THE SINGARENI COLLIERIES COMPANY LIMITED
(A GOVERNMENT COMPANY)
Registered Office
Kothagudem Collieries (P.O) - 507 101, Bhadradri Kothagudem Dist, Telangana State
CIN: U10102TG1920SGC000571

Environment Dept., Srirampur Area
PO:Srirampur Colony-504 303, Dist. Mancherial, Telangana State

Phone No: 08736-238039.
Fax No : 08736-238222.
e-mail:env_srp@scclmines.com
website:www.scclmines.com

Ref.No: SRP/ENV/U-004/2024/191 Date: 30.08.2024.

To
The Member secretary,
Telangana State Pollution Control Board,
Paryavaran Bhavan,
A-3, Industrial Estates,
Sanath Nagar,
HYDERABAD.

Sir,

Sub: Submission of Environmental Statement in Form - V of RK-NT Inc. of Srirampur Area of S.C.C.L for the year 2023-24 – Reg.
Ref: Rule: 14 of Environment Protection Rules, 1986.

*****

With reference to the cited above, please find enclosed herewith Environmental Statement in Form - V of RK-NT Inc. of Srirampur Area of S.C.Co.Ltd., for the year 2023-24.

Thanking you,

Office of the General Manager S.C.C.L. SRIRAMPUR

Yours Sincerely,

General Manager
Srirampur Area.
General Manager
SRIRAMPUR

Encl: As above.

C.c.: The Joint Chief Environmental Engineer,
Telangana State Pollution Control Board,
Zonal Office, Sangareddy District – 502 302.

: The Environmental Engineer,
Telangana State Pollution Control Board,
Regional Office, Nizamabad – 503 002.

: GM(Env.), Kgm.

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
SRIRAMPUR AREA

ENVIRONMENTAL STATEMENT OF RAVINDRA KHANI NEW-TECH. INCLINE FOR THE YEAR 2023-24.

Name of the Project: RavindraKhani New-Tech. Incline

Name of the Area: Srirampur Area, **District**: Mancherial.

1.1Introduction:

The Singareni Collieries Company Ltd., (SCCL) has been exploiting coal for 134 years in the Pranahita - Godavari valley Coal field in the South Indian State of Telenagana. Over the years, the Company had expanded its mining activity KomaramBheem (Asifabad), Mancherial, Peddapalli, Jaya Shankar Bhoopalapalli, Bhadradri Kothagudem and Khammam (New) districts of Telangana State.

The Company's mining activity is divided into three regions vizRamagundam, Bellampally and Kothagudem and each region is also sub-divided into areas for administrative convenience. Srirampur area is one of the areas of the Bellampalli Region.

1.2 Srirampur Area:

Srirampur Area is well connected by road to Mancherial located at 8.5 KM and has well established communication system like telephone, telex etc. Srirampur Area is located in industrially backward area. As a direct benefit of mining activity about 8,085 persons (including OC Mines) are employed at mine level and another 1,118 persons at area level. Assuming an indirect employment of 5 persons for every person directly employed, 46,015 persons are getting benefited.

There are 7 Underground mines in this area viz SRP-1, SRP-3&3A, RK-5, RK-6, RK-7, RK-NT and IK-1A Inclines. There are two opencast mines (SRP OC-II EXPANSION PROJECT& IK OCP) working from in this area. The production from these mines (including OC Mines) during the year 2023-24 is 59,06,089 Tonnes of coal.

1.3 Brief Description of the Mine / Project:

RK-NT Incline is lying in between North Latitude of N 18°50'28'' to 18°52'18'' and East Longitude of E 79°31'14'' to 79°32'34'' in Survey of India Top sheet No. 56N/9. The mine is located around 11km from Mancherial railway station on Kazipet – Ballarsha line of South Central Railway in Mancherial (New) district of Telangana State, and it is at a distance of 256 km from Hyderabad.

RK-NT Incline was started on 19-10-1983. Consent for Operation (CFO) has been obtained for this mine from Telangana Pollution Control Board with a production capacity of 1.0 Million Tonnes per Annum. At present the mine is being worked with conventional Board and Pillar method and Semi-mechanization with SDLs and Short wall mining.

FORM – V (Rule No.14 of EPR'1986)

PART – A

General:

Sl.No	Item	Details
1.	Name and address of Owner / Occupier of the Industry / Operation or process.	General Manager, Srirampur Area, The Singareni Collieries Company Limited, Srirampur – 504 303
2.	Industry category	Non-Red Hazardous (Coal Mine)
3.	Production capacity	1.00 MTPA
4.	Year of Establishment	19.10.1983
5.	Date of last environmental Statement submitted.	19.09.2023

Sl.No.	Item	2022-23	2023-24
1.	Total coal production (in Lakh tones)	1.79	1.61
2.	Total men on roll (as on 31st March)	748	668

PART – B

Water and raw material consumption.

(A) Water Consumption:

Sl. No	Description	Water consumption during the year 2022-23 (KLD)	Water consumption during the year 2023-24 (KLD)
1	Average quantity of water pumped out of the mine	6750.00	Nil
2.	**Water consumption:**		
A.	**Domestic:**		
	a) Water used for drinking/bathing and other industrial requirements	80.00	Nil
	b) Water supplied for nearest township/village for domestic purpose	592.80	Nil
	Sub-Total	**672.80**	**Nil**
B.	**Industrial:**		
	a) Water used for plantation	1400.00	Nil
	b) Water used for dust suppression	80.00	Nil
	c) Water used for stowing	Nil	Nil
	Sub- Total	**1480.00**	**Nil**
	Total water consumption:	**2152.8**	**Nil**
3.	Excess water let out	4597.20	Nil

(B) Raw material consumption of RK-NT:

Sl. No	Description of the Material	Unit	Consumed during the year	
			2022-23	2023-24
1	i) Explosives(Permitted)	Kgs	190772.60	1,54,922.4
	ii) Explosives (others)	Kgs	0	0
2	i) Delay detonators	Nos.	368700	3,26,700
	ii) Ordinary detonators	Nos.	11900	9,500
3	Timber (all types)	Cu.m	345.51	356
4	Tub Lubricant oils	Ltrs.	0	0
5	Gear oils & other lubricant oils.	Ltrs.	5411	4,830
6	Hydraulic oils	Ltrs.	12755	14,070
7	Transformer oils	Ltrs.	0	0
8	Kerosene	Ltrs.	0	0
9	H.S.D.Oil	Ltrs.	2637	2,120
10	Petrol	Ltrs.	250	240
11	Engine oil	Ltrs.	0	0
12	Cement	Bags	1470	2,070
13	Paint Enamel	Ltrs.	76	250
14	Paint red-oxide	Ltrs.	60	140
15	Grease	Kgs	728	182
16	Tub paints	Ltrs.	0	0
17	Girders	Tons	4.991	5000
18	Rails	Tons	0	34.77
19	Roof bolts and nuts	Nos	48500	33,596
20	Channels	Tons	0.381	0
21	Dog nails	Kgs	1500	1,795.653
22	Tub pedestals	Nos	100	100
23	Flat Iron	Tons	0	0
24	G.I Pipes	Mtrs	60.27	330
25	C.I Pipes	Mtrs	0	0
26	Fosrock capsules	Nos	184610	1,47,410
27	Drill roads	Nos	563	548
28	Drill bits	Nos	6364	4,961
29	Coal baskets	Nos	20	40
30	Conveyor belt	Mtrs	0	0
31	Haulage rope	Mtrs	7500	7,500
32	Cap lamp batteries	Nos	15	0

* Including RK-7 Mine

Note: Raw material consumption like explosives, diesel oil and others are dependent upon the stripping ratio, Inclination of the seams, nature of rock strata, distance to coal handling plant from the mine, method of working and technology adopted etc., hence raw material consumption varies from mine to mine and time to time.

PART – C

Pollution discharged to environment / unit of output.

A. *Water pollution Source & Control Measures:*

(a) ***Water pollution sources:***

The source of water pollution is mine discharge water, contaminated water from workshops and domestic waste water.

(b) ***Water pollution control:***

The following control measures are being taken up at the mine to control the water pollution.

i) The mine discharge water is being reutilized after necessary treatment for dust suppression, plantation, domestic use etc.

ii) The excess mine discharge water is being treated in settling tanks before discharge into natural drains.

iii) The domestic sewage from the mine is being treated in septic tank followed by soak pit.

iv) An effective sewerage system is being maintained to treat the colony effluents by constructing Sewage Treatment Plant at Naspur Colony with Capacity of 3 MLD.

v) Post-project water quality monitoring is being carried out by outside agency [M/s Environment Protection Training and Research Institute (EPTRI) Hyderabad (CPCB recognized and NABL accredited laboratory)] as per the frequency stipulated by MoEF&CC for coal mining industry. The water quality monitoring reports are enclosed as **Annexure - I.**

B. *Air pollution Source & Control Measures:*

(a) ***Source of air pollution:***

The activities contributing to the air pollution are mine exhaust air, transportation of coal, men & material, coal handling operations like screening, crushing, etc., The major pollutants are suspended particulate matter, dust and oxides of Nitrogen.

(b) ***Air Pollution Control:***

i. Water spraying arrangements have been made under ground at all working places, loading points and transfer points.

ii. Arrangements have been made for water spraying on the surface conveyor belt.

iii. At CHP, water spraying has been arranged at Conveyor transfer points and at loading points and the conveyor belts have been provided with covered structure.

iv. Surface is kept free of fine coal dust heaps.

v. Coal transport route has been black topped from the mine to CHP. Internal roads have also been black topped.

vi. Avenue plantation has been developed along Coal Transportation Road.

CONTROL OF EMISSION OF NOXIOUS GASES:

The measures taken for mitigating the noxious gases are as follows:

i) Coal transportation trucks and other vehicles are periodically maintained.

ii) Notice boards have been displayed on the surface; advising persons to avoid burning of coal/wood/oil grease impregnated waste cotton/garbage etc., in the mine premises as a method of disposal.

iii) Blasting operations at underground is carried out with delay action detonators and ultra safe P5 explosives, which helps in mitigating the emission of gases from explosives.

iv) Stocks of coal are not allowed to be kept on surface of the mine. If any heap has to be kept for some time, water spraying is done over it to control oxidation of coal.

v) Burning of firewood and coal for domestic purpose in colonies has been stopped due to usage of L.P Gas being distributed free of cost by the company to all the employees.

1. Total manpower of the mine as on 31.03.2024 : 668

2. Total L.P Gas connections to the workers as on 31.03.2024 : 559

vi) Post-project air quality monitoring is being carried out by outside agency [M/s Environment Protection Training and Research Institute (EPTRI) Hyderabad (CPCB recognized and NABL accredited laboratory)] as per the frequency stipulated by MoEF&CC vide GSR 742 (E) for coal mining industry and all the necessary precautions are being taken to maintain the concentration of critical parameters well within the stipulated standards. The air quality monitoring reports are enclosed as **Annexure - II**.

C. *Noise pollution Source & Control Measures:*

(a) ***Source of Noise pollution:***

The source of noise pollution is due to coal dispatch arrangements and surface mine ventilation fan.

(b) ***Noise pollution Control Measures:***

i. The main mechanical ventilators are provided with evasee which dampens the noise.

ii. To dampen the noise levels at CHP, impact rollers are provided at transfer points.

iii. Height of fall is minimized at all coal transfer points and internal lining of bins and chutes are done.

iv. In the high noise intensity working areas / zones earmuffs or earplugs or any other suitable personal protective equipment is being provided to the workmen.

v. Regular noise level monitoring is being done periodically for taking corrective action, wherever required.

vi. Extensive plantation of green belt and vegetation along the roads and around the offices to create a barrier or screen between the source and the receiver so that the noise is absorbed and the exposure level is minimized.

vii. Cushioning belt liners under the tipplers are being provided under tippler resting pads to reduce the noise while tripling the tubs.

viii. Post-project Noise quality monitoring is being carried out by outside agency [M/s Environment Protection Training and Research Institute (EPTRI) Hyderabad (CPCB recognized and NABL accredited laboratory)] at the Mine pit office and surrounding villages as per the frequency stipulated by MoEF&CC for coal mining industry. The noise monitoring reports are enclosed as **Annexure - III.**

PART – D

Hazardous wastes:

The main categories of wastes generated are Metal scrap, used oils, used batteries etc. at Area Workshop. Waste materials are auctioned through M-Junction by e-Auction and disposed to T.S.P.C.B authorized parties on as is where basis is.

PART – E

Land degradation and Solid waste:

Land degradation:

Due to extraction of coal by underground method, surface land gets affected due to subsidence. The following measures are taken to minimize damage to land due to subsidence –

1. Subsidence is monitored periodically and records maintained as per requirements of DGMS Circular No.12 of 1962.

2. Crack filling is carried out regularly.

3. Plantation is taken-up in stabilized areas with suitable species to bind the soil.

Solid Waste:

Solid waste generated is mainly Shale / Sand Stone separated from coal at the Coal Handling Plants, Ferrous/ non-ferrous scrap at the Mines, Workshops and wooden scrap generated at Timber Yards.

***Waste Management*:**

1. Solid waste generated from CHP is transported by trucks to low-lying area in the townships and used for land filling.

2. Old haulage rope is re-used for roof stitching in underground mines.

3. Old haulage rope and tub frames are used for fencing arrangements.

4. Waste timber is used as sleepers for underground haulage track.

Solid waste generated and re-cycled / sold / disposed quantity for the year 2023-24 as compared to the previous year 2022-23 at Srirampur Area.

Sl. No.	**Description**	**Total Quantity**	
		During the year 2022-23	**During the year 2023-24**
I.	(a) Solid waste generated out from CSP (Shale & Stone) (in Tonnes)	12222.300	8689.81
	(b) Garbage generated from Colonies. (in Cu. Mtrs.)	1907	3,905
II.	Quantity recycled	Nil	Nil
III.	Sold.	Nil	Nil
IV.	Disposal	(i) All the rejects at CHP are dumped in the here marked shale dump yard.	(i) All the rejects at CHP are dumped in the here marked shale dump yard.
		(ii) Garbage is disposed off in low-lying areas of the Company	(ii) Garbage is disposed off in low-lying areas of the Company.

PART – F

Characterization of solid waste and disposal practice:

Solid waste generated at Coal Handling Plant is stone, clay and shale. These waste materials are picked out from the coal manually at the picking platforms at the CHP, while coal moves on conveyor belts. After picking, these wastes are stored in the bunkers. From bunkers these solid wastes are transported by trucks for dumping in low-lying areas in the townships.

PART – G

Impact of pollution control measures taken on conservation of natural resources and on cost of production.

1) Water spraying arrangements are made and regular tuning of vehicles is done to control air pollution.

2) 11,390 Nos. of saplings have been planted in the premises of RK – NT incline, around fan house, G.T. Hostel premises and in Naspur Colony to control pollution and create green environment.

3) The annual revenue expenditure for implementation of environmental management plan in the RK-NT Incline is estimated at Rs.37.58 Lakhs i.e., Rs.3.75 per tonne of coal produced in the EIA/EMP.

Expenditure towards the Environmental protection for the year 2023-24 as Compared to the previous year 2022-23.

Sl. No.	Description	Revenue expenditure (in Rs.)	
		2022-23	2023-24
1.	Air Pollution (Prevention & Control)	85574.70	3177768.56
2.	Water Pollution (Prevention & Control)	97189.78	435351.4
3.	Land Development	0	0
4.	Plantation	0	0
5.	Plant & Machinery for Environment protection.	0	387101
6.	Consultancy payments / scientific studies.	0	0
7.	OB reclamation / Subsidence stabilization	197478	304920
8.	Environmental Awareness / Environmental education.	1000	1500
9.	Noise & Blast vibrations	32674.20	30110.8
10.	Others.	0	0
	Total Expenditure	**295141**	**4336751.76**

Annual Revenue expenditure is Rs. 26.93 per tonne of coal produced during the year 2023-24. This is excluding the cost of power, wages, stores and cess charges.

PART – H

Additional measures / investment proposals for environmental protection including abotment of pollution.

1. Provision of quarters along with civil amenities.
2. Provision of playgrounds, recreation and cultural centers and clubs.
3. Incentives for family planning and population control.
4. Communication facilities like road, telephone, bus services etc.
5. Provision of LPG cylinders as fuel to company employees at free of cost.
6. Construction of community latrines (Sulabh toilets) to work persons who are residing outside the company quarters.
7. Green belt development has been taken up in mine premises, townships, CSP, Workshops and along mine colony roads.
8. Asphalting of the entire colony roads and mine is being taken up in a phased manner to reduce dust generation.
9. Proper care is being taken to reduce noise levels by proper lubrication of machinery, restricting falling height of coal at CHP and lining the sides of conveyor system wherever necessary and Green belt development around noise generating sources.

PART – I

Other particulars for improving the quality of the environment:

1. Employees are being educated in protecting environment by conducting environmental awareness week and quiz competitions during World Environment day and World Environment Protection day.
2. Vanamahotsavam is being organized every year and mass plantation is being taken up on a single day as per the guidance of the TGPCB.
3. For improving ground water levels 32 Nos. of Rainwater harvesting structures are constructed in the Srirampur area.
4. Compost pits are being used at mines for disposal of Bio-degradable solid wastes.

Agent,

RK- 7 & NT Group of Mines,
The S.C.Co.Ltd.,
Srirampur Area.

Agent, RK-7 Group
SCCL SRP Area

MONITORING DATA OF RAVINDRA KHANI – NEW TECH (RK-NT) INCLINE FOR THE PERIOD APRIL, 2023 TO MARCH, 2024.

List of Annexures:

Sl.No.	Description	Annexure No.
1	Effluents, Surface & Ground Water Quality monitoring data.	I
2	Ambient Air Quality monitoring data	II
3	Noise level monitoring data	III
4	Attitude of Phreatic Surface &Piezometric Levels	IV
5.	Meteorological data	V

ANNEXURE –I

POST PROJECT WATER QUALITY MONITORING DATA FOR THE PERIOD FROM APRIL, 2023 TO MARCH, 2024 FOR RK-NT INCLINE.

- Location of the water
  Quality monitoring Station: RK-NT incline mine discharge (filter bed outlet)

Sl. No.	Station name	Date of sampling	Concentration in mg/Liter (Except pH)					
			pH (at 25^0 C)	TSS At 105^0 C	TDS (At 180^0 C)	COD	BOD	Oil & Grease
1.	RK-NT`Incline Mine discharge (EW3)	15.04.2023	7.7	20	632	16	2.1	<1
		29.04.2023	7.5	14	741	12	2.7	<1
		15.05.2023	7.9	23	690	18	2.1	<1
		31.05.2023	7.6	16	848	12	2	1
		15.06.2023	7.3	20	964	12	1.5	<1
		30.06.2023	7.5	30	638	15	1.9	<1
		15.07.2023	7.3	33	745	19	2.6	<1
		31.07.2023	7.3	19	685	12	2.1	<1
		14.08.2023	7.7	27	910	20	3.2	<1
		31.08.2023	7.6	23	763	23	4.1	<1
		15.09.2023	7.5	15	678	27	2.8	1
		29.09.2023	7.3	29	794	32	3.6	<1
		13.10.2023	7.8	36	833	19	2.6	<1
		31.10.2023	7.8	19	625	16	2.8	<1
		15.11.2023	7.9	31	810	28	3.6	<1
		30.11.2023	7.4	26	784	23	4.4	1
		15.12..2023	7.7	39	694	20	3.8	<1
		30.12.2023	7.3	22	596	27	3.6	<1
		13.01.2024	7.6	30	910	16	2.8	<1
		31.01.2024	7.9	25	689	23	3.2	<1
		15.02.2024	7.6	23	798	12	2.1	<1
		29.02.2024	7.4	18	856	20	3.6	<1
		15.03.2024	7.7	24	592	27	2.3	<1
		30.03.2024	7.5	30	635	11	2.2	<1
	Minimum		**7.30**	**14.00**	**592.00**	**11.00**	**1.50**	**1.00**
	Maximum		**7.90**	**39.00**	**964.00**	**32.00**	**4.40**	**1.00**
	Average		**7.58**	**24.67**	**746.25**	**19.17**	**2.82**	**1.00**
	98% tile		**7.90**	**37.62**	**939.16**	**30.16**	**4.26**	**1.00**
MoEF GSR 742(E) and GSR 801(E) Effluent standards for coal mines			**6.5-8.5**	**100**	**2100**	**250**	**100**	**10**
Test Method			**4500H$^+$**B	**2540-D**	**2540-C**	**5220-D**	**IS 3025**	**2540 -C**

Surface Water Sampling Locations

Sl. No.	Sampling code	Date of Sampling		Sampling Location	Latitude	Longitude
		1st Quarter	2nd Quarter			
1	SW-1	28.04.2023	02.08.2023	Godavari River Upstream (near Sitharampalli)	N 18˚ 49’ 33.5”	E 79˚ 28’ 21.5”
2	SW-2	28.04.2023	02.08.2023	Godavari River Downstream (Shettipalli)	N 18˚ 53’ 41.8”	E 79˚ 40’ 32.6”
3	SW-4	28.04.2023	02.08.2023	Ramaraopet Tank	N $18^0$49’9”	E $79^0$31’6”
4	SW-5	28.04.2023	02.08.2023	Indaram Tank	N 18˚ 49’ 03.6”	E 79˚ 52’ 02.4”

Groundwater Sampling Locations

Sl. No.	Sampling code	Date of Sampling		Sampling Location	Latitude	Longitude
		1st Quarter	2nd Quarter			
1	GW-2	28.04.2023	02.08.2023	Mudigunta Village	N 18˚ 53’ 08.3”	E 79˚ 32’ 46.3”
2	GW-3	28.04.2023	02.08.2023	Ramaraopet Village	N 18˚ 49’ 20.8”	E 79˚ 30’ 53.1”

Physico-Chemical and Bacteriological Characteristics of Surface Water

Physico-Chemical and Bacteriological Characteristics of Surface Water as per CPCB Water Quality Criteria

S.No	Parameters	Unit	Test Method	CPCB Water Quality Criteria					RESULT			
									SW-1 Godavari River Upstream		SW-2 Godavari River Downstream	
				Class A	Class B	Class C	Class D	Class E	1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1	pH	-	4500-H^+B	6.5-8.5	6.5-8.5	6.0 – 9.0	6.5-8.5	6.0-8.5	8.0	8.1	8.0	8.2
2	Electrical Conductivity	µmhos/ cm	2510-B	-	-	-	-	2250 µmhos/ cm	1455	379	1070	348
3	Dissolved Oxygen (DO)	mg/L	4500-O.C	6 mg/l or more	5 mg/l or more	4 mg/l or more	4 mg/l or more	-	6.9	5.9	6.6	5.2
4	Bio chemical Oxygen Demand (3 days 27° C)	mg/L	IS: 3025	2 mg/l or less	3 mg/l or less	3 mg/l or less	-	-	1.6	2.2	2.2	2.4
5	Total Coliforms	MPN/ 100mL	9221B	50 or less	500 or less	5000 or less	-	-	94	110	140	110
6	Free Ammonia (as N)	mg/L	4500-NH_3 – F	-	-	-	1.2 mg/L or less	-	BDL	BDL	BDL	BDL
7	Boron as B	mg/L	3120-B	-	-	-	-	Less than 2 mg/L	0.16	0.08	0.28	0.21
8	SAR	-	-	-	-	-	-	Less than 26	1.14	0.92	1.12	0.72

S.No	Parameters	Unit	Test Method	CPCB Water Quality Criteria					RESULT			
									SW-4 Ramaraopet Tank		SW-5 Indaram Tank	
				Class A	Class B	Class C	Class D	Class E	1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1	pH	-	4500-H^+B	6.5-8.5	6.5-8.5	6.0 – 9.0	6.5-8.5	6.0-8.5	7.8	7.6	7.8	7.0
2	Electrical Conductivity	µmhos/ cm	2510-B	-	-	-	-	2250 µmhos/ cm	288	325	1012	258
3	Dissolved Oxygen (DO)	mg/L	4500-O.C	6 mg/l or more	5 mg/l or more	4 mg/l or more	4 mg/l or more	-	5.9	6.2	5.9	5.3
4	Bio chemical Oxygen Demand (3 days 27º C)	mg/L	IS: 3025	2 mg/l or less	3 mg/l or less	3 mg/l or less	-	-	3.1	2.4	3.2	3.4
5	Total Coliforms	MPN/ 100mL	9221B	50 or less	500 or less	5000 or less	-	-	280	110	220	220
6	Free Ammonia (as N)	mg/L	4500-NH_3 – F	-	-	-	1.2 mg/L or less	-	BDL	BDL	BDL	BDL
7	Boron as B	mg/L	3120-B	-	-	-	-	Less than 2 mg/L	0.22	0.09	0.12	0.07
8	SAR	-	-	-	-	-	-	Less than 26	1.58	0.95	1.35	0.69

Physico-Chemical Characteristics of Surface Water at Selected Locations in the Study Area

S. No	Parameters	Unit	Test Method	SW-1 Godavari River Upstream		SW-2 Godavari River Downstream	
				1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1.	Colour	Hazen	2120. B	5	5	5	5
2.	Odour	TON	2150. B	No odour observed	No odour observed	No odour observed	No odour observed
3.	Temperature	ºC	2550. B	25.1	25.2	25.0	25.3
4.	Turbidity	NTU	2130. B	0.26	2.5	0.44	7.3
5.	Total Dissolved Solids at 180º C	mg/L	2540.C	865	223	626	204
6.	Total Suspended Solids at 105º C	mg/L	2540. D	17	41	11	37
7.	Chemical Oxygen Demand	mg/L	5220. D	4	16	8	20
8.	Chlorides as Cl^-	mg/L	4500-Cl^-.B	260	31	197	29
9.	Sulphates as SO_4^{2-}	mg/L	4500-SO_4^{2-}.E	106	32	86	30
10.	Fluoride as F^-	mg/L	4500-F^-.C	0.52	0.45	0.41	0.38
11.	Calcium as Ca	mg/L	3500-Ca.B	84	26	80	28
12.	Magnesium as Mg	mg/L	3500-Mg.B	51	21	47	22
13.	Sodium as Na	mg/L	3500-Na.B	167	26	97	21
14.	Potassium as K	mg/L	3500-K.B	33.7	1.2	11.8	2.4
15.	Nitrites as NO_2	mg/L	4500-NO_2^-.B	BDL	0.09	BDL	0.11
16.	Nitrates as NO_3	mg/L	4500-NO_3^-.B	43	4.24	10.3	4.22
17.	Total Phosphates	mg/L	4500-P-D	BDL	0.02	BDL	BDL
18.	Ammonical Nitrogen as NH_3-N	mg/L	4500-NH_3 –C	BDL	BDL	BDL	BDL
19.	Phenolic compounds as C_6H_5OH	mg/L	5530-D	BDL	BDL	BDL	BDL
20.	Oil & Grease	mg/L	5520. B	<1	<1	<1	<1
21.	Carbonates as CO_3	mg/L	2320. B	nil	nil	nil	nil
22.	Bi-carbonates as HCO_3	mg/L	2320. B	180	120	135	95
23.	Fecal Coliforms	MPN/100mL	9221 E	11	4.5	17	4.5
24.	Zinc as Zn	mg/L	3120. B	0.11	0.19	0.10	0.29

S. No	Parameters	Unit	Test Method	SW-1 Godavari River Upstream		SW-2 Godavari River Downstream	
				1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
25.	Iron as Fe	mg/L	3120. B	0.58	0.61	0.35	0.58
26.	Arsenic as As	mg/L	3120. B	BDL	BDL	BDL	BDL
27.	Lead as Pb	mg/L	3120. B	BDL	BDL	BDL	BDL
28.	Cadmium as Cd	mg/L	3120. B	BDL	BDL	BDL	BDL
29.	Total Chromium as Cr	mg/L	3120. B	BDL	BDL	BDL	BDL
30.	Nickel as Ni	mg/L	3120. B	BDL	BDL	BDL	BDL
31.	Copper as Cu	mg/L	3120-B	BDL	BDL	BDL	BDL
32.	Selenium as Se	mg/L	3120-B	BDL	BDL	BDL	BDL

S. No	Parameters	Unit	Test Method	SW-4 Ramaraopet Tank		SW-5 Indaram Tank	
				1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1.	Colour	Hazen	2120. B	5	5	10	5
2.	Odour	TON	2150. B	No odour observed	No odour observed	No odour observed	No odour observed
3.	Temperature	ºC	2550. B	25.1	25.2	25.1	25.1
4.	Turbidity	NTU	2130. B	0.72	4.5	4.6	1.95
5.	Total Dissolved Solids at 180º C	mg/L	2540.C	172	191	590	152
6.	Total Suspended Solids at 105º C	mg/L	2540. D	9	33	40	27
7.	Chemical Oxygen Demand	mg/L	5220. D	12	8	16	16
8.	Chlorides as Cl^-	mg/L	4500-Cl^-.B	38	30	180	19
9.	Sulphates as SO_4^{2-}	mg/L	4500-SO_4^{2-}.E	16	22	69	23
1.	Fluoride as F^-	mg/L	4500-F^-.C	0.32	0.32	0.64	0.42
2.	Calcium as Ca	mg/L	3500-Ca.B	14	25	58	16
3.	Magnesium as Mg	mg/L	3500-Mg.B	11	14	48	12
4.	Sodium as Na	mg/L	3500-Na.B	14	24	54	15
5.	Potassium as K	mg/L	3500-K.B	1.1	5.3	2.6	2.9

S. No	Parameters	Unit	Test Method	SW-4 Ramaraopet Tank		SW-5 Indaram Tank	
				1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
6.	Nitrites as NO_2	mg/L	4500-NO_2^-.B	0.88	BDL	15.5	BDL
7.	Nitrates as NO_3	mg/L	4500-NO_3^-.B	6.9	4.02	4	3.47
8.	Total Phosphates	mg/L	4500-P-D	0.017	BDL	0.024	0.084
9.	Ammonical Nitrogen as NH_3-N	mg/L	4500-NH_3–C	BDL	BDL	BDL	BDL
10.	Phenolic compounds as C_6H_5OH	mg/L	5530-D	BDL	BDL	BDL	BDL
11.	Oil & Grease	mg/L	5520. B	<1	<1	<1	<1
12.	Carbonates as CO_3	mg/L	2320. B	nil	nil	nil	nil
13.	Bi-carbonates as HCO_3	mg/L	2320. B	95	95	265	85
14.	Fecal Coliforms	MPN/100mL	9221 E	46	6.8	17	11
15.	Zinc as Zn	mg/L	3120. B	0.13	0.08	0.12	0.22
16.	Iron as Fe	mg/L	3120. B	0.61	0.32	0.46	0.49
17.	Arsenic as As	mg/L	3120. B	BDL	BDL	BDL	BDL
18.	Lead as Pb	mg/L	3120. B	BDL	BDL	BDL	BDL
19.	Cadmium as Cd	mg/L	3120. B	BDL	BDL	BDL	BDL
20.	Total Chromium as Cr	mg/L	3120. B	BDL	BDL	BDL	BDL
21.	Nickel as Ni	mg/L	3120. B	BDL	BDL	BDL	BDL
22.	Copper as Cu	mg/L	3120-B	BDL	BDL	BDL	BDL
23.	Selenium as Se	mg/L	3120-B	BDL	BDL	BDL	BDL

Physico-Chemical, Bacteriological Characteristics of Groundwater Collected within the Study Area
Organoleptic and Physical Parameters

S. No.	Parameters	Unit	Test Method	IS: 10500 Requirement (Acceptable Limit)	IS: 10500 Permissible Limit in the absence of alternate source	RESULT			
						GW-2 Mudigunta Village		GW-3 RamaraopetVillage	
						1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1.	Colour	Hazen	2120. B	5	15	<5	<5	<5	<5
2.	Odour	TON	2150. B	Agreeable	Agreeable	Agree.	Agree.	Agree.	Agree.
3.	pH	-	4500-H^+B	6.5 to 8.5	No relaxation	7.4	7.4	7.5	7.1
4.	Taste	FTN	2160. B	Agreeable	Agreeable	Agree.	Agree.	Agree.	Agree.
5.	Turbidity	NTU	2130. B	1	5	0.42	0.59	0.58	0.39
6.	Total Dissolved Solids at 180° C	mg/L	2540.C	500	2000	652	761	988	693

General Parameters Concerning Substances Undesirable in Excessive Amounts

S. No.	Parameters	Unit	Test Method	IS: 10500 Requirement (Acceptable Limit)	IS: 10500 Permissible Limit in the absence of alternate source	RESULT			
						GW-2 Mudigunta Village		GW-3 RamaraopetVillage	
						1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1.	Calcium as Ca	mg/L	3500-Ca.B	75	200	54	97	107	83
2.	Magnesium as Mg	mg/L	3500-Mg.B	30	100	52	57	99	58
3.	Chlorides as Cl-	mg/L	4500-Cl-.B	250	1000	124	169	207	148
4.	Sulphates as SO42-	mg/L	4500-SO42- .E	200	400	88	88	104	49
5.	Fluoride as F-	mg/L	4500-F-.C	1.0	1.5	0.79	0.68	0.86	0.78
6.	Nitrates as NO3	mg/L	4500-NO3-.B	45	No relaxation	37	44	48	48
7.	Total Alkalinity as CaCO3	mg/L	2320. B	200	600	310	300	480	320
8.	Total Hardness as CaCO3	mg/L	2340. C	200	600	354	477	689	446
9.	Sulphide as H_2S	mg/L	4500-S2-F&D	0.05	No relaxation	BDL	BDL	BDL	BDL
10.	Total Ammonia-N	mg/L	IS 3025 (Part 34)	0.5	No relaxation	BDL	BDL	BDL	BDL
11.	Phenolic compounds as C6H5OH	mg/L	5530-D	0.001	0.002	BDL	BDL	BDL	BDL
12.	Residual free chlorine	mg/L	4500-Cl-.B	0.2	1.0	BDL	BDL	BDL	BDL
13.	Mineral oil	mg/L	IS:3025 (part 39)	0.5	No relaxation	absent	absent	absent	absent
14.	Anionic Detergents (as MBAS)	mg/L	IS:13428:2005K	0.2	1.0	<0.2	<0.2	<0.2	<0.2
15.	Aluminium as Al	mg/L	3120-B	0.03	0.2	0.08	BDL	0.10	0.09
16.	Barium as Ba	mg/L	3120. B	0.7	No relaxation	0.17	0.24	0.22	0.15
17.	Boron as B	mg/L	3120-B	0.5	2.4	BDL	0.09	0.18	0.07
18.	Iron as Fe	mg/L	3120-B	1.0	No relaxation	0.55	0.28	0.38	0.12
19.	Zinc as Zn	mg/L	3120-B	5	15	0.25	BDL	0.13	BDL
20.	Copper as Cu	mg/L	3120-B	0.05	1.5	BDL	BDL	BDL	BDL
21.	Manganese as Mn	mg/L	3120-B	0.1	0.3	BDL	BDL	BDL	BDL
22.	Selenium as Se	mg/L	3120-B	0.01	No relaxation	BDL	BDL	BDL	BDL
23.	Silver as Ag	mg/L	3120. B	0.1	No relaxation	BDL	BDL	BDL	BDL

Parameters Concerning Toxic Substances

S-No	Parameters	Unit	Test Method	IS: 10500 Requirement (Acceptable Limit)	IS: 10500 Permissible Limit in the absence of alternate source	RESULT			
						GW-2 Mudigunta Village		GW-3 RamaraopetVillage	
						1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1.	Cadmium as Cd	mg/L	3120-B	0.003	No relaxation	BDL	BDL	BDL	BDL
2.	Cyanide as CN-	mg/L	4500-CN-.F	0.05	No relaxation	BDL	BDL	BDL	BDL
3.	Lead as Pb	mg/L	3120-B	0.01	No relaxation	BDL	BDL	BDL	BDL
4.	Molybdenum as Mo	mg/L	3120. B	0.07	No relaxation	BDL	BDL	BDL	BDL
5.	Nickel as Ni	mg/L	3120-B	0.02	No relaxation	BDL	BDL	BDL	BDL
6.	Total Arsenic as As	mg/L	3120-B	0.01	0.05	BDL	BDL	BDL	BDL
7.	Total Chromium as Cr	mg/L	3120-B	0.05	No relaxation	BDL	BDL	BDL	BDL
8.	Mercury as Hg	µg/L	3500-Hg.B	0.001	No relaxation	BDL	BDL	BDL	BDL
9.	**Pesticides:** α–BHC, β-BHC, γ-BHC, δ-BHC, o, p-DDT, p, p' –DDT, Endosulfan, β- Endosulfan, Aldrin, Dieldrin	µg/L	6630. D	Absent	0.001	ND	ND	ND	ND
	2,4-D, Carboryl (Carbonate) Malathion Methyl Parathion Anilophos, Chloropyriphos	Qualitative analysis	6630. D	Absent	0.001	ND	ND	ND	ND
10.	**Polyaromatic Hydrocarbons (PAH's):** Acenaphthene, Acenaphthylene, Anthracene, B(a)A, B(a)P, B(b)F, B(k)F, Pyrene, Dibenz (a,h) anthracene, Fluoranthene, Fluorene, Indeno (1,2,3-(d) Pyrene, Naphthalene, Phenanthrene, Pyrene, Methyl Naphthalene	µg/L	6440.C	--	--	ND	ND	ND	ND

Bacteriological Quality of Drinking water

S. No.	Parameters	Unit	Test Method	IS: 10500 Requirement (Acceptable Limit)	IS: 10500 Permissible Limit in the absence of alternate source	RESULT			
						GW-2 Mudigunta Village		GW-3 RamaraopetVillage	
						1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1	Total Coliforms	MPN/100 mL	9221B	-	-	<1.8	<1.8	<1.8	<1.8
2	Fecal Coliforms	MPN/100 mL	9221 E	-	-	<1.8	<1.8	<1.8	<1.8

Surface Water Sampling Locations

Sl. No.	Sampling code	Date of sampling		Sampling Location	Latitude	Longitude
		1st Quarter	2nd Quarter			
1.	SW-1	07.11.2023	28.12.2023	Godavari River Upstream (near Sitharampalli)	N 18° 49' 33.5"	E 79° 28' 21.5"
2.	SW-2	07.11.2023	28.12.2023	Godavari River Downstream (Shettipalli)	N 18° 53' 41.8"	E 79° 40' 32.6"
3.	SW-4	07.11.2023	28.12.2023	Ramaraopet Tank	N 18°49'9"	E 79°31'6"
4.	SW-5	07.11.2023	28.12.2023	Indaram Tank	N 18° 49' 03.6"	E 79° 52' 02.4"

Groundwater Sampling Locations

Sl. No.	Sampling code	Date of sampling		Sampling Location	Latitude	Longitude
		1st Quarter	2nd Quarter			
1	GW-2	07.11.2023	28.12.2023	Mudigunta Village	N 18° 53' 08.3"	E 79° 32' 46.3"
2	GW-3	07.11.2023	28.12.2023	Ramaraopet Village	N 18° 49' 20.8"	E 79° 30' 53.1"

Physico-Chemical and Bacteriological Characteristics of Surface Water
Physico-Chemical and Bacteriological Characteristics of Surface Water as per CPCB Water Quality Criteria

Sl.No	Parameters	Unit	Test Method	CPCB Water Quality Criteria					RESULT			
									SW-1 Godavari River Upstream		SW-2 Godavari River Downstream	
				Class A	Class B	Class C	Class D	Class E	1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1	pH	-	4500-H+B	6.5-8.5	6.5-8.5	6.0 – 9.0	6.5-8.5	6.0-8.5	8.5	8.1	8.1	8.4
2	Electrical Conductivity	µmhos /cm	2510-B	-	-	-	-	2250 µmhos/cm	652	870	445	495
3	Dissolved Oxygen (DO)	mg/L	4500-O.C	6 mg/l or more	5 mg/l or more	4 mg/l or more	4 mg/l or more	-	5.8	5.1	5.6	5.3
4	Bio chemical Oxygen Demand (3 days 27° C)	mg/L	IS: 3025	2 mg/l or less	3 mg/l or less	3 mg/l or less	-	-	2.8	3.0	2.8	2.8
5	Total Coliforms	MPN/ 100mL	9221 B	• 50 or less	• 500 or	• 5000 or	-	-	240	240	220	170

					less	less						
6	Free Ammonia (as N)	mg/L	4500-NH_3 –F	-	-	-	1.2 mg/L or less	-	BDL	BDL	BDL	BDL
7	Boron as B	mg/L	3120-B	-	-	-	-	Less tha 2 mg/L	0.06	BDL	0.11	0.08
8	SAR	-	-	-	-	-	-	Less than 26	1.44	1.31	1.17	1.34

Sl.No	**Parameters**	**Unit**	**Test Method**	**CPCB Water Quality Criteria**					**RESULT**			
									SW-4 Ramaraopet Tank		**SW-5** Indaram Tank	
				Class A	**Class B**	**Class C**	**Class D**	**Class E**	1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1	pH	-	4500-H^+B	6.5-8.5	6.5-8.5	6.0 – 9.0	6.5-8.5	6.0-8.5	7.8	8.3	7.7	8.5
2	Electrical Conductivity	µmhos /cm	2510-B	-	-	-	-	2250 µmhos/cm	495	935	490	360
3	Dissolved Oxygen (DO)	mg/L	4500-O.C	6 mg/l or more	5 mg/l or more	4 mg/l or more	4 mg/l or more	-	5.8	6.2	5.4	5.5
4	Bio chemical Oxygen Demand (3 days 27° C)	mg/L	IS: 3025	2 mg/l or less	3 mg/l or less	3 mg/l or less	-	-	1.6	3.6	2.0	2.8
5	Total Coliforms	MPN/ 100mL	9221 B	50 or less	500 or less	5000 or less	-	-	140	240	130	170
6	Free Ammonia (as N)	mg/L	4500-NH_3 –F	-	-	-	1.2 mg/L or less	-	BDL	BDL	BDL	BDL
7	Boron as B	mg/L	3120-B	-	-	-	-	Less than 2 mg/L	BDL	0.11	0.11	0.14
8	SAR	-	-	-	-	-	-	Less than 26	0.87	1.89	0.87	1.00

Physico-Chemical Characteristics of Surface Water at Selected Locations in the Study Area

S. No	Parameters	Unit	Test Method	SW-1 Godavari River Upstream		SW-2 Godavari River Downstream	
				1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1	Colour	Hazen	2120. B	5	5	5	5
2	Odour	TON	2150. B	No odour observed	No odour observed	No odour observed	No odour observed
3	Temperature	ºC	2550. B	25.4	25.2	25.3	25.2
4	Turbidity	NTU	2130. B	2.64	10.3	3.11	1.74
5	Total Dissolved Solids at 180º C	mg/L	2540.C	380	512	262	290
6	Total Suspended Solids at 105º C	mg/L	2540. D	14	10	10	8
7	Chemical Oxygen Demand	mg/L	5220. D	8	16	12	16
8	Calcium as Ca	mg/L	3500-Ca.B	42	62	32	30
9	Magnesium as Mg	mg/L	3500-Mg.B	30	49	17	23
10	Sodium as Na	mg/L	3500-Na.B	50	57	33	40
11	Potassium as K	mg/L	3500-K.B	2.6	6.1	2.9	3.3
12	Chlorides as Cl^-	mg/L	4500-Cl^-.B	60	76	36	48
13	Sulphates as SO_4^{2-}	mg/L	4500-SO_4^{2-}.E	55	85	43	52
14	Fluoride as F^-	mg/L	4500-F^-.C	0.7	0.7	0.9	0.7
15	Nitrates as NO_3	mg/L	4500-NO_3^-.B	0.7	0.11	0.44	0.45
16	Nitrites as NO_2	mg/L	4500-NO_2^-.B	BDL	0.03	BDL	BDL
17	Total Phosphates	mg/L	4500-P-D	0.03	0.64	0.02	0.32
18	Ammonical Nitrogen as NH_3-N	mg/L	4500-NH_3-C	BDL	BDL	BDL	BDL
19	Phenolic compounds as C_6H_5OH	mg/L	5530-D	BDL	BDL	BDL	BDL
20	Oil & Grease	mg/L	5520. B	<1	<1	<1	<1
21	Carbonates as CO_3	mg/L	2320. B	Nil	Nil	Nil	Nil
22	Bi-carbonates as HCO_3	mg/L	2320. B	215	280	145	140
23	Fecal Coliforms	MPN/100mL	9221 E	13	13	11	14

S. No	Parameters	Unit	Test Method	SW-1 Godavari River Upstream		SW-2 Godavari River Downstream	
				1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
24	Zinc as Zn	mg/L	3120. B	0.15	0.13	0.09	0.18
25	Iron as Fe	mg/L	3120. B	0.75	0.46	0.46	0.59
26	Arsenic as As	mg/L	3120. B	BDL	BDL	BDL	BDL
27	Lead as Pb	mg/L	3120. B	BDL	BDL	BDL	BDL
28	Cadmium as Cd	mg/L	3120. B	BDL	BDL	BDL	BDL
29	Total Chromium as Cr	mg/L	3120. B	BDL	BDL	BDL	BDL
30	Nickel as Ni	mg/L	3120. B	BDL	BDL	BDL	BDL
31	Copper as Cu	mg/L	3120-B	BDL	BDL	BDL	BDL
32	Selenium as Se	mg/L	3120-B	BDL	BDL	BDL	BDL

S. No	Parameters	Unit	Test Method	SW-4 Ramaraopet Tank		SW-5 Indaram Tank	
				1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1	Colour	Hazen	2120. B	5	5	5	5
2	Odour	TON	2150. B	No odour observed	No odour observed	No odour observed	No odour observed
3	Temperature	ºC	2550. B	25.2	25.2	25.0	25.1
4	Turbidity	NTU	2130. B	4.01	5.69	2.01	0.57
5	Total Dissolved Solids at 180º C	mg/L	2540.C	290	550	288	210
6	Total Suspended Solids at 105º C	mg/L	2540. D	8	6	12	8
7	Chemical Oxygen Demand	mg/L	5220. D	8	24	8	12
8	Calcium as Ca	mg/L	3500-Ca.B	36	60	37	28
9	Magnesium as Mg	mg/L	3500-Mg.B	29	38	22	12
10	Sodium as Na	mg/L	3500-Na.B	29	76	27	25
11	Potassium as K	mg/L	3500-K.B	4.9	6.9	4.5	5.3

S. No	Parameters	Unit	Test Method	SW-4 Ramaraopet Tank		SW-5 Indaram Tank	
				1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
12	Chlorides as Cl^-	mg/L	4500-Cl^-.B	41	115	43	46
13	Sulphates as SO_4^{2-}	mg/L	4500-SO_4^{2-}.E	43	87	45	24
14	Fluoride as F^-	mg/L	4500-F^-.C	0.8	0.9	0.6	0.05
15	Nitrates as NO_3	mg/L	4500-NO_3^-.B	2.6	1.7	2.5	0.68
16	Nitrites as NO_2	mg/L	4500-NO_2^-.B	BDL	BDL	BDL	BDL
17	Total Phosphates	mg/L	4500-P-D	BDL	0.83	0.02	0.27
18	Ammonical Nitrogen as NH_3-N	mg/L	4500-NH_3-C	BDL	BDL	BDL	BDL
19	Phenolic compounds as C_6H_5OH	mg/L	5530-D	BDL	BDL	BDL	BDL
20	Oil & Grease	mg/L	5520. B	<1	<1	<1	<1
21	Carbonates as CO_3	mg/L	2320. B	Nil	Nil	Nil	Nil
22	Bi-carbonates as HCO_3	mg/L	2320. B	155	242	160	100
23	Fecal Coliforms	MPN/100mL	9221 E	14	33	13	11
24	Zinc as Zn	mg/L	3120. B	0.05	0.08	0.21	0.09
25	Iron as Fe	mg/L	3120. B	0.57	0.51	0.61	0.55
26	Arsenic as As	mg/L	3120. B	BDL	BDL	BDL	BDL
27	Lead as Pb	mg/L	3120. B	BDL	BDL	BDL	BDL
28	Cadmium as Cd	mg/L	3120. B	BDL	BDL	BDL	BDL
29	Total Chromium as Cr	mg/L	3120. B	BDL	BDL	BDL	BDL
30	Nickel as Ni	mg/L	3120. B	BDL	BDL	BDL	BDL
31	Copper as Cu	mg/L	3120-B	BDL	BDL	BDL	BDL
32	Selenium as Se	mg/L	3120-B	BDL	BDL	BDL	BDL

Physico-Chemical, Bacteriological Characteristics of Groundwater Collected within the Study Area

Organoleptic and Physical Parameters

Sl. No.	Parameters	Unit	Test Method	IS: 10500 Requirement (Acceptable Limit)	IS: 10500 Permissible Limit in the absence of alternate source	RESULT			
						GW-2 Mudigunta Village		GW-3 RamaraopetVillage	
						1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1.	Colour	Hazen	2120. B	5	15	<5	<5	<5	<5
2.	Odour	TON	2150. B	Agreeable	Agreeable	Agree.	Agree.	Agree.	Agree.
3.	pH	-	4500-H^+B	6.5 to 8.5	No relaxation	8.2	7.5	8.2	7.7
4.	Taste	FTN	2160. B	Agreeable	Agreeable	Agree.	Agree.	Agree.	Agree.
5.	Turbidity	NTU	2130. B	1	5	0.6	0.72	0.26	1.7
6.	Total Dissolved Solids at 180^o C	mg/L	2540.C	500	2000	289	592	277	657

General Parameters Concerning Substances Undesirable in Excessive Amounts

Sl. No.	Parameters	Unit	Test Method	IS: 10500 Requirement (Acceptable Limit)	IS: 10500 Permissible Limit in absence of alternate source	RESULT			
						GW-2 Mudigunta Village		GW-3 RamaraopetVillage	
						1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1.	Calcium as Ca	mg/L	3500-Ca.B	75	200	32	50	28	62
2.	Magnesium as Mg	mg/L	3500-Mg.B	30	100	28	35	22	54
3.	Chlorides as Cl-	mg/L	4500-Cl-.B	250	1000	40	81	36	109
4.	Sulphates as SO42-	mg/L	4500-SO42- .E	200	400	46	75	47	116
5.	Fluoride as F-	mg/L	4500-F-.C	1.0	1.5	0.8	1.1	0.6	1.2
6.	Nitrates as NO3	mg/L	4500-NO3-.B	45	No relaxation	0.77	27	0.7	1
7.	Total Alkalinity as CaCO3	mg/L	2320. B	200	600	160	315	158	375
8.	Total Hardness as CaCO3	mg/L	2340. C	200	600	195	269	162	377
9.	Sulphide as H_2S	mg/L	4500-S2-F&D	0.05	No relaxation	BDL	BDL	BDL	BDL
10.	Total Ammonia-N	mg/L	IS 3025 (Part 34)	0.5	No relaxation	BDL	BDL	BDL	BDL
11.	Phenolic compounds as C6H5OH	mg/L	5530-D	0.001	0.002	BDL	BDL	BDL	BDL
12.	Residual free chlorine	mg/L	4500-Cl-.B	0.2	1.0	BDL	BDL	BDL	BDL
13.	Mineral oil	mg/L	IS:3025 (part 39)	0.5	No relaxation	absent	absent	absent	absent
14.	Anionic Detergents (as MBAS)	mg/L	IS:13428:2005K	0.2	1.0	<0.2	<0.2	<0.2	<0.2
15.	Aluminium as Al	mg/L	3120-B	0.03	0.2	0.08	0.07	0.06	0.05
16.	Barium as Ba	mg/L	3120. B	0.7	No relaxation	0.16	0.14	0.14	0.18
17.	Boron as B	mg/L	3120-B	0.5	2.4	0.05	0.09	0.08	0.12
18.	Iron as Fe	mg/L	3120-B	1.0	No relaxation	0.6	0.38	0.42	0.73
19.	Zinc as Zn	mg/L	3120-B	5	15	0.21	BDL	0.14	0.1
20.	Copper as Cu	mg/L	3120-B	0.05	1.5	BDL	BDL	BDL	BDL
21.	Manganese as Mn	mg/L	3120-B	0.1	0.3	BDL	BDL	BDL	BDL
22.	Selenium as Se	mg/L	3120-B	0.01	No relaxation	BDL	BDL	BDL	BDL
23.	Silver as Ag	mg/L	3120. B	0.1	No relaxation	BDL	BDL	BDL	BDL

Parameters Concerning Toxic Substances

Sl. No.	Parameters	Unit	Test Method	IS: 10500 Requirement (Acceptable Limit)	IS: 10500 Permissible Limit in absence of alternate source	RESULT			
						GW-2 Mudigunta Village		GW-3 RamaraopetVillage	
						1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1.	Cadmium as Cd	mg/L	3120-B	0.003	No relaxation	BDL	BDL	BDL	BDL
2.	Cyanide as CN-	mg/L	4500-CN^-.F	0.05	No relaxation	BDL	BDL	BDL	BDL
3.	Lead as Pb	mg/L	3120-B	0.01	No relaxation	BDL	BDL	BDL	BDL
4.	Molybdenum as Mo	mg/L	3120. B	0.07	No relaxation	BDL	BDL	BDL	BDL
5.	Nickel as Ni	mg/L	3120-B	0.02	No relaxation	BDL	BDL	BDL	BDL
6.	Total Arsenic as As	mg/L	3120-B	0.01	0.05	BDL	BDL	BDL	BDL
7.	Total Chromium as Cr	mg/L	3120-B	0.05	No relaxation	BDL	BDL	BDL	BDL
8.	Mercury as Hg	µg/L	3500-Hg.B	0.001	No relaxation	BDL	BDL	BDL	BDL
9.	**Pesticides:** α–BHC, β-BHC, γ-BHC, δ-BHC, o, p-DDT, p, p' –DDT, Endosulfan, β- Endosulfan, Aldrin, Dieldrin	µg/L	6630. D	Absent	0.001	ND	ND	ND	ND
	2,4-D, Carboryl (Carbonate) Malathion Methyl Parathion Anilophos, Chloropyriphos	Qualitative Analysis	6630. D	Absent	0.001	ND	ND	ND	ND
10.	**Polyaromatic Hydrocarbons (PAH's):** Acenaphthene, Acenaphthylene, Anthracene, B(a)A, B(a)P, B(b)F, B(k)F, Pyrene, Dibenz (a,h) anthracene, Fluoranthene, Fluorene, Indeno (1,2,3-(d) Pyrene, Naphthalene, Phenanthrene, Pyrene, Methyl Naphthalene	µg/L	6440.C	--	--	ND	ND	ND	ND

Bacteriological Quality of Drinking water

Sl. No.	Parameters	Unit	Test Method	IS: 10500 Requirement (Acceptable Limit)	IS: 10500 Permissible Limit in absence of alternate source	RESULT			
						GW-2 Mudigunta Village		GW-3 Ramaraopet Village	
						1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
1	Total Coliforms	MPN/100 mL	9221 B	-	-	<1.8	<1.8	<1.8	<1.8
2	Fecal Coliforms	MPN/100 mL	9221 E	-	-	<1.8	<1.8	<1.8	<1.8

ANNEXURE-II

POST PROJECT AMBIENT AIR QUALITY MONITORING DATA FOR THE PERIOD FROM APRIL, 2023 TO MARCH, 2024 FOR RK-NT INCLINE.

- Location of the Ambient Air Quality monitoring Station: Top of the Manager Office, RK-NT Incline

Sl. No.	Station Name	Date of Sampling	Parameters (µg /Cu. Mtr.)			
			PM_{10}	$PM_{2.5}$	SO_2	NO_2
1.	RK-NT Incline site office(CA3)	05.04.2023	208	49.8	13.4	17.8
		25.04.2023	217	50.1	11.6	17.3
		06.05.2023	198	50.2	10.7	16
		23.05.2023	208	53.1	11.9	19.1
		06.06.2023	184	48.6	12.7	17.2
		23.06.2023	214	56.7	13.8	18.4
		08.07.2023	94	39.4	11.2	16.4
		24.07.2023	82	33.8	11	18.3
		08.08.2023	162	47.2	10.8	17.2
		23.08.2023	176	52.8	12.8	18.4
		08.09.2023	171	51.7	11.3	19.2
		23.09.2023	158	52.1	8.8	15.2
		10.10.2023	154	42.4	10.7	16.4
		24.10.2023	167	56.1	11.5	19.5
		07.11.2023	167	47.3	11.8	16.5
		21.11.2023	173	57.2	12	18.1
		07.12.2023	182	62.9	11.4	14.1
		23.12.2023	159	59.5	17.5	20.3
		08.01.2024	157	57.5	11.9	16
		23.01.2024	171	58.2	10.4	15.3
		09.02.2024	179	60.7	9.3	14.1
		23.02.2024	152	49.9	10.4	13.6
		08.03.2024	184	62.8	10.6	16.4
		23.03.2024	144	54.4	9.2	13
	Minimum		**82.0**	**33.8**	**8.8**	**13.0**
	Maximum		**217.0**	**62.9**	**17.5**	**20.3**
	Average		**169.2**	**52.3**	**11.5**	**16.8**
	98% percentile		**215.6**	**62.9**	**15.8**	**19.9**
	Coal mine standards GSR 742(E), dtd.25.09.2000		**250**	**--**	**120**	**120**

❖ Location of the Ambient Air
Quality monitoring Station: Top of the Residential House at Mudikunta Village.

Sl. No.	Station Name	Date of Sampling	Parameters (µg/Cu.Mtr.)			
			PM_{10}	$PM_{2.5}$	SO_2	NO_2
.	Mudikunta Village(BA1)	04.04.2023	76	41.7	14.1	19.1
		24.04.2023	73	38.8	11.2	14.6
		05.05.2023	68	36.2	9.2	13.8
		22.05.2023	77	45.8	12.1	16.7
		05.06.2023	70	37.4	10.7	14
		22.06.2023	82	35.8	8.4	14.6
		07.07.2023	35	16.1	7.7	12.1
		22.07.2023	65	29.2	8.1	12.9
		07.08.2023	81	32.1	8.4	14.1
		22.08.2023	86	42.5	8.4	13.4
		07.09.2023	68	30.5	10.6	16.1
		22.09.2023	62	32.1	9.6	14.3
		09.10.2023	74	32.1	11.2	18.3
		21.10.2023	68	30.1	9.6	15.2
		06.11.2023	81	36.4	9.4	14.3
		20.11.2023	61	23.4	9.6	16.4
		06.12.2023	72	37.1	8.5	12
		22.12.2023	84	46.4	9.7	15.6
		06.01.2024	69	37.4	9.3	11.7
		22.01.2024	75	38.4	8.7	11.9
		08.02.2024	70	36.6	9.5	12.6
		22.02.2024	77	39.4	8.9	12.9
		07.03.2024	82	43.6	8.3	13.1
		22.03.2024	55	38.2	8.6	13.3
	Minimum		**35.0**	**16.1**	**7.7**	**11.7**
	Maximum		**86.0**	**46.4**	**14.1**	**19.1**
	Average		**71.3**	**35.7**	**9.6**	**14.3**
	98% percentile		**85.1**	**46.1**	**13.2**	**18.7**
	NAAQ Standards, CPCB dtd.18.11.2009		**100**	**60**	**80**	**80**

❖ Location of the Ambient Air
Quality monitoring Station: Top of the Residential House at Kankur Village

Sl. No.	Station Name	Date of Sampling	Parameters (µg/Cu. Mtr.)			
			PM_{10}	$PM_{2.5}$	SO_2	NO_2
3.	Kankur Village(BA3)	04.04.2023	73	39.2	12.9	17.8
		24.04.2023	75	40.2	13.7	18.9
		05.05.2023	79	37.8	10.1	14.7
		22.05.2023	82	44.9	11.7	15.6
		05.06.2023	71	38.1	9.6	13.5
		22.06.2023	80	36.2	11.8	18.4
		07.07.2023	32	18.1	8.6	14.2
		22.07.2023	63	30.1	10.3	16.4
		07.08.2023	62	30.1	7.6	13.7
		22.08.2023	81	41.7	10.6	16.7
		07.09.2023	63	25.4	9.4	15.2
		22.09.2023	68	30.1	7.6	13.4
		09.10.2023	68	29.1	9.4	15.4
		21.10.2023	71	32.8	8.4	14.1
		06.11.2023	69	31.9	9.5	17.1
		20.11.2023	67	26.8	12.5	18.1
		06.12.2023	84	45.4	8.8	12.7
		22.12.2023	69	39.5	9.1	13.3
		06.01.2024	55	29.2	8.1	14.4
		22.01.2024	65	36.4	9.2	13.6
		08.02.2024	82	43.8	8.1	12.2
		22.02.2024	71	38.6	10.4	13.5
		07.03.2024	59	33.9	8.3	12
		22.03.2024	79	41.5	9.8	13.1
	Minimum		**32.00**	**18.10**	**7.60**	**12.00**
	Maximum		**84.00**	**45.40**	**13.70**	**18.90**
	Average		**69.50**	**35.03**	**9.81**	**14.92**
	98% tile		**83.08**	**45.17**	**13.33**	**18.67**
	NAAQ Standards, CPCB dtd.18.11.2009		**100**	**60**	**80**	**80**

❖ Location of the Ambient Air
Quality monitoring Station: Top of the CER Club, Srirampur Colony.

Sl. No.	Station Name	Date of Sampling	Parameters (µg/Cu. Mtr.)			
			PM_{10}	$PM_{2.5}$	SO_2	NO_2
4.	Srirampur Colony(BA4)	06.04.2023	83	47.1	10.8	15.4
		26.04.2023	81	43.1	9.4	17.4
		08.05.2023	76	41.8	12.1	16.4
		24.05.2023	84	48.5	12..6	18.1
		07.06.2023	80	43.7	11.7	17.4
		24.06.2023	76	32.8	10.4	16.9
		10.07.2023	52	20.4	10	16.2
		25.07.2023	46	20.1	9.1	15.4
		09.08.2023	89	42.3	8.7	15.1
		24.08.2023	85	46.9	12.7	19.2
		09.09.2023	81	39.5	12.3	18.5
		24.09.2023	81	41.3	9.4	16.7
		11.10.2023	86	41.7	11.7	17.3
		25.10.2023	82	38.4	10.3	16.7
		08.11.2023	73	34.7	10.1	18.2
		22.11.2023	81	40.1	9.8	16.7
		08.12.2023	59	34.9	8.5	12.7
		25.12.2023	84	43.7	11.5	15.9
		09.01.2024	61	34.5	7.7	14.1
		24.01.2024	64	35.2	8.8	13.2
		10.02.2024	60	33.5	7.7	12.8
		24.02.2024	68	36.5	8.2	12.6
		09.03.2024	62	34.5	8.7	13.9
		26.03.2024	85	45.6	10.1	14
	Minimum		**46.00**	**20.10**	**7.70**	**12.60**
	Maximum		**89.00**	**48.50**	**12.70**	**19.20**
	Average		**74.13**	**38.37**	**9.99**	**15.87**
	98% tile		**87.62**	**47.86**	**12.52**	**18.88**
	NAAQ Standards, CPCB dtd.18.11.2009		**100**	**60**	**80**	**80**

❖ Location of the Ambient Air
Quality monitoring Station: Top of the Residential House at RK-8 Colony

Sl. No.	Station Name	Date of Sampling	Parameters (µg/Cu. Mtr.)			
			PM_{10}	$PM_{2.5}$	SO_2	NO_2
4.	RK-8 Colony(BA5)	05.04.2023	72	39.7	9	14.1
		25.04.2023	79	39.1	10	15.2
		06.05.2023	83	43.7	10.5	15.2
		23.05.2023	76	38.1	10.4	16.4
		07.06.2023	72	37.1	9.2	14.1
		23.06.2023	81	38.4	9.4	15.4
		08.07.2023	39	17.3	11.1	16.4
		24.07.2023	37	18.6	9.1	16.7
		08.08.2023	74	38.5	9.1	16.7
		23.08.2023	68	24.6	11.3	17.1
		08.09.2023	73	32.7	8.9	15.4
		23.09.2023	56	22.6	10.1	16.2
		10.10.2023	74	35.6	8.4	15.4
		24.10.2023	69	26.2	9.8	15.6
		07.11.2023	82	39.1	8.4	15.4
		21.11.2023	74	39.8	10.4	15.4
		07.12.2023	62	36.5	8.8	12.4
		23.12.2023	72	39.6	10.4	15.2
		08.01.2024	49	27.2	10.5	13.1
		23.01.2024	51	29.4	9.2	11.5
		09.02.2024	66	36.1	8	11.6
		23.02.2024	51	29.4	9.6	13.4
		08.03.2024	78	39.4	10.5	12.7
		23.03.2024	74	39.7	8.5	11.4
	Minimum		**37.00**	**17.30**	**8.00**	**11.40**
	Maximum		**83.00**	**43.70**	**11.30**	**17.10**
	Average		**67.17**	**33.68**	**9.61**	**14.67**
	98% tile		**82.54**	**41.91**	**11.21**	**16.92**
	NAAQ Standards, CPCB dtd.18.11.2009		**100**	**60**	**80**	**80**

ANNEXURE- III

NOISE LEVEL MONITORING DATA FOR THE PERIOD FROM APRIL, 2023 TO MARCH, 2024 AROUND RK-NT INCLINE

Fortnight	RK-NT Incline			Srirampur village			Kankur village		
	Date	L_{day}	L_{night}	Date	L_{day}	L_{night}	Date	L_{day}	L_{night}
Apr-I	06.04.2023	61.7	52.3	07.04.2023	47.6	35.5	05.04.2023	47.8	33.4
Apr-II	26.04.2023	62.4	54.3	27.04.2023	49.1	40.2	25.04.2023	44.6	36.1
May-I	09.05.2023	63.1	54.8	10.05.2023	45.9	38.7	08.05.2023	43.1	35.4
May-II	24.05.2023	65.4	54.9	25.05.2023	48	39.2	23.05.2023	41.9	34.4
Jun-I	08.06.2023	61.7	56.5	09.06.2023	46.2	40.1	07.06.2023	42.6	37.4
Jun-II	24.06.2023	65.4	56.7	26.06.2023	46.7	40.5	23.06.2023	45.6	39.5
Jul-I	10.07.2023	67.5	56.4	11.07.2023	48.1	38.4	08.07.2023	50.3	39.5
Jul-II	25.07.2023	67.9	58.4	26.07.2023	47.3	36.5	24.07.2023	46.9	38.5
Aug-I	09.08.2023	67.1	58.2	10.08.2023	49.6	38.6	08.08.2023	50.1	39.5
Aug-II	24.08.2023	67.2	56.3	25.08.2023	46.8	32.5	23.08.2023	45.1	32.1
Sep-I	09.09.2023	58.4	51.3	11.09.2023	42.1	33.8	09.09.2023	41.2	32.1
Sep-II	24.09.2023	67.1	54.6	25.09.2023	48.3	36.2	23.09.2023	47.1	40.2
Oct –I	11.10.2023	64.7	53.8	12.10.2023	43.6	30.8	10.10.2023	48.2	36.4
Oct -II	25.10.2023	63.9	54.8	26.10.2023	43.2	36.6	24.10.2023	46.8	35.1
Nov –I	08.11.2023	68.5	63.7	09.11.2023	46.8	40.5	07.11.2023	47.6	40.3
Nov-II	22.11.2023	63.7	51.4	23.11.2023	46.1	38.5	21.11.2023	48.2	30.5
Dec –I	08.12.2023	64.1	55.4	09.12.2023	48	35.2	07.12.2023	48.4	38.1
Dec-II	25.12.2023	54.5	52.6	26.12.2023	40.8	33.4	23.12.2023	41.1	36.2
Jan–I	09.01.2024	49.7	36.7	10.01.2024	46.2	35.8	08.01.2024	41.5	28.4
Jan –II	24.01.2024	54.2	44.9	25.01.2024	44.1	34.9	23.01.2024	41.9	33.2
Feb-I	10.02.2024	53.5	42.8	12.02.2024	47.4	30.4	09.02.2024	38.8	25.7
Feb-II	24.02.2024	51.5	47.2	26.02.2024	39.5	35.5	23.02.2024	44.5	36.5
Mar-I	09.03.2024	48.8	39.9	11.03.2024	46.2	36.9	08.03.2024	31.6	29.2
Mar-II	26.03.2024	43.3	35.2	27.03.2024	45.2	33.2	23.03.2024	49.2	39.3
	Average	60.64	51.79		45.95	36.33		44.75	35.29
Limits		**75**	**70**		**55**	**45**		**55**	**45**

ANNEXURE-IV

ATTITUDE OF PHREATIC SURFACE IN SRIRAMPUR AREA

Well No.	Name of the Village	Location	Owner'sname	Typeof well	Totaldepth(m)	MP (m)	Dia(m)	Depth to water (m)		
									2023	2024
1	ArunakkaNagar	NearGMOffice, 18°51'18.38" N, 79°30'40.68"E	N.Lingaiah	DW	9.40	1.00	1.00	Winter	3.84	4.38
								Pre monsoon	5.27	5.20
								Monsoon	1.64	
								Post monsoon	2.49	
2	RK6Colony	NearShivatemple, 18°52'15.84" N, 79°30'14.37"E	Q.No.SA-13	DW	10.00	1.20	1.20	Winter	1.74	2.52
								Pre monsoon	3.53	3.70
								monsoon	0.81	
								Post monsoon	1.53	
3	RK6Colony	Kurmawada,18°52'13.25" N, 79°30'2.96"E	KarrePosham	DW	6.50	1.00	1.00	Winter	2.96	1.87
								Pre monsoon	1.90	2.18
								Monsoon	1.28	
								Post monsoon	1.63	
5	S.R.Puram	NaspurXRoad, 18°51'22.27" N, 79°28'51.28"E	AasamiRajamallamma	DW	13.50	1.20	1.20	Winter	6.18	6.24
								Pre monsoon	7.82	7.85
								Monsoon	4.29	
								Post monsoon	4.68	
6	Setharampalli	OnthewaytoIntakewell, 18°50'31.72" N, 79°28'34.46"E	SurimellaLachanna	DW	8.50	1.00	1.00	Winter	2.92	3.76
								Pre monsoon	4.47	5.80
								Monsoon	2.23	
								Post monsoon	2.87	
	Setharampalli	On thewaytoTallapalli,						Winter	10.31	10.55

Well No.	Name of the Village	Location	Owner'sname	Typeof well	Totaldepth(m)	MP (m)	Dia(m)	Depth to water (m)		
									2023	2024
7		18°50'37.91" N, 79°29'0.81"E	M. Gopaiah	DW	15.00	1.20	1.20	Pre monsoon	13.30	13.00
								Monsoon	5.00	
								Post monsoon	7.25	
8	Tallapalli	Roadside,18°49'55.62" N, 79°29'28.15"E	RukumRamaiah	DW	9.10	3.00	3.00	Winter	2.08	2.96
								Pre monsoon	2.17	3.09
								Monsoon	2.03	
								Post monsoon	2.05	
9	Tallapalli	TowardsOC,18°50'3.60"N, 79°29'34.41"E	B.Rajaiah	DW	10.50	1.20	1.20	Winter	5.97	6.80
								Pre monsoon	9.97	7.15
								Monsoon	4.40	
								Post monsoon	6.15	
10	Singapuram	Opp.Panchayatoffice, 18°49'26.43" N, 79°30'11.09"E	NammalaSrinivasu	DW	7.40	3.20	3.20	Winter	3.18	AB
								Pre monsoon	4.17	AB
								Monsoon	1.83	
								Post monsoon	2.54	
12	Ramaraopet	Nearbridge,18°49'17.80" N, 79°30'48.89"E	GuntaChadraiah	DW	7.00	1.30	1.30	Winter	5.22	4.85
								Pre monsoon	5.67	5.60
								Monsoon	1.08	
								Post monsoon	3.53	
14	Indaram	Opp.Essarpetrolbunk, 18°49'13.91" N, 79°31'39.44"E	A.Rajamallu	DW	11.50	3x4	3X4	Winter	6.17	5.60
								Pre monsoon	3.60	6.53
								Monsoon	3.44	
								Post monsoon	3.46	
18	Tekumatla	Alongtheroad,18°48'48.52" N, 79°32'37.20"E	Ricemill (Kamalakar)	DW	11.50	1.60	1.60	Winter	9.74	8.50
								Pre monsoon	11.37	11.40
								Monsoon	7.68	
								Post monsoon	8.21	
19	Tekumatla	Alongtheroad,18°48'40.20" N,	V.Ramireddy	DW	11.00	1.00	1.00	Winter	3.88	4.00
								Pre monsoon	5.07	4.70

Well No.	Name of the Village	Location	Owner'sname	Typeof well	Totaldepth(m)	MP (m)	Dia(m)	Depth to water (m)		
									2023	2024
		79°32'50.84"E						Monsoon	3.10	
								Post monsoon	3.19	
20	Indaram	OnthewaytoTekumatla, 18°49'11.71" N, 79°31'59.03"E	Govt.Well	DW	9.30	2.00	2.00	Winter	4.86	4.26
								Pre monsoon	7.37	7.30
								monsoon	3.73	
								Post monsoon	4.10	
21	Indaram	SideofHPpetrolbunk, 18°49'39.46" N, 79°31'39.96"E	M.Uppalaiah	DW	8.00	1.20	1.20	Winter	6.33	6.19
								Pre monsoon	6.40	6.45
								Monsoon	2.01	
								Post monsoon	2.81	
22	Rasulpalli	Nearbusstop,18°50'33.40" N, 79°33'8.13"E	Madhukar	DW	8.00	1.00	1.00	winter	2.98	2.85
								Pre monsoon	3.05	3.00
								monsoon	1.48	
								Post monsoon	2.44	
23	Mudikunta	NearVillagejunction, 18°51'43.69" N, 79°33'18.11"E	G.Rajaiah	DW	11.40	1.20	1.00	Winter	5.08	6.20
								Pre monsoon	5.51	8.20
								Monsoon	2.70	
								Post monsoon	3.28	
25	Kankur	SCColony,18°51'54.46" N, 79°33'14.21"E	Govt.well/ ReguntlaMallesh	DW	10.00	2.30	2.30	Winter	6.82	2.63
								Pre monsoon	2.85	3.00
								Monsoon	2.00	
								Post monsoon	2.47	
26	Jaipur	Nearbusstop,18°50'41.33" N, 79°34'43.27"E	BehindAEoff.	DW	12.00	1.00	1.00	Winter	2.99	3.45
								Pre monsoon	3.80	3.96
								Monsoon	0.88	
								Post monsoon	1.21	
28	VenkataRaopal li	Opp.toPrimarySchool, 18°52'5.81"N, 79°34'39.14"E	Private well	Ag.W	14.00	1.80	1.80	Winter	2.09	3.00
								Pre monsoon	3.12	4.15
								Monsoon	0.58	
								Post monsoon	2.04	

Well No.	Name of the Village	Location	Owner'sname	Typeof well	Totaldepth(m)	MP (m)	Dia(m)	Depth to water (m)		
									2023	2024
29	Mittapalli	Villagecenter,18°51'27.99" N, 79°33'42.81"E	GaddamSuresh goud	DW	8.00	1.00	1.00	Winter	5.73	5.33
								Pre monsoon	4.39	4.44
								Monsoon	1.83	
								Post monsoon	4.10	
30	Elkanti	Villagecenter,18°48'4.46" N, 79°34'26.10"E	JalampalliPosh amallu (GDK10A-Maz.)	DW	10.00	2.40	2.40	Winter	6.72	4.40
								Pre monsoon	9.70	8.20
								Monsoon	1.70	
								Post monsoon	2.73	
31	Ponnaram	Opp.toTSSWRSchool, 18°55'26.88" N, 79°32'31.76"E	PenchalAnjanna	DW	8.00	1.00	1.00	Winter	3.40	3.83
								Pre monsoon	4.67	4.71
								Monsoon	2.08	
								Post monsoon	3.11	
32	Gudipalli	Alongthemainroad, 18°54'4.14"N, 79°32'25.41"E	VelpulaSampath	Ag.W	11.00	5.00	5.00	Winter	6.91	6.98
								Pre monsoon	7.67	7.71
								Monsoon	3.38	
								Post monsoon	5.73	
33	Gangipalli	Primaryschoolroad, 18°48'31.31" N, 79°35'4.60"E	Opp.NaredlaMal lareddy /PusalaRajeswari	DW	10.00	1.50	1.50	Winter	4.63	7.56
								Pre monsoon	Dry	5.28
								Monsoon	4.75	
								Post monsoon	4.88	
36	Shetpalli	NearHanumantemple, 18°46'55.54" N, 79°34'28.86"E	RanguKittaiah	DW	8.00	2.00	2.00	Winter	6.87	3.75
								Pre monsoon	4.10	6.50
								monsoon	3.02	
								Post monsoon	3.21	
37	Jaipur	Opp.toPostoffice, 18°50'45.19" N, 79°35'10.70"E	BeeskulaMallaia h	DW	10.00	1.50	1.50	Winter	6.96	6.82
								Pre monsoon	7.02	7.72
								Monsoon	4.08	
								Post monsoon	4.49	
38	Jaipur	Hanmanwada,18°50'56.36" N,	BhuneniRajaiah,N earGram	DW	10.00	2.00	2.00	Winter	6.86	7.56
								Pre monsoon	8.30	8.35

Well No.	Name of the Village	Location	Owner'sname	Typeof well	Totaldepth(m)	MP (m)	Dia(m)	Depth to water (m)		
									2023	2024
		79°35'5.14"E	panchayath					Monsoon	6.19	
								Post monsoon	6.28	
39	Narwa	Villageentrance,18°51'12.25" N, 79°33'49.75"E	SalluriPoshaiah/ SCCL Employee	DW	12.00	2.00	2.00	Winter	8.81	8.82
								Pre monsoon	10.50	10.69
								Monsoon	6.08	
								Post monsoon	7.75	
40	Gudipalli	OpptoSC Colony, 18°54'6.84"N, 79°32'12.90"E	Govt well/Openland	DW	10.00	3.00	3.00	Winter	6.54	6.50
								Pre monsoon	dry	8.10
								Monsoon	3.23	
								Post monsoon	5.18	
41	VenkataRaopalli	Villagecenter,18°52'6.46" N, 79°34'33.74"E	Kishtaiah	DW	12.00	5.00	5.00	Winter	6.28	7.50
								Pre monsoon	7.67	8.00
								Monsoon	3.39	
								Post monsoon	4.05	
42	Narsingapur	Near Hanuman temple, 18°47'17.08" N, 79°35'17.18"E	DhanthulaPrabhakar	DW	12.00	1.00	1.00	Winter	5.39	6.25
								Pre monsoon	8.28	8.28
								Monsoon	2.74	
								Post monsoon	3.45	
43	Bejjala	Village Centre, 18°46'11.73" N, 79°34'53.69"E	ThotaBapu, Adj.to Grampanchayath	DW	10.00	3.00	3.00	Winter	4.91	4.30
								Pre monsoon	5.93	6.12
								Monsoon	2.56	
								Post monsoon	3.78	
44	Kistapur	Near Hanuman temple, 18°44'53.49" N, 79°38'7.81"E	Dhanda Krishna Reddy	DW	8.00	1.00	1.00	Winter	4.10	4.64
								Pre monsoon	dry	5.00
								Monsoon	3.35	
								Post monsoon	3.90	
45	Maddulapalli	Villagecenter,18°47'2.53"N, 79°36'12.36"E	SandhanaveniBalaiah/ SCCL Employee	DW	9.00	2.00	2.00	Winter	5.99	3.74
								Pre monsoon	6.47	6.41
								Monsoon	0.88	

Well No.	Name of the Village	Location	Owner'sname	Typeof well	Totaldepth(m)	MP (m)	Dia(m)	Depth to water (m)		
									2023	2024
								Post monsoon	1.38	
46	Polampalli	Indiramacolony, 18°50'25.66" N, 79°39'8.63"E	DharshinalaMadhukar	DW	7.50	1.00	1.00	Winter	4.64	3.54
								Pre monsoon	4.80	5.00
								Monsoon	1.80	
								Post monsoon	3.24	
47	Bhimaram	Alongthehighway, 18°50'51.85" N, 79°40'38.25"E	MindeRayamallu	DW	11.00	3.60	3.60	Winter	4.18	WD
								Pre monsoon	WD	WD
								Monsoon	NA	
								Post monsoon	WD	
48	Bhimaram	Padmashaliwada, 18°51'10.60" N, 79°40'18.97"E	KokkulaRamulu	DW	9.00	1.16	1.15	Winter	2.08	2.00
								Pre monsoon	2.20	2.53
								Monsoon	1.18	
								Post monsoon	1.93	
49	Kothagudem	Adj.to Road,18°51'47.07" N, 79°40'31.14"E	OldNursaryArea	Ag.W	5.50	4.00	4.00	Winter	1.88	2.85
								Pre monsoon	2.41	3.32
								Monsoon	1.18	
								Post monsoon	1.99	
50	Kazipalli	VillageEntrance,18°55'26.98" N, 79°38'44.18"E	KommuDevender	DW	7.00	2.00	2.00	Winter	5.51	5.80
								Pre monsoon	6.27	6.32
								Monsoon	3.10	
								Post monsoon	4.84	
51	Dampur	Gollawada, 18°54'45.59" N, 79°37'52.25"E	KoriviThirupathi	DW	10.50	1.90	1.90	Winter	4.57	4.30
								Pre monsoon	6.47	4.60
								monsoon	2.64	
								Post monsoon	3.89	
52	Reddipalli	Villagecenter,18°55'22.45" N, 79°37'12.10"E	KudenthaNelamma	DW	10.00	2.50	2.50	Winter	3.54	4.41
								Pre monsoon	3.97	4.60
								monsoon	2.64	
								Post monsoon	2.08	
53	Dharmaram	Villagecenter,18°55'29.90" N, 79°36'52.94"E	SanthoshamSriramReddy	DW	10.00	2.45	2.45	Winter	2.08	3.18
								Pre monsoon	3.22	4.03
								Monsoon	2.77	

Well No.	Name of the Village	Location	Owner'sname	Typeof well	Totaldepth(m)	MP (m)	Dia(m)	Depth to water (m)		
									2023	2024
								Post monsoon	1.80	
54	Theegalpahad	Opp.to Bharat petroleum bunk, 18°51'23.15" N, 79°29'24.72"E	Md.RahmanS/o Kaleel	DW	10.00	2.00	2.00	Winter	3.18	3.20
								Pre monsoon	4.37	5.60
								Monsoon	2.36	
								Post monsoon	3.11	
55	Mudikunta	Villagecenter,18°51'42.63" N, 79°33'16.24"E	PadalaShankaraiah S/o Gattaiah	DW	15.00	2.20	2.20	Winter	5.10	3.35
								Pre monsoon	11.07	10.50
								Monsoon	2.70	
								Post monsoon	3.65	
56	Mancherial	Opp.Sunnambattiwada, 18°51'47.99" N, 79°27'25.30"E	PesaraRayalingu	DW	15.00	2.20	2.20	Winter	8.91	8.45
								Pre monsoon	8.45	8.60
								Monsoon	4.19	
								Post monsoon	6.80	

Note: MP: Measuring point ,WD: Well Damaged.

Well No.:4,11,13,15,16,17,24,27,34&35 were Abandoned.

.

ATTITUDE OF PIEZOMETRIC SURFACE AROUND SRIRAMPUR OC-II EXPANSION PROJECT

Piezometric well no.	Location	Depth (m)	Dia. (m)	Measuring point (m)	Depth to water (m)	
					Winter 2024	Pre monsoon 2024
SRP_OCP.I PW-5	About 500 m south of the quarry and 150m north of Indaram Tank (N18^{0}49'35.43" – E 79^{0}30'57.60")	208	0.10	0.30	2.74	4.53
SRP_OCP.II PW-7	Near Singapur village (N18^{0}49'46.47" – E 79^{0}30'25.52")	50	0.10	0.20	AB	AB
SRP_OCP.II PW-8	Near Project Office sub-station. About 125m from N side of quarry surface limit. (N18^{0}51'4.12" – E 79^{0}29'39.90")	50	0.10	0.40	22.98	23.80
SRP_OCP.II PW-10	Road to SRP bus stand, about 300m from N side of quarry surface limit (N18^{0}51'7.10" – E 79^{0}30'11.26")	50	0.1	0.50	15.90	17.07
*SRP_CSIRO PW-11	West side External dump area, Near to Thallapalli village. (N18^{0}49'54.731" – E 79^{0}29'11.085	50	0.1	0.2	NA	NA
*SRP_CSIRO PW-12	West side External dump area. Near to Thallapalli village (N18^{0}49'50.573" - E 79^{0}29'06.202")	50	0.1	0.2	2.00	2.65
*SRP_CSIRO PW-13	West side External dump area. Road to Godavari river (N18^{0}49'45.286" – E 79^{0}29'06.811")	50	0.1	0.2	3.25	4.22
*SRP_CSIRO PW-14	West side External dump area. Road to Godavari River (N18^{0}49'32.305" – E 79^{0}28'50.154")	50	0.1	0.2	4.55	6.48

Note: Piezometric well No.- SRP OCP-PW_1, 2, 3, 4 and 6,7 & 9 were abandoned.
WD: Well damaged, *NA: Not Approachable.

ATTITUDE Of PHREATIC SURFACE IN GODAVARI VALLEY COAL FIELD

Area: **Chennur**

Wel lNo.	Name of the Village	Location	Owners Name	Type of well	Total depth (m)	MP (m)	Dia (m)	D T W (m)	
								Winter-2024	Pre monsoon-2024
5	Chennur	Srinagar Colony, 18°51'16.48" N, 79°46'56.91"E	Devaiah	DW	8.50	0.50	1.20	4.98	7.40
8	Chennur	Behind Theatre, 18°51'26.69" N, 79°47'19.96"E	Ashok Goud	DW	10.00	0.60	1.30	WD	WD
10	Shivalingapur (Chennurloca	18°51'39.30"N, 79°47'31.03"E	Ch. Rangaiah	DW	7.80	0.70	2.00	6.74	6.90
12	Chennur	ChennurG.P .Kothagudem, 18°51'33"N, 79°47'05"E	SunkariLingaia h	DW	10.00	G.L.	1.20	9.95	9.91
13	Chennur	Jendawada, 18°51'37.68" N, 79°47'49.81"E	Monitoring by TSGWD	DW	10.00	G.L.	1.20	2.44	3.50
14	Chennur	Villagecenter, 18°51'25.57" N, 79°48'4.09"E	Towards Godavari River road	DW	11.00	0.50	2.00	4.32	6.90

15	Kistampet	Opp. ZPHS School, 18°50'52.81" N, 79°45'14.11"E	BeraChiranjeevi	DW	7.00	0.55	3.60	3.73	4.10
16	Ellakkapet	TowardsLambadipalliroad,18°51' 24.53" N, 79°45'45.78"E	Opp.toCheruvu	Ag. W	10.00	GL	8.00	3.41	3.57
17*	Shivalingapur(village)	Entranceofthevillage, 18°52'55"N, 79°47'51"E	Govt.well/ C/o MekalaGattakka	DW	8.00	0.50	1.90	4.64	7.40
18	Buddaram	Endofthevillage, 18°54'51.82" N, 79°42'50.66"E	Near Nursery	Ag.W	9.50	0.40	2.70	8.82	9.00
19	Kotapalli	TowardsVemanapalli 18°57'20.76" N, 79°47'24.35"E	KashettiRamanna	DW	11.00	0.50	1.50	2.35	2.41

Note:-MP: Measuring point, Observation

well No.: From 1 to 4,6,7,9 &11 were Abandoned

*****Observation wellNo.17was shifted about 300m distance towards West.

Block / Mine : **IKOCP** Area: **Srirampur**

PiezometricWell No.	Location	Depth(m)	Dia(m)	MP (m)	Depth to water(m)	
					Winter-2024	Pre Monsoon-2024
IKOCP-PW1	On the way to PO office, adj. to coal transport road,Dip side of theproject.3057126.41,949693.45	250	0.10	1.35	15.00	16.56
IKOCP-PW2	Near Indaramvillage, On the way To PO office adj. to coal transport road, Dip side of the project.3056296.11,950728.54	250	0.10	1.35	28.14	30.16

ANNEXURE – V

MICRO-METEOROLOGICAL DATA OF SRIRAMPUR AREA FROM APRIL, 2023 TO MARCH, 2024.

Month	Predominant Wind direction	Wind Speed(m/s)			Temperature(ºC)			Relative Humidity(%)			Rainfall (mm)	
		Mean	Max	Calm %	Mean	Max	Min	Mean	Max	Min	Total	Hourly Highest
April, 2023	SW	2.4	6.9	14.17	25.6	46.6	33.0	35.4	79.1	8.3	0.0	0.0
May, 2023	SW	1.8	6.1	29.97	35.0	47.8	20.9	23.7	73.0	8.2	63.5	22.3
June2023	NW	1.9	6.7	22.22	32.2	45.1	23.7	48.1	93.5	18.7	76.6	18.2
July, 2023	NW	2.1	6.0	8.33	28.6	44.3	20.2	67.1	99.5	16.4	615	52.8
August, 2023	N-NE	1.7	6.1	26.48	29.9	39.8	19.3	67.4	99.7	20.8	69.2	6.0
September, 2023	S	1.6	5.0	15.42	28.2	40.6	18.9	46.6	99.8	19.0	194.2	23.3
October, 2023	NW	1.4	5.1	9.41	27.7	39.8	23.3	44.4	70.1	12.1	0.0	0.0
November, 2023	SE	1.0	6.5	16.11	28.8	41.4	24.3	45.0	74.3	18.4	1.9	0.9
December, 2023	S	1.8	5.5	8.20	22.8	33.3	13.8	45.2	77.3	9.4	0.0	0.0
January, 2024	SW	1.8	4.4	11.40	24.2	33.7	16.1	43.1	75.2	42.5	0.0	0.0
February, 2024	SE	1.8	6.0	13.51	27.0	34.7	18.1	33.7	69.9	36.4	0.0	0.0
March, 2024	SE	1.7	5.0	22.31	28.4	39.4	20.6	43.0	99.9	9.0	0.0	0.0
					Total:						**1020.4**	