

BHEDEN & BARPALI WATER SUPPLY PROJECT

– Detailed project report (Abstract)



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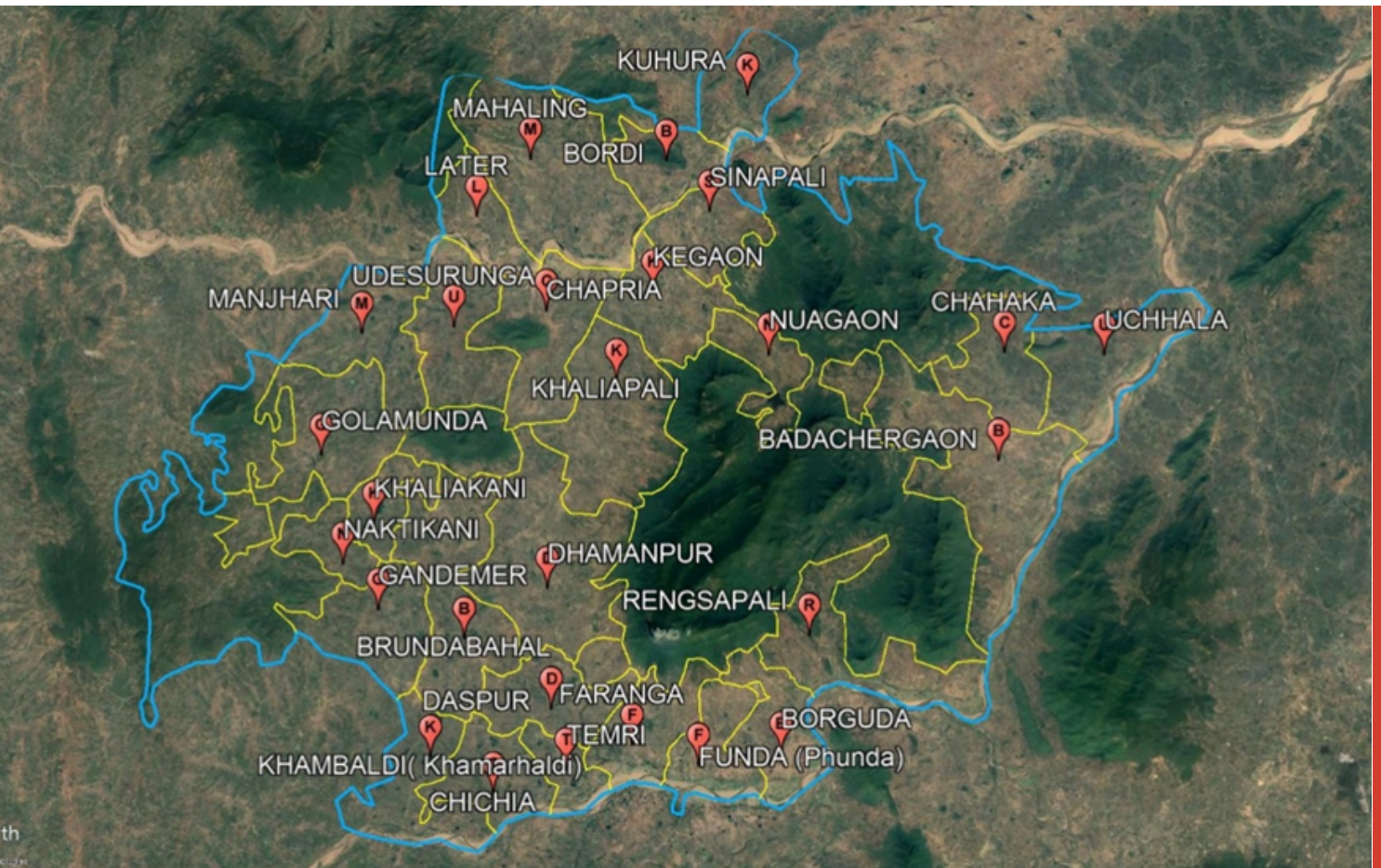
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Background

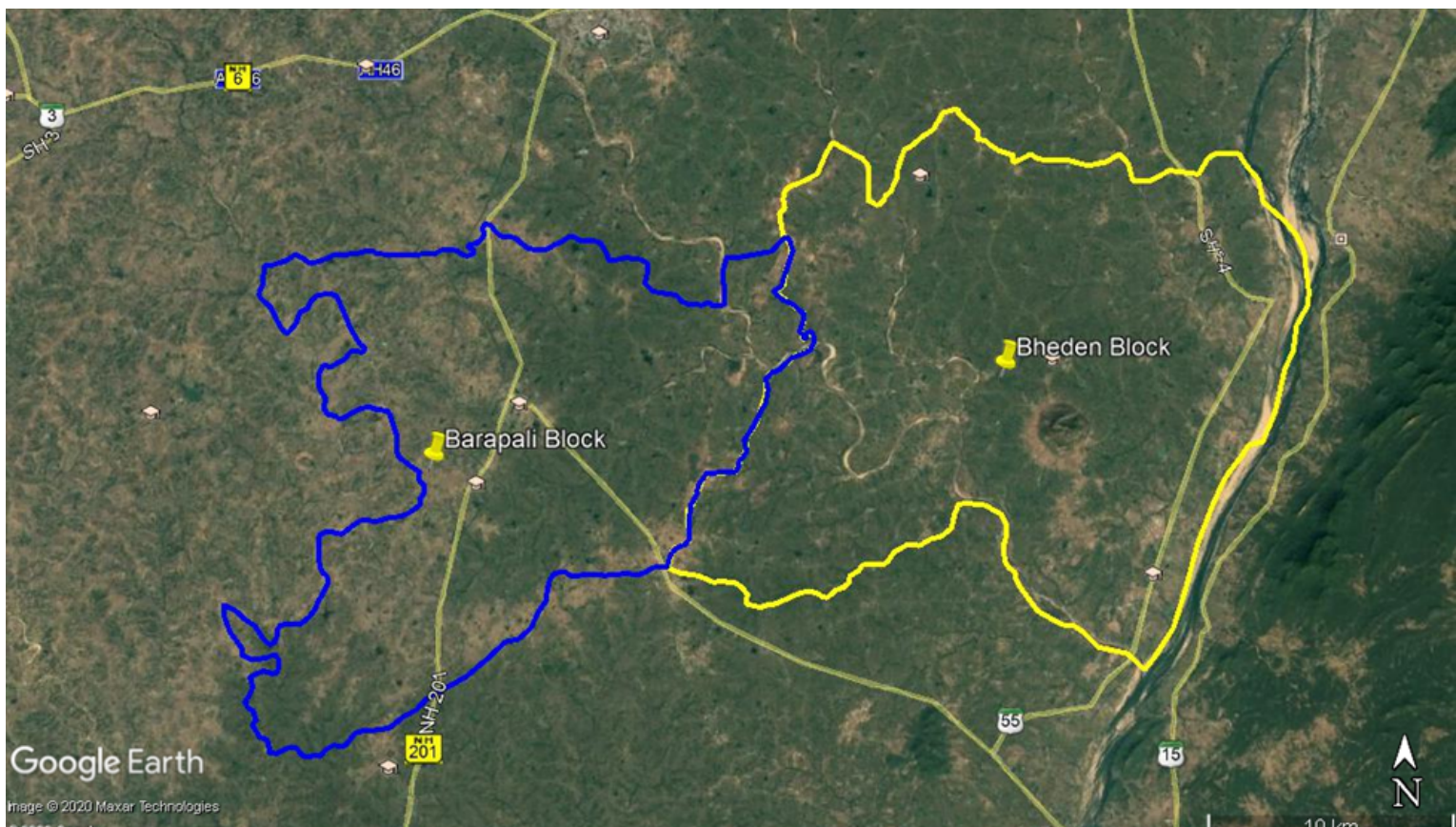
The E.I.C., R.W.S.S, Odisha is engaged in the development of water supply and as part of this endeavor; the Authority has decided to undertake The work "Execution Of Rural Piped Water Supply Projects Pertaining To Bheden & Barpali Block Of Bargarh District including five years Operation & Maintenance" through an Engineering, Procurement and Construction (the "EPC") Contract.

- Mega PWS scheme to Bheden & Barpali Block of Bargarh district.

Introduction

The Proposed project blocks has following scenario :-

- BHEDEN BLOCK has 21 G.P's and 91 Villages.
- BARAPALI BLOCK HAS 22 G.P's and 73 Villages.



The project should include water supply to 164 villages in 43 G.P's of Bheden & Barapali Block of Bargarh district. The existing infrastructures of the commissioned/ completed PWS schemes are to be utilized in maximum as per requirement. The system comprises of Intake well, Jackwell, raw water pump house and pumping machineries, raw water rising main pipelines, water treatment plants, clear water sumps, clear water pump house and pumping machineries, clear water rising/gravity main up to ELSR's/UGR's and distribution piping from ELSR's/UGSR's to habitations in the villages.

INTAKE SOURCE FOR THIS PROJECT:

- Mahanadi River (as per tender document)

PROJECT DELIVERABLES:

-
- Headworks and intake structure.
-
- Raw water pumping main.
-
- Water treatment plant
-
- Clear water reservoir/sump & pumping station
-
- Clear water transmission/gravity mains
-
- Booster pumping stations
-
- Storage reservoirs (ESR's/ UGSR's)
-
- Distribution system up to village habitation street level

BASIC DESIGN PARAMETERS: –

S.No.	Items	Numericals	Units
1	Per Capita Demand	70	Lpcd
2	Pumping Time For Raw Water	20	Hrs
3	Operating Time Of WTP	20	Hrs
5	Filling Time Of OHSR	12	Hrs
6	Distribution	8	Hrs
7	Design Perioed For Pumping Mechinary	2037	Year
8	Design Perioed For Distribution Network	2052	Year
9	Design Perioed For Civil Works	2052	Year
10	Base year	2022	Year
11	Population For 2022		
A	BHEDEN & BARAPALI BLOCK	2,64,669	People
	Total Population	2,64,669	People
12	Demand	70	LPCD
13	Wastage And Institutional Demand	15	LPCD
14	Population Growth Rate Per Decade	14	%

PROPOSED HYDRAULIC DESIGN:

The proposed Piped Water Supply Project to cover 164 VILLAGES IN 43 GPS OF BHEDEN & BARAPALI BLOCK" has been prepared comprising the Construction of Intake, Water Treatment Plant, Storage Reservoirs, Rising Mains both Raw Water & Clear Water and necessary distribution pipe network etc. considering the need of the consumers of different water supply zones for ultimate design year for 30 years taking 2022 as base year.

For BHEDEN & BARAPALI BLOCK:

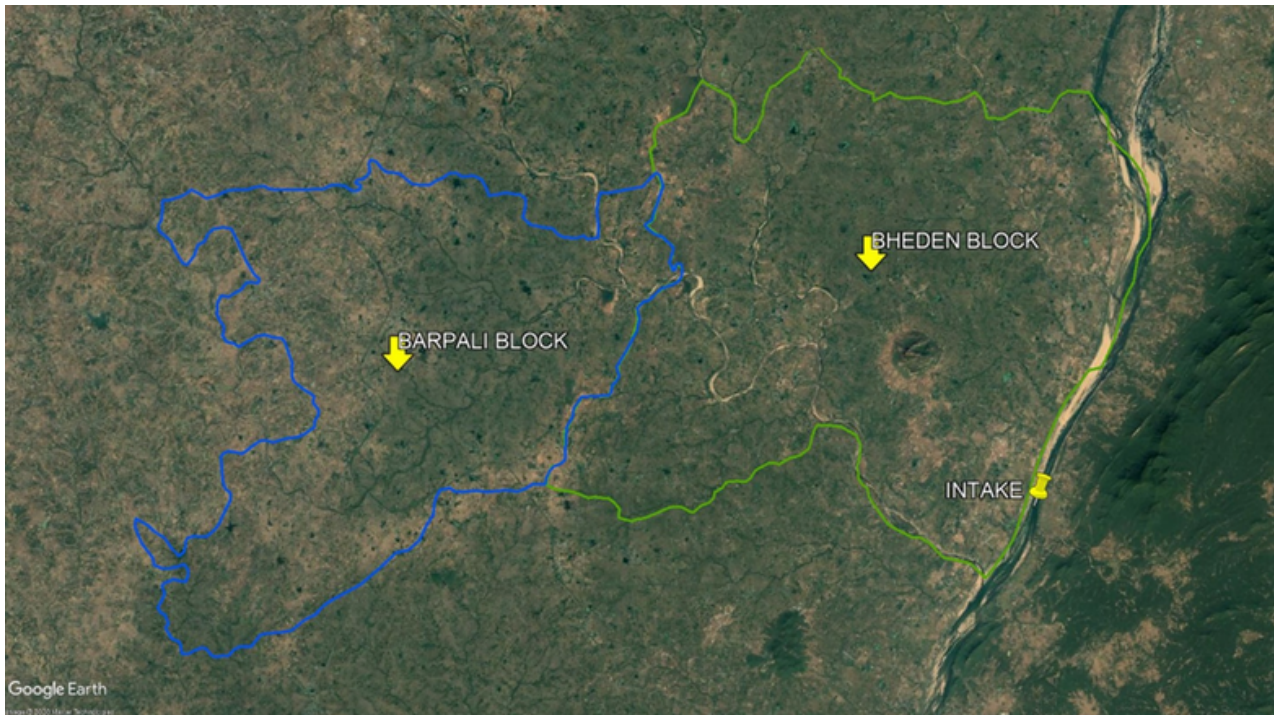
- Rate of supply to the villages: (70 lpcd + 15% UFW) including wastage and institutional demand.
- Calculated water demand of ultimate design years 2052 is about 33.33 MLD.
- Calculated water demand of intermediate design years 2037 is about 27.33 MLD.
- Clear water sump at WTP: 3400 KL.
- Raw water and clear water pumping machineries design for intermediate year of 2037 demand conditions.
- Raw water Rising main material: D.I -K-7/9.
- Raw water pumping : 20 hours /day.
- Design flow : Ultimate design flow based on 2052 year.
- Clear water Pumping mains/ Gravity mains : D.I K-9 / K-7/HDPE.
- Clear water pumping mains design : 20 hours /day.
- Hazen-Williams Roughness coefficient considered as mentioned in CPHEEO manual
- Pipe diameter below 160mm will be HDPE and above will be D.I of K-7/ K-9 class
- Suitable pressures and velocity considered as per system requirement
- Suitable Surge protection, Reservoir management for effective control of flow in to the ESR's/ UGR's, Air management, Pump house Automation, Automatic meter readings for house service connections, inline valves such as butterfly valve, scour valve of suitable size, thrust blocks, crossing structures considered properly.
- Web based online monitoring system is considered and it will be based on wireless and energyless operation.

INTAKE SOURCE LOCATION COORDINATES FOR GOLAMUNDA BLOCK

Source: Mahanadi river (As per the tender document)

Coordinates: 21° 7'11.00"N, 83°51'41.90"E

→ RAW WATER INTAKE FOR BHEDEN & BARAPALI BLOCK



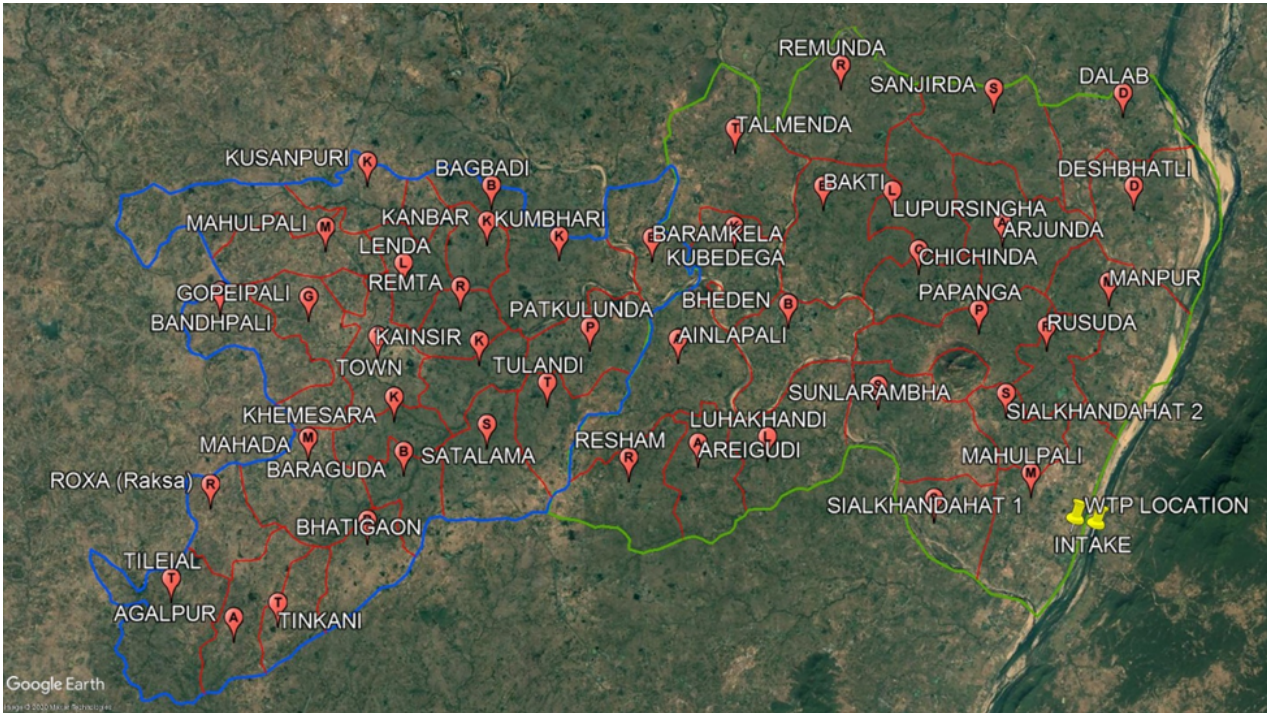
→ SUBMERGENCE IN BHEDEN & BARAPALI BLOCK



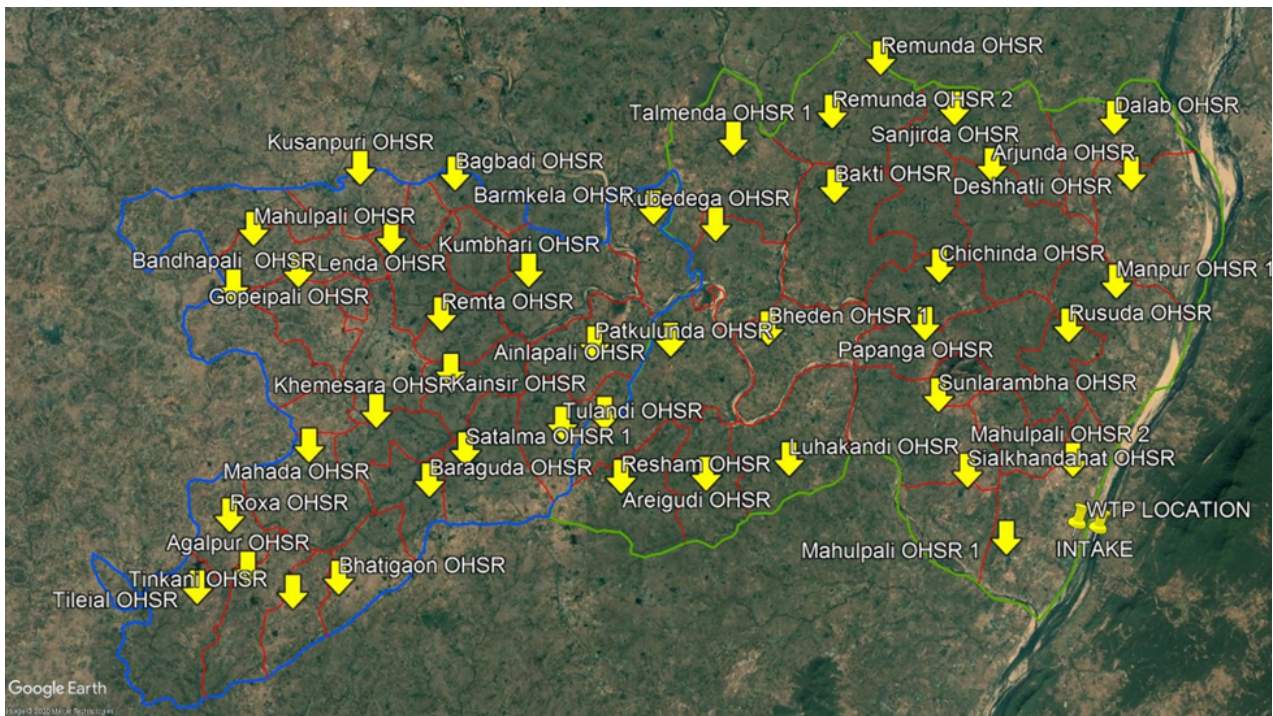
→ WTP LOCATION IN BHEDEN & BARAPALI BLOCK



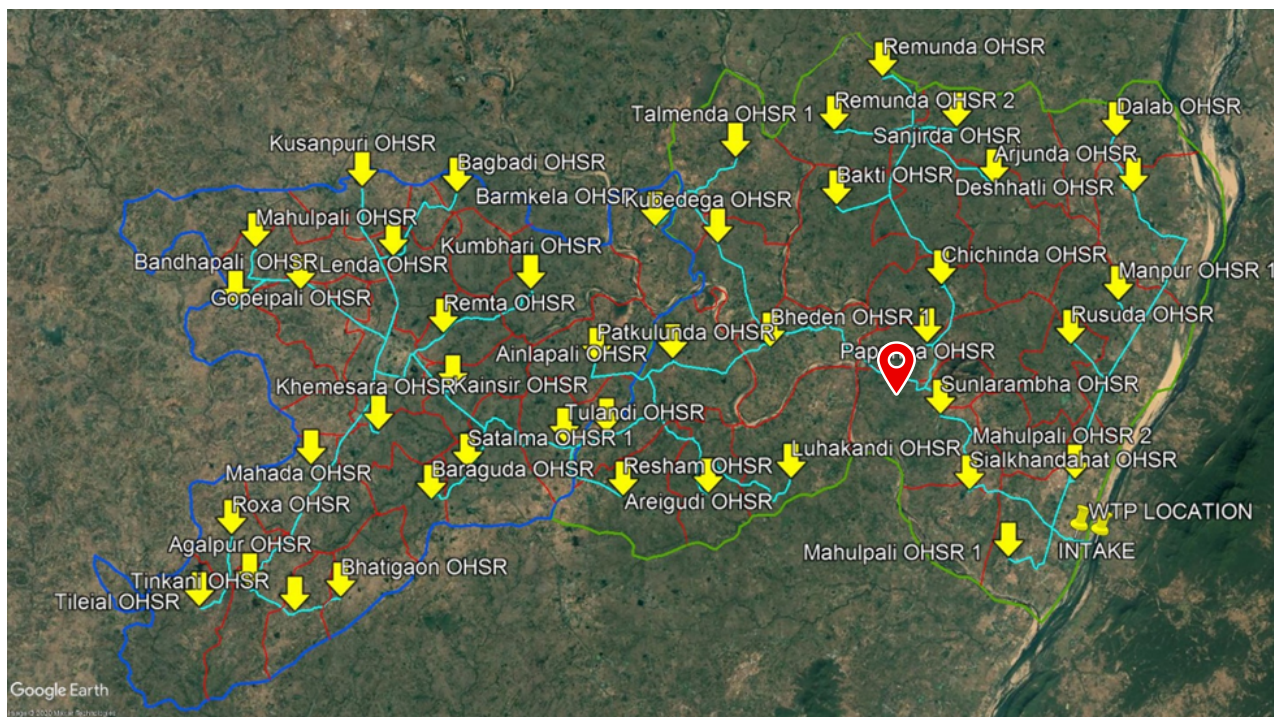
→ BHEDEN & BARAPALI BLOCK G.P BORDERS



→ BHEDEN & BARAPALI BLOCK – ESR LOCATIONS

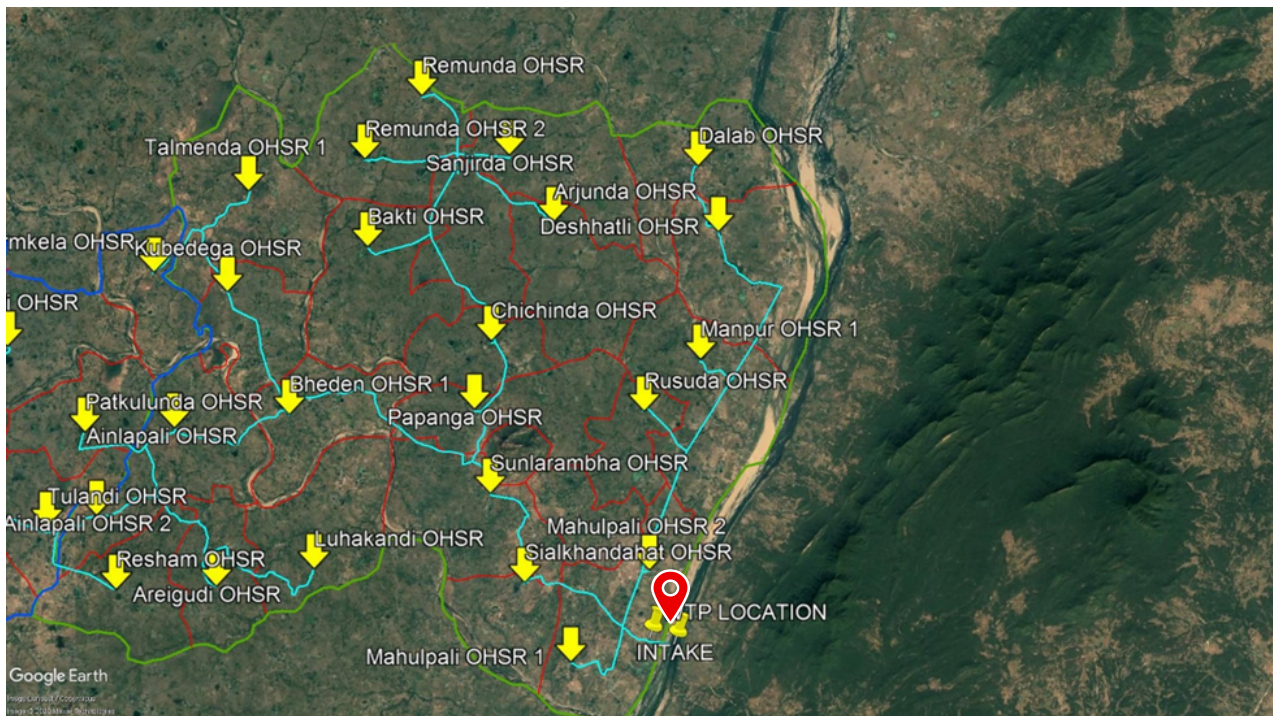


→ BHEDEN & BARAPALI BLOCK – CLEAR WATER PIPELINE

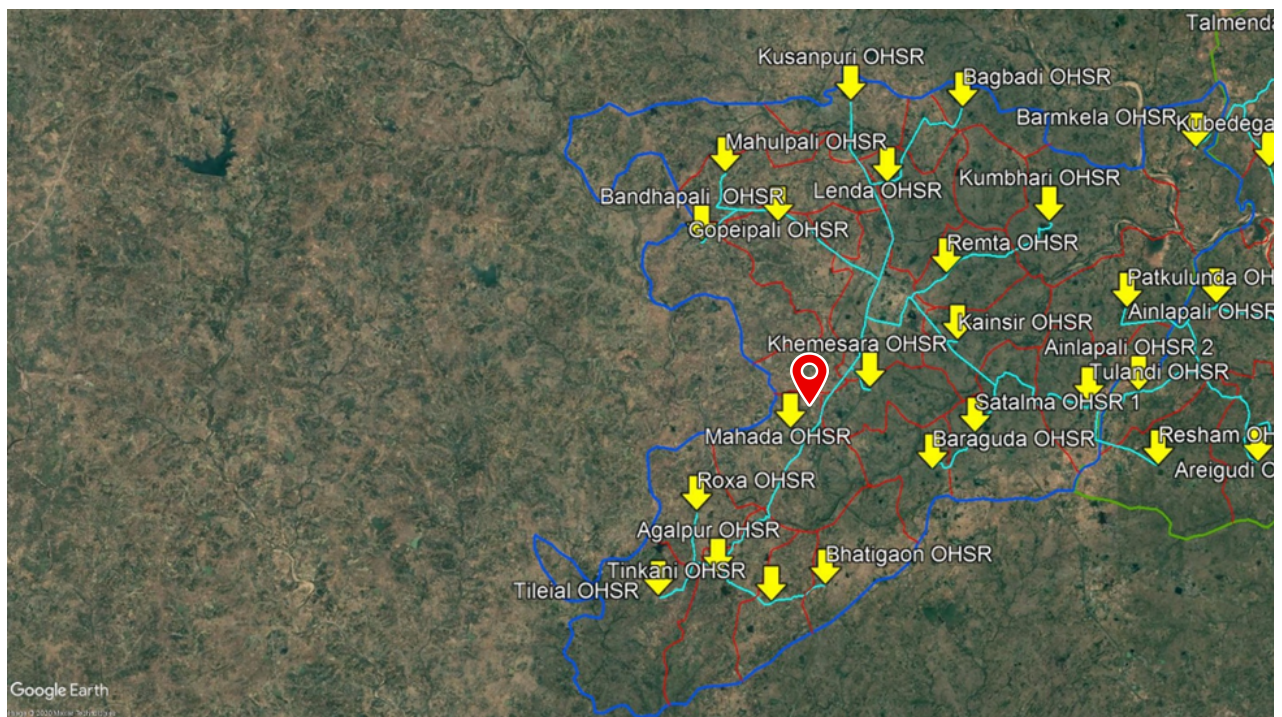


📍 BHEDEN & BARAPALI BLOCK – CLEAR WATER PIPELINE

→ BHEDEN – CLEAR WATER PIPELINE



→ BARAPALI BLOCK – CLEAR WATER PIPELINE



PIPE LINE ABSTRACT FROM INTAKE to WTP (APPROXIMATE)

BHEDEN & BARAPALI BLOCK

S.No	Pump Location	PUMP TYPE	Flow (Total) (M3/Hr)	Pump Head (m)	No.of pumps	Flow Per each Pump	Efficiency	Power per each pump (KW)	Total Power (KW)
1	INTAKE	VT	1,369.03	30	3+1	456.3	80.8%	46.17	138.51
2	WTP	HSC	1,369.03	105	3+1	456.3	80.8%	161.60	484.80
3	IPS-1	HSC	843.71	110	2+1	421.9	80.8%	156.50	313.00
4	IPS-2	HSC	429.68	93	2+1	214.8	80.8%	67.38	134.77
5	IPS-3	HSC	232.45	70	2+1	116.2	80.8%	27.44	54.88
Total power									1125.95

S. No	Diameter	Type of Materials	Length (in M)
1	600	DI K-9	950

PIPE LINE ABSTRACT FROM WTP TO OHSR – BHEDEN & BARAPALI BLOCK

S. No	Diameter	Type of Pipe & Class	Proposed Length (M)
1	100	DI K-9	17,647
2	150	DI K-9	65,868
3	200	DI K-9	33,677
4	250	DI K-9	22,208
5	300	DI K-9	8,370
6	350	DI K-9	4,281
7	400	DI K-9	7,333
8	450	DI K-9	13,843
9	500	DI K-9	12,027
10	600	DI K-9	6,204

CAPACITY DETAILS (APPROXIMATE) FOR GOLAMUNDA BLOCK

S.No	Description	Flow-2052 (Total) (L/min)	Storage Time(Minutes)	Capacity (KL)
1	WTP	27,772	120	3,400
2	IPS-1	17,115	30	550
3	IPS-2	8,716	30	270
4	IPS-3	4,715	30	150

OHSR CAPACITY DETAILS (APPROXIMATE) FOR BHEDEN & BARAPALI BLOCK

S. No	OHSR LOCATION	CAPACITY	STAGING
1	KUMBHARI OHSR	590	20
2	BAKTI OHSR	530	20
3	SANJIRDA OHSR	500	20
4	REMUNDA OHSR-2	485	20
5	TILEIAL OHSR	445	20
6	PATKULUNDA OHSR	440	20
7	RESHAM OHSR	430	20
8	SUNLARAMBHA OHSR	425	20

9	KAINSIR OHSR	420	20
10	BANDHAPALI OHSR	420	20
11	PAPANGA OHSR	405	20
12	LUHAKANDI OHSR	400	20
13	SATALMA OHSR-1	390	20
14	SIALKHANDAHAT OHSR	375	20
15	CHICHINDA OHSR	365	20
16	AREIGUDI OHSR	360	20
17	ARJUNDA OHSR	360	20
18	LENDALMA OHSR	360	20
19	DESHBHATLI OHSR	350	20
20	AGALPUR OHSR	350	20
21	BHEDEN OHSR-1	345	20
22	DALAB OHSR	345	18
23	KUSANPARI OHSR	340	20

26	LUPURSINGHA OHSR	330	20
27	BHATIGAON OHSR	320	18
28	BHEDEN OHSR-2	315	15
29	REMTA OHSR	310	20
30	AINLAPALI OHSR-2	310	20
31	KUBEDEGA OHSR	300	20
32	MAHULPALI OHSR-2	300	20
33	KHEMESARA OHSR	280	20
34	TULANDI OHSR	280	20
35	TALMENDA OHSR-1	280	20
36	TINKANI OHSR	275	20
37	MANPUR OHSR-1	275	20
38	GOPEIPALI OHSR	275	20
39	REMUNDA OHSR-1	275	20
40	BARMKELA OHSR	265	20

41	BARAGUDA OHSR	260	20
42	MAHADA OHSR	255	20
43	BAGBADI OHSR	255	20
44	TALMENDA OHSR-2	250	20
45	MANPUR OHSR-1	235	20
46	MUHULPALI OHSR BARAPALI	230	20
47	ROXA OHSR	230	20
48	MAHULPALI OHSR-1	230	20
49	AINLAPALI OHSR-1	225	20
50	SATALMA OHSR-2	130	20
TOTAL CAPACITY		16, 790	-

SOFTWARES USED:

- Google earth, Auto cad, Epanet.

REFERENCE:

- Tender documents
- CPHEEO MANUAL and other standard manuals.

Note: The proposed design calculations are may change based on the detailed survey after awarding the Tender without claiming extra over the Tendered price.

PHANS4 is engaged in global consulting solutions, where we combine classic management consulting with outstanding technological expertise. For more than 9 years, we have been supporting companies around, through various consulting services to improve the sustainability of their competitiveness and performance capabilities along the entire value chain with the aid of innovative technologies

PHANS4 CONSULTING services are carried out in areas like Water Resources, Irrigation Schemes, Micro Irrigation, Rural Water Supply and Sanitation, WTP, Effluent Treatment Plants, Sewage & Sewerage Treatment, Storm Water Drainage System, Lake Development

RURAL WATER SUPPLY SCHEMES (RWSS)

Water demand studies, Site survey and investigations Reservoir studies, Raw water intake pump calculations, Master balancing reservoir (MBR), Water treatment plant design, Capacity calculations, Elevated service reservoirs, Distribution pipeline networks and hydraulics. Our expertise also includes smart water grid design with SCADA systems

LIFT IRRIGATION SCHEME

PHANS4 CONSULTING has proven expertise in all types of lift irrigation consulting projects with integrated and customized service to clients in the field of irrigation.

Tender Support (Pre-bid Review, Meetings, Queries, Bid submissions) GIS Mapping Survey and Investigations Intake systems, Pump House design and selection, Rising Mains/Pressure Mains (DI, MS Pipes) Gravity mains (DI, MS pipes, HDPE), Delivery Chamber/BPT Distribution network planning, Control and Instrumentation design of entire scheme, Major and Minor outlets with Locations, Bill of Quantities, Project management consulting

WATER AND EFFLUENT TREATMENT PLANT

PHANS4 CONSULTING has focused in improving operational flexibility and reliability mastered the design and development of efficient systems for industrial water treatment and effluent treatment plants.

Site Study & Design engineering, Identification of technologies, Preparation of feasibility study (WTP, ETP), Detailed project reports (WTP, ETP), Transaction advisory services (WTP, ETP), Source Survey, Water quality report (pH, TDS, TSS, Hardness, Cl, SO₄, Turbidity, COD) Design and Supply and Erection and Commissioning of WTP, ETP Operations and Maintenance (WTP, ETP)

STORM WATER DRAINAGE SYSTEM

Over the years PHANS4 CONSULTING has developed design models for efficient storm water drainage systems for various government bodies, SEZ's, Real-estate projects , ports across India Identifying the urban flooded areas using latest technologies, Data collections, Conducting surveys and investigations. Preparation of storm water drainage network, Hydraulic designs of storm water drainage locations like inlet locations, Manholes, Pumping of storm runoffs, Outfall structures and natural streams Conducting rainfall analysis, Design of rain water harvesting systems.

LAKE DEVELOPMENT

Phans4 has proven expertise in major LIS projects with integrated and customised service to clients in the field of irrigation.

SEWAGE AND SEWERAGE TREATMENT

Phans4 consulting has mastered the engineering design for sewerage treatment systems over the years

Develop forecasting models for estimation of sanitary sewage, Hydraulics of sewer, Design of sewer systems, Layouts, Components of the system, Sizing, Design and selection of sewer appurtenances, Suggesting the material for construction of sewers, Structural design of sewers

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