

GANJAM DISTRICT WATER SUPPLY PROJECT

– Detailed project report (Abstract)



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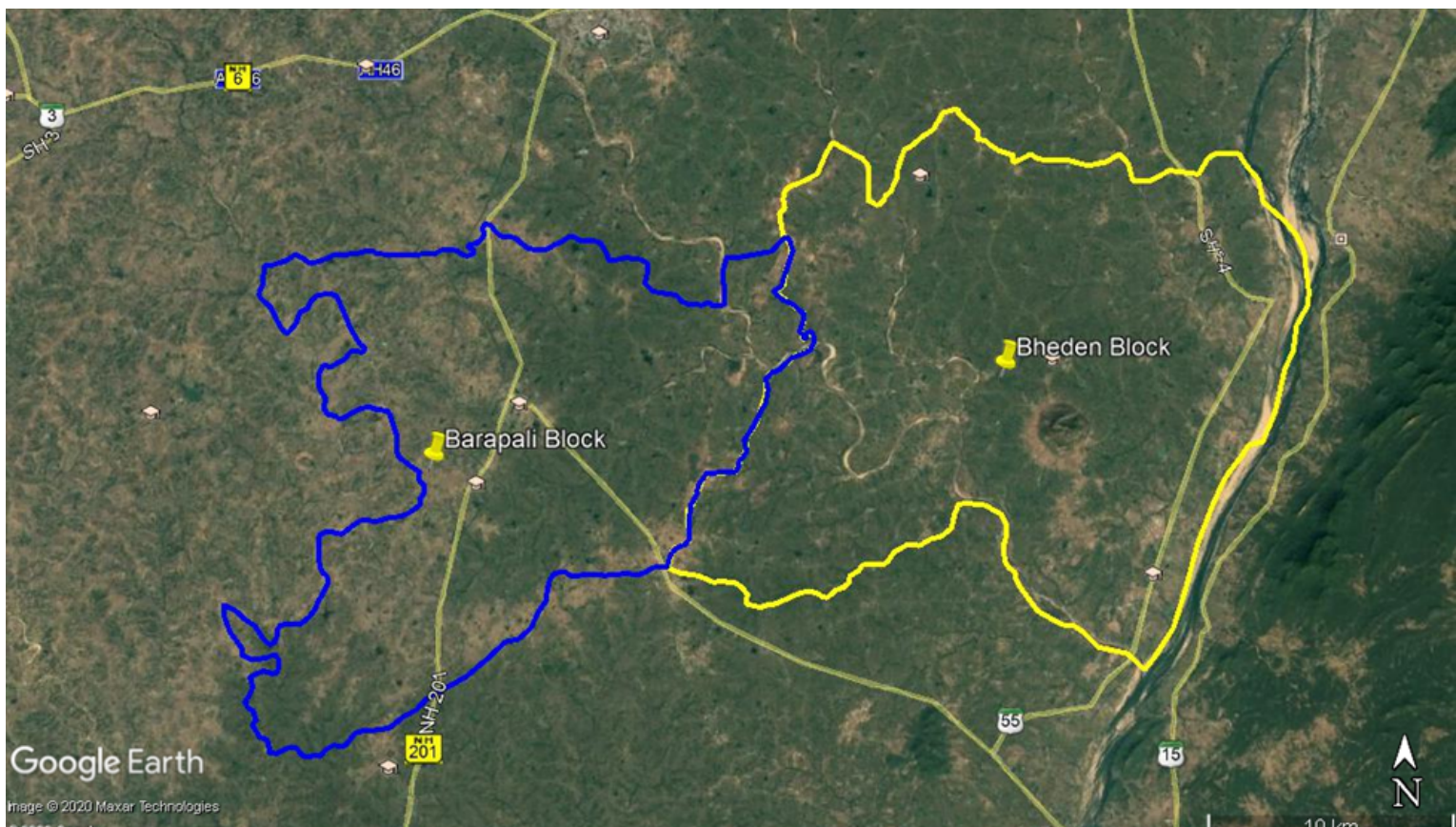
Background

The E.I.C., R.W.S.S, Odisha is engaged in the development of water supply and as part of this endeavour; the Authority has decided to undertake the work "EXECUTION OF 02 NOS. INDIVIDUAL MEGA PWS TO GANJAM DISTRICT (BERHAMPUR DIVISION) INCLUDING FIVE YEARS OPERATION & MAINTENANCE UNDER ONE PACKAGE through an Engineering, Procurement and Construction (the "EPC") Contract.

Introduction

The Proposed project has been considered in two schemes such has following scenario :-

- **SCHEME 1 – MEGA PWS TO 30 GPS of Khallikote Block Under Ganjam District**
- **SCHEME 2 – MEGA PWS TO 33 GPS of Rangeilunda Block & 2 G.P Of Ganjam Block Under Ganjam District**



The project should include water supply to EXECUTION OF 02 NOS. INDIVIDUAL MEGA PWS TO GANJAM DISTRICT (BERHAMPUR DIVISION) INCLUDING FIVE YEARS OPERATION & MAINTENANCE UNDER ONE PACKAGE. 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:

- Indravati 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	2039	Year
8	Design Perioed For Distribution Network	2054	Year
9	Design Perioed For Civil Works	2054	Year
10	Base year	2024	Year
11	Population For 2022		
A	Khalikote	1,50,855	People
	Total Population	1,50,855	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 "EXECUTION OF 02 NOS. INDIVIDUAL MEGA PWS TO GANJAM DISTRICT (BERHAMPUR DIVISION) INCLUDING FIVE YEARS OPERATION & MAINTENANCE UNDER ONE PACKAGE". 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 2024 as base year.

For Khaklikote BLOCK:

- Rate of supply to the villages: (70 lpcd + 15% UFW) including wastage and institutional demand.
- Calculated water demand of ultimate design years 2054 is about 31.2 MLD.
- Calculated water demand of intermediate design years 2039 is about 24.4 MLD.
- Clear water sump at WTP: 800 KL.
- Raw water and clear water pumping machineries design for intermediate year of 2039 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 2054 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 KHALIKOTE BLOCK

Source: SALIA river (As per the tender document)

Coordinates: 19°47'18.00"N, 85° 3'44.11"E

S. No	Diameter	Type of Materials	Length (in M)
1	600	DI K-9	9537

PIPE LINE ABSTRACT FROM WTP TO OHSR – KHALIKOTE BLOCK

S. No	Diameter	Type of Pipe & Class	Proposed Length (M)
1	100	DI K-9	17,949
2	150	DI K-9	19,028
3	200	DI K-9	9,704
4	250	DI K-9	8,894
5	300	DI K-9	6,580
6	350	DI K-9	24,687
7	400	DI K-9	2,182
8	450	DI K-9	5,370

ELECTRO-MECHANICAL DETAILS (APPROXIMATE) FOR KHALIKOTE BLOCK

S.no	Pump location	Pump type	Flow (total) (m ³ /hr)	Pump head (m)	No.of pumps	Flow per each pump	Efficiency	Power per each pump (kw)	Total power (kw)
1	Intake	Vt	1,222.05	50	3+1	407.3	80.80%	68.69	206.07
2	Wtp	Hsc	1,222.05	90	3+1	407.3	80.80%	123.64	370.92
3	Ips-1	Hsc	204.48	110	2+1	102.2	80.80%	37.93	75.86
4	Ips-2	Hsc	431.63	110	2+1	215.8	80.80%	80.06	160.12
5	Ips-3	Hsc	110.93	90	2+1	55.5	80.80%	16.84	33.67
Total power									846.64

CAPACITY DETAILS FOR KHALIKOTE BLOCK

S.No	Description	Flow-2052 (Total) (L/min)	Storage Time(Minutes)	Capacity (KL)
1	INTAKE	26,007.93	120	3,200
2	WTP	26,007.92	30	800
3	IPS-1	4,351.73	30	140
4	IPS-2	9,185.96	30	280
5	IPS-3	2,360.87	30	80

OHSR CAPACITY DETAILS (APPROXIMATE) FOR KHALIKOTE BLOCK

S. No	OHSR LOCATION	Storage	Staging
1	AITTIPUR OHT	335	20
2	BADAPALLI OHT	450	20
3	BADHINUAPALLI OHT 1	320	20
4	BADHINUAPALLI OHT 2	320	20
5	BAKUTAGAM OHT	480	20

6	BENIE OHT 1	410	20
7	BENIE OHT 2	410	20
8	BHIKAPADA OHT	310	20
9	BIKRAMPUR OHT	475	20
10	BN PUR OHT	600	20
11	CHIKILLI OHT	480	20
12	DANAPUR OHT	480	20
13	DIMRIA OHT 1	320	20
14	DIMRIA OHT 2	320	20
15	KAIRASI OHT	370	20
16	KANAKA OHT	465	20
17	KANCHANA OHT 1	405	20
18	KANCHANA OHT 2	405	20
19	KANHAIPUR OHT 1	460	20
20	KANHAIPUR OHT 2	460	20
21	KANHAIPUR OHT 3	460	20
22	KESAPUR OHT	510	18
23	KHAGAPALLI OHT	300	20
24	KOMONDA OHT 1	300	20
25	KOMONDA OHT 2	300	20

26	LANGALESWAR OHT 1	280	20
27	LANGALESWAR OHT 2	280	18
28	MANIKYAPUR OHT	450	15
29	MATHURA OHT 1	420	20
30	MATHURA OHT 2	420	20
31	NAIKANIPALLI OHT	385	20
32	ODIA ALAPUR OHT	365	20
33	PATHARA OHT	365	20
34	SABULIA	540	20
35	SRIKRUSHNASARA OHT 1	305	20
36	SRIKRUSHNASARA OHT 2	305	20
37	TALAPADA OHT	515	20
38	TENTULIAPALLI OHT	250	20
39	TULASIPUR OHT 1	335	20
40	TULASIPUR OHT 2	335	20

SCHEME 2 – PROPOSED HYDRAULIC DESIGN: (CHHATARPUR – GANJAM – RANGEILUNDA

The proposed Piped Water Supply Project “EXECUTION OF 02 NOS. INDIVIDUAL MEGA PWS TO GANJAM DISTRICT (BERHAMPUR DIVISION) INCLUDING FIVE YEARS OPERATION & MAINTENANCE UNDER ONE PACKAGE”. 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 2024 as base year.

S.No.	Items	Numeric als	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	2039	year
8	Design Perioed For Distribution Network	2054	year
9	Design Perioed For Civil Works	2054	year
10	Base Year	2024	year
11	Population For 2024	2,94,015	year
A	CHHATRPUR	137204	People
B	GANJAM	12502	People
C	RANGEILUNDA	147658	People
12	Demand	70	LPCD
13	Wastage And Institutional Demand	15	LPCD
14	Population Growth Rate Per Decade	14	%

For CHHATARPUR – GANJAM – RALIELUNDA BLOCKS

- Rate of supply to the villages: (70 lpcd + 15% UFW) including wastage and institutional demand.
- Calculated water demand of ultimate design years 2054 is about 39MLD.
- Calculated water demand of intermediate design years 2039 is about 30.85 MLD.
- Clear water sump at WTP: 250 KL.
- Raw water and clear water pumping machineries design for Intermediate year of 2039 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 2054 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 CHHATRARPUR – GANJAM – RANGEILUNDA BLOCK

Source: RISHIKULA river (As per the tender document)

Coordinates: 19°25'40.06"N, 85° 0'6.98"E

S. No	Diameter	Type of Materials	Length (in M)
1	500	DI K-9	9537

PIPE LINE ABSTRACT FROM INTAKE to WTP CHHATRARPUR – GANJAM – RANGEILUNDA BLOCK

S. No	Diameter	Type of Materials	Length (in M)
1	500	DI K-9	455

PIPE LINE ABSTRACT FROM WTP TO OHSR – CHHATRARPUR – GANJAM – RANGEILUNDA BLOCK

S. No	Diameter	Type of Pipe & Class	Proposed Length (M)
1	100	DI K-9	29,319
2	150	DI K-9	33,805
3	200	DI K-9	20,957
4	250	DI K-9	12,404
5	300	DI K-9	22,145
6	350	DI K-9	26,669
7	450	DI K-9	10,970
8	500	DI K-9	13,720
Total Length			1,69,989

CAPACITY DETAILS (APPROXIMATE) FOR CHHATRARPUR – GANJAM – RANGEILUNDA BLOCK

S.No	Description	Flow-2052 (Total) (L/min)	Storage Time(Minutes)	Capacity (KL)
1	INTAKE	31,761.08	120	3,900
2	WTP	7,923.46	30	250
3	IPS-1	23,837.62	30	720
4	IPS-2	12,313.07	30	370
5	IPS-3	9,298.35	30	280
6	IPS-4	2,035.71	30	70
7	IPS-5	2,215.89	30	70
TOTAL		89,385.17		

OHSR CAPACITY DETAILS FOR CHHATRARPUR – GANJAM – RANGEILUNDA BLOCK

S. No	OHSR LOCATION	Storage	Staging
1	AGASTINUAGAM OHT	420	20
2	ARJIPALLI OHT 1	285	20
3	ARJIPALLI OHT 2	285	20
4	BADAKUSASTHALLI OHT	360	20
5	BADHAMPUR OHT	410	20
6	BATACHATRAPUR (KANAMANA)OHT	275	20
7	BAULAGAM OHT	275	20
8	BAXIPALLI OHT	310	20
9	BHIKARPALLI OHT	435	20
10	BIPULINGI OHT	180	20
11	BISWANNATHPUR OHT	520	20
12	BOXIPALLI OHT	260	20
13	CHAMAKHANDI OHT	375	20
14	CHANDAPUR OHT	490	20
15	CHIKALAKANDI OHT	195	20
16	CHIKALAKHANDI OHT 1 BAKAKRU	15	20
17	DURA OHT1	355	20

18	DURA OHT2	355	20
19	GANJU OHT	290	20
20	GOLABANDHA OHT	460	20
21	GOLANTHRA OHT	320	20
22	HALADIAPADER OHT	475	20
23	INDRAKLHAI OHT	220	20
24	KALAMPUR OHT	295	20
25	KALIPALLI OHT 1	475	20
26	KALIPALLI OHT 2	475	20
27	KALIPALLI(BADAPUTI VILL)OHT	125	20
28.	KANAMANA OHT	75	20
29.	KARAPADA OHT 1	330	20
30.	KARAPADA OHT 2	330	20
31.	KARAPALLI OHT	345	20
32.	KELUAPALLI OHT	220	20
33.	KOLATHIGAM OHT	190	20
34.	KOTHARSINGI OHT	390	20
35.	LAUDIAGAON OHT	225	20
36.	LAXMIPUR OHT	360	20
37.	LUHAJHAR OHT	405	20
38.	MAHANANDPUR OHT	280	20
39.	MANTRIDI OHT	315	20
40.	MARKANDI OHT	290	20
41.	MENDERJPUR OHT	55	20
42.	NARAYANPUR OHT	135	20
43.	NAREDRAPUR OHT	530	20
44.	PADAMPUR OHT	265	20
45.	PATTLAMPUR OHT	435	20
46.	PODAPADAR OHT 1	265	20
47.	PODAPADAR OHT 2	265	20
48.	PUTLA OHT 1	405	20
49.	PUTLA OHT 2	405	20
50.	RANDHA OHT	450	20

51.	RANGEILUNDA OHT	480	20
52.	RANGIPUR OHT	210	20
53.	SASANAPADAR OHT	335	20
54.	SATRAKUTANI OHT	215	20
55.	SRIRAM CHANDRAPUR OHT	510	20
56.	SUNDARPUR OHT 1	500	20
57.	SUNDARPUR OHT 2	500	20
58.	TANGANAPALLI OHT 1	275	20
59.	TANGANAPALLI OHT 2	275	20

SUPPORTING DATA:

- Google earth path has been provided in back file
- Other supporting files are also enclosed.

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

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.

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.

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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