एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)
(Formerly National Thermal Power Corporation Ltd.)

केन्द्रीय कार्यालय/Corporate Centre

CC: ESE: 1150:2020:GEN

Date: 12.02.2020

To,
Director (IA-Division), Thermal
Ministry of Environment & Forests and Climate Change
3rd Floor, Vayu Block,
Indira Paryavaran Bhawan,
Jor Bagh Road, Aliganj,
New Delhi – 110 003

Sub.: Point wise replies to the Additional Information Sought (ADS) for Environmental Clearance of Singrauli Stage-III (2x800 MW) by MOEF&CC letter dated 22.10.2019.

Ref.: File No. J-13012/09/2016-IA. I (T) dated 22.10.2019

Dear Sir,

This has reference to the application for Environmental Clearance of Singrauli STPP, Stage-III (2x800 MW), at Shaktinagar, Tehsil Dudhi, District Sonbhadra, Uttar Pradesh. The project was considered & appraised in EAC meeting held on 25.09.2019. Subsequently, MOEF&CC vide letter dated 22.10.2019 sought additional information for further consideration of the project.

The pointwise replies of Additional Information Sought (ADS) by MOEF&CC along with the annexures are enclosed.

It is requested that Environmental Clearance for Singrauli STPP, Stage-III (2x800 MW), may kindly be accorded.

Thanking You,

Yours faithfully,

Vijay Prakash 12/2/20

(Dr. Vijay Prakash)
GM & HOD (Env. Engg.)

Encl.: As above

1/6

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ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No. 13, NOIDA (U.P.) Pin-201301
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पंजीकृत कार्यालय : एन. टी. पी. सी. भवन, स्कोप काम्पलैक्स, 7, इंस्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली –110003
Regd. Office : NTPC Bhawan, SCOPE Complex, 7, Institutional Area, Lodhi Road, New Delhi-110003

SINGURALI STPP STAGE-III (2X800) MW QUERY RAISED BY MOEF&CC DURING THE EAC MEETING HELD ON 25.09.2019

<table>
<tr><th>Sl. No.</th><th>Query by MOEF&CC</th><th>RESPONSIBILITY</th></tr>
<tr><td>i</td><td>Pollution load of existing power plant from all stacks in terms of Tons of PM, SO_2 and NOx emitted in a day. The total pollution load of existing and proposed power project and estimation of ground level concentrations considering emissions from all stacks including the proposed project.</td><td>Pollution load of existing power plant (Stage-I and II) from all stacks in terms of Tons of PM, SO_2 and NOx emitted in a day is enclosed at Annexure-I. The estimated pollution load from proposed Stage-III is also shown in Annexure-I. In a nutshell, the current emission loads (tons per day) from Stage-I & II are as follows:
<table>
<tr><td>PM</td><td>29.15</td></tr>
<tr><td>SO2</td><td>173.36</td></tr>
<tr><td>Nox</td><td>100.63</td></tr>
</table>
After commissioning of Stage-III and implementation of FGD in Stage-II, the loads (tons per day) shall reduce to:
<table>
<tr><td>PM</td><td>18.54</td></tr>
<tr><td>SO2</td><td>43.18</td></tr>
<tr><td>Nox</td><td>57.14</td></tr>
</table>
Predicted ground level concentrations considering emissions from all stacks (Stage-II only, as Stage-I is proposed to be decommissioned) including the proposed project (Stage-III) is presented in Annexure-II.</td></tr>
<tr><td>ii</td><td>Further, the estimation of pollution load and prediction of ground level concentrations shall be carried out considering only Stage-II and Stage-III projects as Stage-I (5x200 MW) planned to be after construction of proposed project.</td><td>Enclosed at Annexure-II as mentioned above.</td></tr>
<tr><td>iii</td><td>The water balance diagram for proposed project (considering the air cooled condenser system) as well as existing units.</td><td>The details water requirement and the water balance diagram for Stage-I&II and Stage-III is enclosed as Annexure-III.</td></tr>
<tr><td>iv</td><td>Status of implementation of pollution control equipment to meet the revised emission norms such as FGD, De-</td><td>CPCB vide letter dated 11.12.2017 (Copy enclosed as Annexure-IV-A) has given unit wise timelines for installation of various pollution control systems as follows:</td></tr>
</table>

<table>
<tr>
<td></td>
<td>NOx/SCR/SNCR/Low-NOx burners for operating power plants. Status of achieving specific water consumption of 3.5 m^3/MWh and installing cooling towers inline with the Ministry's notifications dated 7.12.2015 and 28.6.2018. Whether there is any extension received from CPCB. If yes, a copy is to be submitted.</td>
<td>
<table>
<tr><th rowspan="2">Unit</th><th rowspan="2">Emission Norms</th><th colspan="2">Timelines</th></tr>
<tr><th>PM & SO2</th><th>NOx</th></tr>
<tr><td>I</td><td rowspan="5">100/600/600 mg/Nm3 for PM/ SO2/ NOx for 200 MW units</td><td>Dec.,21</td><td rowspan="7">2022</td></tr>
<tr><td>II</td><td>Dec.,21</td></tr>
<tr><td>III</td><td>Aug.,21</td></tr>
<tr><td>IV</td><td>Aug.,21</td></tr>
<tr><td>V</td><td>Apr.,21</td></tr>
<tr><td>VI</td><td rowspan="2">100/200/300 mg/Nm3 for PM/ SO2/ NOx for 500 MW units</td><td>Feb.,21</td></tr>
<tr><td>VII</td><td>Dec.,20</td></tr>
</table>

R&M of ESPs in all units is already in progress.

Further, NTPC is in advance stage of awarding the FGD package for all the units.

NOx control in coal-fired plants is presently achieved by controlling its production by adopting best combustion practices (primarily through excess air and combustion temperatures optimization). Work for combustion modification awarded and under execution to lower down the NOx emission to extent possible levels. With the above mentioned norms, implementation of SCR/ SNCR technology is not required at Singrauli STPS.

Further, CPCB vide letter dated 25.06.2019 has given extension for installing of cooling towers for various units up to 30.06.2022. The copy of the letter is enclosed as Annexure-IV-B. However, the consumptive use of water at Singrauli STPS is 6,713 m^3/hr (3.36 m^3/Mwh).</td>
</tr>
<tr>
<td>v</td>
<td>Wildlife Conservation Plan is to be submitted preferably to be vetted by the Chief Wildlife Warden in the State Wildlife Department as the Schedule-I species are present in the Rihand Reservoir and within 10 km radius of the project.</td>
<td>A Wildlife Conservation plan has been prepared and enclosed at Annexure-V. The Plan shall be submitted for vetting by Chief Wildlife Warden in the State Wildlife Department and implemented after arroval of the project.</td>
</tr>
<tr>
<td>vi</td>
<td>Details of ash generation,</td>
<td>The details relating to ash generation, ash</td>
</tr>
</table>

	utilisation and disposal for last 5 years is to be provided. The area of ash ponds, total volume of ash pond with dyke height, quantity filled till date, available volume, co-ordinates of each ash pond, status of liner, status of disposal system (Lean slurry, medium or high slurry concentrations), AWRS, etc.	utilization and disposal during last six years and the area of ash dyke is enclosed in **Annexure-VI.**
vii	Details of whether villages in the Madhya Pradesh within 10 km radius of the project have been involved in the Public Hearing and whether Madhya Pradesh Pollution Control Board has also been involved in the Public Hearing. A clarification from UPPCB and MPPCB is to be obtained.	Request letter along with EIA report and Executive Summary in English & Hindi was personally submitted to the Madhya Pradesh Pollution Control Board, intimating about the Public Hearing is being held on 09.07.2019. Banners/public announcement was also done in the area to attend the Public hearing to be held on 09.07.2019 at the Venue. As per the attendance list people submitted the representation and also signed in the attendance register that people from various village adjacent to the Madhya Pradesh State have also attended the Public Hearing. Copy of the people attendance sheet is enclosed as **Annexure-VII.**
viii	Reply along with action plan to the public representations received by the Ministry.	The following three representations were received by NTPC from MOEF&CC: 1. Letter dated 19.07.2019 from Shri Sarju Ram Kushwaha and Others regarding installation of 2x800 MW at NTPC Vindhyachal. 2. Letter dated 29.08.2019 from Shri Hira Lal Shah and others regarding establishment of ash dyke for Vindhyachal STPS, Stage-IV 3. Letter dated 06.09.2019 from Shri Abdul Kalam and others regarding establishment of ash dyke for Vindhyachal STPS, Stage-IV As evident from above, the letters at sl. No. 2 and 3 pertains to establishment of ash dyke for Vindhyachal STPS, Stage-IV for which EC has already been accorded and not related to the present case. Further, the letter dated 19.07.2019 mentioned at Sl. No. 1 pertains to installation of 2x800 MW at NTPC Vindhyachal. NTPC is not installing any new unit at Vindhyachal

		STPS. Nevertheless, the representations received from the above mentioned residents of the area are being replied suitably.
ix	Certified EC compliance report by the Regional Office for operating power plants including permission issued for additional ash ponds. As the EC was issued before EIA Notification, 1994, the report should cover emissions from the stack, coal and ash handling units, coal transportation, fugitive emissions at transfer points and stack yard, ambient air quality, water consumption, wastewater discharge, solid waste management, ash generation/utilisation/disposal, groundwater monitoring around the ash pond, existing pollution control equipment, status of online connectivity of stacks with CPCB, 33% greenbelt out of total plant area, CSR activities, Consent conditions, etc.	Certified EC Compliance Report from Regional Office of MOEF&CC vide letter dated 22.11.2019 is enclosed as **Annexure-VIII.**
x	Water quality of Baliya nallah is polluted due to high BOD and COD. Further, Coliforms in all surface water samples in the study area are exceeding the standards. The detailed cause/inference for exceeding the threshold limits is to be ascertained. The comparative analysis of heavy metals in the ground water vis-à-vis drinking water standards is to be brought out in the report.	One month Baseline data on Meteorology, Ambient Air qaulity and water quality has been monitored and is enclosed as **Annexure-IX.**
xi	One month fresh baseline may be collected to ascertain the actual carrying capacity and pollution loads in the region.	One month Baseline data on Meteorology, Ambient Air quality and water quality has been monitored and is enclosed as **Annexure-IX.**
xii	Further, Hon'ble NGT vide order dated 10.07.2019 in OA No.1038/2018 kept certain restrictions for red category projects in critically polluted areas and Singrauli is severely/critically polluted area, the pollution load	**The CEPI index for** Singrauli **area is already below 70 (62.59).** The latest CEPI scores for 100 polluted industrial area/clusters monitored during 2018 is enclosed as **Annexure-X.**

	certificate is to be obtained from the UPPCB. Further, the status of implementation of action plan to bring down the CEPI score below 70 may also to be provided by UPPCB. Further, any specific directions/action plan was given to M/s NTPC to bring down the pollution levels from the operating power plant.	A copy of CEPI Action Plan for Singrauli STPS is enclosed at **Annexure-XI.**
xiii	Details of CER budget earmarked for proposed project inline with the Ministry's OM dated 01.05.2018. The cost of EMP should be revised by separating the cost towards CER.	The total CER budget earmarked for Singrauli STPP Stage-III (2x800 MW) is Rs. 16.0 Crores. This is in line with the Ministry's OM dated 01.05.2018. The activities wise details CER budget is enclosed as **Annexure-XII-A.** The revised cost of EMP is enclosed as **Annexure-XII-B.**
xiv	The status and action plan to achieve 33% greenbelt including the ash ponds. A map showing the extent of greenbelt developed till date and proposed area for greenbelt along with project boundaries and ash ponds with areas shall be submitted.	The total area acquired by Singrauli STPP is 4,491 acres. An area of 1478 acres has been developed as Green Belt in Township, Pump House area, MGR, Ash Dyke etc. A map showing the Green Belt is enclosed as **Annexure-XIII.** The break-up of the land developed under green belt is enclosed as **Annexure-XIV**.

Annexure-I

Pollution Load of Existing Units of Singrauli STPS, Stage-I & II and Proposed Units under Stage-III (Load from Stage-I & II Based on Actual Emission Data for the year 2019-20 up to December, 2020)

Stage-I Units

Unit	Parameter	Load (TPD)
Unit-I	PM	2.21
	SO2	13.04
	Nox	7.67
Unit-II	PM	2.70
	SO2	16.00
	Nox	9.24
Unit-III	PM	2.85
	SO2	16.96
	Nox	9.98
Unit-IV	PM	2.62
	SO2	16.09
	Nox	9.28
Unit-V	PM	2.08
	SO2	12.95
	Nox	7.44
Stage-I	**PM**	**12.46**
	SO2	**75.04**
	Nox	**43.61**

Stage-II Units without FGD

Unit	Parameter	Load (TPD)
Unit-VI	PM	8.14
	SO2	48.31
	Nox	28.22
Unit-VII	PM	8.55
	SO2	50.41
	Nox	28.80
Stage-II without FGD	**PM**	**16.69**
	SO2	**98.72**
	Nox	**57.02**

Stage-II Units with FGD

Unit	Parameter	Load (TPD)
Unit-VI	PM	6.98
	SO2	13.96
	Nox	20.94
Unit-VII	PM	6.98
	SO2	13.96
	Nox	20.94
Stage-II with FGD	**PM**	**13.96**
	SO2	**27.92**
	Nox	**41.88**

Emission Rates for PM/ SO2/ NOx calculated at the rate of 100/ 200/ 300 mg/Nm3 for 500 MW units commissioned before 31.12.2003.

Stage-III Units with FGD

Unit	Parameter	Load (TPD)
Unit-VIII	PM	2.29
	SO2	7.63
	Nox	7.63
Unit-IX	PM	2.29
	SO2	7.63
	Nox	7.63
Stage-III	**PM**	**4.58**
	SO2	**15.26**
	Nox	**15.26**

Emission Rates for PM/ SO2/ NOx calculated at the rate of 30/ 100/ 100 mg/Nm3 for 500 MW units commissioned after 01.01.2017.

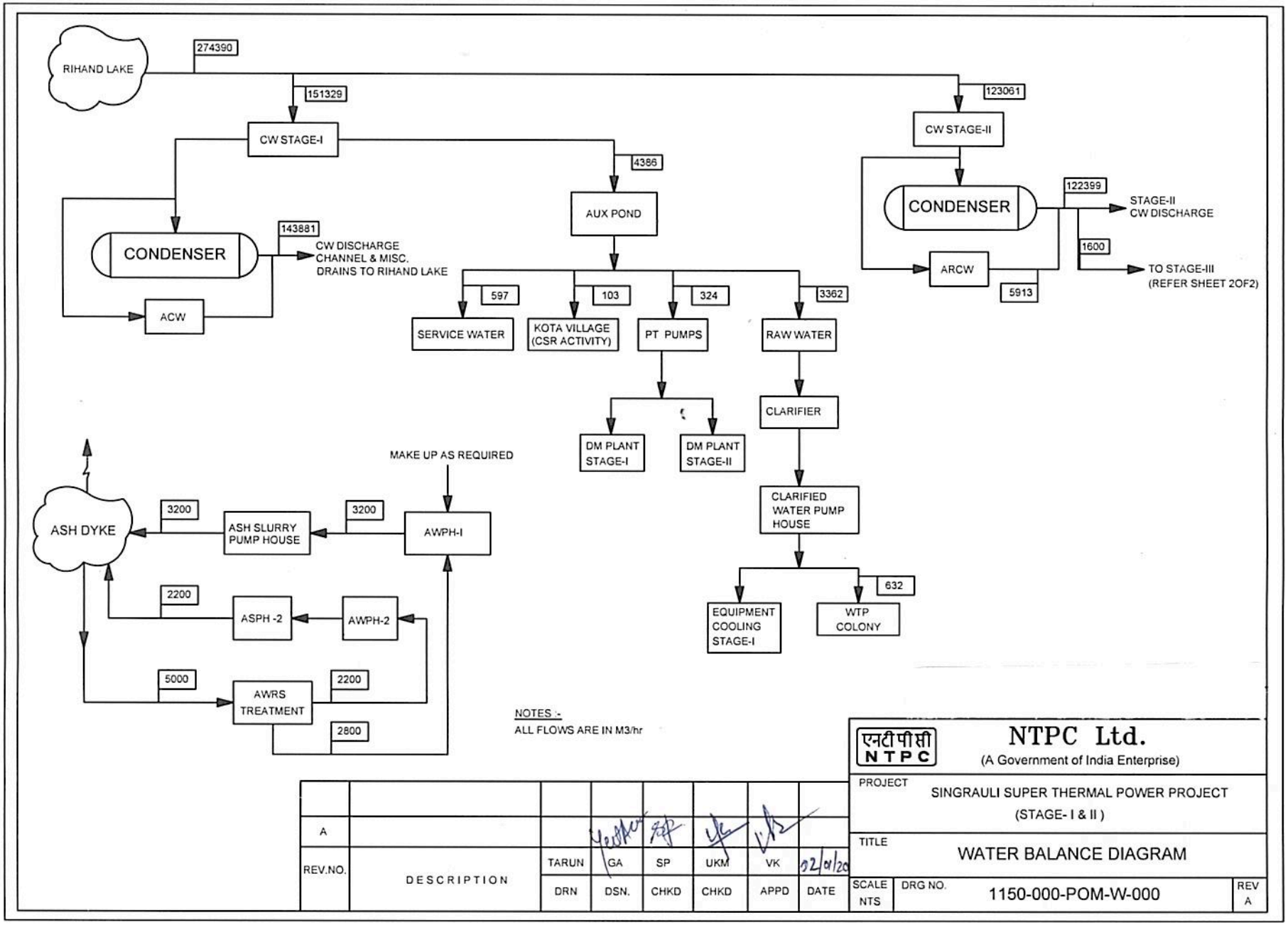
Annexure-II

Predicted Incremental Ground level Concentrations due to Singrauli STPS, Stage- II & III

Parameter	Predicted Maximum 24 Hourly Incremental Ground Level Concentrations in µg/m^3	
	Due to Proposed Stage-III (2x800 MW) Units*	Due to Stage-II** (with FGD) & Stage-III Units (with New Emission Norms)
SO_2	4.10	5.27
NOx	4.10	5.27
PM	1.22	1.58
Distance	4.2 km	4.0 km
Direction	E	E

Notes: * - Emission data as per new emission norms of 30/100/100 mg/Nm3 for PM/SO2/NOx respectively.

** - - Emission data as per new emission norms of 100/200/300 mg/Nm3 for PM/SO2/NOx respectively as these units shall comply with the new emission norms by the time Stage-III becomes operational.



REV.NO.	DESCRIPTION	DRN	DSN.	CHKD	CHKD	APPD	DATE
A		TARUN	GA	SP	UKM	VK	02/01/20

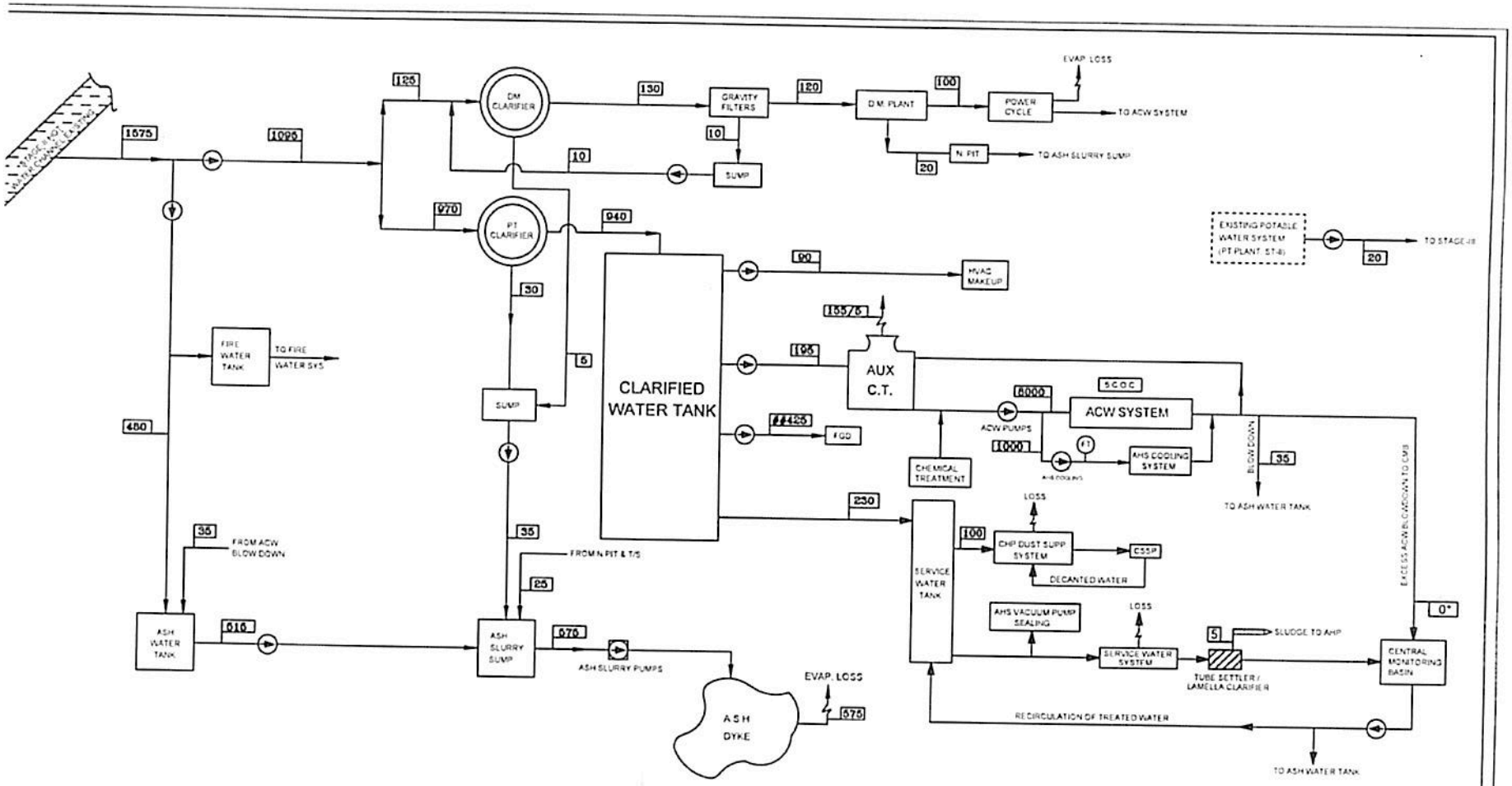
एनटीपीसी NTPC **NTPC Ltd.**
(A Government of India Enterprise)

PROJECT: SINGRAULI SUPER THERMAL POWER PROJECT (STAGE- I & II)

TITLE: WATER BALANCE DIAGRAM

SCALE NTS | DRG NO. 1150-000-POM-W-000 | REV A

SHEET 1 OF 2



REV.NO	DESCRIPTION	DRWDON	CHECKED BY	APPD	DATE
A	FOR FIR PURPOSE ONLY	UKM/DB	M.H	SG	GM

NTPC Ltd. (A Government of India Enterprise)

PROJECT: SINGRAULI STPP STAGE-III (2X800 MW)

TITLE: WATER BALANCE DIAGRAM WITH AIR COOLED CONDENSER

SCALE | DRG NO. 1150-000-POM-W-001 | REV A

SHEET 2 OF 2

SPEED POST

B-33014/07/2017-18/IPC-II/TPP/15953 December 11, 2017

To

Singrauli Thermal Power Station
National Thermal Power corporation
Shaktinagar; Dist: Sonebhadra- 231222, U.P.

Sub: Directions under Section 5 of the Environment (Protection) Act, 1986 regarding compliance of emission limit notified vide notification No.S.O.3305 (E) dated 07.12.2015 – reg.

WHEREAS, taking into consideration pollution from thermal power plants, Ministry of Environment, Forest & Climate Change had issued notification in the year 1984 laying out standards for thermal power plants. Further, the stack height regulation was notified in the year 1989 and effluent standard for thermal power plants was notified in the year 1986. The revised temperature limit of discharge of cooling water from the plants was notified in the year 1999 and thereafter use of beneficiated coal in the plants was issued in June 2002. The fly ash utilization notification was also issued 0n 14th September, 1999 and amended in the year 2003 and 2009. Thereafter, MoEF&CC vide Notification No. S.O.3305(E) dated 07.12.2015 has amended emission limit for particulate matter and notified new limits for Sulphur dioxide (SO_2), Oxides of Nitrogen (NOx) and mercury emission, and water consumption limit for coal/lignite based thermal power plants. As per the notification dated 07.12.2015, thermal power plants are required to achieve the notified limit within two years from the date of the notification i.e. by 07.12.2017;

WHEREAS, with the implementation of the amendment dated 07.12.2015, it is expected that there would be reduction in emission of PM, Sulphur dioxide and oxide of Nitrogen, which in turn will help in improvement in Ambient Air Quality in and around thermal power plants, besides reduction of mercury emission and water use in the thermal power plants will reduce;

WHEREAS, in the meeting on Coal Washeries (Environment & Forest Clearances) and Emission Norms for Thermal Power Plants chaired by the Hon'ble Minister of Environment, Forest & Climate Change and Minister of Power, Coal & Renewable Energy on June 08, 2016, it was decided that a committee comprising representatives from MoEF & CC, Ministry of Power (MoP),Central electricity Authority (CEA), Ministry of Coal (MoC), Power Grid Corporation of India Limited (PGCI) and Central Pollution Control Board (CPCB) may be constituted to look into the all issues related to implementation of norms;

WHEREAS, following decisions were taken in the meeting:

1. MoP/CEA shall submit action plan by December 2016 for phasing out of the power plants commissioned before December, 2003.
2. MoP / CEA shall submit action plan by December, 2016 in respect of power plants commissioned during January, 2004 to December, 2016 indicating unit wise retrofit / renovation for each power plant. The implementation of action plan shall be taken up in backword manner starting from the plants commissioned in the 2015 and the shall be completed by 15.08.2022
3. MoP and CEA shall coordinate with each State Public Sector Undertakings separately for submission of action plan by December, 2016 for all the power plants.

WHEREAS, it was further decided that MoP shall take action for installation of Flue gas Desulphurisation (FGD) if needed to achieve prescribed SO_2 norms based on the SO_2 emission levels from power plants;

WHEREAS, it was also pointed out that NOx control technology in case of Indian coal is not established. Selective Catalytic Reduction (SCR) technology is used for NOx control, however, its feasibility for Indian coal needs to be established. MoP suggested that Pilot studies may be taken up in two plants and based on the results, further action plan to be drawn regarding retrofitting of SCR in plants to achieve prescribed NOx norms;

WHEREAS, the MoP constituted a committee under the Chairmanship of Chairman, Central Electricity Authority (CEA) on 21.09.2016 to prepare an action plan for implementation of new emission limits;

WHEREAS, to ensure compliance of the new emission norms the MOEF&CC convened a meeting on 23.05.2017 in which CEA, NTPC and the Central Pollution Control Board participated;

WHEREAS, the MOEF&CC received a letter from Secretary Ministry of Power *vide* their D.O. letter No. FU-1/2016-IPC dated 30th June, 2017 indicating the concerns of various thermal power plants in the country with regard to the compliance with the new emission norms for the thermal power plants notified on 7.12.2015 particularly w.r.t. Particulate Matter (PM), Sulphur dioxide (SO_2) & Oxides of Nitrogen (NO_x);

WHEREAS, it was noted that out of present 196667 MW installed capacity, about 60 % capacity (1,15,214 MW) meets the new PM norms with existing ESP installations. Remaining capacity of 64,334 MW which does not meet the new environmental norms regarding PM, requiring retrofitting additional fields in Electrostatic Precipitator (ESP)/replacement of ESP in existing plants to meet the new emission norms of PM;

WHEREAS, Ministry of Power after consultation with Central electricity Authority informed that retrofitting additional fields in ESP/replacement of ESP in existing plants will need complete shutdown of 4-6 months for each unit;

WHEREAS, in order to meet SO_2 emission norms, FGD system shall be required to be installed in all plants. MoP informed that about 30-36 months required for design & engineering, approvals, funds arrangements, tendering, erection and commissioning of FGD. Besides, planned shutdown will be required as all plants cannot be shut down simultaneously. Another challenge highlighted for installation of FGD was availability of technologies/suppliers. In addition, issues relating to availability of good quality lime stone for operation of FGD and disposal of Gypsum to run the FGD in existing plants were also taken note of;

WHEREAS, the standard of 300 & 100 mg/NM^3 would require installation of Selective Non Catalytic Reduction (SNCR) or Selective Non Catalytic Reduction (SCR). While these technologies are established globally, these are not established for Indian Coal, which has high ash content. Therefore, it was decided to engage various technology vendors to run pilots at NTPC stations to validate technology of SNCR/SCR system for Indian coal;

WHEREAS, the Ministry of Power in the letter dated 30.06.2017 enclosed the report outlining the plan of action for implementation of the new norms keeping in mind the techno-economic feasibility and ensuring availability of power to all at affordable cost without any disruption;

WHEREAS, as per the phasing plan proposed by MOP after consultation with CEA and Regional Power Committees, out of the installed capacity of 1, 87,162 MW (as on December, 2016), 8217 MW have been identified for retirement/already retired. Further, 12,974 MW of capacity already have either CFBC boilers or FGDs.

WHEREAS, a phasing plan was proposed for the balance 165971 MW of coal based thermal capacity for achieving compliance with 145977 MW capacity proposing installation of FGDs within a period of 7 years to be undertaken in a phased manner. About 3205 MW of coal based capacity was stated to be compliant with revised norms of SO_2 emission;

WHEREAS, it was further noted that approximately about 16789 MW would not be able to install FGDs due to various constraints which include lack of space, etc.;

WHEREAS, CEA has worked out the requirement of capacity of coal based thermal power plants including hydro, wind, solar, gas based units to meet the estimated peak demand of 225 GW in 2021-22;

WHEREAS, MoP suggested that the compliance period of PM for the plants installing FGD may be kept same as per the FGD phasing plan;

WHEREAS, it was requested that for implementation of NOx norms in the plants installed before 31.12.2003 a period of three years may be permitted to achieve specified standards of 600 mg/Nm^3. For other plants a

relaxation of 600 mg/Nm³ in place of 300 and 100 mg/Nm³ for a period of 3 years was also requested;

WHEREAS, taking into account the issues/concerns raised by the MoP and the sensitivity involved in the matter as it relates to general public of the country, the Ministry undertook detailed analysis of each of the issues in the meetings held on 06.07.2017, 27.07.2017, 11.08.2017 and 01.09.2017. These meetings were also attended by the various stakeholders including Ministry of Power, CEA, NTPC etc.;

WHEREAS, MOEF & CC in the meeting with MoP, CEA, NTPC & CPCB etc. held on September 1, 2017 decided that the action plan submitted by MoP for 7 years i.e. up to 2024 was too long and it should instead commence from 2018 and implemented by 2022 with respect to all pollutants. It was further suggested that action plan should be revised prioritising the plants located in critically polluted area /close to habitation /urban area. Based on the decisions taken in the meeting Ministry of Power vide letter No. FU-1/2017-IPC dated 13.10.2017 submitted the revised action plan, to implement/phasing FGD installation/ ESP upgradation to meet new emission norms for thermal power plants;

WHEREAS, as per the revised plan submitted by the MoP vide letter dated 13.102.17, 650 units comprising 196667 MW need to meet the new emission limits. Out of 650 units, FGD will be installed to achieve the emission limit of SO_2 by the year 2022 in all 415 units comprising 161522 MW (01 unit by 2018, 08 units by 2019, and 55 units by 2020, 172 units by 2021 and 178 units by 2022, for 01 units with 150 MW capacity plan is not received). Remaining 235 units comprised of 35145 MW either complying with SO2 emission limits or planned for phasing out;

WHEREAS, ESP upgradation to achieve emission limit of particulate matter will be completed by the year 2022 in PM for 231 units comprising of 65925 MW capacity out of 650 units (01 unit by 2018, 02 units by 2019, 28 units by 2020, 97 units by 2021 and 94 units by 2022, for 09 units of 1400 MW capacity plan by 2022);

WHEREAS, with regard to compliance of emission limit of NOx, it is suggested that pre combustion modification such as in situ modification in boiler, installation of Low NOx burners and Over Fire Air shall be adopted besides installation of SCR/SNCR systems wherever needed by the year 2022;

WHEREAS, electricity is cleanest form of energy which helps in mitigating house hold air pollution which is matter of concern;

WHEREAS, there is need to provide electricity supply to people who do not yet have access to it;

WHEREAS, taking into consideration the technical challenges and time requirements for installation of FGD and other technologies to meet the new emission limits, the MoEF&CC vide its letter F. No. Q-15017/40/2007-CPW

dated 07.12.2017 has directed CPCB to direct all the thermal power plants to ensure compliance with the norms laid down in the 07.12.2015 notification in accordance with the revised Plan submitted by the Ministry of Power letter dated 13.10.2017 as well as NOx by 2022;

WHEREAS, the Ministry of Environment, Forest & Climate Change , Government of India, vide Notifications No. S. O. 157 (E) of 27.02.1996 and S. O. 730 (E) dated 10.07.2002, has delegated the powers vested under Section 5 of the Environment (Protection) Act, 1986 (29 of 1986) to the Chairman, Central Pollution Control Board, to issue directions to any industry or any local body or any other authority for violations of the standards and rules notified under the Environment (Protection) Rules, 1986 and amendment thereof.

NOW, THEREFORE, taking into consideration all material facts including environmental concerns and ensuring stability of power supply and need for phasing the implementation, in exercise of powers vested under Section 5 of the Environment (Protection) Act, 1986, following directions are issued to Singrauli Thermal Power Station, National Thermal Power corporation:

i. That plant shall meet emission limit of PM immediately by installing Electrostatic Precipitator (ESP) by December 2021, December 2021, August 2021, August 2021, April 2021, February 2021 & December 2020 respectively in unit 1, 2, 3, 4, 5, 6 & 7

ii. That plant shall install FGD by December 2021, December 2021, August 2021, August 2021, April 2021, February 2021 & December 2020 in unit 1, 2, 3, 4, 5, 6 & 7 respectively so as to comply SO_2 emission limit

iii. That plant shall take immediate measure like installation of low NOx burners, providing Over Fire Air (OFA) etc. and achieve progressive reduction so as to comply NOx emission limit by the year 2022

The time line mentioned above (i to iii) for compliance of PM, SO_2 & NOx emission limits shall be reviewed by CPCB within a period of three months and shall be brought down further considering the location specificity of the plant such as critical polluted area/ closeness to habitation/ urban area.

The time line for compliance of water consumption limit shall also be finalised in consultation of plants

Singrauli Thermal Power Station shall ensure compliance of directions mentioned above (i to iii) failing which action will be taken under the appropriate provisions of the Environment (Protection) Act, 1986.

(A.K. Mehta)
Chairman

Copy to:

1. The Chairman
   Uttar Pradesh Pollution Control Board
   IIIrd Floor PICUP Bhavan
   Vibhuthi Khand, Gomti Nagar,
   Lucknow – 226 020, UP

2. The Joint Secretary (CP Division)
   Ministry of Environment, Forests and Climate Change
   Prithvi Wing, 2nd Floor, Room No. 216
   Indira Paryavaran Bhawan, Aliganj,
   Jor Bagh Road, **New Delhi – 110 003**

3. The Joint Secretary (Thermal)
   Ministry of Power
   Shram Shakti Bhawan, Rafi Marg
   New Delhi

4. The Regional Director,
   Central Pollution Control Board
   PICUP Bhawan, Ground Floor
   Vibhuti Khand, Gomti Nagar
   Lucknow-226 010

5. The Divisional Head - IT, CPCB

(A. Sudhakar)
Member Secretary

Annexure-IV B

SPEED POST

B-33014/07/2019/IPC-II/TPP/3215 June 25, 2019

To,

The General Manager,
M/s Singarauli Thermal Power Station
National Thermal Power Corporation Limited,
Shaktinagar; Dist: **Sonebhadra- 231222**,
Uttar Pradesh

Sub: Directions under Section 5 of the Environment (Protection) Act, 1986 regarding compliance of specific water consumption limit notified vide notification No.S.O.3305 (E) dated 07.12.2015 – reg.

WHEREAS, taking into consideration pollution from thermal power plants, Ministry of Environment, Forest & Climate Change had issued notification in the year 1984 laying out standards for thermal power plants. Further, the stack height regulation was notified in the year 1989 and effluent standard for thermal power plants was notified in the year 1986. The revised temperature limit of discharge of cooling water from the plants was notified in the year 1999 and thereafter use of beneficiated coal in the plants was issued in June 2002. The fly ash utilization notification was also issued on 14th September, 1999 and amended in the year 2003, 2009 and 2016. Thereafter, MoEF&CC vide Notification No.S.O.3305 (E) dated 07.12.2015 has amended emission limit for particulate matter and notified new limits for Sulphur dioxide (SO_2), Oxides of Nitrogen (NOx) and mercury emission, and specific water consumption limit for coal/lignite based thermal power plants. As per the notification dated 07.12 2015, thermal power plants were required to achieve the notified limit within two years from the date of the notification i.e. by 07.12.2017;

WHEREAS, with the implementation of the water consumption limit notified, PM, SO_2 & NOx dated 07.12.2015, it is expected that there would be reduction in water consumption and in emission of PM, Sulphur dioxide and oxide of Nitrogen;

WHEREAS, the review of work progress by thermal power plants for compliance of emission limits of PM, SO2, NOx & Hg and specific water consumption limit is being done by CPCB on six monthly basis;

WHEREAS, vide letter dated 02.01.2019 thermal power plants were asked to submit the specific water consumption (SWC) data to CPCB and SPCB on quarterly basis starting from Oct – Dec 2018 quarter

by 10th day of the month succeeding the quarter in the provided format;

WHEREAS, based on the specific water consumption data from thermal power plants for the quarter of Oct - Dec 2018, the thermal power plants which were not meeting the specific water consumption limit, were asked to submit time targeted action plan for achieving the specific water consumption limit;

WHEREAS, according to the consultation held with technology providers, power plants and Central Electricity Authority (CEA) the Plants based on Once Through Cooling System shall require maximum 36 months' time to install and commission Cooling Tower System to comply with the applicable specific water consumption limit;

WHEREAS, the Ministry of Environment, Forest& Climate Change, Government of India, vide Notifications No. S. O. 157 (E) of 27.02.1996 and S. O. 730 (E) dated 10.07.2002, has delegated the powers vested under Section 5 of the Environment (Protection) Act, 1986 (29 of 1986) to the Chairman, Central Pollution Control Board, to issue directions to any industry or any local body or any other authority for violations of the standards and rules notified under the Environment (Protection) Rules, 1986 and amendment thereof.

NOW, THEREFORE, taking into consideration all material facts including environmental concerns and ensuring stability of power supply and need for phasing the implementation, in exercise of powers vested under Section 5 of the Environment (Protection) Act, 1986, M/s Singarauli Thermal Power Station, NTPC Limited, Shaktinagar, Sonebhadra, U.P. is hereby directed to install Cooling Tower System to comply with the specific water consumption standards and comply the standards latest by June 30, 2022.

The Plant shall submit six monthly progress report in first week of July and January and shall ensure compliance of directions mentioned above within given time frame, failing which action will be taken under appropriate provisions of the Environment (Protection) Act, 1986.

27/6/19

(S.P.S. Parihar)
Chairman

Copy to:

1. The Chairman
   Uttar Pradesh Pollution Control Board,
   IIIrd Floor, PICUP Bhawan
   Vibhuthi Khand, Gomti Nagar,
   Lucknow – 226 020, U.P.

2. The Addl. Secretary (CP Division)
   Ministry of Environment, Forests and Climate Change
   Prithvi Wing, 2nd Floor, Room No. 216
   Indira Paryavaran Bhawan, Aliganj,
   Jor Bagh Road, **New Delhi – 110 003**

3. The Joint Secretary (Thermal)
   Ministry of Power,
   Shram Shakti Bhawan, Rafi Marg
   New Delhi – 110 001

4. The Regional Director,
   Central Pollution Control Board
   PICUP Bhawan, Ground Floor
   Vibhuti Khand, Gomti Nagar
   Lucknow-226010

5. The Divisional Head - IT, CPCB

(Prashant Gargava)
Member Secretary

Annexure-V

Site Specific Wild Life Conservation Plan for

Singrauli STPP,

Stage-III (2 x 800 MW)

CHAPTER-I
INTRODUCTION AND BACKGROUND

I.1 Introduction

The NTPC had established the coal based Singrauli Super Thermal Power Station (SSTPS) of total 2000 MW capacity under Stage-I (5x200 MW) and Stage-II (2x500 MW) which are operational at Shakti Nagar, Sonbhadra district of Uttar Pradesh state. Now NTPC proposes to augment the capacity by adding 1600 MW (2x800 MW) under Stage-III using coal. In accordance with the approved terms of reference (Vide letter no. J-13012/09/2016/I-A-I(T) dated 06-03-2017) an EIA Study was carried out. The public hearing for the proposed project was conducted on 09.07.2019 at Ambedkar Bhavan, Shakti Nagar, Sonbhadra district of Uttar Pradesh. Final EIA incorporating the issues raised during the public hearing and the management response was submitted to MOEF&CC for accord of Environmental Clearance. The Final EIA was appraised by the EAC during the 33rd Meeting held on 25-9-2019 and stipulated condition"*Wildlife Conservation Plan is to be submitted preferably to be vetted by the Chief Wildlife Warden in the State Wildlife Department as the Schedule-I species are present in the Rihand Reservoir and within 10 km radius of the project".*

As stated in the Terms of Reference (TOR), and the final EIA report that there are no Wildlife Sanctuaries/ National Parks or any ecological sensitive area of national importance, including Reserve Forests exists within 10 km radius from Singrauli STPS. However, Dudichua and Mehrauli protected forests are located at 4.1 km and 8.8 km respectively from Singrauli STPS.

In compliance of the above, the following wildlife conservation and management plan has been prepared.

I.2 Location of the Project and the Eco-Sensitivity of the Vicinity of 10 Km Radius

The Singrauli STPS is located on the northern bank of Rihand Reservoir near Shakti Nagar, tehsil Dudhi in district Sonbhadra of Uttar Pradesh close to the neighbouring state boundary of Madhya Pradesh. The Singrauli STPS is approachable from Renukoot-Singrauli road through an approach road already constructed during Stage-I of this Station. There are no Wildlife Sanctuaries/ National Parks or any ecological sensitive area of national importance, including Reserve Forests within 10 km radius from Singrauli STPS. However, Dudichua and Mehrauli protected forests are located at 4.1 km and 8.8 km respectively. No archaeological monument of national importance & defense installations exist within 10 km radius of the Singrauli STPS. The main plant of Stage-III (2x800 MW) shall be accommodated within existing main plant area. Total land available in the plant area is 4,491 acres which is under industrial land use category. Out of this land, about 562 acres will be required for proposed project. As no additional land is proposed to be acquired for the project, there will be no direct impact on ecology of the area.

I.3 Vegetation and Flora of the Protected Forests in the Buffer Zone

Dudichua and Mehrauli protected forests are located at 4.1 km and 8.8 km respectively from the core area. There are no Reserve Forests within the 10 km radius of the Singrauli STPP. Though Sal (*Shorea robusta*) is the dominant species, there are over a dozen tree species in these protected forests. The list of the trees found in these PFs is given in **Table-1**.

TABLE-1
LIST OF MAJOR PLANT SPECIES FOUND IN THE PROTECTED FORESTS LOCATED IN THE BUFFER ZONE

Sr.No	Scientific Name	Local Name	Family
1	*Madhuca indica*	Mahua	Sapotacceae
2	*Shorea robusta*	Sal	Dipterocarpaceae
3	*Lagerstroemia parviflora*	Sendha	Lythraceae
4	*Diospyros melanoxylon*	Tendu	Ebenaceae
5	*Ficus benghalensis*	Bargad	Moraceae
6	*Terminialia crenulata*	Saaja	Combretaceae
7	*Dalbergia sissoo*	Sissoo	Fabaceae
8	*Syzigium cumini*	Jamun	Myrtaceae
9	*Azadirachta indica*	Neem	Meliaceae
10	*Schleichera oleosa*	Kusum	Sapindaceae
11	*Bombax ceiba*	Semal	Bombacaceae
12	*Terminalia chebula*	Harra	Combretaceae
13	*Boswellia serrata*	Salai / Salaka/ Salaya	Burseraceae
14	*Buchanania lanzan*	Achar	Anacardiaceae
15	*Lannea coromandelica*	Gunja	Anacardiaceae

Forests in and around Singrauli Coalfields are essentially *dry Peninsular Sal (Shorea robusta)* forests. There are also *Northern dry mixed* forests, Boswellia forests and *Southern dry mixed deciduous* forests. Topography is highly uneven and variable. It ranges from plans formed by the valleys of Rihand River to 243 to 609 m tall hills of Mirzapur region in Sonebhadra in U.P. Mining occurs mainly in the plains of Rihand River valley and its tributaries. None of the plants included in the list of Threatened Plants of India, compiled by the Botanical Survey of India are reported or recorded from the study area.

I.4 Wildlife of the Study Area

As per the field survey and information gathered from forest department during the EIA study, Avifauna is represented by 51 bird species of the Indian Wildlife (Protection) Act, 1972. Mammalian fauna within 10 km of the buffer zone of study area are represented by Jackals, Nilgai, Black napped Indian hare, Hanuman langur, Squirrels, Wild boars, common mongoose, which are confined in the following schedules such as Schedule-II, Schedule-III, schedule-IV, and Schedule-V of the Indian Wildlife (Protection) Act, 1972, comprising of 11 species. List of Schedule-I species reported from the study area and their status is shown in **Table-2**.

TABLE-2
LIST OF SCHEDULE-I SPECIES REPORTED IN EIA REPORT (TABLE 3.63) FROM THE BUFFER ZONE OF THE SSTPS PROJECT SITE

Scientific name	Common name	IUCN / WPA	Area of occurrence
Crocodylus palustris	Mugger Crocodile	VU / I	Reservoir in buffer zone
Accipiter badius	Shikra	LC / IV	The entire family Accipitridae is in Schedule IV
Python molurus	Python	NT / I	Reported from the buffer zone.

According to the IUCN Red Data, Shikra (*Accipiter badius)* belongs to LC (Least concern) category. The entire family Accipitridae is placed in the IVth Schedule of the Indian Wildlife (Protection) Act. Either by oversight or typographical error Shikra is included in Schedule-I. But it belongs to Schedule IV and the LC category. Therefore, it is excluded from further discussion about conservation.

Mugger Crocodile (*Crocodylus palustris)* belongs to the lower risk Vulnerable (VU) category of the IUCN. It belongs to Schedule I of the WPA. Python (*Python molurus*) belongs to the lower risk Near Threatened (NT) category of the IUCN. It also belongs to Schedule I of the WPA.

I.5 Elephant Corridor within the 10 Km Buffer Zone of the Project Site

According to the proposal submitted for diversion of 467.809 Ha of forest land/revenue forest land (443.00 Ha forest and 24.809 Ha Revenue forest land=467.809 Ha. forest land) for opencast coal mining in favour of M/s. Northern Coal Fields Limited, Rewa in Singrauli District State of Madhya Pradesh under reference No. F. No. 8-57/2017-FC, Elephant corridor was shown in the working plan of Compartment No.262 of Singrauli Forest division. Further, it was mentioned that the Elephant corridor is located within a distance of 1 Km from the boundary of the aforesaid opencast coal mine. Full document under reference can be accessed from the following link:

However, no further details are available about the existence of the Elephant corridor at actual site. The Book Titled, “Right of Passage: Elephant Corridors of India” Conservation Series Reference No.3 published by the Wildlife Trust of India edited by Menon et al (2017) does not indicate the presence of any such corridor in Singaruli forest division. It doesn’t figure in the list of 101 elephant corridors in the country which have been documented by the **Wildlife Trust of India** with assistance from State Forest Department of Elephant range states. According to the available reports and circumstantial evidence, there is no Functional Elephant Corridor within the 10 Km buffer zone. It is officially clear that there is no National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger Reserve within the 10 km radius of the of the Singrauli STPP.

I.6 General information about the Habit and Habitat of the Indian Elephant, Python and Mugger Crocodile

1.6.1 Habit and Habitat Requirements of Indian Elephant: (*Elephas maximus indicus*)

Elephants are social animals and may form herds of 20-30 individuals led by the oldest female. Herds usually break into stable family groups of 4-7 animals for foraging and may rejoin. The large matriarchal groups' movement is coordinated by the older female for optimal sites of food and water. The different groups maintain long distance contact through sub sonic vocalizations. Males usually remain away from herds at a distance but join in when a female comes to oestrous. Generally, one dominant and super virile male mates with females in oestrous (polygamy). Old males, past prime reproductive life usually lead solitary life and so are sub-adult males. Sometimes, 2-4 sub-adult males form their own groups. During mating, it is common to see the dominant male escorting the oestrous female away from the family group. Elephant is intolerant of hot summer and retreats into a shady spot during noon. In the past, when forest ranges were continuous, elephants used to migrate seasonally in search of better pastures alternating with forests. Human activities like cultivation, highways, township, railways, dams, industries and mines have now fragmented their habitat and made seasonal migrations virtually impossible. Individual temperaments vary from gentle natured to ill tempered, believed to be due to imprint of normal living or harassed living during juvenile period.

Figure-1: Indian Elephant (*Elephas maximus indicus*)

Habitat

Elephants are animals of grasslands and scrub forests who have secondarily switched over to forests once grass lands were mostly brought under cultivation. The mosaic of grass, scrub forests, open forests and dense forests suits them well.

Elephants are constantly on the move and may cover 10-15 km during a single night. Annual home ranges for bulls may vary from 200-1000 sq.km whereas, that of family group may be 50-300 sq.km depending on the quality of the habitat. Elephants consume a variety of diet bark, roots, leaves, stems and twigs, bamboos, vines, shrubs belonging to 100 plus species.

I.6.2 Indian Rock Python: (*Python molurus*)

This is a non-venomous snake and can grow up to 4m and weigh 45 kg. The colour is dark brown and yellowish white in a blotched pattern. They are very good swimmers and take to water when disturbed but on land, they hiss and remain motionless. The species in oviparous and lay up to 100 eggs in a clutch protected and incubated by the female. Being exothermic, python basks in open but can also raise body temperature by muscular contractions.

Figure-2: Indian Rock Python (*Pyhton molurus*)

Habitat

Python occurs in wide range of habitats viz. rocky foot hills, grass lands, marshes, swamps, wood lands, open jungle. At times, they take refuge in mammal burrows, hollow trees etc. It has also been reported close to habitation and crop fields. The snake feeds on mammals, birds and reptiles but prefers the first. Chital deer, fawns, hares, mouse deers, jungle fowl are natural food. It can swallow prey bigger than its size as the jaw bones are not hinged. The prey is constricted to death by muscular movement and swallows head first. Once held in jaw, prey cannot escape because of inward bent teeth.

Goursi et al (2012) carried out a detailed survey on the habitat and status of Python in Pak occupied Kashmir and it was reported that about 91% dens used by the Indian rock pythons were originally the holes of other animals while about 9% python were found inhabiting in the rock crevices and human made caves. About 16% of active dens of Indian rock python were found at distance of 0-100 m

from the water source, 47% were between 100-500 m while 10% dens were at 500-800 m away from the water sources. Among other animals, Peacock, Jackal, Black Partridge, Red Jungle Fowl, Kaleej Pheasant and Russell viper were also observed occupying the same habitat with Pythons.

Pythons are protected by Law under Schedule I of the Wildlife (Protection) Act. They are killed due to ignorance or out of fear when they enter habitation and capture goats or poultry. They are also silently poached for their ornamental skin. Road kills is another tragedy for Pythons as they cross the roads slowly they are crushed to death by fast moving vehicles.

I.6.3 Mugger Crocodile or Swamp Crocodile or Marsh Crocodile (*Crocodylus palustris*)

The Mugger is a medium-sized crocodile (maximum length 4-5 m), and has the broadest snout of any living member of the genus *Crocodylus.* It is principally restricted to the Indian subcontinent where it may be found in a number of freshwater habitat types including rivers, lakes and marshes. In India, Pakistan, Sri Lanka and Iran, *Crocodylus palustris* has adapted well to reservoirs, irrigation canals and man-made ponds. The Mugger can even be found in coastal saltwater lagoons and estuaries.

According to the IUCN Red List of 2009, *Crocodylus palustris* is placed in the low risk VU (Vulnerable) mainly because there was a decline of 20% in 3 generations in extent of occurrence. Principal threats are: Habitat destruction, fragmentation, and transformation, mortality due to increased fishing activities.

Figure-3: Mugger / Marsh / Swamp Crocodile (*Crocodylus palustris*)

CHAPTER-2
IMPACT OF THE PROPOSED PROJECT ON WILDLIFE WITH SPECIAL REFERENCE TO SCHEDULE-I SPECIES

2.1 Introduction

Vicinity map of Singrauli STPS is presented at **Figure-4** and the Google Map covering Singrauli STPS and adjoining Coal Mines is presented in **Figure-5**. The elephant corridor was shown in the working plan of Compartment No.262 of Singrauli Forest division, at a distance of 1 km from the boundary of the mine. The compartment no. 262 is located at a distance of more than 6 km towards north-north-east side of Singrauli STPS and there exist a series of working coal mines between the two. Even the area towards south of coal mines involves intense industrial and economic activities. Therefore, the impact of Singrauli STPS on the area (compartment 262) is extremely unlikely.

The presence of Python in the buffer zone is recorded based on the information given by the people working in the coal mines located in the buffer zone. However, Pythons are neither confined to the project site and its buffer zone nor are they common due to intense human activities. However, pythons may be encountered in the project area during excavation and site clearing activities for Stage-III.

A stretch of 161 km of Son River, 23 km Banas and 26 km of the Gopad river was declared as Son Gharial Wildlife Sanctuary (SGS) in the year 1981, vide the Gazette notification No. 14-47-80-x-(2) under provision of Section 18(1) of the Wild Life (Protection) Act, 1972 (Figure 1). The notification also includes 200 m of land on either side of the river. However, the sanctuary area is more than 60 km. from the project site. The study area does not harbour significant population of crocodiles, but occasionally, these species are reported during high floods. Further, during the entire lifespan of more than 40 years of construction and operation of Singrauli STPS, it was never encountered at any of the projects of NTPC in Singrauli region. As the water requirement of Singrauli STPP, Stage-III shall be met from Discharge Channel of Singrauli STPS, Stage-II and the project shall be based on zero discharge, the direct impact of construction and operation of Singrauli STPS, Stage-III is unlikely.

As no additional land is proposed to be acquired, the proposed 2x800 MW Singrauli super thermal power plant is not going to have any direct impact on the habitat of the wildlife, with special reference to Schedule- I species. Direct adverse impacts associated with the establishment of the TPP shall be limited to 562 Acres within the 4,491 acres of the NTPC existing TPP. As such it is not going to cause any fragmentation of the habitat or shrinkage of habitat or loss of breeding or feeding grounds of wildlife. Indirect and transboundary impacts beyond the borders of the core area shall be on account of possible air, water and noise pollution.

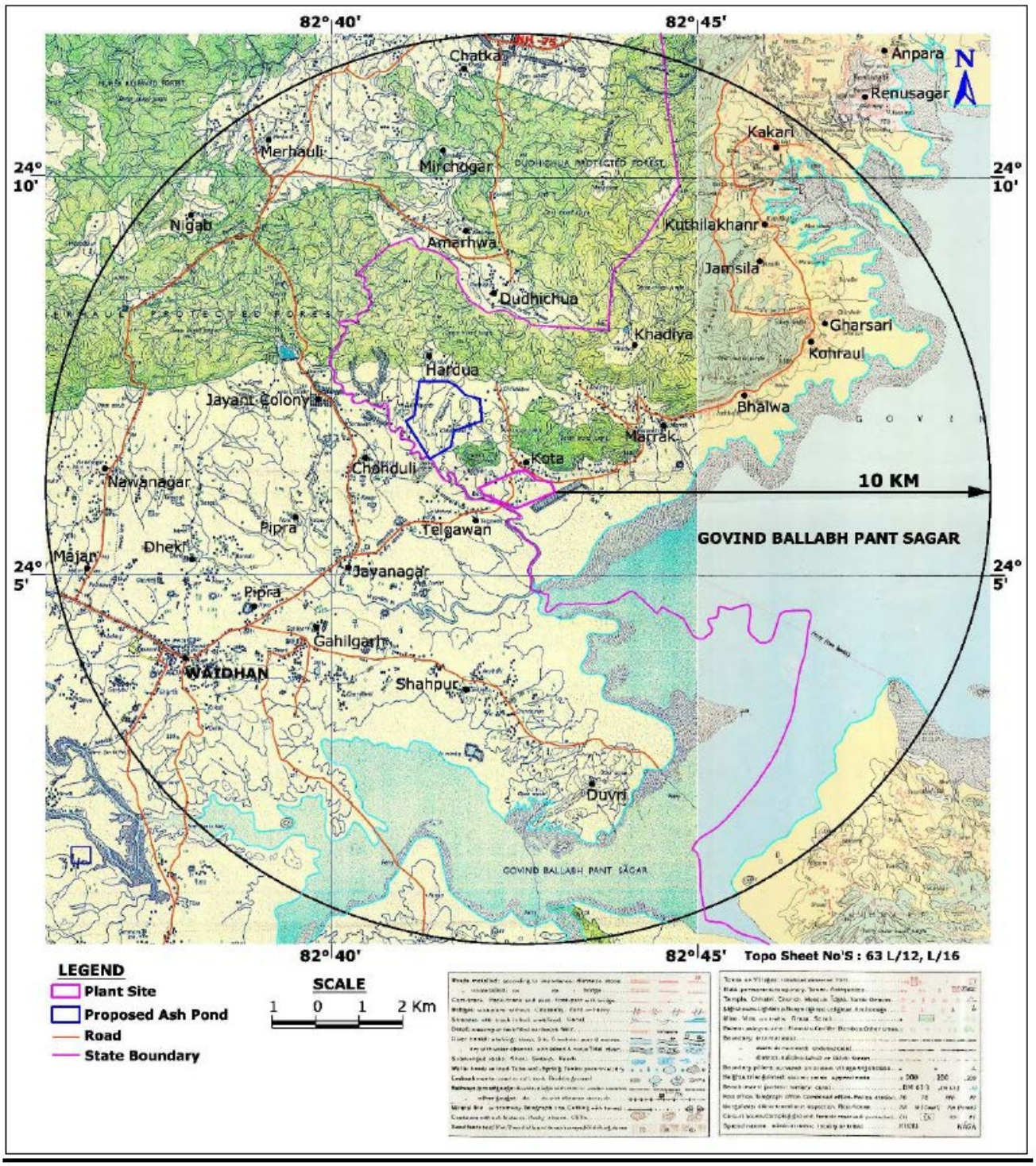


FIGURE-4
VICINITY MAP OF SINGRAULI STPS

FIGURE-5
GOOGLE MAP OF SINGRAULI STPS & COAL MINES OF NCL

2.2 Existing Environmental Quality and Predicted Changes

The primary environmental data has been collected during 15th May, 2017 to 14th May, 2018. During winter, predominant winds from W direction were observed for 13.2% of the total time, with wind speeds in the range of 0.5-19 kmph. During pre-monsoon, predominant winds from W direction were observed for 25.4% of the total time, with wind speed in the range of 1-19 kmph.

The minimum and maximum concentrations for PM10 were recorded as 44.5 µg /m^3 (monsoon) and 82.7 µg /m^3 (winter), respectively. The minimum and maximum concentrations for PM2.5 were recorded as 16.9 µg /m^3 (monsoon) and 55.6 V/m^3 (winter), respectively. The minimum and maximum SO_2 concentrations were recorded as 8.5 µg /m^3 at Ghorauli (AAQ9, during monsoon) and 43.8 µg /m^3 at Matwal (AAQ8, during winter). The minimum and maximum NO2 concentrations were recorded as 10.3 µg/m^3 at Ghorauli (AAQ9, during monsoon) and 51.9 µg/m^3 at Matwal (AAQ8, during winter), respectively. All the ambient air quality parameters are within the National Ambient Air Quality (NAAQ) standards. The incremental concentrations of the proposed project have been predicted and super-imposed on the maximum baseline data to arrive at resultant concentrations during operational phase of the proposed project. The resultant concentrations are given in **Table-3.**

TABLE-3
EXISTING AND PREDICTED AIR QUALITY OF THE WITH RESPECT TO PM10, SO_2 ANDNO_2 DURING DIFFERENT SEASONS.

Pollutant	Maximum Concentrations (µg/m3)		Resultant (µg/m³)
	Maximum baseline in study area	Incremental	
		Single stack height of 275 m with Bi-flue	Single stack height of 275 m with Bi-flue
Post-Monsoon 2017			
PM_{10}	74.3	1.2	75.5
SO_2	26.2	4.1	30.3
NO_2	28.5	4.1	32.6
Winter 2017			
PM_{10}	82.7	1.5	84.2
SO_2	43.8	4.9	48.7
NO_2	51.9	4.9	56.8
Pre-Monsoon 2018			
PM_{10}	75.64	1.9	77.54
SO_2	33.68	4.6	38.28
NO_2	41.18	4.6	45.78

The analysis of surface water indicates the pH values in the range of 6.6 to 8.31, TDS in the range of 79-612 mg/l, DO in the range of 4.8-6.2 mg/l. The water quality results indicate that the Baliya nallah is moderately polluted since the concentrations of BOD and COD are exceeding the permissible standards. Further, Coliforms are also exceeding the standard of drinking water. Ground water analysis reveals that the pH is in the range of 6.16 to 8.47, Total hardness is in the range of 66-679.8 mg/l, Chlorides in the range of 14.2- 348.2 mg/l, Sulphates in the range of 2.8-128.1 mg/l, TDS in the range of 132-1,240 mg/l.

2.3 Zero Liquid Discharge (ZLD) System

The proposed TPP is going to use air-cooled condensers and adopt Zero Liquid Discharge (ZLD) system. Hence, no effluent will be discharged from proposed project. Its freshwater intake is also very low. Besides this, DM plant waste, domestic waste from canteen and toilets will be the other wastes generated. The treated wastewater from sewage & effluent treatment plant will be used in greenbelt development. The complete power plant Stage-III shall be designed as a Zero Liquid Discharge (ZLD) Plant. Hence, it is no going have any adverse impact on the adjacent Rihand reservoir.

CHAPTER-3
PRINCIPLES OF CONSERVATION OF WILDLIFE

3.1 Issues and Challenges involved in Wildlife Conservation

The word conservation is considered synonymous with preservation. Preservation has no meaning in conservation of a biological species. Conservation of a species is not preservation. We preserve food, fruits, vegetables and museum specimens. We also talk about conservation of water and natural resources. But the concept of conservation of a species is totally different from the preservation of food and conservation of resources like water. It may be possible to conserve an individual (but not a species) till it dies by keeping it under ex-situ conditions. But that is not going to save a species if it is rare or declining or facing threats of extinction. Every Act and Rule promulgated by every country for conservation of any rare or endangered or threatened (RET) species emphasizes the importance of habitat conservation as the primary and the most essential component of species conservation.

3.1.1 What is a biological Species?

A species is defined as a collection of individuals which under natural conditions can freely exchange their genes by cross breeding producing viable and fertile progeny of their own kind.

3.1.2 What is being done in India for conservation of a species?

In India, apart from the Wildlife Protection Act, Forest Conservation Act, Environmental Protection Act and Biodiversity Act, we have species-specific conservation plans for individual species like Tiger (Project Tiger), Elephant (Project Elephant), Crocodile and Sea Turtles. We have elaborate set of rules, and operational procedures. In general, they emphasize the importance of habitat conservation as the basic means of in-situ conservation. Habitat conservation calls for the intervention of the authority concerned.

The fundamental issues that one should take in to account before a workable, adequate and feasible species conservation plan is prepared are:

i. Desirability and essentiality

ii. Feasibility

iii. Adequacy

iv. Practicality

3.1.3 Legal Framework for Wildlife Conservation in India

The Government of India has introduced various types of legislations in response to the growing destruction of wildlife and forests. These are:

3.1.3.1 The Wildlife (Protection) Act, 1972 (Last amended in 2006)

The Wildlife (Protection) Act (WLPA), 1972 is an important statute that provides a powerful legal framework for:

- Prohibition of hunting
- Protection and management of wildlife habitats
- Establishment of protected areas
- Regulation and control of trade in parts and products derived from wildlife
- Management of zoos.

The WLPA provides for several categories of Protected Areas/Reserves:

- National Parks
- Wildlife Sanctuaries
- Tiger Reserves
- Conservation Reserves
- Community Reserves

3.1.3.2 The Forest Conservation Act (1980) and National Forest Policy (1998)

The National Forest Policy, 1988, (NFP) is primarily concerned with the sustainable use and conservation of forests, and further strengthens the Forest Conservation Act (1980)

3.1.3.3 Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Rights) Act 2006

3.1.3.4 The Environment (Protection) Act (1986), The Biological Diversity Act (2002),

3.1.3.5 National Wildlife Action Plan (2002-2016) replaces the earlier Plan adopted in 1983 and was introduced in response to the need for a change in priorities given the increased commercial use of natural resources, continued growth of human and livestock populations, and changes in consumption patterns.

3.1.3.6 Wildlife Conservation Initiatives by Indian Government

Project Tiger; Project Elephant, Project Crocodile; UNDP Sea Turtle Project are examples of species-specific action plans.

3.1.3.7 Conservation approach inside Protected Areas

1. Train frontline forest staff in wildlife law
2. Train frontline forest staff in trauma management

3. Train frontline forest staff in systematic patrolling
4. Support intelligence gathering to crackdown on wildlife trade
5. Help hire specialised lawyers to fight critical wildlife cases
6. Improve mobility of frontline forest staff by donating vehicles
7. Help deploy radio-collars and monitor tiger and leopard movement/dispersal
8. Conduct health check-up camps for frontline forest staff
9. Provide veterinary support to conduct post-mortems of wild animals
10. Influence policy through targeted research and dialogue
11. Work in close coordination with the forest department
12. Provide veterinary help during translocation of wild animals
13. Estimate carnivore populations using camera trapping
14. Help strategies and implement anti-poaching operations
15. Help monitor human disturbance and animal distribution inside tiger reserves
16. Motivate forest staff through Wildlife Service Awards
17. Provide essential equipment for forest guards and patrolling camps (anti-poaching camps)
18. Train frontline forest staff in wildlife monitoring

3.1.3.8 Conservation approach outside Protected Areas

1. Enhance livelihood options for local communities to reduce their dependence on forests
2. Strengthen human-wildlife interface management to mitigate future conflict
3. Support intelligence gathering to crack down on wildlife trade
4. Estimate populations of large carnivores in human-dominated landscapes
5. Advocate an integrated conservation approach involving local communities and the forest department
6. Study long-term changes in land use and land cover patterns
7. Assess impact of infrastructure on forest connectivity and suggest mitigation measures
8. Partner with NGOs, educational institutes, corporate and multilateral agencies to further our conservation goals
9. Work in close coordination with the existing government machinery
10. Influence policy through targeted research and dialogue
11. Assess landscape connectivity and help identify wildlife corridors
12. Spread awareness on wildlife and climate change

13. Provide veterinary support in mitigating human-wildlife conflict
14. Train the staff of territorial forest divisions in wildlife law
15. Help improve the law enforcement mechanism along wildlife corridors
16. Study dispersal of tigers and leopards in human-dominated landscapes using camera trapping and genetics
17. Strengthen the rural education system – Teacher training; Developing learning aids; School infrastructure support
18. Understand the correlation between human behaviour and conservation

3.1.3.9 High Priorities for Conservation and Management of Wild animals

We need to understand the following before any Conservation and Management Plan is finalized:

1. Animal behaviour: It is different from human behaviour. Unfortunately, our knowledge about the behaviour of the wild animals is elementary. This includes territoriality.

2. Habitat suitability and adequacy: Besides spatial and topographical issues, resource inventory, carrying capacity, threat perception, conflict with human and or domesticated animals and sustainability of the habitat need to be examined before trying to conserve a species in situ.

3. Residential status: It is important to know whether the wild animal found in a place under consideration is just a casual or accidental visitor; whether it is on the move or migrating and whether there is sustainable residential population.

4. Population monitoring: A program of regular, systematic monitoring of known populations is essential. Breeding grounds should be identified and mapped. Census techniques need to be refined and standardized so that they are scientifically credible. Initially this should be carried out in protected areas.

5. Protection of habitats: Changes in habitats such as resource base, changes in topography, land-use and land cover, water resources require monitoring. Adequate protection should be afforded to prevent poaching and destruction of breeding grounds. It is absolutely necessary to maintain the integrity of the ecosystems so that they continue to support the wildlife. This includes controlling pollution by urban waste and industries, development of potentially disastrous water harnessing projects.

6. Captive Breeding: It is essential only when there is a negative population growth rate due to lower birth rates and higher death rates.

7. Post-release monitoring of restocked animals: A number of studies in India and abroad show that many of animals produced in captivity failed to survive when released in wild. The situation of captive breeding of Mugger in India is in a kind of crisis due to overstocking in captive breeding centres and uncertainty of the success of restocking.

8. Identification and minimisation of negative anthropogenic influences: Some of the major anthropogenic threats are known but need to be pinpointed and mapped. Thus, multidisciplinary actions involving all stakeholders, such as the people living in wildlife habitats, Government departments such as Wildlife, Forest, Irrigation and Fisheries are needed. Identification and mitigation of human/livestock disturbances to wildlife habitats are needed.

9. Public awareness/education about wildlife: Public awareness is an important priority within the scope of overall management plans for the species. Zoos could play a greater role in lobbying for public sympathy. Conservation NGOs need to utilize the media as part of awareness programs.

10. Sustainable use schemes: As long as we try to alienate people from wildlife and as long as there is conflict between wildlife and people, conservation plans are not going to yield desired results. Placing a value on wildlife is a proven technique for gaining acceptance of local people. Just because of fear of misuse, can we conserve any species by putting it in a cage? Conservation is not preservation.

11. Wildlife Sanctuaries, National Parks, Wildlife Reserves: The presence and sustenance of any wild species (not an individual) in any particular area over a long period of time is an enough indication that that the area under consideration is the best bet for conservation of the wild species.

CHAPTER-4 –
PLAN FOR CONSERVATION OF SCHEDULE-I SPECIES

4.1 Conservation of Elephant (*Elephas maximus indicus*): Project Elephant

No elephant was found within the study area during the study. The elephant corridor passing through the vicinity of the buffer zone boundary is no longer in use. The whole area is under extensive opencast mining. Hence there are no chances for revival of the corridor or conservation of Elephants anywhere in the study area. For the conservation of Elephants, Project Elephant stipulates the following procedures and protocols.

Project elephant is a centrally sponsored scheme launched in February 1992. The scheme helps and assists in the management and protection of elephants to the States having free-ranging populations of wild elephants, in order to ensure the survival of elephant population in the wild and protection of elephant habitat and elephant corridor.

4.1.1 Objectives of project elephant

- Protection of elephants, their habitats and elephant corridors.
- Mitigation and prevention of man-elephant conflict.
- To ensure the Welfare of domesticated elephants.

4.1.2 The aim of this project

- To ensure the protection of elephants from hunters and poachers, and prevent illegal trade of ivory. It also includes the strategy to prevent unnatural causes of death of elephants in India.
- To develop and promote scientific and planned management strategies for the conservation of elephants.
- To mitigate and prevent the increasing conflict between humans and elephants in elephant habitats. It also aims to reduce and remove the pressure of human and domestic livestock grazing and other activities in important elephant habitat.
- To ensure ecological restoration of the natural elephant habitats and their migratory routes.
- To promote scientific research on issues related to conservation of elephants and promotion of public awareness and education on these issues.

To ensure the proper health care and breeding of domesticated elephants. To facilitate veterinary care and Eco-development for the elephants.

4.1.3 Major threats to Elephant Corridors

- Problems such as elephant habitat loss which is leading to fragmentation and destruction primarily due to developmental activities such as the construction of roads, railways, buildings, holiday resorts and electric fencing etc.
- Mining activities such as coal mining and iron ore mining have been described as single biggest threats to elephant corridor in Central India. States like Jharkhand, Chhattisgarh and Orissa are mineral rich but also have the highest number of elephant corridors which is leading to elephant man conflict.
- As elephants require extensive grazing ground for food, lack of such grazing grounds can force elephants to search for food elsewhere. Most of the elephant reserves unable to accommodate all the elephants, which results in man-elephant conflict due to the destruction of crops by elephants.

4.1.4 Mitigation strategies

- Fusion of elephant corridors with the nearby protected areas and reserved forest wherever possible. In other areas, to provide protection to the elephant corridors, there is a need for the declaration of ecologically sensitive areas or conservation reserves.

- Securing the elephant corridors would require awareness generation and sensitizing the local population to promote voluntary relocation outside the conflict zones. This would prevent the problem of further fragmentation of continuous forest habitats from encroachment by human beings. It would also provide refuge for other wild animals such as tiger, Sambar, crocodile, bird species etc.

- During the process of securing the elephant corridor, there is a need to monitor the animal movements along with habitat restoration as per the requirements.

4.1.5 Elephant as the national heritage animal of India

- The elephant has been declared as the national heritage animal by the government of India in 2010 after the recommendations of the standing committee on national board for wildlife. This was to ensure sufficient protection for elephants before it's numbered fall to panic levels as it had happened in case of tigers.

- A proposed National elephant conservation authority (NECA) on the lines with NTCA has been proposed to be constituted by amending the Wildlife Protection Act 1972.

4.1.6 Monitoring of illegal killing of elephants (MIKE) programme

- MIKE program was started in South Asia and in 2003 after the conference of parties a resolution of CITES. It aims to provide information which is required by the elephant range countries to make proper management and enforcement decisions and to promote institutional capacity in those States for long-term protection and management of their elephant populations.

4.1.7 Main objectives of MIKE programme

1. To measure the levels and trends in the illegal poaching of elephants. To ensure changes in the trends for protection of elephant population.
2. To determine the factors which are responsible for such changes, and to assess in particular about the impact of decisions of the conference of parties to CITES responsible for such changes.
3. Under this programme, data are collected on a monthly basis from all the sites in specified MIKE patrol form and it is submitted to the sub-regional support office for South Asia programme located in Delhi.

4.1.8 Hathi Mere Sathi

- Ministry of environment and forests (MOEF) in partnership with Wildlife Trust of India (WTI) has launched a campaign called Hathi Mere Sathi. The campaign aims to improve the conservation, protection and welfare of elephants in India. It was launched at Elephant- 8 ministerial meeting which was held in Delhi on 24th may 2011.

- The countries who are the part of the Elephant-8 ministerial meeting are Botswana, Kenya, Srilanka, Republic of Congo, Indonesia, Tanzania, Thailand and India.

- The Hathi Mere Sathi campaign aims at increasing public awareness and developing friendship and companionship between local population and elephants.

41.9 The campaign mascot Gaju

- The campaign Mascot Gaju focuses on various groups which include local people near elephant habitats, youth, policymakers and others. The scheme envisions to set up elephant centres all over the country in the elephant landscapes. It aims to spread awareness about the plight of elephants and promote people's participation in addressing these issues.

- The campaign plans to ensure capacity building of law enforcement agencies at the ground level to enhance protection of elephants, and to advocate for the policies in favour of elephants.

- The elephant task force (ETF) which was constituted by the Ministry of Environment and Forest has recommended the campaign to Take Gajah (the elephant) to the Prajah (the people) in order to increase public awareness and their participation in the conservation and welfare of elephants.

- India has around 25000 - 29000 elephants in the wild. However, the tuskers (male) in India are as threatened as the Tigers as there are only around 1200 tusker elephants left in India.

- The Asian elephants are threatened by the habitat degradation, man-elephant conflict and poaching for the Ivory. This problem is more intense in India which has around 50% of the total population of world's Asian elephants.

4.2 Crocodile Conservation Plan of the MoEF&C.C., G.o.I

4.2.1 The Beginning

Crocodilians were threatened in India due to indiscriminate killing for commercial purpose and severe habitat loss until the enactment of the Wildlife (Protection) Act, 1972. All the three species of crocodiles, namely, Gharial (*Gavialis gangeticus*), Mugger crocodile (*Crocodylus palustris*) and Saltwater crocodile (*Crocodylus porosus*), in the river systems of Odisha were on the verge of extinction by the seventies. Crocodile population started to decline because of the increasing human activity in the rivers and their other traditional habitats, and consequent reduction in the extent of habitable stretches. Also, the survival rate of the crocodile hatchlings was relatively low because of predation. Piecemeal efforts were being made since the sixties to save the crocodile. FAO Expert, Dr.H.R.Bustard, engaged by UNDP/FAO and Government of India studied the prospects of crocodile rehabilitation, and based on his report and guidance a Crocodile Conservation Project was launched in 1975 in different States. Since Odisha is recognized for the existence of all the three species of Indian crocodilians, the Gharial and Saltwater crocodile conservation programme was first implemented in Odisha in early 1975 and subsequently, the Mugger conservation programme was initiated. The UNDP/ FAO provided funds and other technical support through the Government of India.

4.2.2 Management Objectives

- To protect the remaining population of crocodilians in their natural habitat by creating sanctuaries.
- To rebuild natural population quickly through 'grow and release' or 'rear and release' technique that involves the following phases of operation.
- Collection of eggs from natural nests as soon as these are laid.
- Incubation of these eggs under ideal temperature and humidity maintained in artificial hatcheries,
- Hatching and rearing the young crocodilians in ideal captive-husbandry conditions,
- Marking and releasing young crocodiles in protected areas, and
- Assessing the result of the released crocodiles and protection of the same

4.2.3 To Promote Captive Breeding

1. To take-up research to improve management. Some of the major researches have been in the following directions.
2. Interpretation of the various types of data collected during survey and census.

3. Determination of parameters for maximizing success in egg collection, egg incubation, hatching, rearing and release; including husbandry aspects on feeding, food conversion and growth.
4. Study of habitat features and population structure.
5. Study of behavioural biology including reproduction, thermo-regulation, feeding, water-orientation, locomotion etc.
6. To build up the skills of the personnel for better continuity of the project through trainings imparted at the project-sites and the Central Crocodile Breeding and Management Training Institute, Hyderabad.
7. To involve the local people intimately through the following:

   a). Developing a strong level of acceptance of the project by the people, i.e., by locating the projects in rural areas where people could both see and participate in the entire programme.

   b). Protect the immediate and long-term interests of fishermen residing within the sanctuaries who depend on fishing for their livelihood, by providing an alternative source of income that is not detrimental to the conservation aims, if necessary.

   c). Extend the conservation programme to village-level by introducing commercial crocodile farming, so that people can earn an income by conserving crocodiles and their habitats.

On account of the steps taken, both Mugger and Salt water crocodiles are doing well in India. Viswamitri River in Vadodara and Dhamra Estuary in Odisha are proof in support of the above. But Gharial seems to be still in danger.

4.3 Conservation of Python

The presence of Python in the buffer zone is recorded based on the information given by the people working in the Coal mines located in the buffer zone. Pythons are neither confined to the project site and its buffer zone nor are they common everywhere. They are rarely seen in most parts of India and in the neighbouring countries. They are not killed for meat but for skin in India. The main threat is due to fear of snakes. They are also killed when they attack sheep or goats etc. According to the IUCN data, there is no immediate threat to the Pythons and hence they are placed in the lower risk category of NT. The project site and its buffer zone are extensively disturbed it is not a suitable habitat for their conservation in situ. In view of the above, no workable or practically feasible in-situ conservation plan can be suggested for conservation of Pythons. The vehicle drivers shall be instructed to ensure safe road crossing by Pythons since road kills is one of the causes for the death of Pythons.

CHAPTER-5
SITE SPECIFIC CONSERVATION PLAN FOR SCHEDULE-I SPECIES

5.0 Identification of Key Issues

From the discussions in previous chapters, it is clear that there is no direct or indirect impacts of Singrauli Super Thermal Power Project on the wildlife or Schedule-I species. Nevertheless, NTPC being an environmentally conscious corporate entity, proposes a Conservation Plan for the conservation of wildlife in general and Schedule-I species observed in the area, in particular. It is pertinent to mention here that the proposed conservation measures mentioned here are tentative and shall be finalised in consultation with local forest authorities.

NTPC has already published a Biodiversity Policy for conservation of wildlife and biodiversity at its project sites. A copy of the policy is enclosed at Appendix-A to this report.

5.1 Proposed Conservation Actions

Wildlife management involves habitat as much as with wildlife. For maintenance of satisfactory wildlife population, it is essential to maintain optimal habitat conditions and curb/eliminate factors that act against the habitat and wildlife. The conservation action plan has the following objectives:

1) Reduce the severity of impact by adoption of attenuating measures to the extent feasible.
2) Systematically improve and maintain appropriate habitat conditions for in the study area.
3) Prevent wanton and accidental killing by improving awareness.
4) Energise and involve village level institutions like VDAC and Gram Sabhas in general in conservation management of by suitable outreach mechanism.

However, the actions identified by NTPC in the conservation plan also consider the financial, legal and administrative limitations of the company. It is proposed to improve the conservation plan by involving all the stake holders such as local community, forest department, irrigation department and local media.

NTPC proposes to take following steps in the form of management schemes to contain the biodiversity erosion and environmental degradation in the study area:

5.2 Creation of Bio-diversity & Ecological Conservation Cell

(a) Public Education and Awareness Promotion

- To prevent man animal conflict, it is proposed to create awareness among the work force and adjoining villagers with the help of informal education using films and video shows, street plays, story telling, seminars, group discussions,

different competitions and discussions in the schools, posters, leaflets, brochures etc. which will reduce bird hunting by local villagers.

- Special functions shall be separately organized during wildlife week. It is proposed to give special awards to persons helping in protection of wildlife showing exemplary initiative and drive in conservation work for others to emulate.
- Signboards/ posters/ wall oaintings displaying various types of threatened species, their importance and conservation measures (Do's and Don't's) shall be displayed at strategic locations.
- Eminent local leaders, social workers, foresters, NGO personnel shall be involved to interact and train the workers and villagers regarding importance and various additional control measures to be undertaken.

(b) Survey and Monitoring:

NTPC is already undertaking various pollution monitoring programmes in the area including continuous monitoring of ambient air quality in the vicinity of the project. It is proposed to undertake regular survey of the species as well as habitats for assessing population of species and improve upon the conservation action plan.

(c) Anti Poaching Measures

Poaching of various animals occurs for their meat, body parts or to eliminate menace. The birds are targeted according to their economic importance, use in religious rites or alternate medical practices. Anti-poaching initiatives have to be strengthened by the district administration through its various bodies, including police, besides the forest and wildlife departments.

5.3 Workshops with Experts and Stakeholders:

It is proposed to convene the regular workshops of various stakeholders, namely Forest Department, Irrigation Department, District Administration and Gram Pradhans to discuss the key issues and chalk out strategies for implementation of conservation plan. The meetings shall be conducted in the form of day long workshops and wild life experts/ ornithologists shall also be invited to address the meetings, emphasize the importance of conservation actions and suggest mitigatory measures.

5.4 Financial Forecast

The outlay of the plan is Rs 25 Lakhs. However, based on the meetings of the Executive Committee, meeting with stake holders and annual surveys, the actions may be modified within the overall financial framework, in the best interests of conservation.

The costs of various interventions proposed are given in **Table-4**.

TABLE 4: COST OF WILDLIFE CONSERVATION PLAN

Sr. No.	Conservation Actions	Annual Budget in Lakh Rs.
1	Creation of Ecological Conservation Cell for • Public Education and Awareness Promotion • Survey and Monitoring	15
2	Organising Workshops with Experts and Other Stakeholders	10
	Total	**25**

5.5 Plan Period

This initial plan has been suggested for five years from the date of commencement of construction activities for Stage-III. However, based on the workshops, meetings with stake holders and annual surveys, the actions may be modified within the overall financial framework, in the best interests of conservation.

The long term plan to be implemented shall be decided after completion of five years, on the basis of prevailing environmental and ecological conditions, success of mitigatory measures undertaken and need for future actions, based on experience in the first five years.

5.6 Action Plan for First Year

The action plan for the first year is presented in **Table-5**. The action plans for the successive years shall depend on the outcome of the first year and shall be decided at the end of every year.

Table 5: Action Plan for the First Year of Conservation Plan

Time Line	Conservation Actions to be Undertaken	Responsibility
0 Date	Investment Approval for the Project	
6 Months	Creation of Ecological Conservation Cell (EcoCC) and Organizing First Workshop with Experts and Other Stakeholders	NTPC
6 Months – 1 Year	Programmes for • Public Education and Awareness Promotion • Survey and Monitoring Organising First Workshop with Experts and Other Stakeholders	EcoCC
End of First Year	Organising Second Workshop with Experts and Other Stakeholders	NTPC
First Annual Report and Action Plan for Second Year		

List of References:

1.Balakrishnan, P., T.V. Sajeev and T.N. Bindu, 2010. Artificial incubation, hatching and release of Indian Rock Python Pythonmolurus. Asian Reptile Network: 24-27.

2.Glimpses of Initiatives Taken for Elephant Conservation in India (2012-2017)

http://www.wwfenvis.nic.in/WriteReadData/MajorActivityData/Glimpses%20of%20Initiatives%20taken%20for%20Elephant%20Conservation%20in%20India%20(2012-2017).pdf

3.Menon V., S.K.Tiwari, K.Ramkumar, S.Kyarong, U.Ganguly&R.Sukumar (2017) Eds. Right of Passage: Elephant Corridors of India. Conservation Series Reference No.3. Wildlife Trust of India

4.Padamit Singh (2011). Fact Finding Report on the Impact of Coal Mining on the people and Environment of Sangrauli.

5.Proposal No. F. No. 8-57/2017-FC, for diversion of 467.809 Ha of forest land/revenue forest land for Opencast Coal Mining in favour of M/s. Northern Coal jjFields Limited, Rewa in Singrauli District State of Madhya Pradesh.

http://forestsclearance.nic.in/writereaddata/AdditionalInformation/AddInfoSought/0_0_111241213121018572017.pdf

6.State Serial No. Proposal No. MP-051/2016. Area of forest land proposed for diversion (in ha.) : 467.809 Protected Forests

7.Threatened Plants of India : Botanical Survey of India:

https://bsi.gov.in/WriteReadData/userfiles/file/Threatened%20plants%20of%20India/Threatened%20plants%20of%20India.pdf

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8.Wildlife Crime Control Bureau (2011). A Manual on Wildlife species in Trade by Wildlife Crime Control Bureau, Ministry of Environment and Forests, New Delhi

Appendix-A

2018

Biodiversity Policy 2018

NTPC LTD.

A Maharatna Company

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A Maharatna Company

I. Purpose

Biodiversity is variability among living organisms from all sources including diversity within species, between species and of ecosystems.

All phases of the life cycle of electricity generation have impact on water, air, land and the ecosystem dependent on them. Being an environmentally conscious power producer, NTPC recognizes the impacts of its constructional and operational activities on ecosystem and values its dependence on biodiversity.

Considering the strategical and tactical importance of Biodiversity, NTPC is committed towards its sustainable management. This is also in line with United Nations Convention on Biological Diversity (CBD) and National Biodiversity Action Plan (NBAP) 2008 which recommends set of actions towards biodiversity management. To have a comprehensive vision and guiding principle for conservation, restoration and enhancement of biodiversity, NTPC has developed Biodiversity Policy 2018. This policy is an integral part of our Environmental Policy 2017 and its objectives are aligned with that of environmental and sustainability policies.

II. Policy Statement

To mainstream the concept of biodiversity across NTPC's value chain and adopt a precautionary approach for sustainable management of biodiversity in all decision making processes so that the earth's variety of life is ensured in and around the business units of NTPC.

III. Applicability

All existing and upcoming business units of NTPC. Also, each employee is a partner in implementing the policy.

IV. Principles

This policy is guided by following five principles:

1. Consideration of biodiversity in all business decision right from planning to operations and closure of sites;
2. Minimization of adverse impacts on biodiversity through right combination of best industry practices and state of art technologies;
3. Biodiversity goals are not limited to statutory and regulatory compliances but are aimed at the continual improvement of the biodiversity;
4. Provision of accountability for all locations and creating systems to respond to any aberration;
5. Capacity building through inclusiveness and regular knowledge sharing on biodiversity with concerned stakeholders;

2

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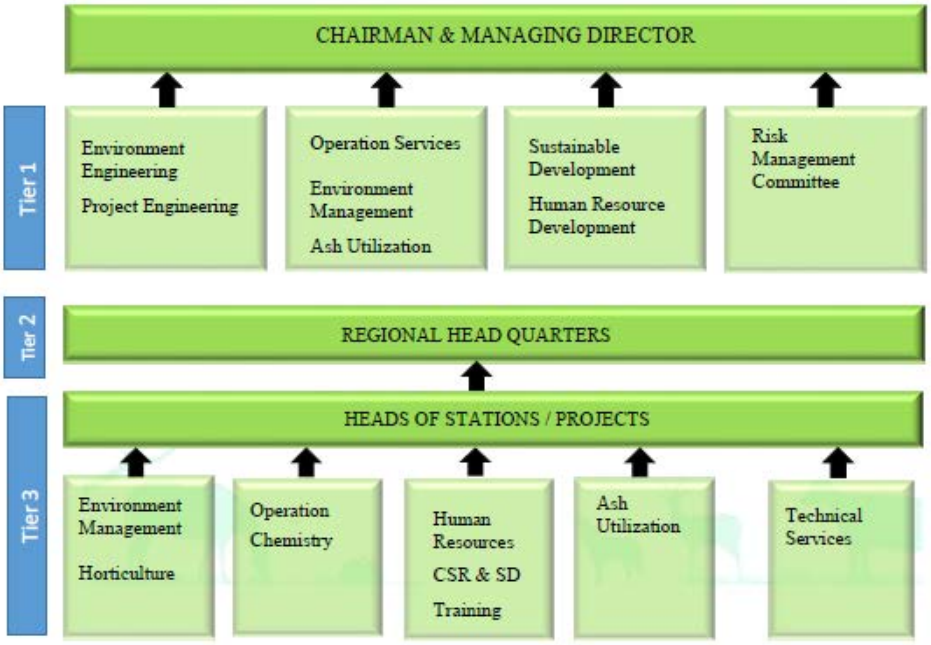
V. Institutional Framework

NTPC follows a three-tier structure as given below for managing conservation, restoration and enhancement of Biodiversity.



This does not reflect the organisation structure but serves to indicate the accountability at various levels in the organisation.

VI. Focus Areas

1. Compliance & Assurance

NTPC shall

I. Ensure legal compliances with respect to biodiversity by complying to rules and regulations related to environment, forest, wildlife, coastal zone and green cover during planning and execution of our projects;
II. Obtain all clearances along with accounting of any futuristic requirements for both new establishments and expansions to the best of our effort;
III. Ensure concerned functions at operating stations to comply norms through reviews, appraisals and reporting and assure relevant stakeholders;

3

A Maharatna Company

IV. Establish systems for measuring and reporting indicators related to biodiversity risk and recommending appropriate action for deviations

2. Stewardship

NTPC shall

V. Conduct studies on biological diversity in all its existing and upcoming projects. These studies shall include identification of protected/ unprotected areas rich in biodiversity;

VI. Plan activities for all projects with minimal negative impacts on biodiversity and, when the impacts cannot be avoided, implement compensatory works for any residual negative impacts such that there is no net loss of biodiversity and, where applicable, have a net positive balance;

VII. Create maps of local biodiversity network and develop "Biodiversity Management Plans" for areas near to our business units with priority to conserve rare and endangered species and also species of medicinal and religious values;

VIII. Set measurable and overarching targets (beyond compliances) and regularly monitor and report its performance in the field of biodiversity conservation;

IX. Take initiatives for restoration of degraded habitats and enhancement of biodiversity in areas (near or far to establishments) which may have been lost due to human interventions;

3. Capacity Building

NTPC shall

X. Raise awareness among local communities, employees and its associates across supply chain about biodiversity through project specific and national level trainings in collaboration with experts.

XI. Collaborate with local communities, organisations, regulatory agencies and research institutes of national/international repute in the field of biodiversity

VII. Review

This policy shall be reviewed according to need and opportunity but not later than once in three years.

Annexure-VI

Details of Ash Dyke Areas

Sl. No.	Name of the Dyke and Coordinates	Area (Acres)	Total capacity (LMT)	Quantity of ash filled till date (LMT)	Available volume (LMT)	Dyke Height	Remark
1	S-1 dyke *(24°06'53'' N 82° 42'84'' E)*	400	234	155	79	13.7 Mtr (includes starter 4.7 M)	2nd raising in service
2	S-2 Dyke *24°03' 22.68" N 82° 42' 34.2'' E*	400	275	124	151	8 Mtr	Starter dyke (OFL 30 acre)
3	Khadia dyke (*24°06' 30.2"N 82°44' 59.8"E)*	630	410	410	0	22 mtr	Capacity exhausted

Details of Ash Generation, Utilization & Disposal in last six years

Ash Utilization Areas	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
	(Qty in Lakh MT)					
Total Ash Generation	37.66	37.00	45.49	36.77	34.83	28.90
Issue to Cement Industries	4.45	0.62	----	----	----	----
Asbestos Industries	0.69	0.20	0.15	0.190	0.121	0.024
Ash dyke raising	1.02	5.25	3.74	3.04	1.93	2.10
Landfill	0.21	---	----	----	8.50	8.03
Ash brick	0.02	0.14	0.08	0.11	0.03	0.02
Others (Bottom ash cover)	3.45	---	----	----	----	---
Total Utilisation	9.85	6.21	3.97	3.34	10.58	10.17
Total Disposal	27.81	30.79	41.51	33.43	24.24	18.72

ANNEXURE-VII

क्षेत्रीय कार्यालय
REGIONAL OFFICE 2
उ0प्र0 प्रदूषण नियंत्रण बोर्ड
U.P. POLLUTION CONTROL BOARD
सोनभद्र
SONBHADRA

सन्दर्भ सं0
Ref. No. C-113176/ NTPC लोक सुनवाई/2019

दिनांक
Date ..25/7/19.....

सेवा में,

मुख्य पर्यावरण अधिकारी(वृत्त–2),
उ0प्र0 प्रदूषण नियंत्रण बोर्ड,
टी0सी0–12वी, विभूति खण्ड, गोमती नगर,
लखनऊ।

विषयः– मेसर्स एन0टी0पी0सी0 लि0, शक्तिनगर, सोनभद्र में सिंगरौली सुपर थर्मल पॉवर प्रोजेक्ट, तृतीय चरण में 2×800 मेगावाट विद्युत उत्पादन हेतु प्लाण्ट की स्थापना के लिये परियोजना की पर्यावरणीय स्वीकृति के सन्दर्भ में दिनांक 09.07.2019 को मेसर्स एन0टी0पी0सी0 लि0, शक्तिनगर, सोनभद्र के उद्योग परिसर स्थित 'अम्बेडकर भवन' में पूर्वाह्न 11:00 बजे सम्पन्न "लोक सुनवाई" की कार्यवृत्त प्रेषित किये जाने के सम्बन्ध में।

महोदय,

उपरोक्त विषय के संदर्भ में अवगत कराना है कि उद्योग की प्रस्तावित परियोजना (2×800 मेगावाट विद्युत उत्पादन की तृतीय चरण) के स्थापनार्थ पर्यावरण स्वीकृति हेतु दिनांक 09.07.2019 को मेसर्स एन0टी0पी0सी0 लि0, शक्तिनगर, सोनभद्र के उद्योग परिसर स्थित 'अम्बेडकर भवन' में पूर्वाह्न 11:00 बजे अपर जिलाधिकारी, सोनभद्र की अध्यक्षता में सम्पन्न की गयी "लोक सुनवाई" की कार्यवृत्त, फोटोग्राफ्स, जन सामान्य द्वारा दिये गये सुझाव/आपत्तियाँ, उपस्थिति एवं वीडियो रिकार्डिंग की दो–दो प्रतियाँ आपके अवलोकनार्थ एवं अग्रिम आवश्यक कार्यवाही हेतु सादर प्रेषित।

भवदीय,

(राधेश्याम)
क्षेत्रीय अधिकारी

संलग्नकः– यथोपरि।

पृ0सं0 एवं दिनांक उपरोक्तानुसार।

प्रतिलिपिः– सदस्य सचिव महोदय, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, लखनऊ को निर्देश पत्र दिनांक 12.02.2019 के अनुक्रम में सादर सूचनार्थ प्रेषित।

क्षेत्रीय अधिकारी

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मे0 एन0टी0पी0सी0 लिमिटेड, शक्तिनगर, सोनभद्र में सिंगरौली सुपर थर्मल पॉवर प्रोजेक्ट, तृतीय चरण में 2X800 मेगावाट विद्युत उत्पादन हेतु प्लाण्ट की स्थापना के लिये परियोजना की पर्यावरणीय स्वीकृति के सन्दर्भ में दिनांक 09.07.2019 को अपर जिलाधिकारी (वि0/रा0), जनपद–सोनभद्र की अध्यक्षता में सम्पन्न हुई "लोक सुनवाई" का कार्यवृत्त।

मे0 एन0टी0पी0सी0 लिमिटेड, शक्तिनगर, सोनभद्र में सिंगरौली सुपर थर्मल पॉवर प्रोजेक्ट, तृतीय चरण में **2X800** मेगावाट विद्युत उत्पादन हेतु प्लाण्ट की स्थापना के लिये परियोजना की पर्यावरणीय स्वीकृति के सन्दर्भ में पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार की अधिसूचना सं0–एस0ओ0 1533 दिनांक 14.09.2006 यथासंशोधित एस0ओ0 3067 ई दिनांक 01.12.2009 में वर्णित प्राविधानों के अनुसार राज्य बोर्ड द्वारा "लोक सुनवाई" की विज्ञप्ति स्थानीय दैनिक समाचार–पत्र हिन्दुस्तान टाइम्स में दिनांक–04.06.2019 एवं दैनिक सामचार–पत्र दैनिक जागरण में दिनांक–05.06.2019 को प्रकाशित कराई गई थी तथा दिनांक–06 जुलाई, 2019 को समीपवर्ती गाँवों चिल्काडाड़, खड़िया, परसवारराजा, कोटा बस्ती एवं तेलगवाँ आदि में लाउड स्पीकर के माध्यम से जन–साधारण से आपत्ति/आक्षेप दिनांक–09.07.2019 तक आमंत्रित किये गये थे। निर्धारित समयावधि के भीतर जन–साधारण से कोई आपत्ति/आक्षेप ज्ञापन प्राप्त नहीं हुए।

लोक सुनवाई की अधिसूचना दिनांक–14 सितम्बर 2006 में वर्णित प्राविधानों के अनुसार "लोक सुनवाई" की कार्यवाही दिनांक–**09.07.2019** को मे0 एन0टी0पी0सी0 लिमिटेड, शक्तिनगर, सोनभद्र के उद्योग परिसर स्थित "**अम्बेडकर भवन**" में पूर्वान्ह 11:00 बजे जिलाधिकारी महोदय, सोनभद्र द्वारा नामित अपर **जिलाधिकारी (वि0/रा0)**, सोनभद्र की अध्यक्षता में प्रारम्भ हुई। सर्वप्रथम **श्री देबाशीष मुख्य महाप्रबन्धक**, एन0टी0पी0सी0, सिंगरौली द्वारा "लोक सुनवाई" में उपस्थित जन–सामान्य का स्वागत करते हुए पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय की पर्यावरणीय प्रभाव मूल्यांकन अधिसूचना दिनांक–14 सितम्बर 2006 के विषय में विस्तृत रूप से अवगत कराया गया।

श्री राधेश्याम, क्षेत्रीय अधिकारी, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, सोनभद्र द्वारा "लोक सुनवाई" के समय उपस्थित जन–सामान्य को परियोजना के विभिन्न पहलुओं के विषय में विस्तृत जानकारी दी गयी तथा अवगत कराया गया कि प्रस्तावित स्थल केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा चिन्हित क्रिटिकली पल्यूटेड क्षेत्र के अन्तर्गत आच्छादित है एवं यहाँ के पर्यावरण सुधार हेतु सिंगरौली एक्शन प्लान को जिलाप्रशासन के सहयोग से कियान्वित किया जा रहा है। पर्यावरणविद् डॉ0 विजय प्रकाश, महा–प्रबन्धक, एन0टी0पी0सी0 द्वारा परियोजना के तकनीकी पहलुओं के विषय में विस्तार से प्रस्तुतिकरण किया गया।

श्री योगेन्द्र बहादुर सिंह, अपर जिलाधिकारी (वि0/रा0), सोनभद्र द्वारा उपस्थित जन–सामान्य को परियोजना के सम्बन्ध में सारांश से अवगत कराया गया तथा उपस्थित जन–सामान्य को आक्षेप/सुझाव हेतु आमन्त्रित किया गया।

लोक सुनवाई के दौरान उपस्थित जन–सामान्य में से श्री पंकज कुमार, निवासी ग्राम–चिल्काडाड़ (रानीबारी), शक्तिनगर, सोनभद्र, श्री राम शुभग शुक्ला, निवासी ग्राम–चिल्काडाड़ (रानीबारी), शक्तिनगर, सोनभद्र, श्री लालजी कुशवाहा पुत्र स्व0 देवमूरत कुशवाहा, स्थानीय निवासी–पुनर्वास कॉलोनी, चिल्काडाड़ बस्ती, शक्तिनगर, सोनभद्र, श्रीमती शान्ती देवी, ग्राम प्रधान, ग्राम पंचायत–कोटा, विकास खण्ड–म्योरपुर, जनपद–सोनभद्र, श्री हेमन्त मिश्र (विस्थापित परिवार सदस्य), श्री ज्वालामुखी मन्दिर, शक्तिनगर, सोनभद्र, श्री

की सहमति व्यक्त की गयी। पुनर्वासित लोगों के साथ बैठक किये जाने के सम्बन्ध में मुख्य महा–प्रबन्धक, एन0टी0पी0सी0 द्वारा आश्वासन दिया गया कि विस्थापित/पुर्नवासित लोगों के साथ बैठक नियमित रूप से किया जायगा।

21. **श्री गोपाल दास दुबे**, तेलगवाँ मध्य प्रदेश द्वारा अवगत कराया गया कि एन0टी0पी0सी0 द्वारा कराये गये सी0एस0आर0 सम्बन्धित कार्यों की सराहना करते हैं तथा सी0एस0आर0 सम्बन्धित कार्य के सम्बन्ध में स्थानीय जनता की भागीदारी है।

22. **श्री हीरालाल** चिल्काडाड़ शक्तिनगर द्वारा अवगत कराया गया कि विस्थापित परिवार/स्थानीय निवासी लगभग 40 वर्षों से तमाम तरह की समस्याओं से जूझ रहे हैं किन्तु एन0टी0पी0सी0 द्वारा उनकी समस्याओं का निराकरण नहीं किया जा रहा है। तत्क्रम में बिजली, चिकित्सा, शिक्षा, पेयजल, की उत्तम व्यवस्था सुनिश्चित कराये जाने तथा विस्थापित परिवारों को रोजगार देने की माँग करते हुए यूनिट स्थापित करने की सहमति व्यक्त की गयी।

23. **श्री मनोनीत रवि**, चिल्काडांड़ द्वारा मुख्य रूप से कथन किया गया कि एन0टी0पी0सी0 द्वारा निकलने वाले रसायनों के प्रभाव से क्षेत्र में प्रदूषण व्याप्त हो गया है, जिससे भयंकर बीमारियां जैसे मिर्गी, असमय बाल झड़ना व अन्य प्रकार की बीमारियां फैली हुई हैं। इसी तरह रिहन्द बाँध में विषैले रसायनों के प्रवाह से भू–गर्भ जल दूषित हो गया है, जिसे पीने से क्षेत्रीय निवासी बीमार हो रहे हैं। उक्त साथ यह भी अवगत कराया गया कि एन0टी0पी0सी0 बीजपुर द्वारा स्थानीय निवासियों/विस्थापितों को बिजली की सुविधा मुहैया करायी जा रही है किन्तु एन0टी0पी0सी0 शक्तिनगर द्वारा विस्थापित परिवारों को बिजली मुहैया नहीं करायी जा रही है। विस्थापित परिवार उ0प्र0 विद्युत बोर्ड से बिजली लेने को विवश हैं। तत्क्रम में बिजर्ली, चिकित्सा, शिक्षा, पेयजल, की व्यवस्था सुनिश्चित कराये जाने तथा विस्थापित परिवारों को रोजगार देने की माँग करते हुए यूनिट स्थापित करने की सहमति व्यक्त की गयी।

<u>लोकसुनवाई में उपस्थित जनसामान्य द्वारा उठाये गये विभिन्न प्रश्नों के परिपेक्ष्य में परियोजना प्रस्तावकों से लिखित रूप से प्रमुख बिन्दुओं पर निम्नवत् उत्तर प्राप्त हुआ है:–</u>

1. **<u>विस्थापितों की समस्या–</u>** इस परियोजना के विस्तार में जमीन अधिग्रहण नहीं किया जा रहा है इसलिए विस्थापन की कोई समस्या नहीं है ।
2. **<u>वृक्षारोपण</u>** – वन विभाग अनपरा क्षेत्र के साथ 10 साल तक समझौता के तहत प्रति वर्ष 35000 पौधे रोपित किए जा रहे है। इसके अलावा जन सुझाव को ध्यान में रखते हुए पीपल, बरगद और पाकंड के पौधे प्राथमिकता के आधार लगाए जाएंगें और ग्रामीण जनों को भी पौधे वितरित किए जाएंगें। सन 1983 से अभी तक 16 लाख पौधें का रोपण किया जा चुका है जिसमें परियोजना के 7 किमी के क्षेत्र में ऐश डाईक, एमजीआर, हेलीपैड, परियोजना परिसर, आवासीय कालोनी, स्माल हाईड्रो एरिया सोलर प्लांट इत्यादि स्थानों पर पौधे लगाए गए है । इसमें लगभग 80 प्रतिशत पौधे वर्तमान में भी जीवित हैं।
3. **<u>उद्योग से जनित राख के निस्तारण की समस्या –</u>** प्रस्तावित परियोजना नवीनतम तकनीकी पर आधारित है। इसमें राख कम उत्पन्न होगी। उत्पन्न राख निस्तारण के लिए एनसीएल गोरबी माइंस के साथ समझौता किया जा रहा है । वर्तमान में 35 प्रतिशत राख का उपयोग विभिन्न क्षेत्रों जैसे राख ईट निर्माण, राख बॉध निर्माण की उचाई बढाने में एवं राख उपयोगकर्ता कंपनियों को देना, भूमि भराव आदि उद्देश्यो में किया जा रहा है। अन्य क्षेत्रों जैसे एनएचएआई इत्यादि में राख उपयोग के प्रयास जारी हैं। शत प्रतिशत राख उपयोग खदान के राख भराव के प्रावधान किए जा रहे हैं।

को निराकरण करने एवं विस्थापितों को नियमानुसार सुविधा देने का दायित्व उद्योग के स्वयं का होता है। यदि उद्योग जन–सामान्य से प्रदूषण सम्बन्धी प्राप्त शिकायतें का निस्तारण कर लेता है तो उद्योग के क्षमता विस्तार में कोई रूकावट नही आयेगी। अध्यक्ष महोदय द्वारा इस बात पर प्रसन्नता व्यक्त की गयी कि जन–सामान्य में पर्यावरण के प्रति जन–जागरूकता बढ़ रही है तथा कोई भी उद्योग पर्यावरणीय मानकों की अनदेखी नहीं कर सकता है।

मुख्य महाप्रबन्धक, एन0टी0पी0सी0 द्वारा उत्पादन निगम की तरफ से जन–सामान्य की प्रदूषण सम्बन्धी आशंकाओं को दूर करने का आश्वासन दिया गया तथा सभी लोगों से उद्योग के क्षमता विस्तार में सहयोग करने की अपील की गयी।

उपरोक्त विचारो, सुझाओं, टिप्पणीयों एवं आपत्तियों के अतिरिक्त दैनिक समाचार–पत्रों में आम–सूचना जारी होने के उपरान्त से "लोक सुनवाई" की तिथि तक एवं लोक सुनवाई के दौरान प्रस्तावित परियोजना के सम्बन्ध में अन्य कोई लिखित एवं मौंखिक आपत्तियाँ प्राप्त नहीं हुई हैं। अन्त में अध्यक्ष महोदय द्वारा सभी उपस्थित गणमान्य नागरिकों को धन्यवाद देकर "लोक सुनवाई" की कार्यवाही पूर्ण करने की घोषणा की गयी।

उपरोक्तानुसार "लोक सुनवाई" की कार्यवृत्ति एवं वीडियो रिकार्डिंग की सी0डी. आपके अवलोकनार्थ एवं सादर प्रस्तुत है।

09/7/19

(राधेश्याम)
क्षेत्रीय अधिकारी,
उ0प्र0 प्रदूषण नियंत्रण बोर्ड
सोनभद्र।

9.7.19

(योगेन्द्र बहादुर सिंह)
अपर जिलाधिकारी(वि0/रा0)
सोनभद्र।

Forwarded.

10/07/19

जिलाधिकारी महोदय,

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मे0 एन0टी0पी0सी0 लिमिटेड, शक्तिनगर, सोनभद्र में सिंगरौली सुपर थर्मल पॉवर प्रोजेक्ट, तृतीय चरण में 2X800 मेगावाट विद्युत उत्पादन हेतु प्लाण्ट की स्थापना के लिये परियोजना की पर्यावरणीय स्वीकृति के सन्दर्भ में दिनांक 09.07.2019 को अपर जिलाधिकारी (वि0/रा0), जनपद–सोनभद्र की अध्यक्षता में सम्पन्न हुई "लोक सुनवाई" का कार्यवृत्त।

मे0 एन0टी0पी0सी0 लिमिटेड, शक्तिनगर, सोनभद्र में सिंगरौली सुपर थर्मल पॉवर प्रोजेक्ट, तृतीय चरण में **2X800** मेगावाट विद्युत उत्पादन हेतु प्लाण्ट की स्थापना के लिये परियोजना की पर्यावरणीय स्वीकृति के सन्दर्भ में पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार की अधिसूचना सं0–एस0ओ0 1533 दिनांक 14.09.2006 यथासंशोधित एस0ओ0 3067 ई दिनांक 01.12.2009 में वर्णित प्राविधानों के अनुसार राज्य बोर्ड द्वारा "लोक सुनवाई" की विज्ञप्ति स्थानीय दैनिक समाचार–पत्र हिन्दुस्तान टाइम्स में दिनांक–04.06.2019 एवं दैनिक सामचार–पत्र दैनिक जागरण में दिनांक–05.06.2019 को प्रकाशित कराई गई थी तथा दिनांक–06 जुलाई, 2019 को समीपवर्ती गाँवों चिल्काडाड़, खड़िया, परसवारराजा, कोटा बस्ती एवं तेलगवाँ आदि में लाउड स्पीकर के माध्यम से जन–साधारण से आपत्ति/आक्षेप दिनांक–09.07.2019 तक आमंत्रित किये गये थे। निर्धारित समयावधि के भीतर जन–साधारण से कोई आपत्ति/आक्षेप ज्ञापन प्राप्त नहीं हुए।

लोक सुनवाई की अधिसूचना दिनांक–14 सितम्बर 2006 में वर्णित प्राविधानों के अनुसार "लोक सुनवाई" की कार्यवाही दिनांक–**09.07.2019** को मे0 एन0टी0पी0सी0 लिमिटेड, शक्तिनगर, सोनभद्र के उद्योग परिसर स्थित "**अम्बेडकर भवन**" में पूर्वान्ह 11:00 बजे जिलाधिकारी महोदय, सोनभद्र द्वारा नामित अपर **जिलाधिकारी (वि0/रा0)**, सोनभद्र की अध्यक्षता में प्रारम्भ हुई। सर्वप्रथम **श्री देबाशीष मुख्य महाप्रबन्धक**, एन0टी0पी0सी0, सिंगरौली द्वारा "लोक सुनवाई" में उपस्थित जन–सामान्य का स्वागत करते हुए पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय की पर्यावरणीय प्रभाव मूल्यांकन अधिसूचना दिनांक–14 सितम्बर 2006 के विषय में विस्तृत रूप से अवगत कराया गया।

श्री राधेश्याम, क्षेत्रीय अधिकारी, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, सोनभद्र द्वारा "लोक सुनवाई" के समय उपस्थित जन–सामान्य को परियोजना के विभिन्न पहलुओं के विषय में विस्तृत जानकारी दी गयी तथा अवगत कराया गया कि प्रस्तावित स्थल केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा चिन्हित क्रिटिकली पल्यूटेड क्षेत्र के अन्तर्गत आच्छादित है एवं यहाँ के पर्यावरण सुधार हेतु सिंगरौली एक्शन प्लान को जिलाप्रशासन के सहयोग से कियान्वित किया जा रहा है। पर्यावरणविद् डॉ0 विजय प्रकाश, महा–प्रबन्धक, एन0टी0पी0सी0 द्वारा परियोजना के तकनीकी पहलुओं के विषय में विस्तार से प्रस्तुतिकरण किया गया।

श्री योगेन्द्र बहादुर सिंह, अपर जिलाधिकारी (वि0/रा0), सोनभद्र द्वारा उपस्थित जन–सामान्य को परियोजना के सम्बन्ध में सारांश से अवगत कराया गया तथा उपस्थित जन–सामान्य को आक्षेप/सुझाव हेतु आमन्त्रित किया गया।

लोक सुनवाई के दौरान उपस्थित जन–सामान्य में से श्री पंकज कुमार, निवासी ग्राम–चिल्काडाड़ (रानीबारी), शक्तिनगर, सोनभद्र, श्री राम शुभग शुक्ला, निवासी ग्राम–चिल्काडाड़ (रानीबारी), शक्तिनगर, सोनभद्र, श्री लालजी कुशवाहा पुत्र स्व0 देवमूरत कुशवाहा, स्थानीय निवासी–पुनर्वास कॉलोनी, चिल्काडाड़ बस्ती, शक्तिनगर, सोनभद्र, श्रीमती शान्ती देवी, ग्राम प्रधान, ग्राम पंचायत–कोटा, विकास खण्ड–म्योरपुर, जनपद–सोनभद्र, श्री हेमन्त मिश्र (विस्थापित परिवार सदस्य), श्री ज्वालामुखी मन्दिर, शक्तिनगर, सोनभद्र, श्री

की सहमति व्यक्त की गयी। पुनर्वासित लोगों के साथ बैठक किये जाने के सम्बन्ध में मुख्य महा–प्रबन्धक, एन0टी0पी0सी0 द्वारा आश्वासन दिया गया कि विस्थापित/पुर्नवासित लोगों के साथ बैठक नियमित रूप से किया जायगा।

21. **श्री गोपाल दास दुबे**, तेलगवाँ मध्य प्रदेश द्वारा अवगत कराया गया कि एन0टी0पी0सी0 द्वारा कराये गये सी0एस0आर0 सम्बन्धित कार्यों की सराहना करते हैं तथा सी0एस0आर0 सम्बन्धित कार्य के सम्बन्ध में स्थानीय जनता की भागीदारी है।

22. **श्री हीरालाल** चिल्काडाड़ शक्तिनगर द्वारा अवगत कराया गया कि विस्थापित परिवार/स्थानीय निवासी लगभग 40 वर्षों से तमाम तरह की समस्याओं से जूझ रहे हैं किन्तु एन0टी0पी0सी0 द्वारा उनकी समस्याओं का निराकरण नहीं किया जा रहा है। तत्क्रम में बिजली, चिकित्सा, शिक्षा, पेयजल, की उत्तम व्यवस्था सुनिश्चित कराये जाने तथा विस्थापित परिवारों को रोजगार देने की माँग करते हुए यूनिट स्थापित करने की सहमति व्यक्त की गयी।

23. **श्री मनोनीत रवि**, चिल्काडांड़ द्वारा मुख्य रूप से कथन किया गया कि एन0टी0पी0सी0 द्वारा निकलने वाले रसायनों के प्रभाव से क्षेत्र में प्रदूषण व्याप्त हो गया है, जिससे भयंकर बीमारियां जैसे मिर्गी, असमय बाल झड़ना व अन्य प्रकार की बीमारियां फैली हुई हैं। इसी तरह रिहन्द बाँध में विषैले रसायनों के प्रवाह से भू–गर्भ जल दूषित हो गया है, जिसे पीने से क्षेत्रीय निवासी बीमार हो रहे हैं। उक्त साथ यह भी अवगत कराया गया कि एन0टी0पी0सी0 बीजपुर द्वारा स्थानीय निवासियों/विस्थापितों को बिजली की सुविधा मुहैया करायी जा रही है किन्तु एन0टी0पी0सी0 शक्तिनगर द्वारा विस्थापित परिवारों को बिजली मुहैया नहीं करायी जा रही है। विस्थापित परिवार उ0प्र0 विद्युत बोर्ड से बिजली लेने को विवश हैं। तत्क्रम में बिजली, चिकित्सा, शिक्षा, पेयजल, की व्यवस्था सुनिश्चित कराये जाने तथा विस्थापित परिवारों को रोजगार देने की माँग करते हुए यूनिट स्थापित करने की सहमति व्यक्त की गयी।

<u>लोकसुनवाई में उपस्थित जनसामान्य द्वारा उठाये गये विभिन्न प्रश्नों के परिपेक्ष्य में परियोजना प्रस्ताबकों से लिखित रूप से प्रमुख बिन्दुओं पर निम्नवत् उत्तर प्राप्त हुआ है:–</u>

1. **<u>विस्थापितों की समस्या–</u>** इस परियोजना के विस्तार में जमीन अधिग्रहण नहीं किया जा रहा है इसलिए विस्थापन की कोई समस्या नहीं है ।
2. **<u>वृक्षारोपण</u>** – वन विभाग अनपरा क्षेत्र के साथ 10 साल तक समझौता के तहत प्रति वर्ष 35000 पौधे रोपित किए जा रहे है। इसके अलावा जन सुझाव को ध्यान में रखते हुए पीपल, बरगद और पाकड के पौधे प्राथमिकता के आधार लगाए जाएंगें और ग्रामीण जनों को भी पौधे वितरित किए जाएंगें। सन 1983 से अभी तक 16 लाख पौधें का रोपण किया जा चुका है जिसमें परियोजना के 7 किमी के क्षेत्र में ऐश डाईक, एमजीआर, हेलीपैड, परियोजना परिसर, आवासीय कालोनी, स्माल हाईड्रो एरिया सोलर प्लांट इत्यादि स्थानों पर पौधे लगाए गए है । इसमें लगभग 80 प्रतिशत पौधे वर्तमान में भी जीवित हैं।
3. **<u>उद्योग से जनित राख के निस्तारण की समस्या –</u>** प्रस्तावित परियोजना नवीनतम तकनीकी पर आधारित है। इसमें राख कम उत्पन्न होगी। उत्पन्न राख निस्तारण के लिए एनसीएल गोरबी माइंस के साथ समझौता किया जा रहा है । वर्तमान में 35 प्रतिशत राख का उपयोग विभिन्न क्षेत्रों जैसे राख ईट निर्माण, राख बॉध निर्माण की उचाई बढाने में एवं राख उपयोगकर्ता कंपनियों को देना, भूमि भराव आदि उद्देश्यो में किया जा रहा है। अन्य क्षेत्रों जैसे एनएचएआई इत्यादि में राख उपयोग के प्रयास जारी हैं। शत प्रतिशत राख उपयोग खदान के राख भराव के प्रावधान किए जा रहे हैं।

4. <u>समीपवर्ती गॉव में बिजली की आपूर्ति की समस्या</u> –

- एनटीपीसी द्वारा विद्युत उत्पादन किया जाता है। वितरण का कार्य उ0प्र0 बोर्ड द्वारा किया जाता है। इसके बावजूद जन प्रतिनिधियों जैसे सांसद/ विधायक/ग्राम प्रधान एवं जनता की आवश्यकताओं के अनुरुप चिल्काडॉड़, परसवार राजा, कोटा, भैरवां, मिश्रा, इत्यादि गॉवों में सार्वजनिक स्थानों पर सोलर स्ट्रीट लाइट की स्थापना।
- प्रारम्भ में भारत सरकार की विद्युतीकरण योजना के अनुसार 05 किमी के दायरे में एनटीपीसी द्वारा इन्फ्रास्टैक्चर की व्यवस्था की गई थी। अब यह स्कीम भारत सरकार द्वारा बन्द कर दी गई है।

5. <u>सी0एस0 आर0 बजट का निर्धारण एवं व्यय</u>–

- समय–समय पर स्वतंत्र एजेंसी द्वारा परियोजना समीपवर्ती गॉवो/एरिया में नीड एसेसमेन्ट सर्वे और परसेप्सन स्टडी के माध्यम से।
- सांसद, विधायक, ग्राम प्रधानों प्रतिनिधियों एवं जनता की आवश्यकताओं के मद्देनजर।
- जिला प्रशासन द्वारा निर्देशित कार्य
- उक्त कार्यो के लिए वर्ष 2017–18 में रु0 456 लाख का बजट स्वीकृत था।
- जिसमें से लगभग रु0 388 लाख का कार्य पूर्ण किया जा चुका है और लगभग रु0 68 लाख का कार्य प्रगति पर है *(कार्य का विवरण संलग्न है)*।
- उक्त कार्यो के लिए वर्ष 2018–19 में रु0 405 लाख का बजट स्वीकृत था। जिसमें से लगभग रु0 185 लाख का कार्य पूर्ण किया जा चुका है और लगभग रु0 220 लाख का कार्य प्रगति पर है *(कार्य का विवरण संलग्न है)*।
- उक्त कार्यो के लिए वर्ष 2019–20 में रु0 650 लाख का बजट स्वीकृत था, जिसमें से लगभग रु0 60 लाख का कार्य पूर्ण किया जा चुका है और लगभग रु0 590 लाख के कार्य के लिए प्रस्ताव बन रहा है *(कार्य का विवरण संलग्न है)*।

6. <u>समीपवर्ती गाँव में स्वास्थ्य सेवाओं के सम्बन्ध में कृत कार्यवाही</u>–

- परियोजना समीपवर्ती विस्थापित गॉवों की जनता एवं ग्रामीण विद्यालयों के बच्चों के लिए एक निश्चित अंतराल पर एनटीपीसी के डॉक्टर एवं पैरामेडिकल स्टाफ के साथ मोबाइल चिकित्सा कैम्प की व्यवस्था एवं निःशुल्क दवाओं का वितरण।
- परियोजना समीपवर्ती विस्थापित गॉवों की जनता के लिए बड़े स्वास्थ्य कैंपो का जैसे– मेगा आई कैंप, कैंसर डिटेक्शन कैंप, जच्चा– बच्चा जागरुकता शिविर, हृदय रोग इत्यादि चिकित्सा शिविरों का आयोजन एवं समस्त रोगियों को उपचार और दवा का वितरण।
- एनटीपीसी सिंगरौली द्वारा परियोजना समीपवर्ती गॉवों में डाट्स की एम्बूलेंस जाकर टीबी जैसी घातक बिमारी के बारे में लोगों को जागरुक करना और उन्हें अपने अस्पताल के माध्यम से उनकी जॉच और उपचार निःशुल्क किया जाता है।
- जिला प्रशासन के निर्देश पर प्राथमिक स्वास्थ्य केन्द्र, शाहगंज एवं सामूदायिक स्वास्थ्य केन्द्र, घोरावल का रंगाई, पुताई, खिड़की, दरवाजों की मरम्मत, यात्री शेड के लिए बजट स्वीकृत।
- भविष्य में भी हम सामाजिक ज़रुरतो को देखते हुए व जिला प्रशासन की निर्देशों का पालन करते हुए उक्त सभी चिकित्सा शिविरों को लगाने का कार्य करते रहेंगे।

7. <u>खेल–कूद के सम्बन्ध में कृत कार्यवाही –</u>

- जिला प्रशासन के निर्देशानुसार तीरन्दाजी प्रतियोगिता की स्पोन्सरशिप में रु0 20 लाख का अनुदान किया गया।

- ग्रामीण खेल–कूद प्रतियोगिता के लिए अन्तर स्कूल प्रतियोगितायें समय–समय पर कराई जाती है।

8. उद्योग द्वारा शिक्षा से सम्बन्धित प्रदान किये जाने वाले सेवाओं का विवरण–

- आस–पास के ग्रामीण विद्यालयों में बैग और स्टेशनरी का वितरण।
- समय–समय पर ड्यूवल डेस्क, टेबल, चेयर की व्यवस्था।
- विद्यालय के भवनों का निर्माण।
- जिला प्रशासन के निर्देश पर कस्तुरबा गांधी आवासीय बालिका विद्यालय का नवीनीकरण एवं बाउन्ड्री वाल का निर्माण।
- बालिका सशक्तीकरण अभियान के अन्तर्गत वर्ष 2018 से प्रतिवर्ष लगभग 125 बालिकाओं का शिक्षा एवं अन्य गतिविधियों सम्बन्धी एक महीने का आवासीय प्रशिक्षण ।
- ग्रामीण निरक्षर महिलाओं को साक्षर बनाने हेतु प्रौढ़ शिक्षा का संचालन।
- जिला प्रशासन के निर्देश पर वनवासी गिरिवासी सेवा प्रकल्प, घोरावल में हास्टल एवं किचन के निर्माण के लिए बजट स्वीकृत।
- जिला प्रशासन के निर्देश पर जनता इंटर कालेज में शिक्षण कक्षों के लिए बजट स्वीकृत।

9. उद्योग द्वारा समीपवर्ती बेरोजगार युवकों/युवतियों को दी जाने वाली ट्रेनिंग का विवरण –

- पूर्व में युवको– युवतियों को विविध प्रशिक्षण जैसे– पूर्व में सिलाई प्रशिक्षण के बाद लगभग 150 महिलाओं को सिलाई मशीन भी वितरित की गई। निकटवर्ती गावों के युवको– युवतियों को मशरुम की खेती, बैग मेकिंग, सलवार सूट बनाने का प्रशिक्षण, कम्प्यूटर प्रशिक्षण, क्वालिटी सर्किल का प्रशिक्षण, इलेक्ट्रीशियन, ब्यूटीशियन, मोटर रिवाईंडिंग इत्यादि का प्रशिक्षण दिया गया। वर्तमान सुझावों को ध्यान में रखते हुए उन्हें अन्य हाई स्किल्ड ट्रेनिंग दिया जा सकता है।
- कम्प्यूटर प्रशिक्षण युवक/युवतियों के लिए निःशुल्क प्रदान की जाती है। इसके चयन की प्रकिया में निम्नलिखित प्राथमिकतायें है:–

(क) आवेदक को अध्ययनरत होना चाहिए और 12वीं कक्षा में कम से कम 50 प्रतिशत प्राप्तांक होना चाहिए किन्तु आवेदकों का चयन कक्षा 12वीं में प्राप्त प्राप्तांकों के वरियता क्रम से किया जाएगा। आवेदक के परिवार की कुल वार्षिक आय रु0 100000.00 (एक लाख रुपये) से कम होनी चाहिए।

(ख) प्रवेश में दिव्यांग/बालिका/विस्थापित परिवार के सदस्य/एससी/एसटी/ओबीसी अभ्यर्थियों को अंको की समानता होने पर प्राथमिकता दी जायेगी।

(ग) एनटीपीसी/एनसीएल/पोस्ट ऑफिस/बैंक/सरकारी संयंत्रों/संस्थानों में कार्यरत कर्मचारियों के बच्चों के उपर विचार नही किया जाएगा।

(घ) कम्प्यूटर प्रशिक्षण प्रत्येक वर्ष 25 लोगों को दिया जाता था, परन्तु 2018–19 में 35 लोगों को दिया गया है और इस प्रकार की स्कीम भविष्य में भी जारी रहेगी।

10. पेयजल आपूर्ति के सम्बन्ध में कृत कार्यवाही का विवरण :–

- एनजीटी एवं जिला प्रशासन के निर्देश पर चिल्काडॉड गॉव में 04 और परसवार राजा गॉव में 02 आर ओ प्लाण्टों का संचालन एवं अनुरक्षण समय–समय पर किया जा रहा है।
- परसवार राजा गॉव में इन्ट्रीग्रेटेड पाईप लाईन वाटर सप्लाई सीस्टम और इसके प्रचालन एवं अनुरक्षण के लिए यूपी जल निगम द्वारा 03 साल का करार किया गया है।
- इसके अलावा एनजीटी के निर्देश पर परसवार राजा गॉव में टैंकर द्वारा पीने योग्य पानी की आपूर्ति भी की जा रही है।

11. <u>चिल्काडॉड़ गॉव में आवागमन एवं ओवर वर्डेन की समस्या के सम्बन्ध में:</u>–चिल्काडॉड गॉव में आवागमन के लिए जिला प्रशासन द्वारा उचित समाधान प्रदान करने के लिए सभी पक्षों के साथ बैठक की गई है, क्योकि चिल्काडॉड़ गॉव में ओवर वर्डन की समस्या एनसीएल द्वारा कोयला खदान से उत्पन्न हुई है। इसलिए इस विषय में जिला प्रशासन द्वारा एक तकनीकी कमेटी बनाई गई है जिसमें एनसीएल को समस्या के समाधान हेतु जरुरी दिशा निर्देश जारी किये गये है।

12. <u>एलीफैन्ट कॉरीडोर प्रकरण–</u> दुद्धीचुऑ संरक्षित (Protected) क्षेत्र का **EIA (Environmental Impact Assesssment)** में जिक्र किया गया है। इसमें यह स्पष्ट करना है कि एलीफैन्ट कॉरीडोर प्रस्तावित यूनिट के 10 किमी के दायरे में नहीं है।

13. <u>जेएमई कालोनी के सीवेज ट्रीटमेन्ट के संबंध में कृत कार्यवाही का विवरण</u> –जेएमई कालोनी के सीवेज ट्रीटमेन्ट के बहाव के संदर्भ में बताना है कि जेएमई के सीवेज के ट्रीटमेन्ट के लिए आक्सीडेशन पॉन्ड है जिससे सीवेज का उपचार किया जाता है और बन्द पाईप द्वारा जेएमई से आक्सीडेशन पॉन्ड तक सीवेज जाता है। बाहर बस स्टैण्ड या कही अन्यत्र से आने वाले अपशिष्ठ का बहाव एनटीपीसी के कार्य क्षेत्र में नही आता है।

14. <u>बलिया नाले से प्रवाहित होने वाले प्रदूषित/काले पानी के संबंध में</u>– बलिया नाला से होकर गुजरने वाला गन्दे/काले पानी का जिक्र किया गया है, जिसमें यह स्पष्ट करना है कि बलियानाला का गन्दा पानी एनसीएल के अपस्ट्रीम से आता है। अतः यह एनटीपीसी सिंगरौली से संबंधित नहीं है।

15. <u>स्थानीय/विस्थापित लोगों को रोजगार मुहैया कराये जाने के सम्बन्ध में कृत कार्यवाही का विवरण</u>– अब जो नई यूनिट आने वाली है उसमें आधुनिक तकनिकी का इस्तेमाल हो रहा है और एनटीपीसी में स्थाई नियुक्ति के लिए पीएसयू संस्था द्वारा ओपेन वैंकेन्सी निकालकर भर्ती ली जाती है। वर्तमान में जो कान्ट्रैक्टरिंग एजेंसी है उनमें ढेर सारे पीएपी को काम मिला है। पीएपी कान्ट्रक्टरों को संविदा कार्य के रुप में चिन्हित संविदा का कार्य दिया जाता है। इसके साथ ही पीएपी के लोगों की जीप एनटीपीसी में संविदा के रुप में लगाई गई है। नई यूनिट के संचालन में निकटवर्ती गावों के नौजवानों के लिए ढेर सारी ऐजेंसीज के कार्यो में रोजगार के अवसर उपलब्ध होंगें ।

16. <u>एन0आई0टी0 में स्थानीय लोगो के लिए रोजगार के प्राविधान के संबंध में–</u>

- नई यूनिट लगाने के लिए वैश्विक स्तर पर टेंडर किया जाता है जिसमे नियम एवं शर्ते निर्धारित होती है।
- नई यूनिट के आने से रोजगार की संभावनाएं बढती हैं जिसका लाभ अंततः स्थानीय जनसमुदाय को मिलता है ।

अन्त में अपर जिलाधिकारी (वित्त एवं राजस्व) द्वारा अपने अध्यक्षीय भाषण में उपस्थित सभी जन–प्रतिनिधियों, अधिकारियों एवं जन–सामान्य को धन्यवाद देते हुए अपना मत व्यक्त किया। अध्यक्ष महोदय द्वारा जानकारी दी गयी कि शासन द्वारा संतुलित विकास को दृष्टिगत रखते हुए यह व्यवस्था की है कि ऐसी परियोजनाओं को लगाये जाने से पूर्व प्रत्यक्ष एवं परोक्ष रूप से प्रभावित होने वाले जन–सामान्य का मत जानने हेतु "लोक सुनवाई" की कार्यवाही की जाती है। इस कार्यवाही के माध्यम से जन–सामान्य से प्राप्त आपत्तियों, टिप्पणीयों एवं उद्योग द्वारा समस्या के निराकरण की दिशा में किए गये प्रयासों को लिपिबद्व करके विडियों रिकार्डिंग के साथ स्टेट लेवल इन्वायरमेन्टल इम्पैक्ट एसेसमेन्ट अथॉरिटी/पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार को परियोजना के सम्बन्ध में अग्रिम निर्णय लेने हेतु प्रेषित किया जाता है। वहाँ पर पर्यावरण के क्षेत्र में अनुभवी तथा पारगंत अधिकारियों द्वारा पर्यावरण के सभी पहलुओं का अध्ययन करने के उपरान्त ही उद्योग की क्षमता में विस्तार करने हेतु पर्यावरणीय स्वीकृति दी जायेगी। उद्योग से होने वाले प्रदूषण

को निराकरण करने एवं विस्थापितों को नियमानुसार सुविधा देने का दायित्व उद्योग के स्वयं का होता है। यदि उद्योग जन–सामान्य से प्रदूषण सम्बन्धी प्राप्त शिकायतें का निस्तारण कर लेता है तो उद्योग के क्षमता विस्तार में कोई रूकावट नही आयेगी। अध्यक्ष महोदय द्वारा इस बात पर प्रसन्नता व्यक्त की गयी कि जन–सामान्य में पर्यावरण के प्रति जन–जागरूकता बढ़ रही है तथा कोई भी उद्योग पर्यावरणीय मानकों की अनदेखी नहीं कर सकता है।

मुख्य महाप्रबन्धक, एन0टी0पी0सी0 द्वारा उत्पादन निगम की तरफ से जन–सामान्य की प्रदूषण सम्बन्धी आशंकाओं को दूर करने का आश्वासन दिया गया तथा सभी लोगों से उद्योग के क्षमता विस्तार में सहयोग करने की अपील की गयी।

उपरोक्त विचारो, सुझाओं, टिप्पणीयों एवं आपत्तियों के अतिरिक्त दैनिक समाचार–पत्रों में आम–सूचना जारी होने के उपरान्त से "लोक सुनवाई" की तिथि तक एवं लोक सुनवाई के दौरान प्रस्तावित परियोजना के सम्बन्ध में अन्य कोई लिखित एवं मौंखिक आपत्तियाँ प्राप्त नहीं हुई हैं। अन्त में अध्यक्ष महोदय द्वारा सभी उपस्थित गणमान्य नागरिकों को धन्यवाद देकर "लोक सुनवाई" की कार्यवाही पूर्ण करने की घोषणा की गयी।

उपरोक्तानुसार "लोक सुनवाई" की कार्यवृत्ति एवं वीडियो रिकार्डिंग की सी0डी. आपके अवलोकनार्थ एवं सादर प्रस्तुत है।

09/7/19

(राधेश्याम)
क्षेत्रीय अधिकारी,
उ0प्र0 प्रदूषण नियंत्रण बोर्ड
सोनभद्र।

9.7.19

(योगेन्द्र बहादुर सिंह)
अपर जिलाधिकारी(वि0/रा0)
सोनभद्र।

Forwarded.

10/07/19

जिलाधिकारी महोदय,

मेसर्स सिंगरौली सुपर थर्मल पॉवर प्रोजेक्ट, चरण–III में 2X800 मेगावाट विद्युत उत्पादन हेतु प्लाण्ट की स्थापना के लिये प्रस्तावित परियोजना के पर्यावरणीय स्वीकृति हेतु स्थापना से पूर्व ई0आई0ए0 नोटिफिकेशन दिनांक–14.09.2006 के प्राविधान एवं यथासंशोधित दिनांक–01.12.2009 के अनुसार दि0--**09.07.2019** को पूर्वान्ह 11:00 बजे मे0 एन.टी.पी.सी. लिमिटेड, शक्तिनगर, जनपद–सोनभद्र के अम्बेडकर भवन में पर्यावरणीय स्वीकृति हेतु लोकसुनवाई के दौरान अधिकारियों / कर्मचारियों, एवं क्षेत्रीय आम नागरिकों की उपस्थिति का विवरण :–

क्र0 सं0	नाम सर्वश्री	पदनाम एवं विभाग / पता	हस्ताक्षर
1	Yogendra Bahadur Singh	A.D.M (Sonbhadra)	
2	Debashis Sen	CGM Singrauli	[signature]
3	Vijay Prakash	GM (EMM)	Vijay Prakash
4	Prabhat Kumar	GM (OS), SSTPS	[signature]
5	S. Mathew	GM (M) SSTPS	[signature]
6	S. C. Naik	GM (O) SSTPS	[signature]
7	Radheyshyam	R.O (UPPCB) Regional Officer Sonbhadra	
8	Shiv Bahadur	JE (UPPCB) Sonbhadra	[signature]
9	S. P. Acharya	AGM Env.	[signature]
10	Rajesh Singh SA.	UPPCB Sonbhadra	[signature]
11	बृज बिहारी यादव ग्राम प्रधान प्रतिनिधि पनारी	9451983470	[signature] 09/07/19
12	[illegible] चौबे, परसवार चौबे	8005070334	
13	राम चरण चौबे, परसवार चौबे	9453007761	[signature] 9/7/19
14	गंगाबहादुर चौबे परसवार चौबे	8858838283	[signature] 9-7-19
15	अवध प्रसाद कोटा बस्ती चिल्काडांड	9451627750	[signature]
16	नन्दलाल पूर्व प्रधान मि0 मं0उपा0 BJP	9450165676	[signature]
17	Pankaj Mishra, Adv.,	9839298407	[signature]
18	PANNALAL	9415392718	[signature]

63	AKASH KUMAR GUPTA काकोरी	9519439707	[illegible]
64	Suresh Chand 6 B 297 V.K. [illegible]	8318372557	Chand
65	Dileep Kumar Bhawani Nagar	6307037301	Dileep
66	[illegible]	9453019663	[illegible]
67	रामसेवक	9452647916	रामसेवक
68	[illegible]	9415897208	[illegible]
69	सुरेन्द्र नाथ सिंह	9451626394	[illegible]
70	Pankaj Kumar	7376801542	Pankaj
71	[illegible]	9487246134	[illegible]
72	[illegible]	9455801896	[illegible]
73	Chandra Shekhar, [illegible]	6306672690	Chand
74	Rakesh Kumar Dixit [illegible]	9450162400	[illegible]
75	सीताराम यादव		सीताराम
76	Sohail khan Sivaje Nagar	94156447[illegible]	[illegible]
77	Abid Khan [illegible]	8948482488	[illegible]
78	[illegible]	7450738606	[illegible]
79	Shiv Badan yadav Baliahala	9450787518	शिवबदन यादव
80	Sanjay yadav	7525959839	Sanjay
81	Ram Sakha Patel	9453964282	[illegible]
82	Dinesh Kumar Singh	9415492337	[illegible]
83	[illegible]	9452251035	
84	[illegible]	9452699203	

85	जयप्रकाश कश्यप/सिराथू	7347742414	[signature]
86	बबलू कुमार सावंत तेलियरगंज	8787002117	[signature]
87	रामचन्द्र	8765028711	
88	ज्वाला प्रसाद सोनी	9559143535	Jwala
89	त्रिवेणी राय	9935262043	[signature]
90	रामकेवल यादव, तेलियरगंज	9452186468	[signature]
91	संजय कुमार सिंह	9532166645	Sanjay
92	रामकली कुशवाहा	9532166286	रामकलि
93	शुभमति		
84	Man Mohan Nigam	9452042620	[signature]
85	Rajendra prasad	9451812535	Rajendra
86	सहीकुन		
87	रामरती प्रेमलता		
88	शकुन्तला		
89	करुणाकुमारी		
90	राजकुमारी		
91	उर्मिला देवी		
92	मंजू		
93	प्रमिला		
94	वीर मति		
95	गुड़िया		
96	ममता	9451926507	Mamta

	नाम	पता	हस्ताक्षर
139	Sujeet. MGR	9451593412	sujit
140	लोकनाथ सिंह पलिया नाला		लोकनाथ सिंह
141	मंगल प्रसाद कलेक्टरगंज		
142	रामजी हैरो खां		
143	Satya Prakash	9165636460	[illegible]
144	Narendra Kumar	9889940203	[illegible]
145	Pritam Kumar	8004812730	[illegible]
146	Ramkalesh Yadav	7376353325	
147	Manish Kr. Stoke Pup mne Chhatarpur	7376106584	[illegible]
148	विनोद यादव	9453821115	[illegible]
149	Manoj Kumar Gupta	9455314029	[illegible]
150	Vijay Kumar Sahu	9926770173	[illegible]
151	Rajesh Kumar sah	9826363680	Rajesh
152	आत्माराम		
153	Ashish Kumar Sahu Chhikuduad Bsat SKT	9956621678	Ashish
154	ARJUNKUMAR Kushwaha	800505-75	[illegible]
155	भगवान दास कुशवाहा	9450165077	भगवानदास
156	रविन्द्र पाण्डेय शिवाजी नगर	9005336960	रविन्द्र पाण्डेय
157	रामदयाल पाण्डेय जिला प्रकोष्ठ	9340150915	[illegible]
158	गोपाल दास दुबे समाजसेवक	9826408829	[illegible]
159	शशि यादव	9453699717	शशि यादव
160	गुलेश्वर सोनी (पूर्व ग्राम प्रधान- कोटा)	9452372214	गुलेश्वर सोनी

161	मनोज कुमार सिधपुरवा (1)	9450870778	[signature]
162	चन्दन सिंह	9451245077	[signature]
163	P. d. Pandey. Prem Nagar	9651454669	[signature]
164	दीपनारायण सिंह न्यू कालोनी	9111719702	[signature]
165	[illegible] सिंह, सिधपुरवा	9453007731	[signature]
166	निरज कुमार M.G.R	8604087022	[signature]
167	Sunita chaudhari M.G.R.	6392926809	[signature]
168	Rohit Kumar "	8887735879	[signature]
169	PRABHAT KARMAKAR PREM NAGAR	6388369991	[signature]
170	MD. IMTIYAZ ANSARI Prem Nagar MGR	7376024889	[signature]
171	Anand K. Pandey Bhairwa	8318375850	[signature]
172	ASHISH CHAUBEY Parmwan Chaubey [illegible]	8009259746	[signature]
173	Chiranjeev Chaubey [illegible]	7607708684	[signature]
174	Rashmikant Pandey [illegible]	8765067925	[signature]
175	Udit Narayan Singh	9451632597	[signature]
176	राजकुमार पाण्डेय - [illegible]	9415928193	[signature]
177	दीपक कुमार [illegible] रानी	8005008852	[signature]
178	Prithvi Goutam, Ambedkar Nagar	7376452101	[signature]
179	सत्य कुमार [illegible]	9621888302	[signature]
180	[illegible]		[signature]
181	[illegible]	8004000957	[signature]
182	राजेश कुमार [illegible]	9415729028	[signature]

Public Hearing Advertisement At Telgava Village Madhya Pradesh

Annexure-VIII

भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
क्षेत्रीय कार्यालय (मध्य)
Ministry of Environment, Forest and Climate Change
Regional Office (Central Region)

केन्द्रीय भवन, पंचम तल, सेक्टर–एच, अलीगंज, लखनऊ–226024
Kendriya Bhawan, 5th Floor, Sector-H, Aliganj, Lucknow- 226024, Telefax: 2326696, 2324340, 2324047, 2324025
Email: (Env.) m_env@rediffmail.com, (Forest) goimoefrolko@gmail.com

Speed Post
Dated: 22.11.2019

IV/Env/UP/Th-57/410/2016/405

सेवा में,

महाप्रबंधक एवं विभागाध्यक्ष (इंवायरमेंट इंजीनियरिंग),
मैसर्स नेशनल थर्मल पावर कॉर्पोरेशन विद्युत व्यापार निगम लिमिटेड,
एन.टी.पी.सी भवन, स्कोप कॉम्प्लेक्स,
7 इंस्टीट्यूशनल एरिया, लोधी रोड,नई दिल्ली 110003

विषय: राष्ट्रीय थर्मल पावर कॉरपोरेशन द्वारा सिंगरौली में सुपर थर्मल स्टेशन की स्थापना- अंतिम क्षमता 2000 मेगावाट- प्रमाणित अनुपालन रिपोर्ट हेतु.

पत्र सं0 एवं तिथि: 10/1/1/76-Env. Dated 17.01.1977

Sir,

This is to kindly inform you that a letter was addressed to the **M/s NTPC, Plot No.-A-8A, Sector-24, Post Box No.13, Noida-U.P.-201301** by this office on **05.11.2019** which has been returned due to refusal to accept the letter, therefore the same letter is again being sent to the above mentioned address.

2. Hence, please find enclosed herewith copy of certified compliance report of M/S National Thermal Power Corporation at Singrauli-Ultimate Capacity 2000 MW.

भवदीया

22.11.19

(डॉ. सत्या)
वैज्ञानिक-डी / संयुक्त निदेशक

भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
क्षेत्रीय कार्यालय (मध्य)
Ministry of Environment, Forest and Climate Change
Regional Office (Central Region)

केन्द्रीय भवन, पंचम तल, सेक्टर–एच, अलीगंज, लखनऊ–226024
Kendriya Bhawan, 5th Floor, Sector-H, Aliganj, Lucknow- 226024, Telefax: 2326696, 2324340, 2324047, 2324025
Email: (Env.) m_env@rediffmail.com, (Forest) goimoefrolko@gmail.com

Certified Compliance Report

S.No.	Items	Details
1.	परियोजना का नाम Name of Project	Installation of Super Thermal Station at Singrauli by National Thermal Power Corporation in Central Sector-Ultimate Capacity 2000 MW.
2.	परियोजना प्राधिकारण का पता Address of project authorities	M/s National Thermal Power Corporation Ltd., Plot No.- A-8A, Sector 24, Post Box no. 13, Noida-201301, Uttar Pradesh
3.	पत्र सं0 एवं तिथि Letter no. & Date	10/1/1/76-Env. Dated 17.01.1977
4.	क्षेत्रीय कार्यालय पत्र सं0 Regional Office File no.	IV/Env/UP/Th-57/410/2016
5.	स्थल दौरा तिथि Date of site visit	08.10.2019
6.	परियोजना की स्थिति Status of Project	Operational

7. स्थल दौरा के दौरान अवलोकन/**Observations made during the site visit:** As per discussion during site visit and documents submitted by PA, Singrauli Super Thermal Power Station (STPS) located in Sonebhadra District of UP, is the first Super Thermal Power Station of the country that was Cleared by the Government of India on 8th Dec. 1976, the project began to take shape in early 1978. The first unit of 200 MW was commissioned in Feb.'1982 within 4 years after award of main plant package. Subsequently four more units of 200 MW each were commissioned to complete the first stage. Thereafter two units of 500 MW each were commissioned in Stage II. Thus 2000 MW project was completed by 1987 within 10 years in a green field site. Coal required for this station is taken from Jayant Coal Mines of M/s NCL and water is met from Rihand reservoir. Power generation from NTPC, Singrauli is supplied to all states of Northern Grid. They have obtained CTO for air and water which is valid up to 31.12.2019.

SALIENT FEATURES:

1. Installed capacity: 2000 MW
2. Date of approval from GOI Dept. of Science & Technology : 17.01.1977
3. Source of coal: Jayant block of NCL
4. Source of cooling water: Govind Ballabh Pant Sagar.

5. Units	Capacity	1st synchronization
Unit I	200 MW	13.02.1982
Unit II	200 MW	25.11.1982
Unit III	200 MW	28.03.1983
Unit IV	200 MW	02.11.1983
Unit V	200 MW	26.02.1984
Unit VI	500 MW	23.12.1986
Unit VII	500 MW	24.11.1987

In addition and report submitted by PA, they have provided following pollution control systems and measures:

- Electrostatic Precipitators
- Neutralisation Pits
- Coal Settling Pits
- DE & DS Systems in CHP
- Ash Dykes & Ash Disposal Systems
- Ash Water Recycling System (AWRS)
- Dry Ash Extraction System (DAES)
- Liquid Waste Treatment Plants (LWTP)
- Sewage Treatment Plants & reused system
- Online Stack Monitoring by CEMS
- Online Effluent Monitoring by EQMS
- Online Ambient Air Monitoring by AAQMS
- Afforestation- More than 15.75 lac plantation so far, 50,000 (18-19)
- ISO 14001 certified by BIS

<u>On going activities:</u>

- R&M of ESP to achieve PM below 100 mg/Nm3 as per new norms
- FGD- BID opened on dated 21.10.2019
- DAES in all units
- CW duct replacement

As per submitted stack emission report the value of SO_2 in all units were found high. However, they have also submitted the status with respect to changes in environmental norms and directive from CPCB as below:-

Act Sl	Parameter	Standard	Revised standard for TPP installed before 31st Dec 2003	Time schedule as per CPCB directive	Status
5A	Water Consumption Limit	3.5 m3/MWh with CT (station is with Once	All plants with Once through cooling (OTC) shall install Cooling tower (CT) and achieve water	-	Water consumption is 3.36 M3/MWh. Layout is not feasible for CT (Small Hydro is on CW Channel outfall & water

		through cooling system)	consumption up to maximum of 3.5 M3/MWh		drawn by VSTPP from discharge canal. CPCB has been requested for waive-off CT condition.
25	Particulate matter (SPM)	150 mg/Nm³ revised to achieve 100 mg/Nm³ with time bound programme	100mg/Nm3	U#1: Dec 2021 U#2: Dec 2021 U#3: Aug 2021 U#4: Aug 2021 U#5:Apr 2021 U#6: Feb 2021 U#7: Dec 2020	Work is in progress in all units by M/s BHEL. **Completed work:** U# 1,2,3 (two pass each) U# 4&5 all passes U# 6 (three pass) U# 7 (two pass) Planed to achieve before directed schedule.
	Sulphur Dioxide (SO_2)	Nil	600 mg/Nm3 (200 MW)	U#1: Dec 2021 U#2: Dec 2021 U#3: Aug 2021 U#4: Aug 2021 U#5: Apr 2021	NIT dated 19 Aug 2019 & BID open on dated 21.10.2019 (earlier NIT dated 28 Sept. 2018 could not awarded due to poor response).
		Nil	200 mg/Nm³ (500 MW)	U#6: Feb 2021 U#7: Dec 2020	
	Oxide of Nitrogen (NOx)	Nil	600 mg/Nm³ (200 & 500 MW)	U#1 to 7 By 2022	Complying.
	Mercury (Hg)	Nil	0.03 mg/Nm³ (500 MW)	-	Complying (0.003 to 0.017 mg/Nm3)

Afforestation as reported by PA:

S. No.	Year	No. of plantation	Location of plantation
1	2015-16	10000	VV colony stadium, JME area
2	2016-17	41000	Solar PV plant, helipad area
3	2017-18	50000	Anpara area (Jogendra, Khajura, Ranhor),small hydro, V.V. colony area
4	2018-19	50000	Anpara area (Jogendra, Khajura),CW intake canal area
5	2019-20	45000	Anpara area (Lojhara, Khajura, Ranhor),small hydro area

As per discussion and I nformation submitted by PA during visit, it was found that during inception of Singrauli STPS there was no notification/regulation for EC clearance. However, the approval for installation of Singrauli STPS (2000MW) was accorded by NCEPC, Dept of Science & Technology vide letter dated 17. 01.1977 with the direction that "**Much more thought should be**

given to the problem of adequate disposal of Fly ash and its possible re-use". Though as per observations and discussion held during visit PA has stated that the Singrauli Super Thermal Power Station (STPS) is currently producing about 30-32 lakh tonne ash per annum. Five Bricks Plants (@8000 bricks per day) are in operation for internal use of NTPC. Present Ash Utilization is low mainly because of huge availability of ash in the coal based thermal power plants as reported by PA. Further, it is pithead plant located far away from urban areas, due to which potential for ash utilization in various areas is limited as stated by PA.

As per MoEFCC vide letter no. J-13011/32/92-IA-II (T) dated 27 Oct, 2008; the requirement of additional ash pond area of S-2 dyke for sinrauli STPS in the periphery of the Rihand Reservoir has been considered. As per mentioned letter, STPS has existing dykes covering an area of 630 acres and 400 acres as khadia dyke and S-1 duke respectively. However, Based on the recommendation of the Expert Appraisal Committee for Thermal Power and Coal Mine Project, the Ministry of Environment and Forests hereby approves the 400 acres of additional area as ash disposal with the following conditions:-

1.	**The ash pond shall be lined with impervious lining.**	Ash pond has been lined with impervious lining as reported by PA.
2.	**The ash pond water shall be re-circulated and reused within the plant.**	Ash pond water is being recycled and reused within plant for ash slurry preparation.
3.	**The ash pond (S-2 dyke) shall be located beyond HFL of the Rihand reservoir**	S2 dyke is beyond HFL of Rihand Reservoir as reported by PA.
4.	**The dyke should be so designed so that there shall be no chance of breaching of the dyke at any stage during use and after abandoning.**	They have submitted that the ash dyke has been constructed for Singrauli STPP based on the maximum factor of safety for stability of the ash dyke at different conditions as per IS:7894-1975 code i.e. Steady Seepage and Earthquake conditions. The dyke has been inclined form highest slope to lowest slope to easily make away to flow the slurry water from the toe drain into the lowest point as stated by PA. Therefore, this has helped to flow the slurry water away from the Rihand dam. Thus necessary precautions have been taken in designing of ash dyke to prevent breaching of dyke at any stage of during use and after abandoning as per report submitted by PA.
5.	**There shall be no leakage/seepage horizontally in to the reservoir. If at any stage leakage/seepage is observed, the**	The status of this condition has already been mentioned in previous EC condition. In addition , it has been stated by PA that as the dyke is a

	necessary preventive/mitigative measures shall be deployed immediately to stop leakage/seepage in to the reservoir.	porous structure, it allows a gradual movement of water through its pores. In order to keep the downstream slope dry and stable, a sand chimney and sand blanket are provided to intercept the seepage, if any and channelize the same through the rock toe and toe drain.
6.	It shall be ensured that there is no flooding of the ash dyke area at any point of time during dyke in use and/or after use due to flooding of the area and rising of FRL of the Reservoir.	There is 24x7 monitoring of ash dykes and all necessary precautions have been taken to prevent any flooding of ash dyke area as submitted by PA.

Later on, one another approval was issued from MOEF&CC New Delhi for additional ash disposal area for singrauli STPS of M/S NTPCL with the following conditions:

No.	General Conditions	Compliance Status
1.	NTPC should make arrangements for collection of dry fly ash and loading in respect of all the seven units (5 units of 200 MW) capacity and 2 units of 500 MW capacity each of the Singrauli Super Thermal Power Station.	As per submitted report, due to existence of a large number of thermal power projects (Singrauli STPS, Rihand STPS, Vindhyachal STPP, Anpara TPS & Renusagar Power Corporation) in the Singrauli region and lack of market for ash based products, the scope of ash utilization is limited. Considering the low demand of dry ash/ash based products in the Singrauli Region, dry fly ash extraction system has been provided as per requirement.
2.	The Ash Pond area should be provided with clay liner to avoid groundwater contamination due to leaching. Efforts should be made to minimize encroachment on the submergence area of the Rihand Reservoir.	As per submitted ground water monitoring results, there are no contaminations in ground water observed due to leaching of ash. They have submitted that NTPC conducted a detailed geo-hydrological study for the ash disposal area through University of Roorkee. The study was conducted over a period of 24 months & covered detailed field investigations (geological, geophysical and geohydrological), rock, coal, ash and ground water characterization, leachability of metals from ash and absorption characteristics of soil) and computer modeling of ground water contamination.

		The study recommends that "there is no need for lining of proposed ash ponds for SSTPS either by soil or by synthetic material" as reported by PA. They have stated that, Submergence area of Rihand reservoir has not encroached by NTPC.
3.	**Progressive utilization of fly ash in respect of Singrauli Power Station should be ensured in accordance with the Notification dated 14th September, 1999 regarding Fly Ash Utilization.**	NTPC explored all possible avenues and prepared a practical and workable fly ash utilization plan, submitted to MoEF, Delhi vide letter dated 25.07.98 as mentined by PA. Five Bricks Plants (@8000 bricks per day) are in operation for internal use of NTPC. The PA submitted that due to existence of a large number of thermal power projects (Singrauli STPS, Rihand STPS, Vindhyachal STPP, Anpara TPS & Renusagar Power Corporation) in the Singrauli region and lack of major construction activities and lack of market for ash based products, the scope of ash utilization is limited. Though NTPC has always been giving adequate thrust for ash utilization, it may be appreciated that whatever opportunities exist in the Singrauli area are shared by five thermal power projects, and therefore 100 percent ash utilization (in accordance with the Notification dated 14th September, 1999) is not possible as reported by PA.
4.	**Before charging the ash pond, compliance report on these stipulations should be submitted to the Ministry.**	Compliance of conditions are regularly submitted to regulatory authorities as stated by PA.

04.11.19

(डा0 श्रीमती सत्या)
संयुक्त निदेशक / वैज्ञानिक "डी"

Annexure-IX

Additional Data Generation for Meteorology, Ambient Air Quality, Water Quality

and

Results of Modelling Due to Stage-II & III

for Singrauli STPP, Stage-III (2 x 800 MW)

1.0 Introduction

NTPC has set up coal based Singrauli Super Thermal Power Station (SSTPS) of total 2000 MW capacity under Stage-I (5x200 MW) and Stage-II (2x500 MW),which are operational at Shakti Nagar, Sonbhadra district of Uttar Pradesh state. NTPC now proposes to augment the capacity by addition of 1600 (2x800) MW under Stage-III using coal. Stage-I (5x200 MW) will be decommissioned after commissioning of the proposed project (Stage-III). The total capacity of the project after expansion will be 2600 MW.

The above project was considered by EAC during its meeting held on 25/09/2019. The following additional details have been sought.

2.0 Scope of Study

The scope of study includes compliance to below clarifications sought by EAC:

- Pollution load of existing power plant from all stacks in terms of Tons of PM, SO_2 and NO_X emitted in a day. The total pollution load of existing and proposed power project and estimation of ground level concentrations considering emissions from all stacks including the proposed project (Point no-1);
- Further, the estimation of pollution load and prediction of ground level concentration shall be carried out considering only Stage-II and Stage-III projects as Stage-I (5x200 MW) planned to be decommissioned after construction of proposed project (Point no-2);
- One month fresh baseline may be collected to ascertain the actual carrying capacity and pollution loads in the region (Point no-11);
- Water quality of Baliya nallah is polluted due to high water samples in the study area are exceeding the standards. The detailed cause/interference for exceeding the threshold limits is to be ascertained. The comparative analysis of heavy metals in the ground water vis-a-vis drinking water standards is to be brough out in the report (Point no-10);
- Wildlife conservation plan is to be submitted preferable to be vetted by the Chief Wildlife Warden in the State Wildlife Department as the Schedule-I species are present in the Rihand Reservoir and within 10 km radius of the project (Point no-5);

Detailed studies haven carried out during the period 15th November, 2019 to 15th December, 2019 to carry out the baseline environmental monitoring studies and the same has been used to assess the predicted incremental ground level concentrations.

3.0 DESCRIPTION OF THE ENVIRONMENT

3.1 Meteorology

The meteorological data recorded during the monitoring period is very useful for proper interpretation of the baseline information as well as for input prediction models for air quality dispersion. Historical data on meteorological parameters will also play an important role in identifying the general meteorological regime of the region.

Onsite monitoring was undertaken for various meteorological variables in order to generate the site specific data. The central meteorological station was installed at Singrauli STPP colony, Shakti nagar at a height of about 10 m from ground level free from any obstruction. The data from 15th November 2019 to 15th December 2019 is given in the report. The data generated has also been compared with the meteorological data recorded at nearest India Meteorological Department (IMD) station located at Sidhi.

Meteorological Data Generated at Site

The meteorological parameters were recorded on hourly basis during the study period and comprise of parameters like wind speed, wind direction (from 0 to 360 degrees), temperature, relative humidity, atmospheric pressure, rainfall and cloud cover. The maximum, minimum and average values for all the parameters except wind speed and direction are presented in **Table-1**.

TABLE-1
SUMMARY OF THE METEOROLOGICAL DATA GENERATED AT SITE

Month	Temperature (ºC)		Relative Humidity (%)		Atmospheric Pressure (mb)	
	Max	Min	08:30 hrs	17:30 hrs	08:30 hrs	17:30 hrs
November	29.7	19.8	64	42	973.2	968.7
December	27.2	14.3	71	48	976.5	970.9
Range	**14.3-29.7**		**42 - 71**		**968.7 - 976.5**	

Observations on Meteorology at Project Site:

Predominant winds from W direction were observed for 12.6% of the total time, with wind speeds (% frequencies) in the range of 1.0-11 km/hr. In the N direction winds were observed for 7.1% of the total time, with wind speeds (% frequencies) in the range of 1.0-11 km/hr. Calm conditions prevailed for 41.9% of the time.

Secondary Data Collected from IMD- Sidhi

Seondary data from IMD- Sidhi has been collected for atmospheric pressure, temperature, relative humidity, rainfall, wind speed and direction. The IMD station at Sidhi (Station code 42577) is about 90 km from the project site. The collected data is tabulated in **Table-2**. The windrose are presented in **Figure-1.**

TABLE-2
CLIMATOLOGICAL DATA STATION: IMD, SIDHI
(BASED ON OBSERVATIONS: 1971-2000)

Month	Atmospheric Pressure (Mb)		Temperature (^{0}C)		Relative Humidity (%)		Rainfall (mm)
	0830	1730	Max	Min	0830	1730	TOTAL
January	985.7	982.4	29.4	4.3	76	47	27.4
February	983.7	980.2	32.8	6.3	69	40	23.8
March	981.1	977.1	38.3	10.5	51	27	12.5
April	976.9	972.5	42.9	16.9	38	21	6.6
May	973.0	968.8	45.0	21.6	39	24	10.8
June	969.1	965.5	44.3	23.2	58	46	144.3
July	969.1	966.2	37.6	23.0	80	72	338.3
August	970.5	967.6	35.2	23.1	83	76	331.9
September	974.8	971.5	35.2	21.5	81	71	248.8
October	980.4	977.0	35.5	14.9	73	52	37.9
November	984.3	980.6	32.7	9.4	71	47	8.0
December	986.6	983.1	29.1	5.4	73	49	9.2
Total							**1199.5**

Source: India Meteorological Department, Climatological Norms, Sidhi

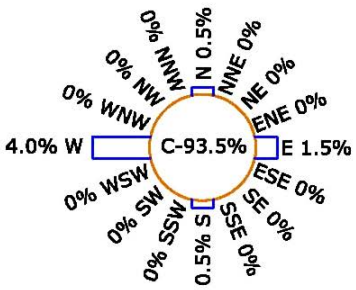
Comparison of Primary and Secondary Data

The India Meteorological Department (IMD) records the data at two times a day viz. 0830 hr and 1730 hr while the site-specific data has been recorded at an hourly interval. On comparison of site specific data generated for study period vis-à-vis the IMD data, slight variations were observed. The following observations are brought out:

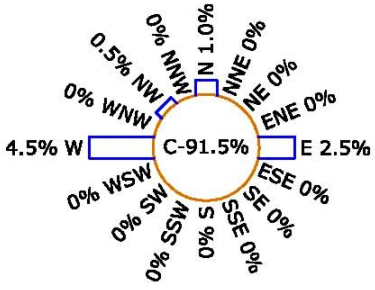
- The temperature recorded on site when compared vis-à-vis the IMD data, slight variations was found. The maximum and minimum temperatures recorded at site during study period were 14.3^{o}C and 29.7^{o}C, whereas the maximum and minimum values recorded at IMD-Sidhi during the same period are 5.4^{o}C and 32.7^{o}C respectively;

- The relative humidity was observed to range from 42–71% during the study period of partly post monsoon and partly winterseason at the site, whereas according to IMD Sidhi the relative humidity was observed to be in the range of 47–73% for the season; and

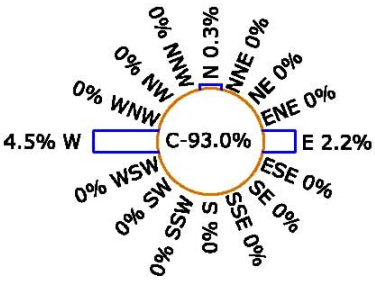
- The wind pattern of the study area is broadly in comparison with the IMD data.The data generated at project site when compared with the data recorded at IMD, it is observed that the data generated at the site is broadly in comparison with regional meteorology, except for few variations. The variations occurred due to frequency of recording, elevation difference between two stations and the distance between the two stations.



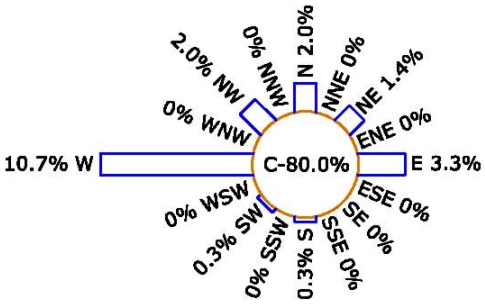
08-30 Hrs
POST MONSOON



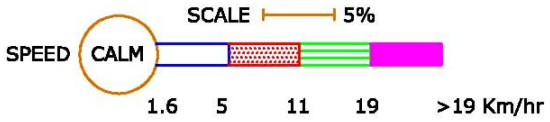
17-30 Hrs
POST MONSOON



08-30 Hrs
WINTER



17-30 Hrs
WINTER



Source: India Meteorological Department, Sidhi

FIGURE-1
SEASONAL WINDROSES, IMD SIDHI (1971-2000)

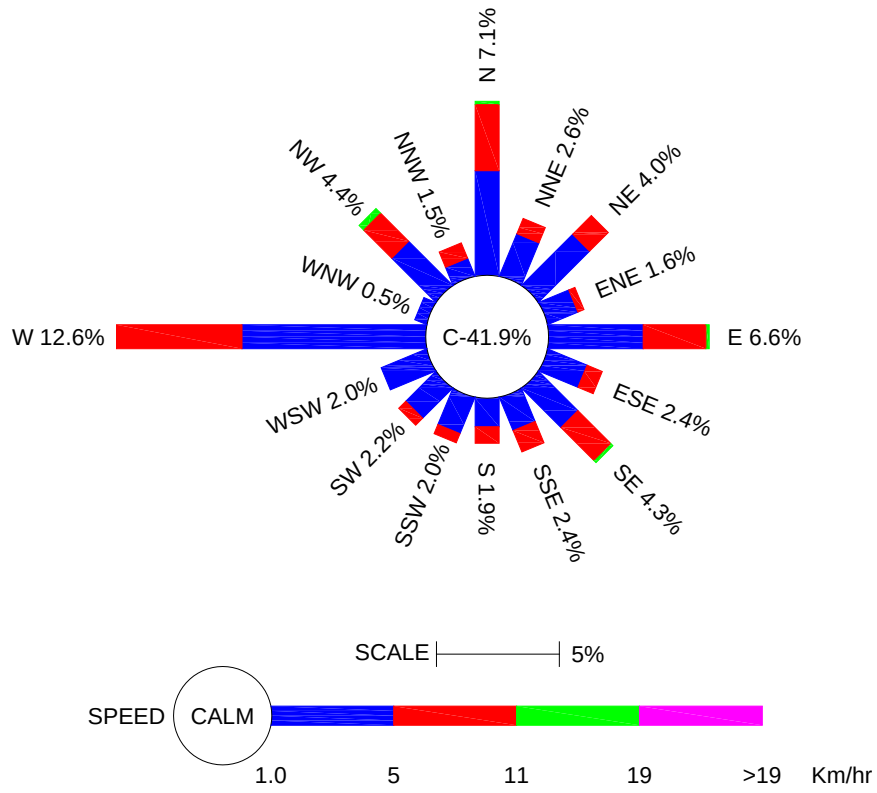


FIGURE-1(A)
SITE SPECIFIC WINDROSE

3.2 Ambient Air Quality

The ambient air quality with respect to the study zone of 10 km radius around the project site forms the baseline information. The various sources of air pollution in the region are industrial, traffic, urban and rural/residential activities. This will also be useful for assessing the conformity to standards of the ambient air quality during the plant operation. The study area represents mostly industrial environment with operating power plants and coal mines.

This section describes the selection of sampling locations, methodology adopted for sampling, analytical techniques and frequency of sampling.

Ambient Air Quality Monitoring (AAQM) stations were setup at tweleve locations with due consideration to the above mentioned points. **Table-3** gives the details of environmental setting around each monitoring station. The location of the selected stations with reference to the plant boundary is given in the same table and shown in **Figure-2**.

Frequency and Parameters for Sampling

Ambient air quality monitoring was carried out at a frequency of two days per week at each location. The baseline data of air environment was generated for the following parameters:

- Particulate Matter (PM_{10});
- Particulate Matter ($PM_{2.5}$);
- Sulphur dioxide (SO_2);
- Nitrogen dioxide (NO_2);
- Mercury (Hg);
- Carbon Monoxide (CO);
- Ozone (O_3);
- Lead (Pb);
- Ammonia (NH_3);
- Benzene (C_6H_6);
- Benzo(a) Pyrene – Paricualte phase (BaP);
- Arsenic (As); and
- Nickel (Ni)

TABLE-3
DETAILS OF AMBIENT AIR QUALITY MONITORING LOCATIONS

Code	Name of the Station	Distance from Plant Boundary (km)	Direction	Environmental Setting	Environment Setting of the AAQ Location	Near by Emission Sources
AAQ1	Paraswar	1.0	E	Downwind	Commercial area	Road transportation, Coal yards and Market area
AAQ2	Telgawan	0.6	SW	Crosswind	Industrial area	NTPC Vindyachal and Singrauli, Mines
AAQ3	Saraswah	3.4	NW	Crosswind	Industrial area	NTPC Vindhyachal and road transportation, Coal yards
AAQ4	Chilkadand	2.2	N	Crosswind	Residential area	Coal cook-stoves usage and local activities
AAQ5	Juri	4.4	SW	Crosswind	Residential area	Coal cook-stoves usage and local activities
AAQ6	Diyapahar	2.1	NW	Crosswind	Commercial area	Road transportation, Coal yards and Market area
AAQ7	Bhalwa	4.9	ENE	Crosswind	Industrial area	NTPC Singrauli, Ash Dyke and Mines
AAQ8	Matwal	1.6	SW	Crosswind	Commercial area	Mines, Road transportation, Coal yards and Market area
AAQ9	Ghorauli	7.8	W	Upwind	Residential area	Coal cook-stoves usage and local activities
AAQ10	Nigab	8.6	NW	Crosswind	Industrial area	Mines, Coal yards and Overburden dumping
AAQ11	Mohaddam	8.2	NNE	Crosswind	Residential area	Coal cook-stoves usage and local activities
AAQ12	Adhaura	9.7	SE	Crosswind	Industrial area	NTPC Rihand, and coal yards and mines

FIGURE-2
AIR QUALITY MONITORING LOCATIONS

- Presentation of Primary Data

  The summary of the results for the one month study period are presented in various statistical parameters like 98th percentile, average, maximum and minimum values have been computed from the observed raw data for all the AAQ monitoring stations. The summary of these results for each location is presented in **Table-4.** These are compared with the standards prescribed by Central Pollution Control Board (CPCB) NAAQS 2009 for industrial and rural /residential zone.

- *Observations of Primary Data*

  Observations for each location representing one month monitoring period are described as following:

  The minimum and maximum concentrations for PM_{10} were recorded as 62.8 $\mu g/m^3$ and 73.6 $\mu g/m^3$ respectively. The minmum and maximum concentrations were recorded at Adhaura (AAQ12) and Matwal (AAQ8) respectively. All the concentrations found to be less than NAAQ standard limit of 100 $\mu g/m^3$.

  The minimum and maximum concentrations for $PM_{2.5}$ were recorded as 28.8 $\mu g/m^3$ and 49.3 $\mu g/m^3$ respectively. The minimum and maximum concentrations were rcorded at Ghorauli Adhaura (AAQ12) and Matwal (AAQ8) respectively. All the concentrations found to be less than NAAQ standard limit of 60 $\mu g/m^3$.

  The minimum and maximum SO_2 concentrations were recorded as 25.0 $\mu g/m^3$ at Juri (AAQ5) and 46.1 $\mu g/m^3$ at Matwal (AAQ8). All the concentrations found to be less than NAAQ standard limit of 80 $\mu g/m^3$.

  The minimum and maximum NO_2 concentrations were recorded as 24.7 $\mu g/m^3$ at Diyapahar (AAQ6) and 51.3 $\mu g/m^3$ at Matwal (AAQ8) respectively. All the concentrations are found to be less than NAAQ standard limit of 80 $\mu g/m^3$.

  The concentration of mercury found to be in the range of <0.1 $\mu g/m^3$.

  The concentrations of CO in the study area are observed to be in the range of 344 to 732 $\mu g/m^3$.

  The concentrations of O_3 in the study area are observed to be in the range of 3.2 to 16.9 $\mu g/m^3$.

  The concentration of mercury and other criteria pollutants are found to be below the detection limits in the study region.

  The concentrations of PM_{10}, $PM_{2.5}$ and other gaseous emissions when compared to previous monitroring results the current values were observed to be more or less in the same range as of previous campaign. These concentrations can be attributed to the local industries and coal mines in the region.

TABLE-4

SUMMARY OF AMBIENT AIR QUALITY RESULTS ($\mu g/m^3$)

Location Code	Location	PM_{10}				$PM_{2.5}$			
		Min	Max	Avg	98%	Min	Max	Avg	98%
AAQ1	Paraswar	64.2	72.6	67.8	72.5	35.3	46.8	39.5	46.6
AAQ2	Telgawan	65.2	71.3	67.8	71.3	35.6	45.1	38.9	44.9
AAQ3	Saraswah	66.4	72.5	68.9	72.4	34.9	48.6	40.3	48.5
AAQ4	Chilkadand	64.6	70.3	67.0	70.2	33.3	45.9	38.3	45.9
AAQ5	Juri	63.2	65.7	64.3	65.7	31.0	44.1	36.5	44.1
AAQ6	Diyapahar	62.9	72.0	66.7	72.0	30.8	45.5	37.0	45.3
AAQ7	Bhalwa	64.7	68.9	66.2	68.7	33.3	47.1	37.6	47.1
AAQ8	Matwal	68.8	73.6	70.5	73.4	34.4	49.3	38.7	49.3
AAQ9	Ghorauli	64.5	67.3	65.7	67.1	31.7	44.2	36.3	44.2
AAQ10	Nigab	63.4	68.6	65.8	68.4	29.5	45.7	34.4	45.7
AAQ11	Mohaddam	63.6	67.3	65.0	67.1	29.7	43.6	34.5	43.3
AAQ12	Adhaura	62.8	66.0	63.9	65.8	28.8	42.8	33.1	42.8
Study Area Range		**62.8 – 73.6**				**28.8 – 49.3**			

TABLE-4 (Contd...)

SUMMARY OF AMBIENT AIR QUALITY RESULTS ($\mu g/m^3$)

Location Code	Location	SO_2				NO_2			
		Min	Max	Avg	98%	Min	Max	Avg	98%
AAQ1	Paraswar	29.4	43.1	34.5	42.9	29.9	49.6	37.9	49.4
AAQ2	Telgawan	31.3	43.0	35.4	42.8	29.4	48.6	37.1	48.4
AAQ3	Saraswah	32.8	45.2	37.4	45.0	31.2	49.6	38.5	49.4
AAQ4	Chilkadand	28.7	43.3	33.6	42.7	30.6	50.2	38.3	50.0
AAQ5	Juri	25.0	33.0	27.5	32.6	28.0	46.3	35.5	46.1
AAQ6	Diyapahar	28.8	41.6	33.6	41.4	24.7	50.9	35.1	50.6
AAQ7	Bhalwa	33.3	42.5	36.1	42.4	32.2	48.5	36.6	48.2
AAQ8	Matwal	36.4	46.1	39.3	46.0	37.0	51.3	41.2	51.2
AAQ9	Ghorauli	33.8	38.1	35.4	38.0	33.2	45.7	36.9	45.7
AAQ10	Nigab	33.0	42.4	35.8	42.3	32.5	46.8	36.7	46.8
AAQ11	Mohaddam	33.6	41.8	35.8	41.7	32.8	46.2	36.8	46.1
AAQ12	Adhaura	32.8	40.3	34.8	40.2	29.7	42.5	33.7	42.5
Study Area Range		**25.0 – 46.1**				**24.7 – 51.3**			

TABLE-4 (Contd...)

SUMMARY OF AMBIENT AIR QUALITY RESULTS ($\mu g/m^3$)

Location Code	Location	CO				O3			
		Min	Max	Avg	98%	Min	Max	Avg	98%
AAQ1	Paraswar	353	652	485	644	10.8	15.7	13.0	15.2
AAQ2	Telgawan	348	651	480	644	10.2	15.4	12.6	14.9
AAQ3	Saraswah	351	647	480	640	9.6	14.7	11.9	14.2
AAQ4	Chilkadand	344	632	469	624	8.8	13.8	11.1	13.3
AAQ5	Juri	363	598	447	581	3.2	8.8	6.5	8.6
AAQ6	Diyapahar	346	732	497	725	5.4	9.6	7.8	9.5
AAQ7	Bhalwa	387	626	462	621	9.7	15.1	12.1	14.7
AAQ8	Matwal	422	672	499	667	8.6	16.9	12.1	16.3
AAQ9	Ghorauli	362	577	430	572	5.2	8.4	6.7	8.2
AAQ10	Nigab	382	619	456	614	6.7	11.6	8.3	11.1
AAQ11	Mohaddam	378	608	450	603	6.6	11.1	8.1	10.6
AAQ12	Adhaura	374	598	445	593	6.2	10.3	7.6	9.8
Study Area Range		**344 – 732**				**3.2 –16.9**			

TABLE-4 (Contd...)
SUMMARY OF AMBIENT AIR QUALITY RESULTS ($\mu g/m^3$)

Location Code	Location	Hg				Bap			
		Min	Max	Avg	98%	Min	Max	Avg	98%
AAQ1	Paraswar	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ2	Telgawan	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ3	Saraswah	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ4	Chilkadand	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ5	Juri	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ6	Diyapahar	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ7	Bhalwa	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ8	Matwal	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ9	Ghorauli	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ10	Nigab	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ11	Mohaddam	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
AAQ12	Adhaura	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01
Study Area Range		**<0.1**				**<0.01**			

TABLE-4 (Contd...)
SUMMARY OF AMBIENT AIR QUALITY RESULTS ($\mu g/m^3$)

Location Code	Location	NH3				Pb			
		Min	Max	Avg	98%	Min	Max	Avg	98%
AAQ1	Paraswar	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ2	Telgawan	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ3	Saraswah	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ4	Chilkadand	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ5	Juri	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ6	Diyapahar	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ7	Bhalwa	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ8	Matwal	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ9	Ghorauli	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ10	Nigab	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ11	Mohaddam	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
AAQ12	Adhaura	<20.0	<20.0	<20.0	<20.0	<0.001	<0.001	<0.001	<0.001
Study Area Range		**<20.0**				**<0.001**			

TABLE-4 (Contd...)
SUMMARY OF AMBIENT AIR QUALITY RESULTS ($\mu g/m^3$)

Location Code	Location	Ni				As			
		Min	Max	Avg	98%	Min	Max	Avg	98%
AAQ1	Paraswar	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ2	Telgawan	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ3	Saraswah	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ4	Chilkadand	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ5	Juri	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ6	Diyapahar	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ7	Bhalwa	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ8	Matwal	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ9	Ghorauli	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ10	Nigab	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ11	Mohaddam	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ12	Adhaura	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Study Area Range		**<0.001**				**<0.001**			

TABLE-4 (Contd...)
SUMMARY OF AMBIENT AIR QUALITY RESULTS ($\mu g/m^3$)

Location Code	Location	Benzene			
		Min	Max	Avg	98%
AAQ1	Paraswar	<0.001	<0.001	<0.001	<0.001
AAQ2	Telgawan	<0.001	<0.001	<0.001	<0.001
AAQ3	Saraswah	<0.001	<0.001	<0.001	<0.001
AAQ4	Chilkadand	<0.001	<0.001	<0.001	<0.001
AAQ5	Juri	<0.001	<0.001	<0.001	<0.001
AAQ6	Diyapahar	<0.001	<0.001	<0.001	<0.001
AAQ7	Bhalwa	<0.001	<0.001	<0.001	<0.001
AAQ8	Matwal	<0.001	<0.001	<0.001	<0.001
AAQ9	Ghorauli	<0.001	<0.001	<0.001	<0.001
AAQ10	Nigab	<0.001	<0.001	<0.001	<0.001
AAQ11	Mohaddam	<0.001	<0.001	<0.001	<0.001
AAQ12	Adhaura	<0.001	<0.001	<0.001	<0.001
Study Area Range		**<0.001**			

3.3 RESPONSE TO ADS RELATED TO AIR QUALITY

SR.NO-1 & 2

Query by MoEF&CC:

Pollution load of existing power plant from all stacks in terms of Tons of PM, SO_2 and NO_x emitted in a day. The total pollution load of existing and proposed power plant and estimation of ground level concentrations considering emissions from all stacks including the proposed project.

Further, the estimation of pollution load and prediction of ground level concentrations shall be carried out considering only Stage-II and Stage-III projects as Stage-I (5x200 MW) planned to be after construction of proposed project.

Response:

Pollution load of existing power plant from all stacks is presented separately.

The impact on air quality is assessed based on emissions from existing power plant considering:

- Stage-II stacks (with FGD, in compliance with new emission norms of 100/200/300 mg/Nm^3 for PM/SO_2/NOx respectively) as these stacks will be retrofitted with additional air pollution control equipment by the time Stage-III becomes operational and
- Stage-III (with new emission norms of 30/100/100 mg/Nm^3 for PM/SO_2/NOx respectively).

The modeling simulations have been carried out for Particulate Matter (PM), Sulphur Dioxide (SO_2) and Oxides of Nitrogen (NO_2) are the important pollutants emitting from the project.

Prediction of impacts on air environment has been carried out employing mathematical model based on a steady state Gaussian plume dispersion model designed for multiple point sources for short term. In the present case, AERMOD Version 7.1 dispersion model based on steady state Gaussian plume dispersion, designed for multiple point sources for short term and developed by United States Environmental Protection Agency [USEPA] has been used for simulations from point sources.

Model Input Data

For the modeling purpose, pollutants like PM, SO_2 and NO_x are considered. These net emissions are calculated for modeling purpose. The details of the emissions envisaged from the existing Stage-II & Stage-III are presented in **Table-5.**

TABLE-5
STACK EMISSIONS FROM STAGE-II & III

	Stack Height	Dia	Vel	Temp	PM	SO_2	NOx
	(m)	(m)	(m/sec))	^{0}K	g/s	g/s	g/s
STAGE-II (2X500 MW) [Existing]							
Unit-VI:500 MW	220	7	21	403	80.78	161.57	242.36
Unit-VII:500 MW	220	7	21	403	80.78	161.57	242.36
STAGE-III (2X800 MW) [Proposed]							
Unit-VIII: 800 MW	275	8.8	18.3	333	26.50	88.40	88.40
Unit-IX: 800 MW	275	8.8	18.3	333	26.50	88.40	88.40

Meteorological Data

The hourly meteorological data recorded at site is converted to the mean meteorological hourly data as specified by CPCB and the same has been used in the model. In absence of site specific mixing heights, IMD publication has been referred for the mixing heights and the same is used in the model.

Presentation of Results

In the present case, model simulations have been carried out based on recent monitoring. For the short-term simulations, the concentrations have been estimated around 441 receptors as Uniform-Cartesian grind points to obtain an optimum description of variations in concentrations over the site in 10 km radius covering 16 directions.The incremental concentrations are given in **Table-6.**

The estimation of pollution load and prediction of ground level concentrations have been carried out considering Stage-II and Stage-III project as Stage-I (5x200 MW) planned after construction of the proposed project.The cumulative incremental

concentraions of proposed Stage-III The incremental concentrations are given in **Table-7.**

TABLE-6
STAGE-III: PREDICTED 24-HOURLY SHORT TERM MAXIMUM INCREMENTAL GROUND LEVEL CONCENTRATIONS

Expressed in µg/m³

Pollutant	Maximum Incremental Ground Level Concentration
SO_2	5.27 (4.0 km, E)
NO_2	5.27 (4.0 km, E)
PM	1.58 (4.0 km, E)

Isopleths are presented in **Figure-3** to **Figure-5.**

- ***Resultant Concentrations***

The incremental concentrations of the proposed project are super imposed on the maximum baseline data to arrive at resultant concentrations during operational phase of the proposed project. The resultant concentrations are given in **Table-7.**

TABLE-7
RESULTANT CONCENTRATIONS

Pollutant, (µg/m³)	Maximum Concentrations (µg/m³)		Resultant
	Maximum baseline, (µg/m³) in study area	Incremental (µg/m³)	(µg/m³)
PM_{10}	73.6	1.58	75.18
SO_2	46.1	5.27	51.37
NO_2	51.3	5.27	56.57

The incremental concentrations when superimposed over the existing maximum baseline concentrations, the resultant concentrations are observed to be within the permissible levels for residential/rural conditions.

Conclusion

It can be concluded that, the resultant GLC's will be within the prescribed limits during the operation of the Singrauli project with 2600 MW power plant. However as the Stage-I units shall be de-commissioned after the commissioning of Stage-III, the baseline values are expected to decrease, thereby leading to an overall improvement in air quality of the area.

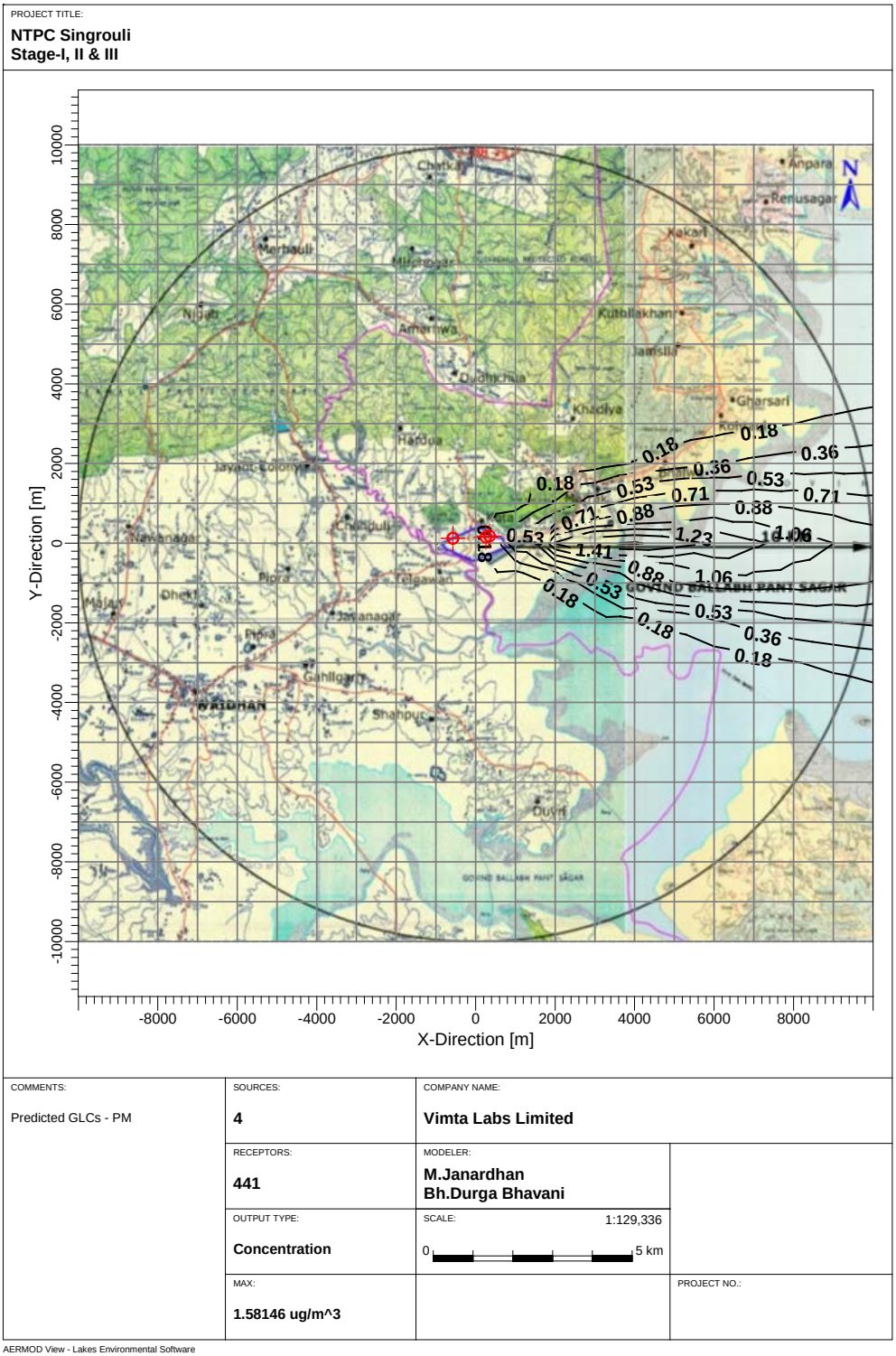


FIGURE-3
STAGE-II (EXISTING), STAGE-III (PROPOSED)- PM

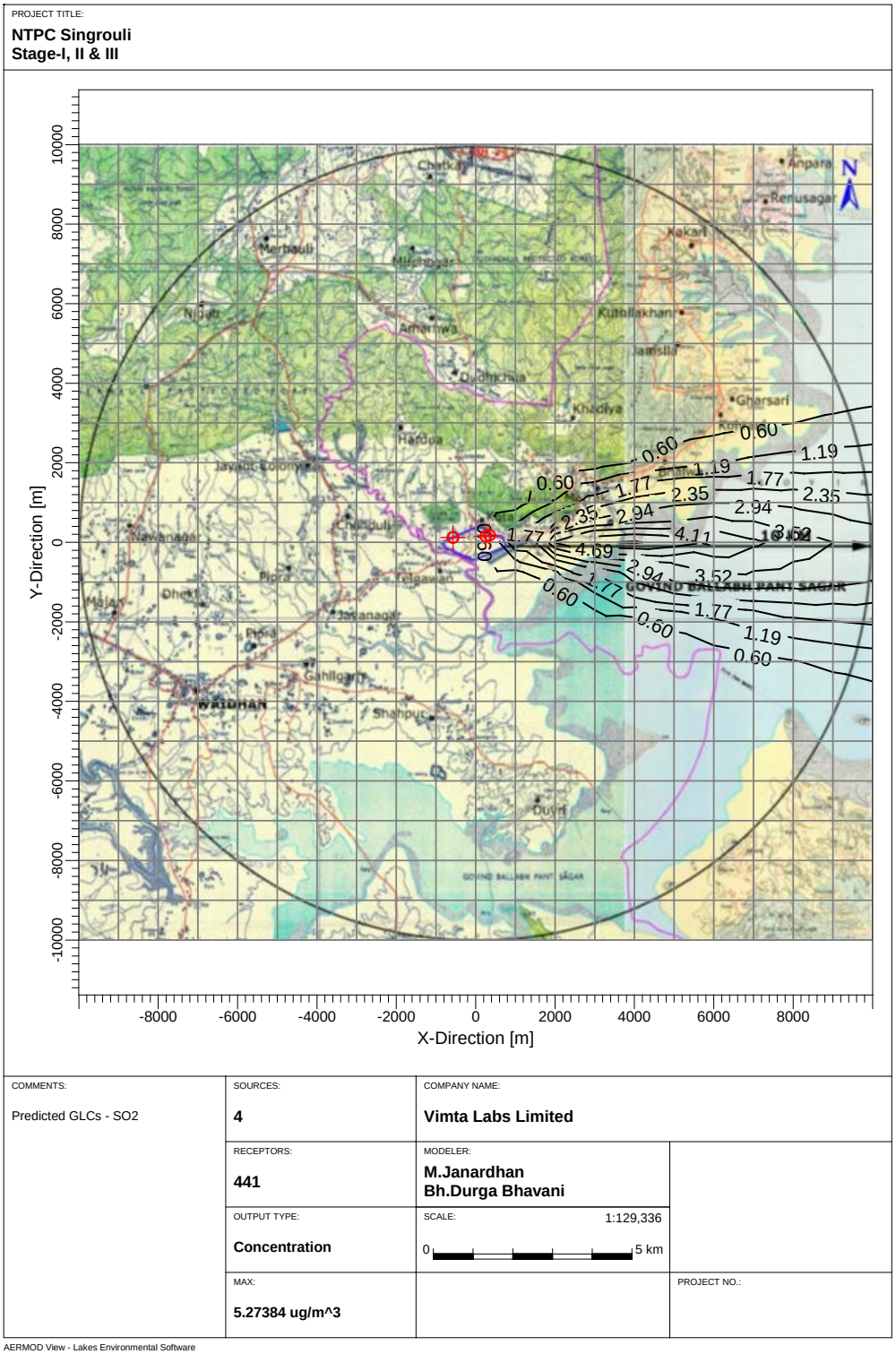


FIGURE-4
STAGE-II (EXISTING), STAGE-III (PROPOSED)- SO_2

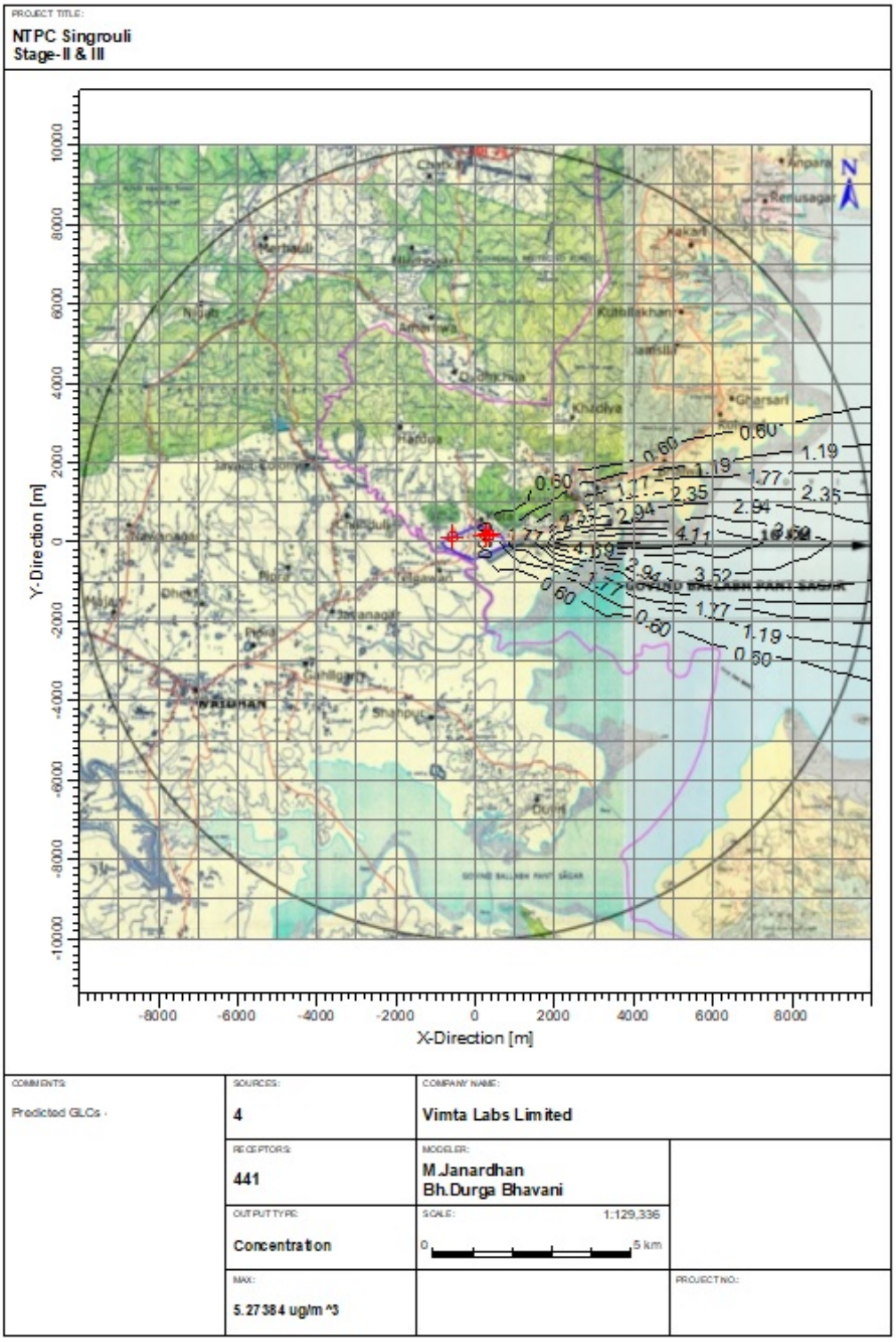


FIGURE-5
STAGE-II (EXISTING), STAGE-III (PROPOSED)- NO_x

3.4 Water Quality

Ten surfacewater and fifteen ground water sources covering 10 km radial distance were examined for physico-chemical, heavy metals and bacteriological parameters in order to assess the effect of industrial and other activities on surface and ground water. The samples were analyzed as per the procedures specified in 'Standard Methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA).

Water Sampling Locations

The samples were taken as grab samples and were analyzed for various parameters to compare with the standards for drinking water as per IS: 10500 for ground water sources and IS: 2296 (Class-C) for surface water sources. The water sampling locations are identified in **Table-8** and shown in **Figure-6**.

TABLE-8
SURFACE AND GROUND WATER SAMPLING LOCATIONS

Sampling Station Code	Location Name	Latitude (N)	Longitude (E)	MSL in m	Distance from Plant Boundary (km)	Direction w.r.t. Plant Boundary
Ground Water						
GW1	Near Telgawan village	24°05'53.8"	82°41'58.7"	268	__	Within Plant Boundary
GW2	Khadiya village	24°06'58.8"	82°44'06.7"	266	3.0	NNE
GW3	Near ash Dyke area	24°06'41.2"	82°44'26.5"	268	4.1	NNE
GW4	Jogichaura village	24°07'01.2"	82°45'04.8"	264	3.2	NE
GW5	Paraswar village	24°06'51.4"	82°44'20.7"	267	2.8	NEE
GW6	Juwari village	24°05'23.4"	82°41'01.1"	266	2.2	S
GW7	Near churchuriya village	24°02'51.1"	82°43'47.9"	270	6.2	SSW
GW8	Duvri (ash pond area of NTPC Vindhyachal)	24°02'37.4"	82°42'12.4"	284	7.1	SSE
GW9	Churchuriya (ashpond area of NTPC Vindhyachal)#	24°03'24.8"	82°41'57.3"	285	6.8	S
GW10	Near Juri village	24°04'00.2"	82°40'14.0"	279	5.5	SW
GW11	Rani Bari village	24°07'26.7"	82°42'42.1"	307	0.4	W
GW12	Saraswah village	24°06'48.3"	82°39'52.5"	277	3.2	WWN
GW13	Near Shaktinagar	24°07'19.3"	82°41'43.4"	262	1.8	NW
GW14	Diyapahar	24°07'22.6"	82°42'10.4"	260	3.2	NW
GW15	Medhauli village	24°11'04.8"	82°38'48.0"	394	8.2	NW
Surface Water						
SW1	Near Tarapur (Rihand reservoir)	24°06'56.7"	82°44'06.7"	259	1.8	W
SW2	Rihand reservoir	24°06'22.6"	82°42'31.7"	272	1.2	SE
SW3	Near Kota (Rihand Reservoir)	24°06'11.2"	82°43'22.0"	274	0.3	SW
SW4	Baliya Nallah U/P of plant	24°07'09.0"	82°40'39.2"	278	2.1	WWN
SW5	Baliya Nallah D/S of plant	24°05'58.6"	82°41'59.7"	256	2.2	S
SW6	Rihand reservoir	24°03'21.2"	82°42'23.5"	280	8.1	SE
SW7	Rihand Reservoir	24°02'11.4"	82°43'38.5"	262	7.6	SE
SW8	Rihand Reservoir	24°02'07.6"	82°42'43.4"	261	8.8	SSE
SW9	Rihand Reservoir	24°02'57.1"	82°41'49.8"	254	8.1	SW
SW10	Rihand Reservoir	24°02'48.3"	82°41'23.7"	259	9.2	SSW

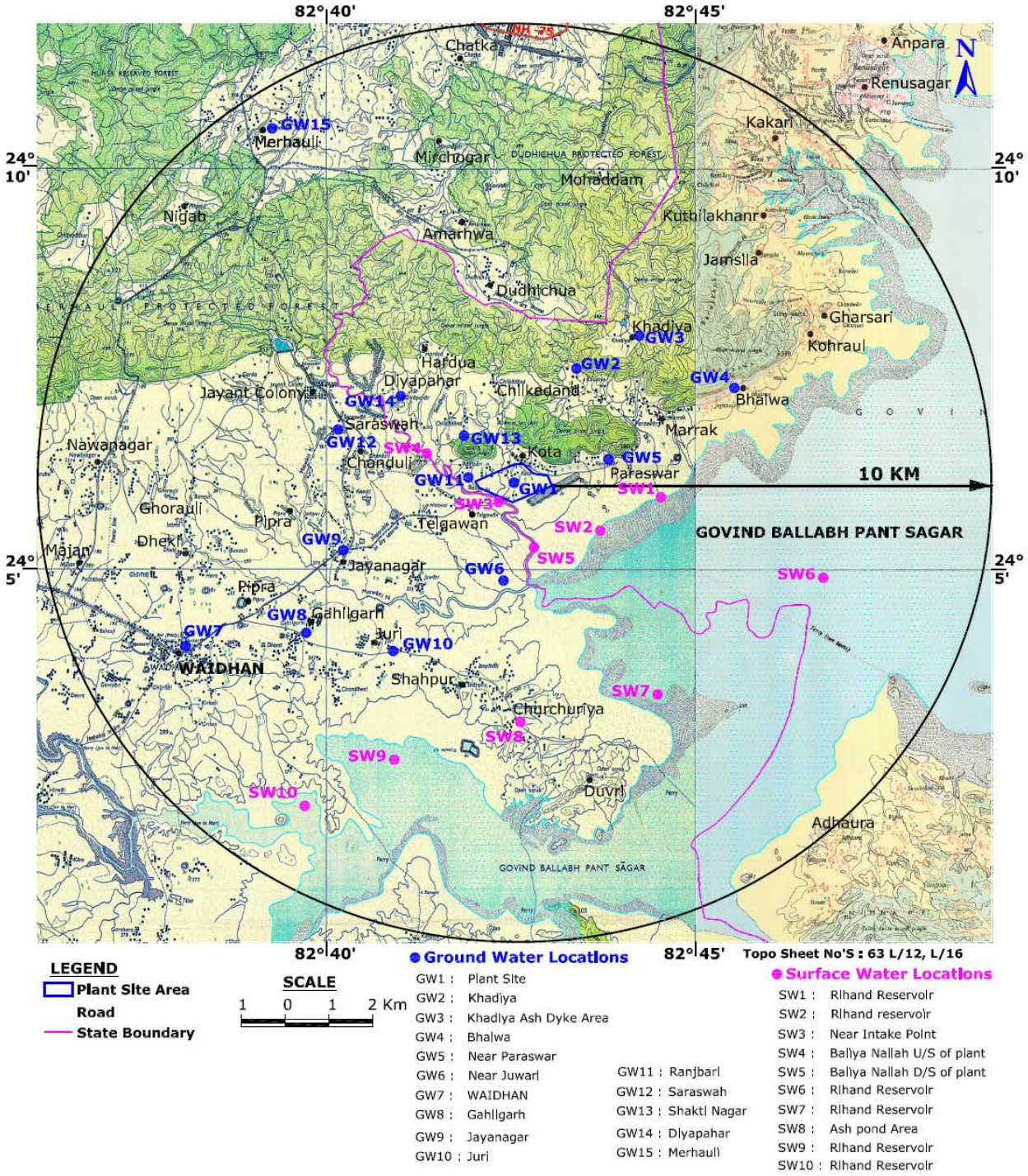


FIGURE-6

SURFACE AND GROUND WATER SAMPLING LOCATIONS

Presentation of Results

The summary of the results for surface water quality and ground water quality representing the month of 15th November to 15th December 2019 are presented in **Table-9** and **10.** The results of surface water are further compared with water quality standards (IS 2296:1992)

Results

Surface Water Quality

- The analysis results indicate the pH values in the range of 7.3 to 8.0, Minimum value was observed at SW7 and maximum value was observed at SW4 and SW6 which are well within the specified standard of 6.5 to 8.5.

- The TDS was observed in the range of 106 mg/l to 553 mg/l, the minimum TDS value was observed at SW9 and maximum TDS value was observed at SW4.
- DO was observed to be in the range of 5.6 to 6.1 mg/l respectively.
- The chlorides and sulphates were found to be in the range of 10.2 to 118.5 mg/l and 3.2 to 61.2 mg/l respectively. It is observed that chlorides and sulphates are well within the permissible limits. It is evident from the above values that all the parameters are found to comply with the requirements of IS: 2296 specification of surface water.

Observations on U/S & D/S of Baliya Nala

pH: The Baliya Nala Surface water pH Values are ranged between 7.7 to 8.0
TDS: The Baliya Nala Surface water TDS Values are ranged between 418 to 553
COD:The Baliya Nala surface water COD values are ranged between 60 to 65 mg/l
BOD: The Baliya Nala surface water BOD values are ranged between 12 to 15 mg/l
Fluoride as F: The Baliya Nala surface water F values are ranged between 0.6 to 0.8 mg/l
Arsenic (As): The Baliya Nala surface water As values <0.01
Chromium (Cr):The Baliya Nala surface water Cr values <0.05
Copper (Cu): The Baliya Nala surface water Cu values are <0.01 mg/l
Iron (Fe): The Baliya Nala surface water Fe values are ranged between 0.40 to 0.50 mg/l
Lead (Pb): The Baliya Nala surface water Pb values <0.01 mg/l
Mercury (Hg): The Baliya Nala surface water Hg values <0.001
Cadmium (Cd): The Baliya Nala surface water Cd values <0.001 mg/l
Zinc (Zn): The Baliya Nala surface water Zn values <0.01
Total coliform was in the range of 480 to 850 MPM/100 ml

The analysis results of samples from Baliya Nala (Upstream and Downstream), NTPC Singrauli indicates that the all the analyzed values were in the conformity with the effluent standards notified vide G.S.R. 422(E) dated 19.05.1993 under Environment (Protection) Act, 1986 for discharge of effluents into inland surface water except BOD.

TABLE-9
SURFACE WATER SAMPLES

Sr. No	Parameters	Unit	SW1	SW2	SW3	SW4	SW5
1	pH	-	7.5	7.6	7.5	8.0	7.7
2	Colour	Hazen	3	3	2	3	2
3	Conductivity	µS/cm	184	174	162	880	662
4	TDS	mg/l	123	114	106	553	418
5	DO	mg/l	5.7	5.6	5.8	5.8	5.8
6	BOD	mg/l	<3	<3	<3	12	15
7	COD	mg/l	<5	<5	<5	60	65
8	Total Hardness as $CaCO_3$	mg/l	67.5	61.9	62.3	311.0	220.9
9	Total Alkalinity as CaCO3	mg/l	68.5	59.6	51.8	208.6	138.5
10	Calcium as Ca	mg/l	17.8	17.2	16.2	70.4	53.2
11	Magnesium as Mg	mg/l	5.6	4.6	5.3	32.8	21.4
12	Chlorides as Cl	mg/l	11.2	15.2	15.2	118.5	87.5
13	Residual free chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2
14	Phosphates as PO_4	mg/l	0.42	0.26	0.32	0.44	0.52
15	Sulphates as SO_4	mg/l	5.6	3.2	6.4	56.8	61.2
16	Fluorides as F	mg/l	0.6	0.7	0.4	0.6	0.8
17	Nitrates as NO_3	mg/l	1.2	0.9	1.1	4.2	3.2
18	Sodium as Na	mg/l	10.2	9.8	7.8	56.8	48.9
19	Potassium as K	mg/l	1.8	3.2	1.6	4.4	2.8
20	Total Boron as B	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
21	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
22	Cyanides	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2
23	Oil & grease	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
25	Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
28	Iron as Fe	mg/l	0.04	0.03	0.02	0.5	0.4
29	Chromium as Cr^{+6}	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
30	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
31	Zinc as Zn	mg/l	0.02	0.01	0.02	<0.01	<0.01
32	Aluminum as Al	mg/l	0.01	0.01	<0.01	<0.01	0.02
33	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
34	SAR	-	0.54	0.54	0.43	1.40	1.43
35	Insecticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	Anionic detergents as MBAS	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2
37	Total Coliforms	MPN/100	560	850	720	480	650

Note: ($) Indicates no limits have been specified; UO: Unobjectionable

TABLE-9 (Contd...)
SURFACE WATER SAMPLES

Sr. No	Parameters	Unit	SW6	SW7	SW8	SW9	SW10
1	pH	-	8.0	7.3	7.6	7.6	7.6
2	Colour	Hazen	1	2	3	3	2
3	Conductivity	µS/cm	172.5	186	184	169	195
4	TDS	mg/l	111	119	122	106	121
5	DO	mg/l	6.1	5.8	5.6	5.9	5.7
6	BOD	mg/l	<3	<3	<3	<3	<3
7	COD	mg/l	<5	<5	<5	<5	<5
8	Total Hardness as $CaCO_3$	mg/l	61.9	60.4	64.2	56.0	77.1
9	Total Alkalinity as CaCO3	mg/l	53.6	49.8	62.8	38.6	48.6
10	Calcium as Ca	mg/l	16.2	17.4	16.8	15.5	16.7
11	Magnesium as Mg	mg/l	5.2	4.1	5.4	4.2	8.6
12	Chlorides as Cl	mg/l	13.9	21.6	10.2	25.5	24.5
13	Residual free chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2
14	Phosphates as PO_4	mg/l	0.49	0.56	0.68	0.71	0.38
15	Sulphates as SO_4	mg/l	8.6	9.4	11.6	8.4	10.4
16	Fluorides as F	mg/l	1	0.8	0.7	0.6	0.8
17	Nitrates as NO_3	mg/l	1.2	0.8	1.1	0.9	1.1
18	Sodium as Na	mg/l	10.5	14.2	12.2	11.2	8.4
19	Potassium as K	mg/l	1.1	1.3	1.2	1.5	1.6
20	Total Boron as B	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
21	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
22	Cyanides	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2
23	Oil & grease	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0
24	Cadmium as Cd	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
25	Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
27	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
28	Iron as Fe	mg/l	0.06	0.05	0.04	0.06	0.07
29	Chromium as Cr^{+6}	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
30	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
31	Zinc as Zn	mg/l	0.02	0.01	<0.01	0.02	<0.01
32	Aluminum as Al	mg/l	0.03	0.01	0.02	<0.01	0.02
33	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
34	SAR	-	0.58	0.80	0.66	0.65	0.42
35	Insecticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	Anionic detergents as MBAS	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2
37	Total Coliforms	MPN/100	580	590	640	620	630

Note: ($) Indicates no limits have been specified; UO: Unobjectionable

TABLE-9 (A)
WATER QUALITY STANDARDS IN INDIA (SOURCE IS 2296:1992)

Characteristics	Designated Best Use				
	A*	B*	C*	D*	E*
Dissolved Oxygen (DO)mg/l, min	6	5	4	4	-
Biochemical Oxygen demand (BOD)mg/l, max	2	3	3	-	-
Total coliform organisms MPN/100ml, Max	50	500	5000	-	-
pH value	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5
Colour, Hazen units, max.	10	300	300	-	-
Odour	Unobjectionable			-	-
Taste	Tasteless	-	-	-	-
Total dissolved solids, mg/l, max.	500	-	1500	-	2100
Total hardness (as $CaCO_3$), mg/l, max.	200	-	-	-	-
Calcium hardness (as $CaCO_3$), mg/l, max.	200	-	-	-	-
Magnesium hardness (as $CaCO_3$), mg/l, max.	200	-	-	-	-
Copper (as Cu), mg/l, max.	1.5	-	1.5	-	-
Iron (as Fe), mg/l, max.	0.3	-	0.5	-	-
Manganese (as Mn), mg/l, max.	0.5	-	-	-	-
Cholorides (as Cu), mg/l, max.	250	-	600	-	600
Sulphates (as SO_4), mg/l, max.	400	-	400	-	1000
Nitrates (as NO_3), mg/l, max.	20	-	50	-	-
Fluorides (as F), mg/l, max.	1.5	1.5	1.5	-	-
Phenolic compounds (as C_2H_5OH), mg/l,max.	0.002	0.005	0.005	-	-
Mercury (as Hg), mg/l, max.	0.001	-	-	-	-
Cadmium (as Cd), mg/l, max.	0.01	-	0.01	-	-
Salenium (as Se), mg/l, max.	0.01	-	0.05	-	-
Arsenic (as As), mg/l, max.	0.05	0.2	0.2	-	-
Cyanide (as Pb), mg/l, max.	0.05	0.05	0.05	-	-
Lead (as Pb), mg/l, max.	0.1	-	0.1	-	-
Zinc (as Zn), mg/l, max.	15	-	15	-	-
Chromium (as Cr^{6+}), mg/l, max.	0.05	-	0.05	-	-
Anionic detergents (as MBAS), mg/l, max.	0.2	1	1	-	-
Barium (as Ba), mg/l, max.	1	-	-	-	-
Free Ammonia (as N), mg/l, max	-	-	-	1.2	-
Electrical conductivity, micromhos/cm,max	-	-	-	-	2,250
Sodium absorption ratio, max	-	-	-	-	26
Boron, mg/l, max	-	-	-	-	2

**Class A- Drinking Water Source without conventional treatment but after disinfection*
**Class B- Outdoor Bathing*
**Class C- Drinking water source after conventional treatment and disinfection*

**Class D- Propogation of Wildlife and Fisheries*
**Class E- Irrigation, Industrial Cooling, Controlled Waste Disposal*
**Below Class E- Not meeting Class A, B, C, D & E Criteria*

Comparitive Analysis as per IS 2296:1992 Standard Specification

As pH, DO, TDS, Total coliforms, BOD and COD the criteria for Class 'A' of water (Drinking water source after conventional treatment and disinfection) in Rihand Reservoir and other samples and except Baliya Nallah samples the criteria for Class 'C' of water (Drinking water source after conventional treatment and disinfection).

Ground Water Quality

- The analysis results indicate that the *pH* ranges in between 7.34 to 8.21 at GW15 and GW10 respectively, which is well within the specified standard of 6.5 to 8.5.

- Total *hardness* was observed to be ranging from 125.7 to 301.8 mg/l. The minimum hardness (125.7 mg/L) was recorded at GW10 and maximum *hardness* (301.8 mg/l) was recorded at GW11.

- *Chlorides* were found to be in the range of 28.6 mg/l to 146.5 mg/l.

- *Sulphates*were found to be in the range of 14.2 mg/l to 57.6 mg/l.

The Total Dissolved Solids (TDS) concentrations were found to be ranging in between 236 to 718 mg/l.

TABLE-10
GROUND WATER SAMPLES

Sr. No	Parameters	Unit	IS: 10500 (2012) Limits	GW1	GW2	GW3	GW4	GW5
1	pH	-	6.5 – 8.5 (NR)	7.86	7.65	8.03	7.86	7.76
2	Colour	Hazen	5(15)	3	2	3	2	2
3	Taste	-	Ag	Ag	Ag	Ag	Ag	Ag
4	Odour	-	Ag	Ag	Ag	Ag	Ag	Ag
5	Conductivity	µS/cm	$	382	732	369	687	802
6	Turbidity	NTU	1(5)	3	3	2	3	4
7	TDS	mg/l	500(2000)	251	474	236	440	517
8	Total Hardness as $CaCO_3$	mg/l	200(600)	137.4	213.7	143.2	215.1	236.4
9	Total Alkalinity	mg/l	200(600)	132	193	116	197	214
10	Calcium as Ca	mg/l	75(200)	37.2	53.2	33.9	45.2	56.2
11	Magnesium as Mg	mg/l	30(100)	10.8	19.6	14.2	24.8	23.3
12	Residual Chlorine	mg/l	0.2 (1)	<0.2	<0.2	<0.2	<0.2	<0.2
13	Boron as B	mg/l	0.5(1)	0.06	0.08	0.04	0.05	0.09
14	Chlorides as Cl	mg/l	250(1000)	28.6	80.2	34.2	72.4	85.2
15	Sulphates as SO_4	mg/l	200(400)	14.2	52.6	16.4	36.8	57.6
16	Fluorides as F	mg/l	1.0(1.5)	0.5	0.8	0.07	1	0.6
17	Nitrates as NO_3	mg/l	45(NR)	1.2	4.2	1.8	2.8	1.6
18	Sodium as Na	mg/l	$	23.0	69.5	18.4	58.2	72.2
19	Potassium as K	mg/l	$	2.8	1.6	1.1	1.8	6.5
20	Phenolic Compounds	mg/l	0.001(0.002)	<0.001	<0.001	<0.001	<0.001	<0.001
21	Cyanides as CN	mg/l	0.05 (NR)	<0.02	<0.02	<0.02	<0.02	<0.02
22	Anionic Detergents	mg/l	0.2 (1.0)	<0.2	<0.2	<0.2	<0.2	<0.2
23	Mineral Oil	mg/l	0.5(NR)	<0.1	<0.1	<0.1	<0.1	<0.1
24	Cadmium as Cd	mg/l	0.003 (NR)	<0.003	<0.003	<0.003	<0.003	<0.003
25	Arsenic as As	mg/l	0.01 (0.05)	<0.01	<0.01	<0.01	<0.01	<0.01
26	Copper as Cu	mg/l	0.05 (1.5)	0.04	0.02	0.02	<0.01	0.01
27	Lead as Pb	mg/l	0.01 (NR)	<0.01	<0.01	<0.01	<0.01	<0.01
28	Manganese as Mn	mg/l	0.1 (0.3)	0.01	<0.01	0.02	0.03	0.02
29	Iron as F	mg/l	0.3(NR)	0.06	0.08	0.09	0.12	0.09
30	Total Chromium as Cr	mg/l	0.05(NR)	<0.05	<0.05	<0.05	<0.05	<0.05
31	Selenium as Se	mg/l	0.01(NR)	<0.01	<0.01	<0.01	<0.01	<0.01
32	Zinc as Zn	mg/l	5(15)	0.08	0.86	0.42	0.64	0.86
33	Aluminum as Al	mg/l	0.03(0.2)	<0.01	<0.01	<0.01	<0.01	<0.01
34	Mercury as Hg	mg/l	0.001(NR)	<0.001	<0.001	<0.001	<0.001	<0.001
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent	Absent
36	E. Coli	-	Absent	<0.2	<0.2	<0.2	<0.2	<0.2
37	Total Coliforms	MPN/100ml	Absent	Nil	Nil	Nil	Nil	Nil

Note: ($) Indicates no limits have been specified; Ag: Agreeable

TABLE-10 (Contd...)
GROUND WATER SAMPLES

Sr. No	Parameters	Unit	IS: 10500 (2012)Limits	GW6	GW7	GW8	GW9	GW10
1	pH	-	6.5 – 8.5 (NR)	8.11	7.68	8.09	8.04	8.21
2	Colour	Hazen	5(15)	2	3	3	2	3
3	Taste	-	Ag	Ag	Ag	Ag	Ag	Ag
4	Odour	-	Ag	Ag	Ag	Ag	Ag	Ag
5	Conductivity	µS/cm	$	546	495	727	459	382
6	Turbidity	NTU	1(5)	3	5	3	4	3
7	TDS	mg/l	500(2000)	351	311	475	294	245
8	Total Hardness as $CaCO_3$	mg/l	200(600)	181.0	187.6	210.0	170.1	125.7
9	Total Alkalinity	mg/l	200(600)	156	148	229	143	106
10	Calcium as Ca	mg/l	75(200)	40.8	37.5	43.5	33.8	31.2
11	Magnesium as Mg	mg/l	30(100)	19.2	22.8	24.6	20.8	11.6
12	Residual Chlorine	mg/l	0.2 (1)	<0.2	<0.2	<0.2	<0.2	<0.2
13	Boron as B	mg/l	0.5(1)	0.12	0.05	0.06	0.08	0.09
14	Chlorides as Cl	mg/l	250(1000)	53.6	48.4	64.5	43.1	46.2
15	Sulphates as SO_4	mg/l	200(400)	34.6	22.9	37.6	22.6	14.2
16	Fluorides as F	mg/l	1.0(1.5)	0.9	0.8	0.6	0.8	0.6
17	Nitrates as NO_3	mg/l	45(NR)	2.6	1.8	3.1	1.4	4.8
18	Sodium as Na	mg/l	$	41.2	26.5	68.5	26.4	29.4
19	Potassium as K	mg/l	$	1.9	2.4	3.6	2.1	1.6
20	Phenolic Compounds	mg/l	0.001(0.002)	<0.001	<0.001	<0.001	<0.001	<0.001
21	Cyanides as CN	mg/l	0.05 (NR)	<0.02	<0.02	<0.02	<0.02	<0.02
22	Anionic Detergents	mg/l	0.2 (1.0)	<0.2	<0.2	<0.2	<0.2	<0.2
23	Mineral Oil	mg/l	0.5(NR)	<0.1	<0.1	<0.1	<0.1	<0.1
24	Cadmium as Cd	mg/l	0.003 (NR)	<0.003	<0.003	<0.003	<0.003	<0.003
25	Arsenic as As	mg/l	0.01 (0.05)	<0.01	<0.01	<0.01	<0.01	<0.01
26	Copper as Cu	mg/l	0.05 (1.5)	<0.01	0.02	0.01	0.02	<0.01
27	Lead as Pb	mg/l	0.01 (NR)	<0.01	<0.01	<0.01	<0.01	<0.01
28	Manganese as Mn	mg/l	0.1 (0.3)	0.01	0.02	<0.01	0.02	<0.01
29	Iron as F	mg/l	0.3(NR)	0.11	0.041	0.08	0.06	0.08
30	Total Chromium as Cr	mg/l	0.05(NR)	<0.05	<0.05	<0.05	<0.05	<0.05
31	Selenium as Se	mg/l	0.01(NR)	<0.01	<0.01	<0.01	<0.01	<0.01
32	Zinc as Zn	mg/l	5(15)	0.75	0.06	0.04	0.86	0.42
33	Aluminum as Al	mg/l	0.03(0.2)	<0.01	<0.01	<0.01	<0.01	<0.01
34	Mercury as Hg	mg/l	0.001(NR)	<0.001	<0.001	<0.001	<0.001	<0.001
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent	Absent
36	E. Coli	-	Absent	<0.2	<0.2	<0.2	<0.2	<0.2
37	Total Coliforms	MPN/ 100ml	Absent	Nil	Nil	Nil	Nil	Nil

Note: ($) Indicates no limits have been specified; Ag: Agreeable

TABLE-10 (Contd...)
GROUND WATER SAMPLES

Sr. No	Parameters	Unit	IS: 10500 (2012)Limits	GW11	GW12	GW13	GW14	GW15
1	pH	-	6.5 – 8.5 (NR)	7.77	7.56	7.92	7.78	7.34
2	Colour	Hazen	5(15)	3	2	3	2	3
3	Taste	-	Ag	Ag	Ag	Ag	Ag	Ag
4	Odour	-	Ag	Ag	Ag	Ag	Ag	Ag
5	Conductivity	µS/cm	$	1103	724	742	804	634
6	Turbidity	NTU	1(5)	5	3	4	3	3
7	TDS	mg/l	500(2000)	718	474	479	519	405
8	Total Hardness as $CaCO_3$	mg/l	200(600)	301.8	202.8	239.2	260.2	163.8
9	Total Alkalinity	mg/l	200(600)	287	193	227	235	162
10	Calcium as Ca	mg/l	75(200)	75.6	49.5	54.2	65.4	34.9
11	Magnesium as Mg	mg/l	30(100)	27.4	19.2	25.2	23.5	18.6
12	Residual Chlorine	mg/l	0.2 (1)	<0.2	<0.2	<0.2	<0.2	<0.2
13	Boron as B	mg/l	0.5(1)	0.11	0.06	0.09	0.11	0.14
14	Chlorides as Cl	mg/l	250(1000)	146.5	76.4	74.5	90.5	83.5
15	Sulphates as SO_4	mg/l	200(400)	56.4	49.6	28.5	32.6	28.4
16	Fluorides as F	mg/l	1.0(1.5)	0.8	0.5	0.7	0.9	0.7
17	Nitrates as NO_3	mg/l	45(NR)	7.9	10.6	7.6	5.2	2.4
18	Sodium as Na	mg/l	$	112.8	70.2	59.8	64.3	65.4
19	Potassium as K	mg/l	$	3.9	5.5	1.6	1.8	8.6
20	Phenolic Compounds	mg/l	0.001(0.002)	<0.001	<0.001	<0.001	<0.001	<0.001
21	Cyanides as CN	mg/l	0.05 (NR)	<0.02	<0.02	<0.02	<0.02	<0.02
22	Anionic Detergents	mg/l	0.2 (1.0)	<0.2	<0.2	<0.2	<0.2	<0.2
23	Mineral Oil	mg/l	0.5(NR)	<0.1	<0.1	<0.1	<0.1	<0.1
24	Cadmium as Cd	mg/l	0.003 (NR)	<0.003	<0.003	<0.003	<0.003	<0.003
25	Arsenic as As	mg/l	0.01 (0.05)	<0.01	<0.01	<0.01	<0.01	<0.01
26	Copper as Cu	mg/l	0.05 (1.5)	<0.01	0.01	0.02	<0.01	0.01
27	Lead as Pb	mg/l	0.01 (NR)	<0.01	<0.01	<0.01	<0.01	<0.01
28	Manganese as Mn	mg/l	0.1 (0.3)	0.02	0.03	<0.01	<0.01	0.02
29	Iron as F	mg/l	0.3(NR)	0.11	0.16	0.12	0.09	0.08
30	Total Chromium as Cr	mg/l	0.05(NR)	<0.05	<0.05	<0.05	<0.05	<0.05
31	Selenium as Se	mg/l	0.01(NR)	<0.01	<0.01	<0.01	<0.01	<0.01
32	Zinc as Zn	mg/l	5(15)	0.24	0.08	0.22	0.82	0.36
33	Aluminum as Al	mg/l	0.03(0.2)	<0.01	<0.01	<0.01	<0.01	<0.01
34	Mercury as Hg	mg/l	0.001(NR)	<0.001	<0.001	<0.001	<0.001	<0.001
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent	Absent
36	E. Coli	-	Absent	<0.2	<0.2	<0.2	<0.2	<0.2
37	Total Coliforms	MPN/ 100ml	Absent	Nil	Nil	Nil	Nil	Nil

Note: ($) Indicates no limits have been specified; Ag: Agreeable

3.5 RESPONSE TO ADS RELATED TO WATER QUALITY

Query by MoEF&CC:

Water quality of Baliya nallah is polluted due to high BOD and COD. Further, coliforms in all suface water samples in the study area are exceeding the standards. The detailed cause/interference for exceeding the threshold limits is to be ascertained. The comparative analysis of heavy metals in the ground water vis-à-vis drinking water standards is to be brought out in the report.

Response:

Baliya nallah Upstream Vs Downstream

The BOD & COD levels of nallah ranged between 12 to 15 mg/l and 60 to 65 mg/l respectively.

Interference for exceeding the threshold limits of BOD & COD

Running water, because of its churning, dissolves more oxygen than still water. Respiration by aquatic animals, decomposition, and various chemical reactions consume oxygen. Oxygen-consuming waste include stormwater run-off from farmland or urban streets, feedlots, and failing septic systems. Aeration of water will accelerate the decomposition of organic and inorganic material. Therefore, BOD levels at a sampling site with slower, deeper waters might be higher for a given volume than the levels for a similar site in highly aerated waters. BOD directly affects the amount of dissolved oxygen. The greater the BOD, the more rapidly oxygen is depleted. This means less oxygen is available to higher forms of aquatic life. The consequences of high BOD are the same as those for low dissolved oxygen: aquatic organisms become stressed, suffocate, and die.

Chemical Oxygen Demand (COD) is due to decomposition of organic matter and the oxidation of inorganic chemicals such as ammonia and nitrite.

Ballia Nala drains off the northern part of Bina (Extn.) and southern part of Dudhichua coal mines. Further, Senduri and Hadwaria nalla, draining Khadia are also tributaries of Ballia nala. As the Nalla carries the effluents from various coal mining areas and human settlements, the BOD & COD values are higher.

Heavy Metals in Ground Water:

Heavy metals can enter a water supply by industrial and consumer waste or even from acidic rain breaking down soils and relasing heavy metals into streams and ground waters. Heavy metals are dangerous because they tend to bio-accumulate. Bio-accumulation in food chains as a result of the non-degradable state of heavy metals. Bio-accumulation means an increase in the concentrations of a chemical in a biological orgfanism over time, compared to the chemical concentration in the environment. Compounds accumulate in the living things any thime they are taken up and stored faster than they are broken down.

The analysis of ground water samples shows the heavy metal concentrations is well within the limits of IS-10500.

Iron content: It is an essential and non-conservative trace element found in significant concentration in drinking water because of its abundance in the earth's crust.

The groundwater is oxygen poor, iron (and manganese) will dissolve more readily, particularly if the pH of the water is on the low side (slightly more acidic). Dissolved oxygen content is typically low in deep aquifers, particularly if the aquifer contains organic matter. Decomposition of the organic matter depletes the oxygen in the water and the iron dissolves as Fe2+. Under these conditions, the dissolved iron is often accompanied by dissolved manganese or hydrogen sulfide (rotten egg smell). When this water is pumped to the surface, the dissolved iron reacts with the oxygen in the atmosphere, changes to Fe3+ (i.e., is oxidized) and forms rust-colorediron minerals. In the present study the values of iron are well within the permsible limit of IS-10500.

Zinc: Zinc is a metal which shows fairly low concentration which may be due to its restricted mobility from the place of rock weathering or from the natural sources The values of zinc are showed within the limit of drinking water standard.

Cadmium (Cd): The concentration of cadmium in lithosphere is low. The main sourcesof cadmium are industrial activities. Cadmium is highly toxic and responsible for several cases of poisioning through food. It replaces zinc biochemically and causes high blood pressure. Cadmium concentration in ground water of the study area are below the detectable limits.

Chromium: Chromium is essential nutrient for animals and plants. Chromium is considered as a relative biological and pollution significance element. In the present investingations, the chromium concentration is below detectable level.

Lead: Lead inhibits several key enzymes involved in the overall process of haemo-synthesis whereby metabolic intermediate accumulates. The study revealed that the concentration of lead is below the detectable level. The concentrations of lead observed to be within the safe limit.

Copper (Cu): It is one of the essential elements for human beings. It is widely distributed metal in nature. Copper can exist in aquatic environment in three forms namely soluble, colloidal and particulate. It is found in less quantity as an essential element for organisms. Excess of copper in human body is toxic and causes hypertension and produces pathological changes in brain tissues. Excessive ingestion of copper is responsible for specific disease of the bone. In the present study, the concentration of Copper ranged between a minimum of BDL and a maximum of 0.04 mg/l. The values of copper are showed within the limit of drinking water standard.BIS limit for copper is 1.5 mg/l.

Nickel (Ni): Nickel occurs in natural water as a divalent cation with pH range between 5-9. Nickel is a natural element of the earth's crust; therefore, small

amounts are found in food, water, soil and air. Nickel occurs naturally in the environment at low levels. Nickel dermatitis, consisting of itching of the fingers, hands and forearms, it the most common effect in humans from chronic skin contact with nickel. However, nickel concentration in ground water of the study area is below the detectable level.

Arsenic (As): It is a toxic non-essential element and occurs widely in nature. It commonly occurs in insecticides, fungicides and herbicides. Among its components, High concentration of arsenic (III) compounds causes metabolic disorder. It also causes dermatitis and the irritation of upper respiratory passage, ulceration and perforation of nasal septum, lung cancer. However, the arsenic concentration in ground water of the study area is below the detectable level

CONCLUSION:

In the present investigation, the heavy metal concentration such as iron, zinc, copper, lead and chromium are well within the permissible limits prescribed by the IS-10500 standards. However, the concentrations of cadmium, arsenic and nickel in the ground water samples of the study area were found to be below detectable level.

Annexure-X

Item No. 02 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 1038/2018

(With report dated 01.11.2019)

News item published in "The Asian Age" Authored by Sanjay Kaw
Titled "CPCB to rank industrial units on pollution levels"

Date of hearing: 14.11.2019

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE S.P WANGDI, JUDICIAL MEMBER
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER
HON'BLE MR. SAIBAL DASGUPTA, EXPERT MEMBER

For Respondent(s): Mr. Raj Kumar, Advocate
Ms. Nandini Sen, Advocate for State of West Bengal
Mr. Attin Shankar Rastogi, Advocate
Mr. Dhananjay Baijal, Advocate for TSPCB

ORDER

1. The question for consideration is remedial action for control of pollution in identified polluted industrial clusters in compliance of earlier order of this Tribunal dated 10.07.2019 requiring the statutory authorities to take action by way closure, prosecution and recovery of compensation from identified polluters in polluted industrial clusters. The said directions are set out in later part of this order.

2. The matter has been earlier dealt with inter alia vide orders dated 13.12.2018 and 10.07.2019 in the light of Comprehensive Environmental Pollution Index (CEPI) which includes weightages on nature of pollutants, ambient pollutant concentrations, receptors

*strategies for implementation of necessary norms at every level in right direction. The scale of compensation needs to be suitably revised so that the same is deterrent and adequate to meet the cost of reversing the pollution.***"**

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11. During the hearing today, a copy of the letter dated 17.05.2019 was handed over by the Learned Counsel for the CPCB, indicating the latest CEPI scores for 100 polluted industrial areas/clusters monitored during 2018. The said scores are as follows:

The CEPI Scores in descending order for Industrial Areas/Clusters monitored during 2018

Sl. No.	Name of Polluted Industrial Areas (PIAs)	Air	Water	Land	* CEPI Score	# Status of Environment
1.	Tarapur(Maharashtra)	72.00	89.00	59.25	93.69	Ac_Wc_Ls
2.	Najafgarh-Drain basin including Anand Parbat, Naraina, Okhla, Wazirpur(Delhi)	85.25	86.00	55.75	92.65	Ac_Wc_Ls
3.	Mathura(Uttar Pradesh)	86.00	81.00	45.00	91.10	Ac_Wc_Ln
4.	Kanpur(Uttar Pradesh)	66.00	85.00	45.00	89.46	Ac_Wc_Ln
5.	Vadodara(Gujarat)	82.00	80.75	48.75	89.09	Ac_Wc_Ln
6.	Moradabad(Uttar Pradesh)	76.00	71.50	68.75	87.80	Ac_Wc_Lc
7.	Varanasi-Mirzapur(Uttar Pradesh)	67.50	80.00	39.63	85.35	Ac_Wc_Ln
8.	Bulandsahar-Khurza(Uttar Pradesh)	79.50	76.00	36.75	85.23	Ac_Wc_Ln
9.	Gurgaon(Haryana)	70.00	80.00	36.75	85.15	Ac_Wc_Ln
10.	Manali (Tamil Nadu)	59.75	72.25	71.75	84.15	As_Wc_Lc
11.	Panipat(Haryana)	66.00	72.75	60.00	83.54	Ac_Wc_Lc
12.	Firozabad(Uttar Pradesh)	76.00	72.00	32.50	81.62	Ac_Wc_Ln
13.	Udham Singh Nagar (Uttarakhand)	33.00	79.50	26.00	81.26	An_Wc_Ln
14.	Jodhpur (Rajasthan)	67.00	66.00	65.00	81.16	Ac_Wc_Lc
15.	Pali (Rajasthan)	66.00	65.00	65.50	80.48	Ac_Wc_Lc
16.	Ankleshwar (Gujarat)	72.00	57.50	51.00	80.21	Ac_Ws_Ls
17.	Gajraula Area(Uttar Pradesh)	71.00	70.00	45.00	80.14	Ac_Wc_Ln
18.	Vapi (Gujarat)	66.00	75.00	30.00	79.95	Ac_Wc_Ln
19.	Siltara Industrial Area (Chhattisgarh)	76.00	51.75	31.75	79.94	Ac_Ws_Ln
20.	Bhiwadi (Rajasthan)	66.50	71.00	44.75	79.63	Ac_Wc_Ln
21.	Vellore -North Arcot	49.00	75.00	35.75	79.38	An_Wc_Ln

57.	Aligarh(Uttar Pradesh)	56.25	61.88	11.88	64.42	As_Wc_Ln
58.	Hajipur(Bihar)	57.50	41.13	39.25	64.36	As_Wn_Ln
59.	Hazaribagh(Jharkhand)	61.00	20.00	41.00	64.20	Ac_Wn_Ln
60.	Coimbatore (Tamil Nadu)	47.25	53.75	45.25	63.64	An_Ws_Ln
61.	Singrauli (UP & MP)	45.00	57.25	27.75	62.59	An_Ws_Ln
62.	Cuddalore (Tamil Nadu)	25.00	58.25	41.25	62.56	An_Ws_Ln
63.	Faridabad(Haryana)	55.25	53.75	28.75	62.17	As_Ws_Ln
64.	Bhavnagar (Gujarat)	61.00	15.50	15.50	61.94	Ac_Wn_Ln
65.	Howrah (West Bengal)	60.50	20.00	16.00	61.76	Ac_Wn_Ln
66.	Paradeep (Orissa)	43.00	57.50	17.00	60.61	An_Ws_Ln
67.	Erode (Tamil Nadu)	34.13	47.00	52.75	60.33	An_Wn_Ls
68.	Saraikela (Jharkhand)	57.75	17.50	34.00	60.26	As_Wn_Ln
69.	Kattedan(Telangana)	42.25	50.75	45.25	60.17	An_Ws_Ln
70.	Dhanbad(Jharkhand)	43.00	57.50	12.50	59.78	An_Ws_Ln
71.	Indore(Madhya Pradesh)	18.50	56.88	20.75	58.53	An_Ws_Ln
72.	Bhadravati(Karnataka)	45.00	52.00	30.00	58.48	An_Ws_Ln
73.	Mandideep (Madhya Pradesh)	56.00	55.25	10.00	58.43	As_Ws_Ln
74.	Mangalore(Karnataka)	15.00	54.50	54.25	58.20	An_Ws_Ls
75.	Barajamda(Jharkhand)	51.88	25.63	46.75	57.64	As_Wn_Ln
76.	Korba (Chhattisgarh)	43.75	17.75	54.00	57.57	An_Wn_Ls
77.	Ahmedabad(Gujarat)	53.50	48.50	16.00	57.11	As_Wn_Ln
78.	Haridwar (Uttarakhand)	50.75	52.38	13.75	55.70	As_Ws_Ln
79.	Asansol (West Bengal)	54.00	16.25	13.75	55.03	As_Wn_Ln
80.	Chembur(Maharashtra)	52.25	50.75	10.00	54.67	As_Ws_Ln
81.	Morbi (Gujarat)	51.00	47.25	14.00	54.24	As_Wn_Ln
82.	Mandi Govindgarh (Punjab)	23.75	53.75	1.50	53.91	An_Ws_Ln
83.	Raichur(Karnataka)	32.75	47.88	32.50	53.42	An_Wn_Ln
84.	West Singhbhum(Jharkhand)	51.88	25.88	11.25	53.28	As_Wn_Ln
85.	Greater Kochin (Kerala)	47.38	35.88	29.50	52.94	An_Wn_Ln
86.	Pimpari-Chinchwad(Maharashtra)	52.00	6.25	5.25	52.16	As_Wn_Ln
87.	Gwalior (Madhya Pradesh)	50.00	43.13	7.75	51.67	As_Wn_Ln
88.	Junagarh (Gujarat)	47.00	25.00	35.00	51.64	An_Wn_Ln
89.	Jajpur (Orissa)	43.50	26.25	41.25	49.62	An_Wn_Ln
90.	Nagda –Ratlam (Madhya Pradesh)	12.00	47.00	28.00	48.78	An_Wn_Ln
91.	Jamshedpur(Jharkhand)	46.00	19.25	20.25	48.10	An_Wn_Ln
92.	Mahad(Maharashtra)	41.00	35.75	29.00	47.12	An_Wn_Ln

93.	Bhillai-Durg (Chhattisgarh)	43.00	32.75	19.75	46.69	An_Wn_Ln
94.	Angul Talchar (Orissa)	44.75	13.25	23.00	46.43	An_Wn_Ln
95.	Haldia (West Bengal)	45.00	35.00	3.75	45.72	An_Wn_Ln
96.	Vishakhapatam (Andhra Pradesh)	27.25	12.75	42.75	44.74	An_Wn_Ln
97.	Dewas (Madhya Pradesh)	28.00	31.63	31.75	37.79	An_Wn_Ln
98.	Jharsuguda (Orissa)	36.00	21.50	8.75	37.20	An_Wn_Ln
99.	Digboi (Assam)	23.50	25.25	6.50	26.39	An_Wn_Ln
100.	Pithampur (Madhya Pradesh)	13.50	19.50	6.75	20.23	An_Wn_Ln

12. *Question for consideration is whether mere making of action plans obviates the requirement of enforcing the law. Continued polluting activities are criminal offences under the law of the land. The rule of law requires prohibiting such activities to[5] safeguard the environment and the innocent victims.[6]*

13. *The answer has to be in the negative. Once the industrial clusters have been notified as polluting, while action plans may certainly be prepared, the polluting activity, which is a criminal offence, cannot be allowed to be continued. The essence of rule of law is that no activity which is against the law is allowed to continue and the person violating the law is punished according to law.[7] Thus merely requiring improvement does not obviate the need for punishing the law violators/polluters; stopping polluting activity and recovering compensation for the damage already caused so as to recover the cost of restoration[8] is the*

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[5] Under Section 5 of the EPA Act, Section 31A of the Air Act and Section 33A of the Water Act, the power of Board to give directions includes the power to direct the closure, prohibition or regulation of any industry, operation or process; or the stoppage or regulation of the supply of electricity or water or any other service.

[6] https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(18)30261-4/fulltext stating 1.24 million deaths in India in 2017, which were 12·5% of the total deaths, were attributable to air pollution, including 0.67 million from ambient particulate matter pollution and 0.48 million from household air pollution. 7 Goa Foundation Vs. Union of India and Ors., (2014) 6 SCC 590, at para 72-75,the Supreme Court noted the power that rests with the Pollution Control Board under Section 31 A of the Air Act and Section 33 A of the Water Act and directed that the authorities should take stringent actions in line with these power in cases of polluting industries. 8 Tirupur Dyeing Factory Owners Association Vs. Noyyal River Ayacutdars Protection Association & Ors., (2009) 9 SCC 737, in paras 26, 27, 33 & 34, the Supreme Court emphasis on developmental activities to be such that it does not compromises with the ability of the future generation to meet their needs and in this regard, authorities are to take into consideration the macro effect of wide-scale land and environmental degradation caused by absence of remedial measures.

[7] Goa Foundation Vs. Union of India and Ors., (2014) 6 SCC 590, at para 72-75,the Supreme Court noted the power that rests with the Pollution Control Board under Section 31 A of the Air Act and Section 33 A of the Water Act and directed that the authorities should take stringent actions in line with these power in cases of polluting industries.

[8] Tirupur Dyeing Factory Owners Association Vs. Noyyal River Ayacutdars Protection Association & Ors., (2009) 9 SCC 737, in paras 26, 27, 33 & 34, the Supreme Court emphasis on developmental activities to be such that it does not compromises with the ability of the future

List for further consideration on 04.03.2020.

Adarsh Kumar Goel, CP

S.P Wangdi, JM

K. Ramakrishnan, JM

Dr. Nagin Nanda, EM

Saibal Dasgupta, EM

November 14, 2019
Original Application No. 1038/2018
AK

Annexure-XI

Station: NTPC Singrauli, Shaktinagar

IMPLEMENTATION STATUS OF SINGRAULI ACTION PLAN
Summary of proposed action points
ISSUES REGARDING NTPC Shaktinagar

Sl.	Action Points	Compliance Status as on 31.12.2019
1	An action plan to achieve PM emission of 100 mg/Nm3	**Work is in progress.** Contract has been awarded to M/s BHEL on 14.11.2013 for retrofitting ESP's of all 07 units. Two passes of Unit 1,2,3 & 7, Three passes of unit 6 and all 4 passes of unit 4&5 completed.
2	Provision of Dry ash collection system	**Work is in progress.** Stage: I: Dry ash collection system is installed in two unit of 200 MW. Work has been awarded to M/s BHEL for DAES installation in all units of Stage-I and work is in progress with ESP augmentation. Stage II: Further, work for DAES installation in Stage-II (2x500 MW) is in progress by (M/s Indure Ltd). Civil work of building, compressor house, Silo completed. Erection work silo, piping, installation of compressor and receiver tank etc is in completion stage there after commissioning to start.
3	On line opacity meter has been installed in stack of all power plants of NTPC. The matter of linking data of CPCB/UPPCB Net work will be carried out within six months.	**Complied.** Data has been linked with CPCB/UPPCB.
4.	Two nos. continuous ambient air quality monitoring stations has been installed	**Complied.** AAQMS data has been linked with CPCB/UPPCB
5	Hazardous waste shall be treated and disposed properly	**Complied.** HW waste is being send to TSDF and recyclable waste is sent to registered recyclers through MSTC.
6	Proper management of Bio-medical waste generated from three hospitals of NTPC units shall be ensured	**Complied**
7	Ensuring of 5 cycle recirculation of cooling water in NTPC Rihand TPP	Not applicable to Shaktinagar.

Sl.	Action Points	Compliance Status as on 31.12.2019
8	Road map for 100% fly ash utilization by 2014.	Action plan has already submitted. Presently ash being used in area of ash brick manufacturing by own 5 machines, issue of ash to industries, land development & ash dyke raising. Efforts are continued to increase ash utilization by advertisement / EOI in news paper. NTPC has made provision to provide incentive in transportation cost to cement/asbestos/brick manufacturer as to enhance ash utilization. NTPC approached NCL for providing mine for backling with ash. As per Ntification dtd 25.01.2016, NTPC will bear cost of transportation in road construction projects of NHAI/State highways. Contract awarded for supply to Audi - Shaktinagar road for which awaiting clearance from PWD. Further for supply of ash in NHAI road projects (Hanumana -Varanasi) for which contract is in award stage. Land development with ash is being done in nearby area for increasing ash utilization.
9	Continuous operation and maintenance of APCS & oil spillage treatment.	**Complied.** Continuous operation and maintenance of APCS & oil spillage treatment is being carried out regularly.
10	Complete recirculation of new ash pond overflow to achieve zero discharge effluent shall be achieved	**Complied**. AWRS installed in new ash pond and overflow is being recycled since 04.12.14.
11	The possibility should be explored for co-processing of oil bearing sludge in cement kilns	Oil bearing sludge will be burnt in boiler when oil tank will be cleaned.

Annexure-XII-A

ESTIMATED / PROJECTION OF CER BUDGET FOR SINGRAULI STPP STAGE-III (2X800 MW)

Sr. No.	Activities	Budget in Rs. Crores
1	Approach Road/ Internal Road, Culverts, Drainage system, guarding wall, etc. Infrastructure support in Street lighting, Solar street lights at common place, etc.	6.00
2	Installation of Bore well & Water Tank, etc. Providing Hand Pumps, Drinking water in different Villages	1.00
3	Construction/ renovation of Anganwadi/ Community Hall, Shed & Chabutara in Cremation Ground. Construction/ renovation of Bus Stop/sheds, Boundary wall of Panchayat Bhawan, etc.	2.00
4	Construction/ renovation of Boundary Wall, Gate & additional rooms in School. Providing Infrastructure & Furniture in Schools. Water Tank in School. Providing Play equipment's & Sports Items in School. Assistance to Meritorious Student etc.	2.50
5	Deepening/ renovation of Ponds and Construction/ renovation of Ghat/Playground/.	1.50
6	Vocational Skill to Women of Villages-Tailoring/ Papad making/ Pickle making/ Beautician training, Technical Skill Development Programs, etc.	0.10
7	Health Camp & Mobile Medical Ambulance/Augmentation of Primary Health facilities & and Infrastructure support, sanitation, Swachhata Abhiyan, etc.	1.00
8	Promotion of Rural Sports, Sports Activities in Schools and Clubs, Cultural traditions, etc.	0.40
9	Miscellaneous CD Works -As per need and requirement, contingency, etc. at disposal of BUH in consultation with local community/ administration/ Govt.	1.50
	Total	**16.00**

[Note: Actual implementation would be carried out under the guidance of District Magistrate, Sonebhadra & in consultation with Stakeholders]

Annexure-XII-B

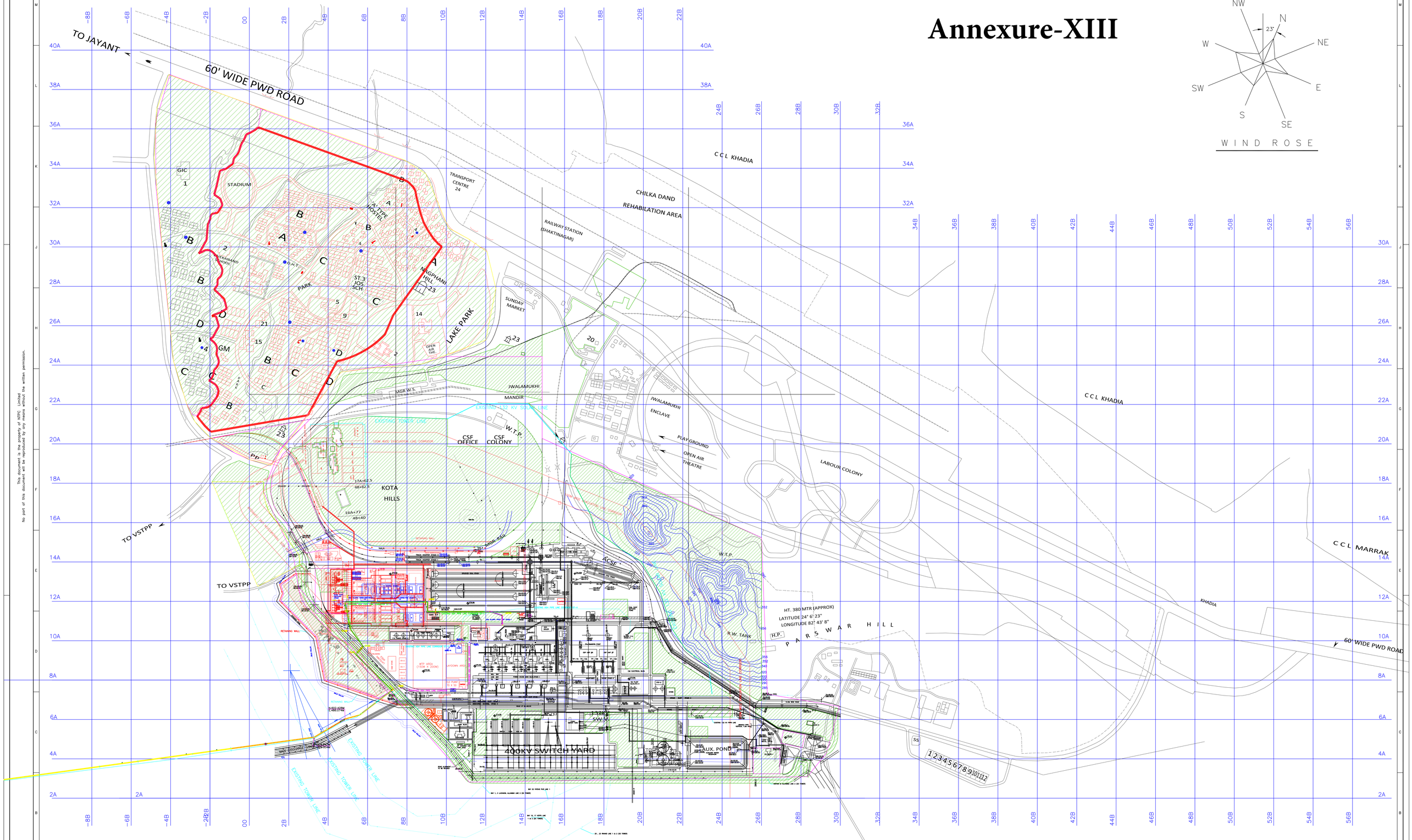
Cost Provision for Environmental Measures

A cost provision Rs. 2459.8 crores has been kept towards environmental measures.

S.No	Item Description	Cost (Rs. in Crores)
1	Electrostatic Precipitator	253.01
2	Chimney	81.62
3	Air Cooled Condensers including Civil Works	618.96
4	Ash Handling including Ash water Recirculation	299.24
5	Ash Disposal Civil Work	296.18
6	Dust Extraction & Suppression System	8.00
7	DM Plant Waste Treatment System	9.00
8	Sewerage collection, Treatment & Disposal	8.00
9	Environmental Lab. & Monitoring Equipment	3.00
10	Green Belt, Afforestation & Landscaping and CER	9.00
11	FGD and SCR	873.57
Total (Rs in crores)		**2459.58**

Annexure-XIII

WIND ROSE



0 60 120 180 240 300M
SCALE

NTPC Limited
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: SINGRAULI SUPER THERMAL POWER PROJECT
STAGE-III (2X800 MW)

TITLE: GENERAL LAYOUT PLAN

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ES	APPD	DATE
D1	PRELIMINARY LAYOUT	RAJ K.	KK	RB							15.03.17
0	PRELIMINARY LAYOUT	RAJ K.	KK	RB							20.12.16
					CLEARED BY						

SIZE	SCALE	DRG. NO.	REV. NO.
A0	1 : 6000	1150-999-POC-F-001	0-D1

ANNEXURE-XIV

Green Belt Development in Singrauli STPP

Sl. No.	Area	Acres
1	MGR Workshop	9.37
2	Jwalamukhi Mandir	22.31
3	Kota hills	160.48
4	Coal dust settling pond	4.14
5	Behind central store	3.16
6	CHP control room area	4.75
7	Fire station area	0.48
8	Fuel Oil Pump House area	3.40
9	Near baliya nalah	19.79
10	Near BHEL Gate	19.60
11	C. W. Pump house area	62.73
12	Township area	537.96
13	Khadia Ash Dyke	630
	TOTAL	1478.16