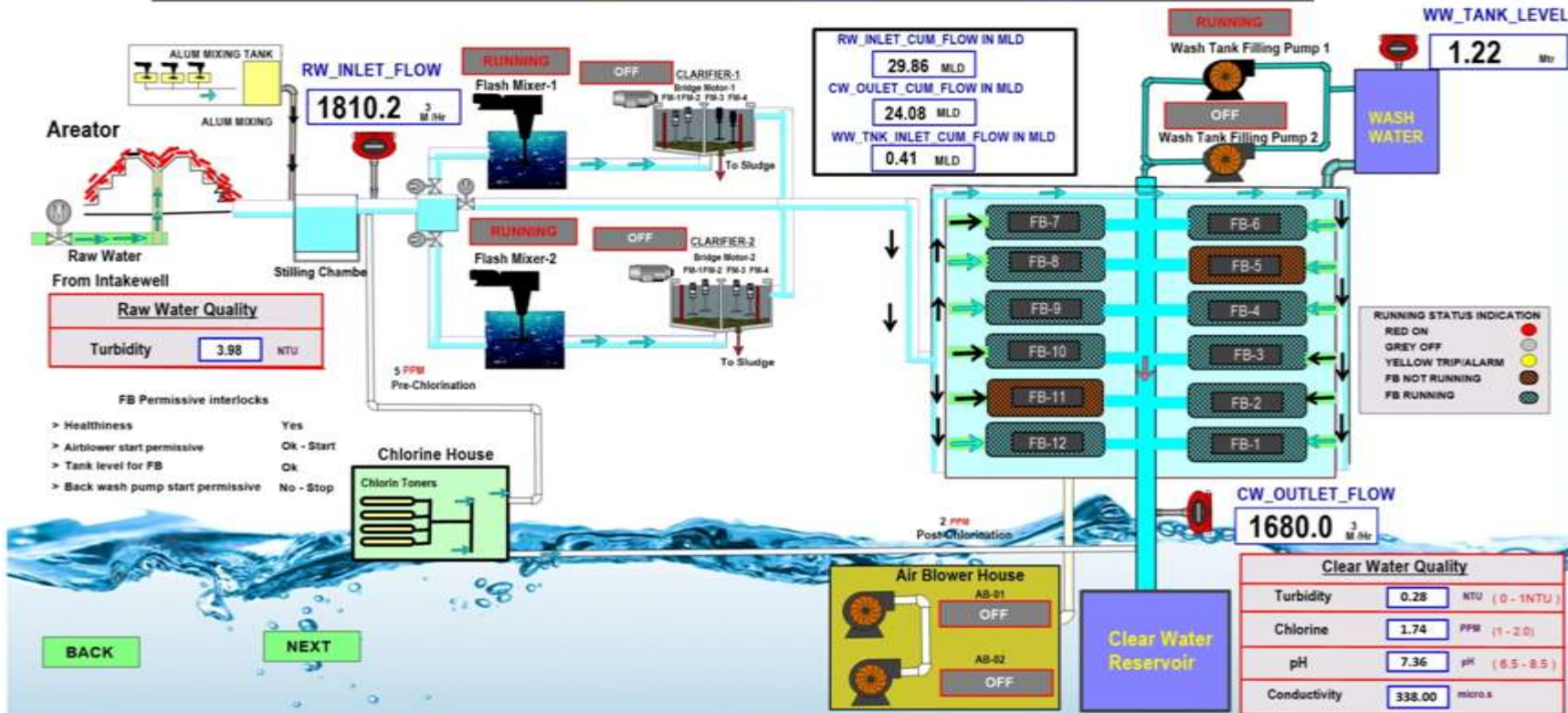
PROCESS OVERVIEW

FILTER HOUSE

EVENTS

DATA LOG

ALARM HISTORY





BENEFITS



- Improves productivity and efficiency
- Track history, condition and location of assets
 - ✓ Streamline workflow
- Schedule preventive and predictive maintenance
 - ✓ Enrich decision making
- Provide accurate financial summary information of repairs
 - ✓ Save time and money
- Reduces data redundancies
- Easy to share to other departments



ANALYSIS



- ❖ Coverage area of water Supplied
- ❖ Spatial Analysis of Water Infrastructure Development
- ❖ Buffer Analysis
 - To Depict the effect due to power breakdown
- ❖ Tracking of Non Revenue Water (NRW)
- ❖ Gis-Based Decision Support System
 - To Predicting the change of water quality and water volume
- ❖ Integration of SCADA inputs to Spatial Database gives real time monitoring

MISSION BHAGIRATHA Dept.
TELANGANA



మిషన్ భగీరథ

ఇంటింటికీ తాగునీరు, ఇల్లాలి కష్టాలు తీరు

THANK YOU