BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,

Principal Bench, New Delhi

Original Application No. 459/2018

In the matter of: -

Rashmi Singh — Applicant(s)

Vs.

NTPC Limited & Ors. — Respondent(s)

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(Nazimuddin)
Scientist-E
Central Pollution Control Board,
Parivesh Bhawan, East Arjun Nagar,
Delhi- 110032.

Date: 05.03.2021
Place: Delhi

BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

Original Application No. 459/2O18

Earlier 196/2O14 (CZ)

Rashmi Singh Vs NTPC Ltd. &Ors

Report of the Committee

in the matter of Rashmi Singh Vs NTPC Limited & Ors (OA No. 459/2018)

Date of Submission – 2nd March 2021

M/s NTPC Limited is located at village Sipat, Tehsil Masturi, District Bilaspur (Chhattisgarh) for generation of 2980 MW power in its Super Thermal Power Plant (STPP). The EC for stage I and Stage II was granted in year 1999 and 2004 respectively with subsequent amendment thereon. The applicant has challenged the compliance of EC conditions in its OA No 459/2018.

Hon'ble NGT (Principal Bench) vide order dated 27.02.2020 has directed the committee constituted in OA No 200/2018 Dukalu Ram & Ors Vs Union of India vide order dated 14.02.2019 to consider the aspects raised by the applicant. The members of the committee are as under :-

1. Dr. R. P. Mishra, Scientist-D, Central Pollution Control Board, RD, Bhopal
2. Dr. P. R. Sakhare, Scientist D, Ministry of Environment Forests & CC, RO, Nagpur
3. Dr. Saransh Mitter, District Collector Bilaspur

The committee has collected and perused reports of NTPC Sipat, MoEF&CC Nagpur, CSIDC Raipur and CECB Bilaspur. The committee has also consulted the following reports and data to verify the issues raised by the applicant, which are on record of Hon'ble NGT along with report submitted by this committee on 15th July 2020.

1. EC compliance report of MoEF&CC, Regional Office, Nagpur dated 20.06.2019
2. Report of Studies on terrestrial ecology and aquatic ecology by Guru Ghasidas University, Bilaspur (2015)
3. Fly ash data in public domain on website of Central Electricity Authority (CEA)
4. Soil analysis report submitted by Soil Testing Officer, Tilak Nagar, Bilaspur
5. Raipur declaration (2nd June 2017) on Fly ash by Hon'ble NGT

6. Report of Study on Impact of Coal Dust on Soil, Crop and Tree Species due to Open Wagon Coal Transportation conducted by Indira Gandhi Krishi Vishwavidyalaya BTC College Of Agriculture And Research Station Sarkanda, Bilaspur, Chhattisgarh
7. Environment (Protection) Amendment rules, 2020 notified in The Gazette of India on 21st May 2020
8. Study of heavy metal in coal and fly ash has been completed and analysis submitted by IICT Hyderabad has been submitted by NTPC Sipat.
9. Study conducted by Indira Gandhi KrishiVishwavidyalaya BTC College of agriculture and research station Sarkanda, Bilaspur
10. Reports published by CEA (Central Electricity Authority)
11. Soil analysis report in the villages in question

In compliance of Hon'ble NGT order dated 20.08.2020, committee has visited site of M/s NTPC Limited, Sipat on 11.11.2020 and verified the status of EC compliance with operational condition of pollution control devices provided by NTPC. The observation and finding of the committee is summarised as under:-

Sl. No	**EC Condition**	**Present Status of Compliance verified during visit to NTPC site**
1	Coal should be used @ 10 MT/ year for Stage-I with Sulphur content not exceeding 0.24%. The coal should be transported from Korba Coalfields by Captive MGR in closed wagons to avoid dust pollution.	EC granted for Stage-I with restricting Sulphur content not exceeding 0.24% was amended vide MoEF & CC letter no. J-13011/10/1996-IA-II (T) dated 8th September 2014. In the above said letter MoEF&CC has accorded amendment in the said EC for sourcing coal from operating SECL mine with maximum Sulphur content of 0.4 percent. **(Annexure-02).** NTPC in its reply submitted to the committee has informed about conducting study of coal quality by Centre for energy studies, IIT Delhi in which Sulphur content was endorsed to be within 0.4%. The report is in the records of Hon'ble NGT.

		(Annexure-03) NTPC has started covering of coal wagons from 20.08.2020 with tarpaulin after Hon'ble Supreme Court upheld the order, in an appeal filed by NPTC, against the order passed by this Hon'ble tribunal regarding covering of coal wagons. **Hence Complied**
2	As per the proposal submitted for Ash Utilization, it should be ensured that fly ash is used in cement industry, brick making and in raising the ash dyke etc. Efforts should also be made in the area of mine filling, land development and agriculture etc. For brick making, about 50 acres of land with all infrastructure facilities should be earmarked. Full fly ash utilization should be ensured at the end of 9th year from the date of commissioning of the project	Ash utilization data presented by NTPC Sipat indicate very low percentage of fly ash utilization during 2015 to 2020. However in FY 2020-21 rising trend is observed which may be due to utilization of fly ash in raising of ash dykes. Dry fly ash was found being issued to fly ash brick manufacturers and Cement industries. Pond ash was supplied in Bilaspur – Pathrapali and Raipur - Dhamtari NHAI project. NTPC Sipat got allocation of Manikpur OCM void for ash filling purpose. SECL has agreed for filling of 2888529 CUM fly ash in Manikpur OCM vide its letter number 241 dated 05.12.2020 **(Annexure-04)**. Possession of 70 acre land in Saler Village, near NTPC Sipat, in district Bilaspur had been given to CSIDC on 24-05-2016 for Micro Small Enterprises Cluster Development. Further, CSIDC has got approval for Land diversion from Agricultural to Industrial use. Land

		diversion from Agricultural to Industrial use has been notified in Gazette on 08.05.2020. CSIDC has moved for Lay out plan approval with Town and country planning. Presently, about 100 ash-based industries are reported to be operational in the vicinity of NTPC, Sipat. **Hence not complied.**
3	Keeping in view the location of Sonthi Pahar Reserved Forest, additional Monitoring Station should be installed at the site to assess the ambient air quality. Monitoring should be initiated immediately to ascertain the project status and the scenario after commissioning of the project. A special study should be undertaken to ascertain impact of SO2 on the flora in the project impact zone particularly the forest patches.	Ambient Air Quality monitoring station was found operational during visit by out sourced agency. The photographs of monitoring station are placed at **Annexure -01.** Monitoring records were also presented before committee for verification and found satisfactory. Copy of few reports is placed at **Annexure- 05.** Study on Terrestrial ecology was conducted in 2002 & in 2015 which concludes negligible effect on Eco system. **Copy of the report is in records of Hon'ble NGT.** **Hence Complied.**
4	Regular monitoring for SPM, SO2, NOx around the power plant may be carried out and records maintained. A Monitoring Station should be established near Sonthi Pahar forest in NE direction of the power plant	Three CAAQMS are found installed at plant boundary including one at adjoining NTPC township boundary and real time monitoring is connected with CPCB and CECB Server. Screen shot of its connectivity is placed at **Annexure-06.** **Hence complied.**
5	Since maximum concentration for SO2 near Sonthi Pahar is likely to be close to permissible levels for	It was informed to the committee that AAQ monitoring is also being done in nearby villages namely Janji, Kaudia and Karra manually at

	sensitive area, continuous monitoring and analysis of ambient air quality in the region should be undertaken during planning, construction and operational phase of the project.	regular interval. Records were found maintained by NTPC, copy of few monitoring reports are placed at **Annexure-07.**Photographs of monitoring station are placed at **Annexure-01.** **Hence Complied.**
6	Utilization of land for Stages I & II of the project shall be restricted to 4382.44 acres, which is already in possession of the project authorities. 70 acres of additional land will be acquired by M/s. NTPC for ash based units.	As per records produced by NTPC, Sipat before committee it seems that only 4360 acres of land had been acquired for project including MGR, switch yard and township. **Hence Complied.** The documents placed by NTPC Sipat, before the committee reveals that NTPC Sipat had approached District Collector, Bilaspur in 2005 for acquisition of 70 acre land as stipulated in EC. Copy of document is placed at **Annexure- 08.** **Hence not complied.**
7	Ash generated to the tune of 2.15 million tones per year shall be used in a phased manner as per the provisions of the Fly Ash Utilisation Notification of September, 1999 and its subsequent amendments. By the end of ninth year, full fly ash utilisation should be ensured. The cost of ash utilisation measures proposed in the total project cost should be intimated.	It was reported that NTPC has started its operation on full power generation capacity in year 2011 and simultaneously implemented use of fly ash in various defined sectors as per fly ash utilization notification 1999. At the time of inspection ash dyke raising was in progress in lagoon #02 and further ash dyke raising is to be taken in Lagoon # 01 and 03.NTPC Sipat has got weighting of its design for ash dyke raising by IIT/NIT. NTPC Sipat has obtained allocation of Manikpur OCM void for ash filling purpose. SECL has agreed for filling of 2888529 CUM flyash in manikpur OCM.

		CPCB has also imposed EC on thermal power plants of NTPC in its Sipat Unit. NTPC has made appeal in Hon'ble Supreme Court and obtained stay on payment of EC. **Hence not complied.**
8	Details of the plan to develop ash utilizing industrial units in the 70 acre plot proposed by the project proponent should be worked out in consultation with the State Government and the draft plan in this regard should be submitted to MOEF within 6 months of environmental clearance. 70 acres of land will only be utilized for setting up ash based industries.	Detailed action taken in this context has been described at point 2. **Not complied.**
9	Regular monitoring of the air quality should be carried out in and around the power plant and records be maintained. Periodic six monthly reports should be submitted to this Ministry.	M/s NTPC Sipat has produced monitoring records before the committee for verification and informed about regular submission of data to MoEF&CC. Copy of the monitoring reports is placed at **Annexure-09.** **Hence Complied**
10	A long-term study on radioactivity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter mechanism for an in-built continuous monitoring of radioactivity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	Study of radioactivity has been done by BARC Mumbai, and it is concluded in the report that the radiation levels in and around the Sipat Super Thermal Power Station of NTPC Ltd., is comparable with the National average values. The naturally occurring radionuclide levels in groundwater / surface water / drinking water samples is observed well below the Atomic Energy Regulatory Board (AERB) and World Health Organization (WHO) prescribed limit /

		guideline values. The activity concentration of naturally occurring radio nuclides in soil, food matrices, flora and fauna is comparable to the national background levels. Copy of the report is placed at **Annexure-10.** Study on heavy metals in coal and fly ash was completed through IICT Hyderabad. Copy of the report is placed at **Annexure-11.** NTPC has informed the committee that there are no technology/instruments available for in built continuous monitoring of radioactivity & heavy metals in coal & fly ash (including bottom ash). As & when technology/ instruments is available then NTPC shall install the same. **Hence Complied**
11	Monitoring of surface water quantity and quality shall also be regularly conducted and records maintained. The monitored data shall be submitted to the ministry regularly. Further, monitoring point shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring of heavy metals in ground water shall be undertaken.	Ground water and surface water quality was found being monitored monthly in surrounding 11 villages namely Hardadih, Sukhripali, Ralia, Rank, Janji, Kaudia, Bhilai, Gatora, Darrabhata, Nawadih and Deori. Lilagarh river and kharang river water quality is also monitored monthly. Heavy metals are also monitored monthly in ground water in the plant peripheral six villages namely Hardadih, Sukhripali, Raliya, Bhilai, Gatura and Raank. Six monthly monitoring reports are submitted to the Regional office and head office of ministry and records were found maintained by NTPC. Copies of few reports are placed at **Annexure-12.** **Hence Complied.**
12	Minimum required environmental	Water is sourced from Hasdeo RBC. In order to

	flow suggested by the competent authority of the state Govt. shall be maintained in the channel/Rivers (as applicable) even in lean season.	ensure minimum required flow NTPC has surrendered 27 MCM water out of earlier allocation of 120 MCM, leaving present allocation 93 MCM. Copy of surrender letter is placed at **Annexure-13.** **Hence Complied.**
13	Fly ash shall not be used for agriculture purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall takes place at any point of time. In case, the option of mine void filling is to be adopted, prior detail study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the state pollution control board and implementation done in close co-ordination with the state pollution control board.	Fly ash was not found being used for agriculture purpose. Vide OM Ref: F.No.22-13/2019-IA.III dated 28.08.2019, MoEF & CC, has issued notification for utilization of fly ash in reclamation of low lying area and stowing in abandoned mines/quarries as per SOP developed by CPCB. NTPC Sipat got allocation of Manikpur OCM void for ash filling purpose. SECL has agreed for filling of 2888529 CUM fly ash in Manikpur OCM vide its letter number 241 dated 05.12.2020 but filling of mine void has still not started. **Hence Complied**
14	CSR schemes should address Public hearing issues and shall be undertaken based on need base assessment in and around the villages with in 5 Km of the site and in constant consultation with the village panchayat and the district administration. As part of	CSR funds were found allocated as DPE guidelines and expenditures were found incurred on community development. More over CSR expenditures are decided as per direction/instruction from district collector. The annual budget allocated for CSR activity is about Rs 900 lakh per year on an average. List of CSR activity incorporating major activities

	CSR prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken. Development of fodder farm, fruit bearing orchard, vocational training etc. can form a part of such programmes. Company shall provide separate budget for community development activities and income generating programmes. Vocational training programmes for possible self-employment and jobs shall be important to identify villagers free of cost	are place at **Annexure- 14.** **Hence Complied.**
15	The environment statement for each financial year ending 31st march in form-V as is mandated to be submitted by the project proponent to the concern state pollution control board as prescribed under the Environment (protection) rule, 1986, as amended subsequently, shall also to be put on the website of the company along with the status of compliance of Environmental clearance conditions and shall also be sent to the respective regional offices of the ministry by e mail.	Environment statement submission was found regular. **Hence Complied.**
16	Top surface of the coal wagons shall be completely covered with	NTPC Sipat has started covering of coal wagons with tarpaulin from 20.08.2020 after

	tarpaulin sheet/Cloth so that coal will not get exposed to atmosphere and becomes secondary emissions. This will avoid fugitive dust emissions during the transport. Water sprinkling shall be done on the top surface of coal at loading point before covering with tarpaulin sheet. Due safety procedures shall be followed so that the covered sheet doesn't open up and fly away during transport which will endanger safety of nearby people, agricultural fields, etc. Water sprinkling measures as proposed at loading and unloading point shall be continued. Progress report of implementation shall be submitted to this ministry and concerned Regional office as part of Compliance report.	Hon'ble Supreme Court upheld the order, in an appeal filed by NPTC, against the order passed by this Hon'ble tribunal regarding covering of coal wagons. Photographs are presented at **Annexure-01.** NTPC has appraised that company is pursuing with RDSO Lucknow for mechanical covering of coal wagons. Token fee has already been paid to RDSO. Consultancy Project proposal is awaited. **Hence Complied.**
17	Dense avenue plantation shall be developed on either side of the track wherever habitations/agricultural lands exists in consultation with local forest department to minimize the dust and noise pollution.	In order to ensure green belt along railway track of MGR, a large-scale tree plantation scheme was adopted by NTPC. As informed to committee plantation of **48919** plants along the MGR track has been completed on 30.04.2020 through CGRVVN Ltd. Bilaspur. Copy of report obtained from CGRVVN is placed at **Annexure-15.** **Hence Complied.**

18	AAQ monitoring within 1 km on either side of track, close proximity to nearby habitation, shall be continued once in a quarter and the progress report shall be submitted.	AAQ monitoring is being conducted in six villages namely Lutra, Bitkula, Nirtu, Jhanj, Utarda and nevsa, along MGR track and report of the same are being submitted to ministry on quarterly basis. Monitoring report of the same is enclosed at **Annexure-16.** **Hence complied.**
19	Health survey study of the local people shall be carried out. The report should clearly bring out the impact on surrounding forests, agriculture/crop patterns, percentage of yield, public health due to open wagon coal transportation, etc.	This condition was imposed in the EC amendment issued on 17.05.2018. NTPC had conducted this study through CIMS Bilaspur wherein it has been mentioned that "*the prevalence of Chronic Obstructive Pulmonary Disease (COPD) found in our study is similar with the prevalence of COPD among non-coal dust exposure area in the country"*. Copy of the report is placed at **Annexure-17.** It is submitted that Study for impact on forest, crop etc carried out by TCB College of agriculture, Bilaspur. Study is completed and there is no adverse finding in report. Copy of the report is placed at**Annexure-18.** **Hence Complied.**
20	As stipulated by the earlier EAC on 31.03.2016, PP should study alternative methodologies /technologies being utilized including abroad, to prevent coal dust blow from moving open wagons carrying coal, if any. The results of this study should be submitted within one year.	NTPC, Sipat has already taken up with RDSO Lucknow, the designer of BOBR wagons for mechanical covering of coal wagons. NTPC has started covered coal transport, **Hence Complied.**

In compliance of Hon'ble NGT order dated 27.02.2020 about issues of non-compliances raised by the applicant, the committee has also visited the specific sites and called the records to verify the facts. The issues to be looked into by this committee include :-

1. Coal handling and its quality
2. Land area and its use
3. Fly ash utilization
4. Green belt development and its compliance
5. Ambient air quality monitoring
6. Compliance of zero liquid discharge
7. Court cases
8. Soil testing in villages around NTPC
9. Compliance of EC conditions
10. Installation of Flue Gas Desulphurisation (FGD)

Sl. No.	**Non compliances according to applicant**	**Observation of the committee**
01	*EC condition No. (viii)for coal transport to be done through closed wagon transport has not being complied with and no exemption should be granted in this context.*	NTPC has started covering of coal wagons from 20.08.2020 after Hon'ble Supreme Court upheld the order, in an appeal filed by NPTC, against the order passed by this Hon'ble tribunal regarding covering of coal wagons.
02	*EC condition No. (ix)is not being complied despite more than 10 years of plant operation It is mentioned therein that 70 acres of revenue land has been identified at saler Village which has got transferred to Dept. of industries, Govt. of Chhattisgarh and then to CSIDC. It is mentioned therein that CSIDC has sought approval from concerned*	The issue has been described at point 06 of EC compliance status.

	authorities and the same is awaited. It is also mentioned in the Report that NTPC is pursuing the matter with CSIDC for early implementation. All in all it is clear from a mere reading that the above mentioned EC condition No. (ix)is not being complied with.	
3	*EC condition has not been complied with. It is stated that the maximum land for stage I and II of Sipat is 4382.44 acres. According to the Applicants this condition is being violated in a big way because of leakage from Ash Dykes, as more than 200 Acres of land has got marshy.*	The committee has visited the site and observed marshy condition in agriculture fields but it was difficult to decide its reason as no leakage from ash dykes was observed. At site it was found that irrigation canal passing adjacent to agriculture field was also damaged at many places. Photographs taken during visit are placed at **Annexure-01.** Reasons are what so ever but interest of farmers shall be on priority. Hence its needs an in-depth study to find out the cause and formulate an action plan for its remediation. The cost of study should be paid by NTPC.
4	*EC condition pertaining to Fly Ash utilization condition is being violated and even 49.54% figure of use is not correct as maximum portion of the ash is being used for raising height of ash dam.*	Central Electricity Authority (CEA) is the agency for compilation of National data of fly ash generation and utilization under various heads. CEA publishes its annual report on fly ash generation and utilization and made available in public domain as linkcea.nic.in/reports/others/thermal/tcd/flyash. As per the CEA reports Chhattisgarh is having maximum number of thermal power plants in India with annual utilization 77.12% of fly ash. ***As per Environment (Protection) Amendment rules, 2020 notified in The Gazette of India***

		on 21st May 2020, amendment made in Environmental (Protection) Rules, 1986 in rule 3, for sub rule (8) point 2(iv), Thermal Power Plants are permitted to dispose flyash in abandoned or working mines (to be facilitated by mine owner) with environmental safeguards. In this context NTPC Sipat has obtaind permission for filling of fly ash in Manikpur coal mine.
5	*Study on heavy metals in coal and fly ash said to have been done by the IICT Hyderabad but the same has not been brought on the record and NTPC is not complying the condition in this regard.*	In compliance of applicant's observation about para 3 vi regarding study on heavy metals in coal and fly ash , NTPC Sipat has submitted copy of analysis report dated 29.05.2017 done by Indian Institute of Chemical Technology, Hyderabad. Copy of the report is placed at **Annexure-11.**
6	*Study for impact on forest, crop etc. by TCB College of agriculture, Bilaspur, Chhattisgarh is under process i.e. still not done hence the non-compliance.*	The said study has been completed and copy of the report is placed at **Annexure-18.**
7	*There are ongoing court cases thereby proving that NTPC is in breach of mandatory requirements of environment regulations.*	NTPC has briefed about three cases i.e. 7893 of 2014 CJM, Bilaspur, OA No. 195/2014 Hon'ble NGT (CZ) and present OA No. 459/2018. Copy of the decisions provided in favour of NTPC Sipat in case number 7893 of 2014 is placed at **Annexure-19** and OA No. 195/2014 is at **Annexure-20.**
8	*The capital cost on EMPIS has only been mentioned whereas no breakup/item wise details have been*	As desired NTPC Sipat, has provided copy of breakup details for capital cost of EMPIS. Copy attached at **Annexure-21.**

	provided to ascertain the actual use.	
9	*It is falsely stated that all conditions of MPSPCB's NOC dated 5th March, 1997 has been complied with. Condition No. 7 at page 23 of the MPSPCB's NOC annexed with Original Application states that Zero Liquid Discharge had to be achieved but a perusal of Annexure 6 at page 53 with the Original Application, Additional Affidavit of Applicant dated 21.01"2016 and para 7 of Reply to CECB's Affidavit of October, 2019 at pages 1082 to 1087 shows that there has been a discharge of polluted water from Ash dams and how such pollution is causing the land to become marshy and causing damage to the crops.*	The basic nature of the TPP is air polluting however waste water generated from various section of the plant may be treated in ETP. The major sources of wastewater generation are cooling tower blow down, boiler blow down, ash pond overflow and condenser water. NTPC has installed two ETP of total 15000 KLD capacity for waste water treatment. NTPC has also provided Ash water recycling system (AWRS) to reuse it in slurry formation to transport ash from plant to ash dyke. As per water balance chart maximum part of treated water is used as make up water in slurry formation. NTPC has installed continuous water quality monitoring system at the outlet of every ETP which is connected with server of CPCB and CECB. At the inspection AWRS and ETP were found operational. Photographs of AWRS are also presented at **Annexure-01.** The review of water pollution control system indicates that NTPC has sufficient capability to treat waste water generated in the plant.
10	*EC condition No. 2 (viii) of using coal of only 0.24% sulphur. The NTPC violated this condition till 2014 and got the condition amended during the pendency of this application. Even the new norm 0.40% sulphur content is being violated as the sulphur content is much higher as evident from the chemical property chart filed by the applicant earlier.*	After perusal of documents placed by NTPC committee is in view that EC for stage I was issued in 1999 with sulphur content 0.24 % but coal to be used from Dipika Mine. The sulphur content condition was modified upto 0.36% in 2002 and upto 0.4 % in 2014. The units of Stage I was made operational in year 2011. More over EC of Stage II was granted on

		08.06.2004 without any sulphur content condition but coal to be used from same Dipika Coal Mine. The operation of Stage II was started in 2008 i.e. before operation of Stage-I. Testing of sulphur content in coal of Dipika mine was done by IIT and regularly by CIMFR (for process use only) and report of IIT is placed at **Annexure-03**.
11	*False information has been submitted by NTPC to MoEF&CC which has not BEEN verified independently. The Google image produced by the applicant has a calculation that instead of 259 acre of green belt area as claimed by the NTPC, hardly120 acre can be considered as green belt.*	NTPC claims for plantation of 3,72,421 trees in residential area, plant premises, MGR Track and ash dyke though Chhattisgarh Rajya Van Vikas Nigam Limited and produced copies of work orders. Norms of plantation is 2000 trees per hectare i.e. 1000 trees per acre. As per norms of 80 percent survival total number of survived trees came to around 297936. As per plantation norms of 1000 trees per acre (297936/1000) it come to around 297 acres.

OBSERVATION :-

1) As per EC condition mechanism for an in-built continuous monitoring of radioactivity and heavy metals in coal and fly ash (including bottom ash) shall be put in place. In this context NTPC has informed that there are no technology/instruments available for in built continuous monitoring of radioactivity & heavy metals in coal & fly ash (including bottom ash). As & when technology/ instruments is available then NTPC shall install the same. Hence status of compliance could not be judged.

2) In compliance of Hon'ble NGT observation in its order 27.02.2020, the committee has visited the area in close proximity with the ash dyke and observed waterlogging in agriculture fields but it was difficult to decide its reason as no leakage from ash dykes was observed. At site it was also found that irrigation canal passing adjacent to

agriculture field was also damaged at many places. Photographs taken during visit are placed at **Annexure-01.** In compliance to Hon'ble NGT Direction soil testing reports of land in villages Raliya, Hardadih, Raank, Bhilai, Kaudiya, Gatora and Sakhripali was called from collector Bilaspur. The said report is on the record of Hon'ble NGT. Copy of the report is placed on **Annexure-22** indicates about no adverse effect on soil. In this context committee is in the view that reasons are what so ever but interest of farmers shall be on priority. Hence its needs that an in-depth study to find out the cause and formulate an action plan for its remediation shall be conducted. The cost of the project should be paid by NTPC.

3) In compliance of Ministry of Environment Forest & CC letter dated 7.12.2017, Central Pollution Control Board has issued direction to M/s Sipat Super Thermal Power Station, Bilaspur on 11.12.2017, 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. **M/s Sipat Super Thermal Power Station was directed to install FGD in unit #01and 02 by 31.12.2022 and Unit # 03,04& 05 by 31.12.2021 so as to comply SO_2 emission limit.**

In the above context M/s Sipat Super Thermal Power Station, NTPC Ltd has informed in its reply submitted to Oversight committee that work order for FGD installation has been awarded for Stage-I unit (3x660MW). Completion schedule submitted by NTPC for unit #01 & 03 is November 2021 and for Unit # 02 is February 2022. Stage II (2x500 MW) units proposal for installation of FGD is under tendering stage. Copy of work order and pert chart plan is attached at **Annexure-23.** In compliance of Hon'ble Supreme court order dated 21.07.2020 NTPC Sipat is submitting quarterly progress report in Hon'ble NGT. At the time of visit civil work for construction of FGD stack was found in progress and in consonance with PERT chart submitted by NTPC. Photographs of the same are placed at **Annexure- 01.**

RECOMMENDATIONS :-

1. Ministry of Environment, Forests and Climate Change vide its office memorandum dated 28th August 2019 has changed in conditions stipulated in the Environmental Clearances of Thermal power Plants and Coal Mines in line with the fly ash

notification and subsequent amendment. As per changes made vide this office memorandum, the guidelines prepared by CPCB for disposal of flyash for reclamation of low lying areas and in stowing/backfilling of abandoned mines/quarries shall be followed during disposal of ash in abandoned or working mines. In this context a committee may be appointed to ensure proper management of flyash in the state and implementation of SOP developed by CPCB.

2. NTPC, Sipat shall conduct an in-depth study though any reputed institute to find out the reasons for water logging in the fields near ash dyke. The scope of the work shall also include providing various options for remediation of agricultural field.

3. NTPC, Sipat to obtain further directions from MOEF&CC regarding those EC conditions which are declared as impossible (Continuous monitoring of radioactive emission) and R&D activities in for modifications in coal wagons in the same line of EC amendment in case of NTPC, Ramagundam (AP) and NTPC Unchahar (UP). Copy of EC is enclosed at Annexure-25.

Note: This report was shared with Collector Bilaspur. Collector has provided his report to CPCB and MoEF&CC and has also directly submitted that report to NGT on 02.03.2021.

(Dr. P.R. Sakhare)
Scientist 'D'
MoEF&CC, RO, Nagpur

(Dr. R.P. Mishra)
Scientist 'D'
CPCB, RD, Bhopal

ETP Stage-I (3 x 250 m^3/hr)

Pic-1.1

Pic-1.2

Pic-1.3

Pic-1.4

Pic-1.5

Pic-1.6

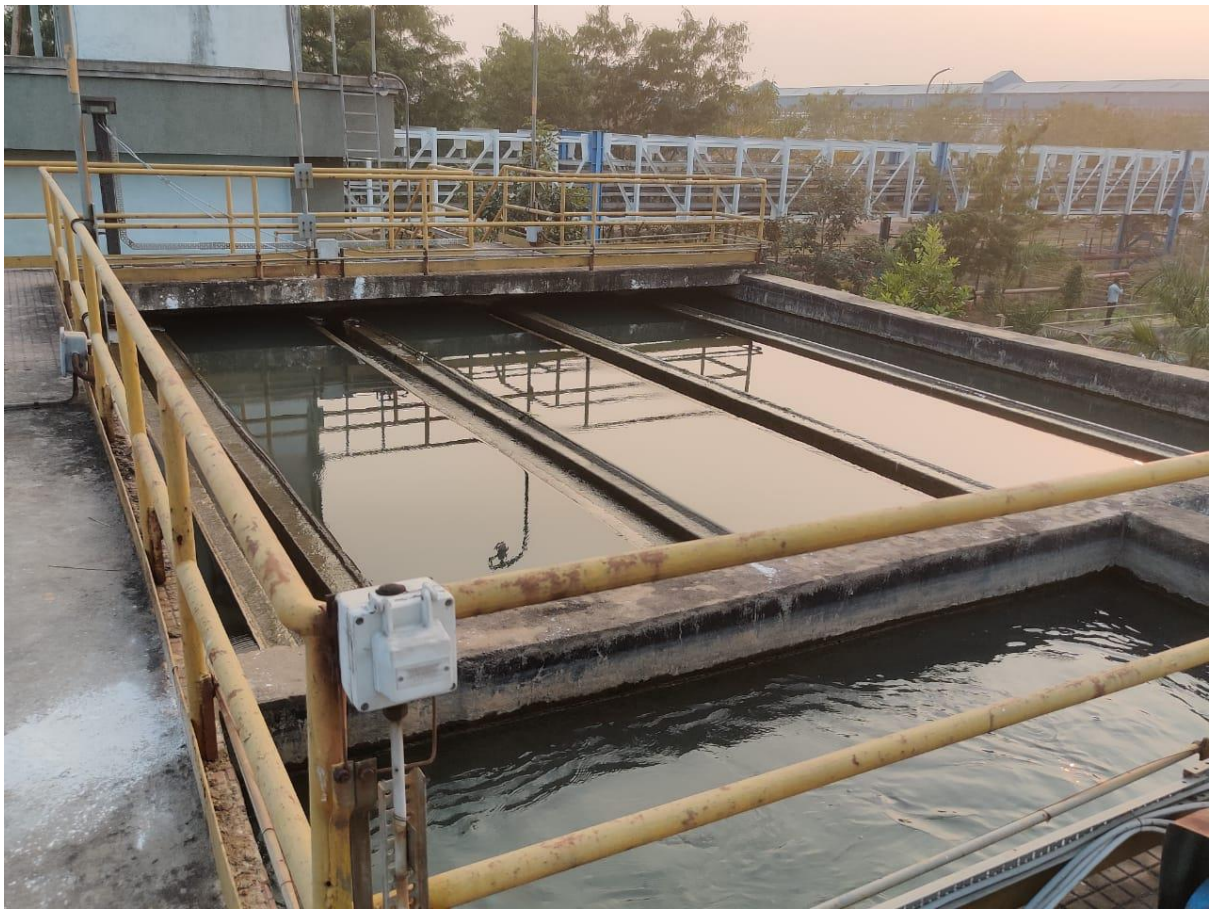
ETP Stage-II (2 x 125 m^3/hr)

Pic-2.1

Pic-2.2

Pic-2.3

Pic-2.4



Pic-2.5

PIC-1 AWRS Pump House Sump

PIC-2 AWRS Pump House Building

Pic-3 AWRS Pumps

CAAQMS Analyzers

Pic-1


MANUFACTURED BY:
Chemtrols
Thermo
SCIENTIFIC
AAQMS
SWITCHYARD
STATION

Pic-2

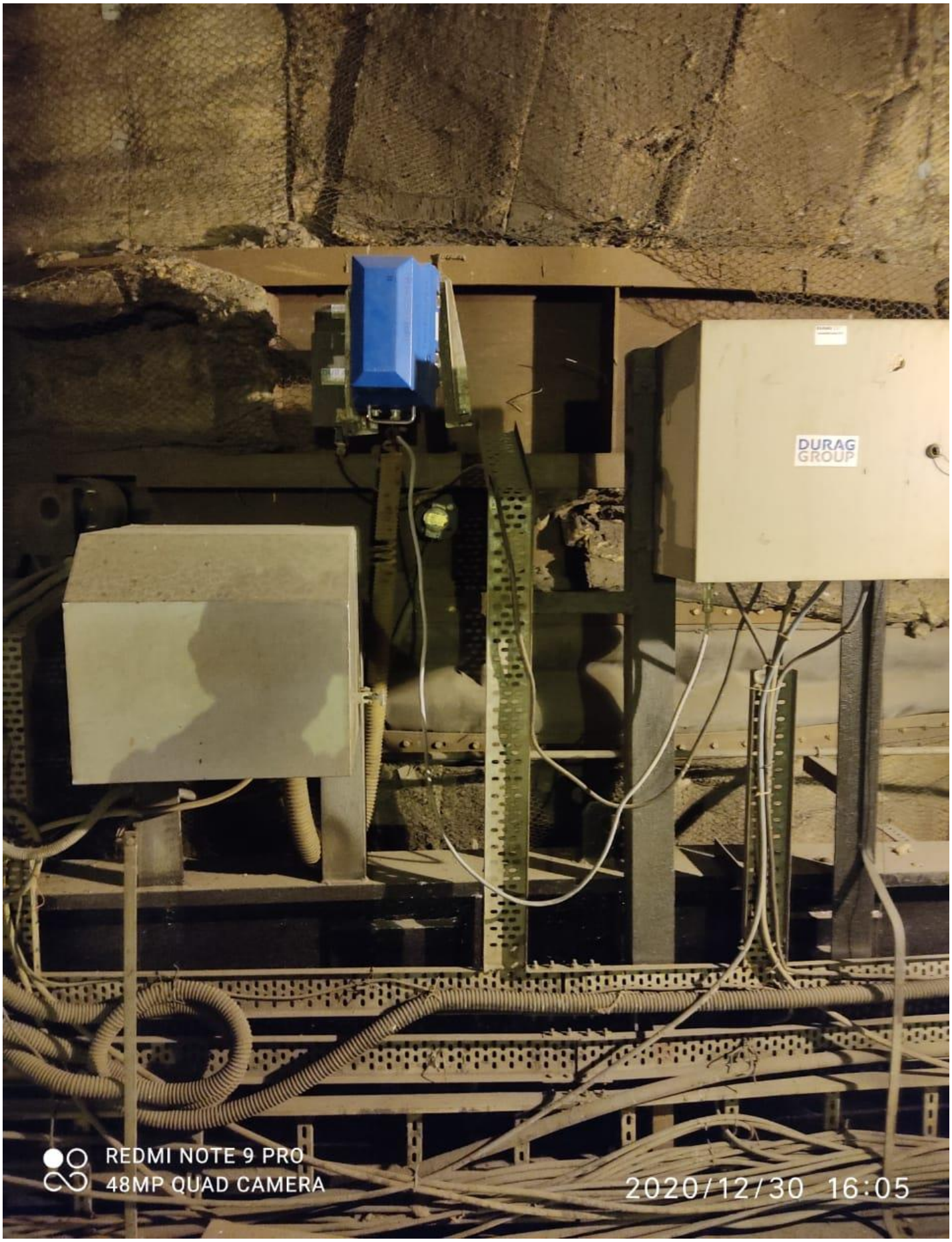
Pic-3

Pic-4

Pic-5

Instrumentation installed for CEMS

Unit-1 SPM



Unit-2 SPM

Unit-4 SPM

Unit-5 SPM

SOx NOx Probe Stage -2 (Unit 4 & 5)

Calibration Cylinder for Unit-2 CEMS

COAL TRANSPORTATION THROUGH COVERED WAGONS

Pic-1

Pic-2


Unnamed Road, Sirki Khurd, Chhattisgarh 495446, India
Sirki Khurd
Chhattisgarh
India
2020-09-03(Thu) 04:12(PM)
Google

Pic-3


Ratija, Chhattisgarh 495446, India
Latitude
22.3426258°
Longitude
82.5088097°
Local 10:30:59 AM
GMT 05:00:59 AM
Altitude 257.83 meters
Thursday, 17-09-2020

Pic-4

Plantation along MGR track

Pic-1

Pic-2

Pic-3

Pic-4

Pic-5

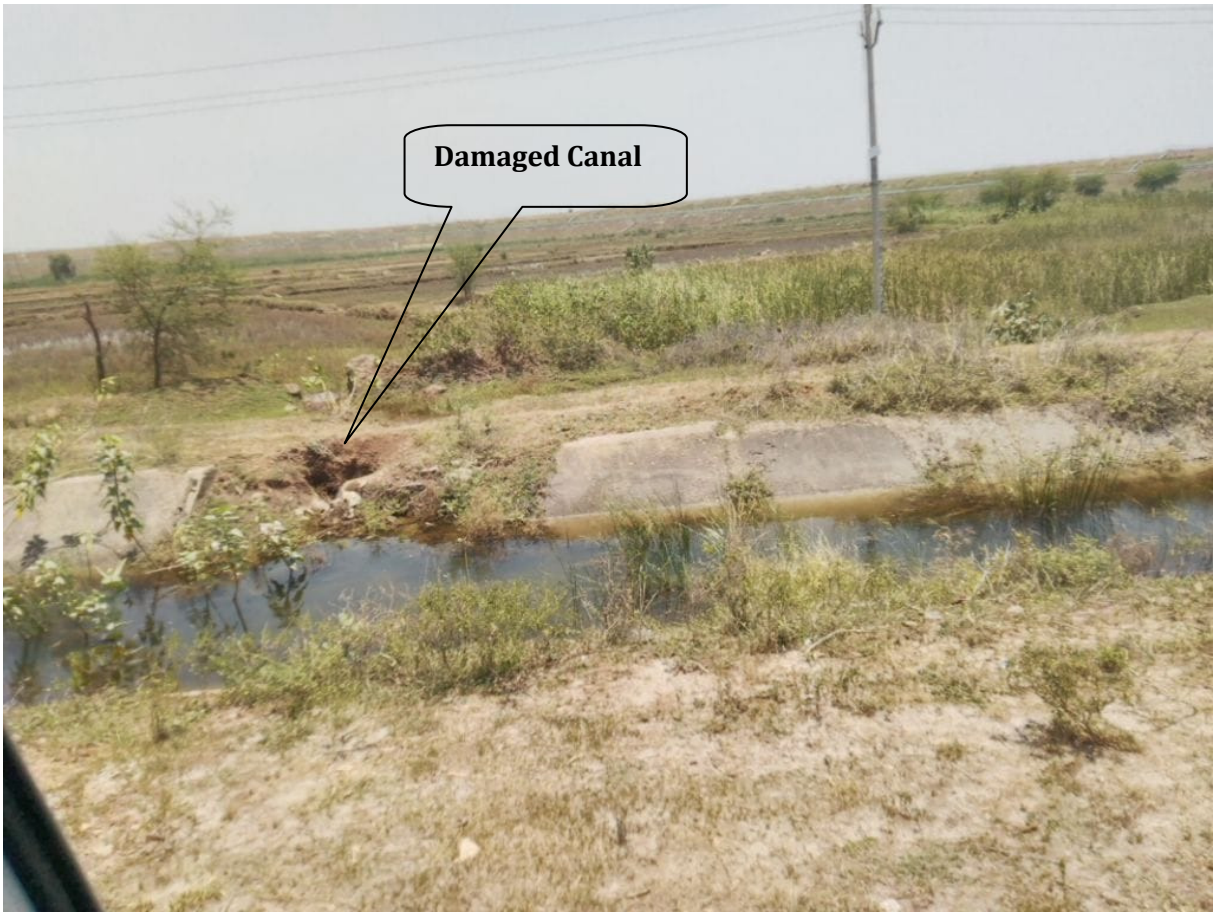
Pic-6

Pic-7


Canal is broken &
water going outside


Canal filled with silt
causing overflow


Water flown
out from canal

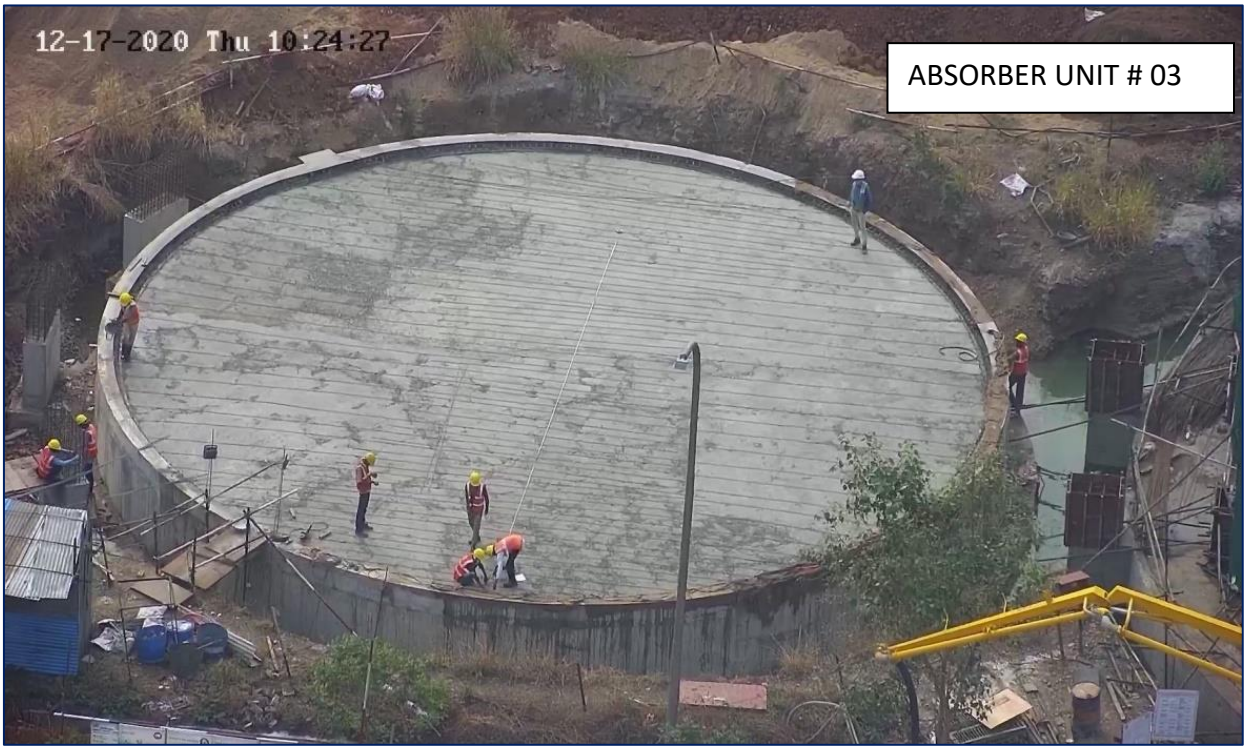

Damaged Canal

WORK PROGRESS IN FGD NSTALLATION


10:24:44
CHIMNEY UNUT # 03


19-12-2020 Sat 11:10:09
ABSORBER UNIT # 01
FGD Sipat


12-17-2020 Thu 10:25:56
ABSORBER UNIT # 02


12-17-2020 Thu 10:24:27
ABSORBER UNIT # 03

ANNEXURE-02

J-13011/10/1996 -IA.II (T)
Government of India
Ministry of Environment, Forests and Climate Change

3rd Floor, Vayu Block,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, New Delhi-110003

Dated: 8th September, 2014.

To

M/s NTPC Ltd.
Engineering Office Complex,
Plot No. A-8A, Sector-24,
Post Box No. 13,
Noida (U.P.) – 201301

Ph: 0120-2410333; Fax: 0120-2410136/2410137

Sub: **3x660 MW (Stage-I) Sipat Super Thermal Power Project at District Bilaspur in Chhattisgarh by M/s NTPC Ltd. - reg. amendment in EC for change of source of coal.**

Sir,

This has reference to your letters dated 22.05.2013 and 29.11.2013 on the above subject. It is noted that EC was accorded by MoEF for 2000 MW (4x500) on 22.02.1999 and subsequent amendment dated 30.04.2002 for change of fuel composition and unit size (3x660 MW).

2. The matter was placed before the Expert Appraisal Committee (Thermal Power) in its 8th Meeting held during January 9-10, 2014. In acceptance of the recommendation of the Expert Appraisal Committee (Thermal Power) and in view of the information/clarification furnished by you, with respect to the above mentioned power project, the Ministry accords amendment in the said EC for sourcing coal from operating mines of SECL with a maximum sulphur content of 0.4% instead of sourcing from Dipika mines with sulphur content not exceeding 0.36% and transportation of coal by open wagons with suitable measures instead of closed wagons, depending on the availability. However, permission for transportation of coal by open wagons is accorded **only for one year** with the stipulation that within one year, NTPC will come out with a plan of carrying coal in a cleaner way.

3. Further, the following conditions are stipulated in addition to the conditions of the EC dated 22.02.1999 and its amendment dated 30.04.2002.

(i) *The transportation of coal shall be by Rail only.*

(ii) Harnessing solar power within the premises of the plant particularly at available roof tops shall be undertaken and status of implementation shall be submitted periodically to the Regional Office of the Ministry.

(iii) A long term study on radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter mechanism for an in-built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.

(iv) Mercury emissions from stack shall also be monitored on periodic basis.

(v) Fugitive emissions shall be controlled to prevent impact on agricultural or non-agricultural land.

(vi) No ground water shall be extracted for use in operation of the power plant even in lean season. No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up / operation of the power plant.

(vii) Monitoring of surface water quantity and quality shall also be regularly conducted and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall be undertaken.

(viii) Minimum required environmental flow suggested by the Competent Authority of the State Govt. shall be maintained in the Channel/ Rivers (as applicable) even in lean season.

(ix) Fly ash shall not be used for agricultural purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, prior detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the State Pollution Control Board and implementation done in close co-ordination with the State Pollution Control Board.

(x) Green belt shall also be developed around the Ash Pond over and above the Green Belt around the plant boundary.

(xi) CSR schemes should address Public Hearing issues and shall be undertaken based on need based assessment in and around the villages within 5.0 km of the site and in constant consultation with the village Panchayat and the District Administration. As part of CSR prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken. Development of fodder farm, fruit bearing orchards, vocational training etc. can form a part of such programme. Company shall provide separate budget for community development activities and income generating programmes. Vocational training programme for possible self employment and jobs shall be imparted to identify villagers free of cost.

(xii) For proper and periodic monitoring of CSR activities, a CSR committee or a Social Audit committee or a suitable credible external agency shall be appointed. CSR activities shall also be evaluated by an independent external agency. This evaluation shall be both concurrent and final.

(xiii) An Environmental Cell comprising of at least one expert in environmental science/ engineering, ecology, occupational health and social science, shall be created preferably at the project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would

be accountable for implementation of environmental regulations and social impact improvement/mitigation measures.

(xiv) The project proponent shall formulate a well laid Corporate Environment Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.

(xv) The environment statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.

4. All other conditions mentioned in this Ministry's letter of even no. dated 22.02.1999 and its amendment dated 30.04.2002 shall remain the same, as applicable.

5. This issues with the approval of the Competent Authority.

(Dr. Saroj)
Scientist 'F'

Copy to:

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110001.
2. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
3. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
4. The Secretary, Department of Environment, Government of Madhya Pradesh, Bhopal.
5. The Chairman, Madhya Pradesh Pollution Control Board, E-5, Arera Colony, Paryavaran Parisar, Bhopal-462016, Madhya Pradesh.
6. The Chief Conservator of Forests, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, Arera Colony, Ravishankar Nagar, Bhopal - 462016.
7. The Collector, District Bilaspur, M.P.
8. Guard file.

(Dr. Saroj)
Scientist 'F'

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Vol. 63, February 2004, pp. 156-162

Impact of Indian and imported coal on Indian thermal power plants

A Chandra* and H Chandra

Centre for Energy Studies, Indian Institute of Technology, Delhi, Hauz Khas, New Delhi 110 016

Received: 23 May 2003; accepted: 30 October 2003

Energy efficiency and environment analysis have been performed for coal based thermal power plants situated in Delhi for Indian and imported coal from Australia and America. In our study, it has been found that it is better to use imported coal in Indian thermal power plants, with advantages like, less amount of coal feed, low CO_2 emission, and less amount of particulate generation. The effect of per cent excess air on particulate generated and collection efficiency of electrostatic precipitator (ESP) is also analyzed, and it is found that as the particulate generated (before discharge) is less for imported coal, one may use less efficient ESP in thermal power plants.

Keywords : Impact, Indian and imported coal, Coal, Indian Thermal Power Plants, Thermal Power Plants

1 Introduction

The power generation in India has registered remarkable growth since it gained independence in 1947(ref. 1). Power generation increased from 1362 MW in 1947 to about 104917 MW in 2002(ref. 2). Thermal power plants and hydro-sectors are the major power producer in India. The major portion of power demand in India is met by thermal power plants due to availability of fossil fuels (coal, oil, and gas). Around 72 per cent of total installed capacity is met by thermal power plants and 25-30 per cent is met by hydroelectric power generation, while the rest accounts for other sources of power generation. Among the conventional means of power generation, fossil fuel fired thermal power plants are very significant in the energy scenario of India[3-9].

Fossil fuels (coal, oil, and gas) is going to remain the primary source of energy in India in spite of attempts to harness hydel, nuclear, and renewable sources of energy. In the sphere of fossil fuels, India is not very well placed with reference to resources of oil and import of oil is very expensive. However the situation with respect to coal reserves is comparatively better, as it contributes 84 per cent of thermal power generation while, gas and oil contribute to 13 and 3 per cent of thermal power generation, respectively[10-12].

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In India the demand of electricity is always more than the supply and the coal reserves in India is in better condition than other fossil fuels, thus the power production is totally dependant on the coal, which is responsible to a large extent, in polluting our environment. Environmental problems associated with thermal power plants start with transportation of coal from mine, feeding it to boiler, and the emission of flue gases[13]. Nowadays the environmental problems of energy use are related with environmental cost, which have been rising, reinforcing the effect of increased monetary costs in creating incentives for increasing the efficiency with which energy is used[14].

The energy efficiency and environmental pollution of thermal power plant are dependent upon the fuel used for combustion in furnace of boiler. Since coal reserves in India is in better situation, thus it is worthwhile studying the impact of coal quality in thermal power plants. However the coal found in India is characterized by low calorific value and high ash content. As a result, for getting a unit amounts of electricity, large amount of pollutants are generated. It is desirable to have a good quality of coal for power generation, as it reduces the pollutants generated/unit of electricity. The problem is analyzed in the present study by considering good quality of coal obtained from overseas. The work reported here examines the impact of coal quality in thermal power plant situated

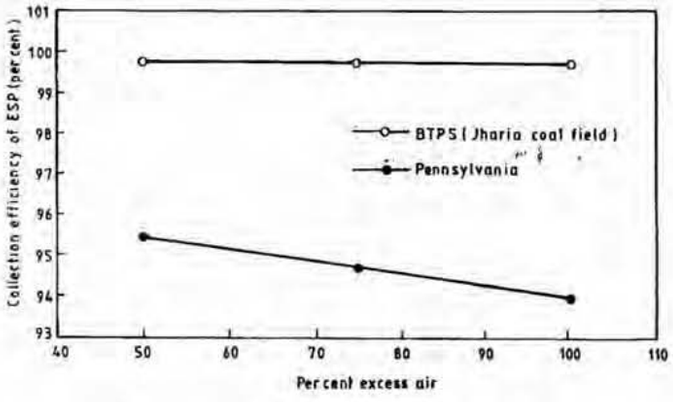

Figure 5 — Variation of collection efficiency of ESP with respect to per cent excess air used for combustion in BTPS Plant

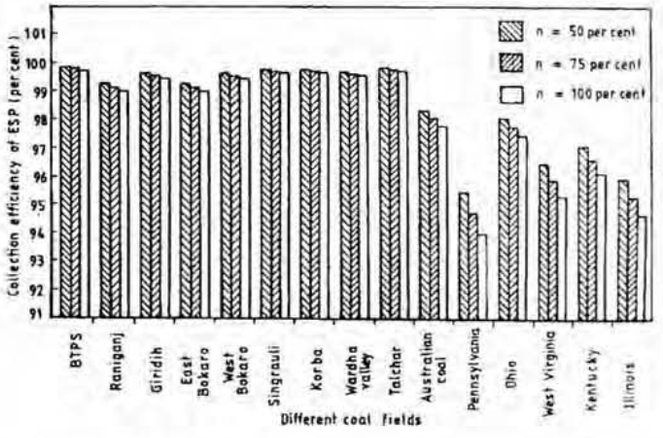

Figure 6 — Collection efficiency of ESP for BTPS and different coal fields used in BTPS with variation of per cent excess air (n)

50, 75 and 100 per cent, respectively. From Figure 4, it is evident that Indian coals are more polluting with respect to the dust emission to environment. It is due to the fact that the ash fraction of Indian coal (varying between 21 to 40 per cent) is more than the imported coal (varying between 7.5 to 15 per cent). In imported coal American coal is better than Australian coal. As the particulate generated is high for Indian coal therefore it is must to control it before discharging into atmosphere with the help of pollution control devices, e.g., electrostatic precipitators (ESPs). Large ESPs are required in order to meet the stipulated emissions standards, which will increase the capital cost and maintenance cost of power plant and hence higher value of obtaining power. Form Figure 4, it is also evident that the inlet dust concentration decreases as the per cent excess air increases. It is due to the fact that after combustion the mass of the particulate is same but due to excess air used for combustion its density decreases.

From Figure 4, it is evident that the inlet dust concentration is high for BTPS (Jharia coal field) while low for Pennsylvania coal. In order to meet CPCB emission standard of 0.150 g/Nm^3; the variation of collection efficiency of ESP with respect to per cent excess air, Figure 5 is drawn. Form Figure 5, it is evident that when the per cent excess air is more then the collection efficiency decreases, and as the inlet dust concentration for Pennsylvania coal is low compared with Jharia coal, therefore the collection efficiency for Pennsylvania coal is low. From Eq. (15), it may be observed that the collection efficiency depends upon inlet dust concentration only, because the outlet dust concentration is fixed by CPCB. Now when inlet dust concentration decreases then the collection efficiency of ESP also decreases. The inlet dust concentration of the Pennsylvania coal is lower than Jharia coal, because the ash fraction of Pennsylvania coal (7.5 per cent) is lower than Jharia coal (46.56 per cent). The inlet dust concentration also depends up on the flue gas flow rate, which depends upon the per cent excess air, and as the per cent excess air increases, flue gas flow rate increases, and the inlet dust concentration decreases.

Figure 6 shows the collection efficiency of ESP for BTPS and various coal fields used in BTPS with variation of per cent excess air. From Figure 6, it is evident that the required collection efficiency of ESP is low for imported coal than Indian coal, as imported coal has low inlet dust concentration. And as the inlet dust concentration decreases then the collection efficiency also decreases, because the outlet dust concentration remain constant by the standards fixed by CPCB. The inlet dust concentration also depends upon the flue gas flow rate, which depends upon the per cent excess air used for combustion.

4 Conclusions

In this study the suitability of Indian coal and imported coal from Australia and America for Indian thermal power plant is assessed with respect to energy efficiency and environment analysis. It is estimated that less amount of coal feed is required in the case of imported coal (to get the same energy efficiency) to generate the same amount of electricity, as it has high calorific value. Also the CO_2 emission and particulate generated (before discharge) is lower for imported coal than Indian coal. As the particulate generated are less for imported coal thus we can use less efficient ESPs to control particulate. The SO_2 emission is high in the case of imported coal, which might require flue gas desulphurisation treatment in some cases. One

साउथ ईस्टर्न कोलफील्ड्स लिमिटेड
मिनी रत्न कम्पनी
(कोल इंडिया लिमिटेड का सहायक कम्पनी)
सीपत रो, पी.बी. नं.60, बिलासपुर (छ.ग.) 495 006
पर्यावरण विभाग

South Eastern Coalfields Limited
(A MINI RATNA COMPANY)
(A Subsidiary of Coal Indrias Ltd.)
Seepat Road, P.B. No.60, Bilaspur (C.G.) 495 006
Environment Department
CIN: U10102CT1985GOI003161
Tel. 07752 246324
Tele Fax 07752 246324

संदर्भ : एस.ई.सी.एल/बीएसपी/पर्यावरण/2020/271 दिनांक : 05.12.2020

प्रति
सदस्य सचिव,
छत्तीसगढ़ पर्यावरण संरक्षण मण्डल,
नवा रायपुर, अटल नगर, रायपुर छ.ग.

विषय:- Allotment of void at Western query of Manikpur OC of SECL Korba Area for fly ash filling.

महोदय,

उपरोक्त विषयांतर्गत लेख है कि, SECL द्वारा कोरबा क्षेत्र कि माणिकपुर ओपन कास्ट खदान की वेस्टर्न क्वारी में Fly Ash के भरने की अनुमति हेतु निम्नलिखित ताप विद्युत संयन्तों से आवेदन प्राप्त हुए है ।

1. NTPC सीपत
2. BALCO कोरबा
3. LANCO अमरकंटक प्रा. लिमिटेड
4. MARUTI Clean Coal Pvt Limited
5. ACB(India) Ltd.

दिनांक 17.04.2020 को कोल इंडिया द्वारा "Guidelines of CIL for Offering Mine Voids for Fly Ash Disposal" जारी की गई । उपरोक्त आवेदन इन guidelines के अनुसार जाँचने के पश्चात इन ताप विद्युत संयन्तों को उपलब्ध 6 million cubic meter में से निम्नलिखित तालिकानुसार fly ash भरने की मात्रा आबंटित करना प्रस्तावित किया जा सकता है।

TPP	Generation Cap	% of Total Generation	Allotment of Quantity (in Cu.m.)	Distance in Kms
NTPC	2980	48.1421648	2888529.89	68
BALCO	1740	28.1098546	1686591.28	25
LANCO	600	9.69305331	581583.199	13
MARUTI	600	9.69305331	581583.199	37
ACB	270	4.36187399	261712.439	28
Total	6190	100	6000000	

उपरोक्त प्रस्तावित आबंटन आपके अवलोकनार्थ एवं टिप्पणी हेतु प्रेषित है तत्पश्चात इसकी अंतिम स्वीकृति एवं कोल इंडिया guidelines अनुसार विद्युत संयंत्रों के साथ की अग्रिम कारवाही पूरी की जाएगी।

धन्यवाद ।

भवदीय
5.12.2020
महाप्रबंधक (खनन)/ पर्यावरण

प्रतिलिपि :-
- निदेशक तकनीकी , एसईसीएल बिलासपुर

SE (P/C)
DE (P)
5.12.2020

ENVIRONMENTAL MONITORING AT SONTHI PAHAR, SIPAT

NAME OF CLIENT	:	M/s NATIONAL THERMAL POWER CORPORATION LIMITED DIST-SIPAT, DIST: BILASPUR CHHATISGARH
NAME OF CONTRACTOR	:	NETEL (INDIA) LIMITED ENVIRONMENT MANAGEMENT SERVICES SV ROAD, MANPADA, THANE – 400 610
NATURE OF JOB	:	AMBIENT AIR QUALITY MONITORING AT SONTHI PAHAR RESERVE FOREST AREA, SIPAT DIST: BILASPUR, CHHATTISGARH
WORK ORDER	:	4000086178-037-1019 dated 06/04/2012
DURATION OF PROJECT	:	1 YEAR (12 MONTHS)

For NETEL (INDIA) LIMITED

A. S. SHELKE
GENERAL MANAGER – EMS

पंकज शर्मा
PANKAJ SHARMA
उप महाप्रबंधक (इ एम जी)
DGM(EMG)
एनटीपीसी लि. सीपत, बिलासपुर (छ.ग.)
NTPC Ltd. SIPAT, BILASPUR (C.G.)

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उप महाप्रबंधक (इ (एम जी)
DGM(EM:G)
एनटीपीसी लि. सीपत, बिलासपुर (छ.ग.)
NTPC Ltd. SIPAT, BILASPUR (C.G.)

TABLE: 01 Ambient Air Quality Monitoring Data

LOCATION : KAIMADIH			Concentration of Pollutants, µg/m³					
			PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	HC
			µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	ppm
PERMISSIBLE LIMITS: µg/m³			100	60	80	80	2000	-
DATE OF MONITORING	1st & 2nd FORTNIGHT	4/7/2012	48.67	25	9.21	19.32	672	0.56
		6/7/2012	44.44	16.66	12.29	20.65	668	0.553
		10/7/2012	56.66	30	11.05	21.15	670	0.556
		13/07/12	34.72	12.5	9.5	20.05	645	0.548
		17/07/12	40.04	23.33	13.1	23.5	652	0.565
		20/07/12	Sampling not done					
		23/07/12	37.5	28.5	10.72	21.6	640	0.525
		27/07/12	52	33	12	22.2	628	0.513
Minimum concentration			**34.7**	**12.5**	**9.2**	**19.3**	**628**	**0.513**
Maximum concentration			**56.7**	**33.0**	**13.1**	**23.5**	**672**	**0.565**
Average			**44.9**	**24.1**	**11.12**	**21.2**	**653.6**	**0.546**
98th percentile			**56.1**	**32.6**	**13.0**	**23.3**	**671.8**	**0.564**

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NTPC Ltd. SIPAT, BILASPUR (C.G.)

TABLE: 01 Ambient Air Quality Monitoring Data

LOCATION : BHARUADIH			Concentration of Pollutants, µg/m³					
			PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	HC
			µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	ppm
PERMISSIBLE LIMITS: µg/m³			100	60	80	80	2000	-
DATE OF MONITORING	1st & 2nd FORTNIGHT	4/7/2012	51.75	21.05	9.02	19.25	665	0.551
		6/7/2012	41.21	23.8	12.45	19.57	658	0.539
		10/7/2012	52.58	33.2	10.3	22.5	668	0.555
		13/07/12	43.44	29.16	11.47	21.5	650	0.538
		17/07/12	55	34	14	24	638	0.525
		20/07/12	Sampling not done					
		23/07/12	39.7	22.5	9.78	20.08	630	0.516
		27/07/12	40.03	27.27	9.9	21	641	0.532
Minimum concentration			**39.70**	**21.05**	**9.02**	**19.25**	**630**	**0.516**
Maximum concentration			**55.00**	**34.00**	**14.00**	**24.00**	**668**	**0.555**
Average			**46.24**	**27.28**	**10.99**	**21.13**	**650.0**	**0.537**
98th percentile			**54.71**	**33.90**	**13.81**	**23.82**	**667.6**	**0.555**

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RESULTS & DISCUSSION ON OBSERVATIONS

Respirable Particulate Matter (PM_{10})

PM_{10} concentrations at the **BHARUADIH** were observed

- Range 39.70 to 55.0 µg/m^3, with the
- Mean value as 46.24 µg/m^3 and the
- 98th percentile value as 54.71 µg/m^3.
- Limit: 100.0 µg/m^3

PM_{10} concentrations at **KAIMADIH** were observed

- Range 34.7 to 56.7 µg/m^3, with the
- Mean value as 44.9 µg/m^3 and the
- 98th percentile value as 56.1 µg/m^3.
- Limit: 100.0 µg/m^3

Respirable Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ concentrations at the **BHARUADIH** were observed

- Range 21.05 to 34.0 µg/m^3,
- mean value as 27.28 µg/m^3
- 98th percentile value as 33.9 µg/m^3.
- Limit: 60.0 µg/m^3

$PM_{2.5}$ concentrations at **KAIMADIH** were observed

- Range 12.50 to 33.0 µg/m^3,
- mean value as 24.1 µg/m^3 and the
- 98th percentile value as 32.6 µg/m^3.
- Limit: 60.0 µg/m^3

Sulphur Dioxide (SO_2)

SO_2 concentrations at the **BHARUADIH** were observed

- Range 9.02 to 14.0 µg/m^3,
- Mean value as 10.99 µg/m^3
- 98th percentile value as 13.81 µg/m^3.
- Limit: 80.0 µg/m^3

SO_2 concentrations at **KAIMADIH** were observed

- Range 9.20 to 13.10 µg/m^3,
- The mean value as 11.12 µg/m^3
- 98th percentile values as 13.0 µg/m^3.
- Limit: 80.0 µg/m^3

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NTPC Ltd. SIPAT, BILASPUR (C.G.)

Oxides of Nitrogen (NO_x)

NO_X concentrations at the **BHARUADIH** were observed
- The range 19.25 to 24.0 µg/m³,
- Mean value as 21.13 µg/m³
- 98th percentile value as 23.82 µg/m³,
- Limit: 80.0 µg/m³

NO_X concentrations at **KAIMADIH** were observed
- Range 19.3 to 23.5 µg/m³,
- Mean value as 21.2 µg/m³
- 98th percentile value as 23.3 µg/m³.
- Limit: 80.0 µg/m³

Carbon Monoxide (CO)

CO concentrations at the **BHARUADIH** were observed
- The range 630 to 668 µg/m³,
- Mean value as 650 µg/m³
- 98th percentile value as 667.6 µg/m³,
- Limit: 2000 µg/m³

CO concentrations at **KAIMADIH** were observed
- Range 628 to 672 µg/m³,
- Mean value as 653.6 µg/m³
- 98th percentile value as 671.8 µg/m³.
- Limit: 2000 µg/m³

Hydrocarbon as Methane (HC)

HC concentrations at the **BHARUADIH** were observed
- The range 0.516 to 0.555 ppm,
- Mean value as 0.537 ppm
- 98th percentile value as 0.555 ppm,
- Limit: No Limit Specified

HC concentrations at **KAIMADIH** were observed
- Range 0.513 to 0.565 ppm,
- Mean value as 0.546 ppm
- 98th percentile value as 0.564 ppm.
- Limit: No Limit Specified

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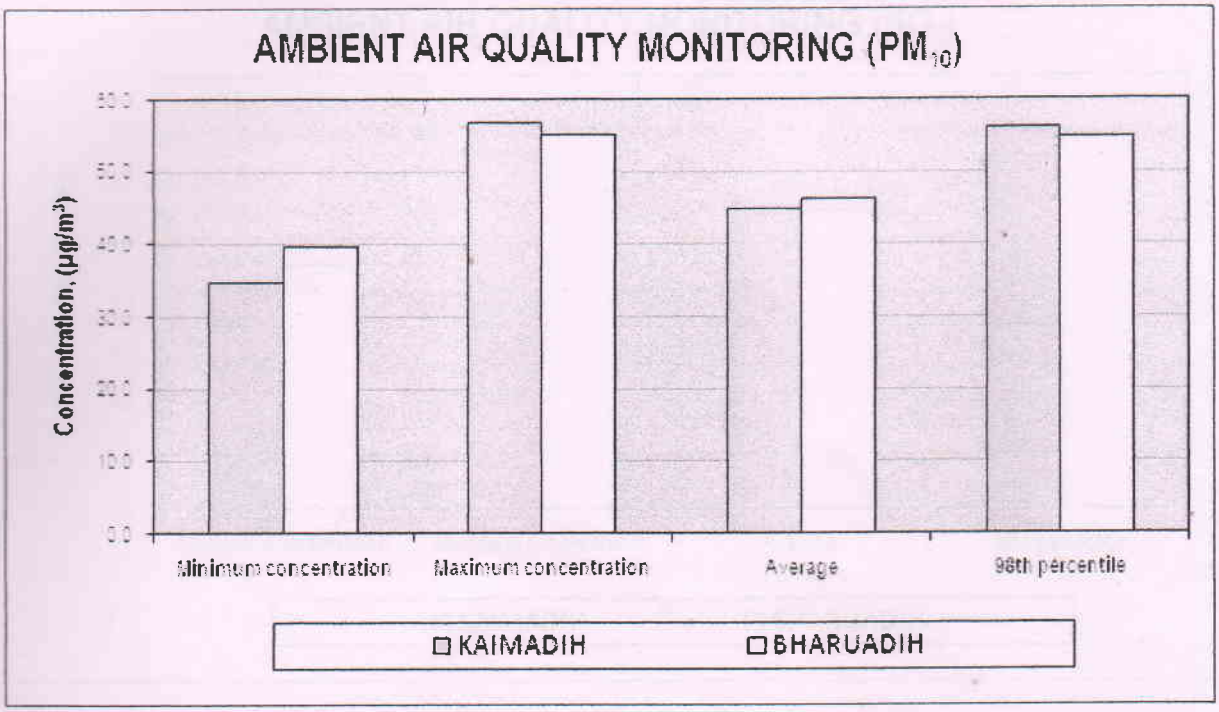
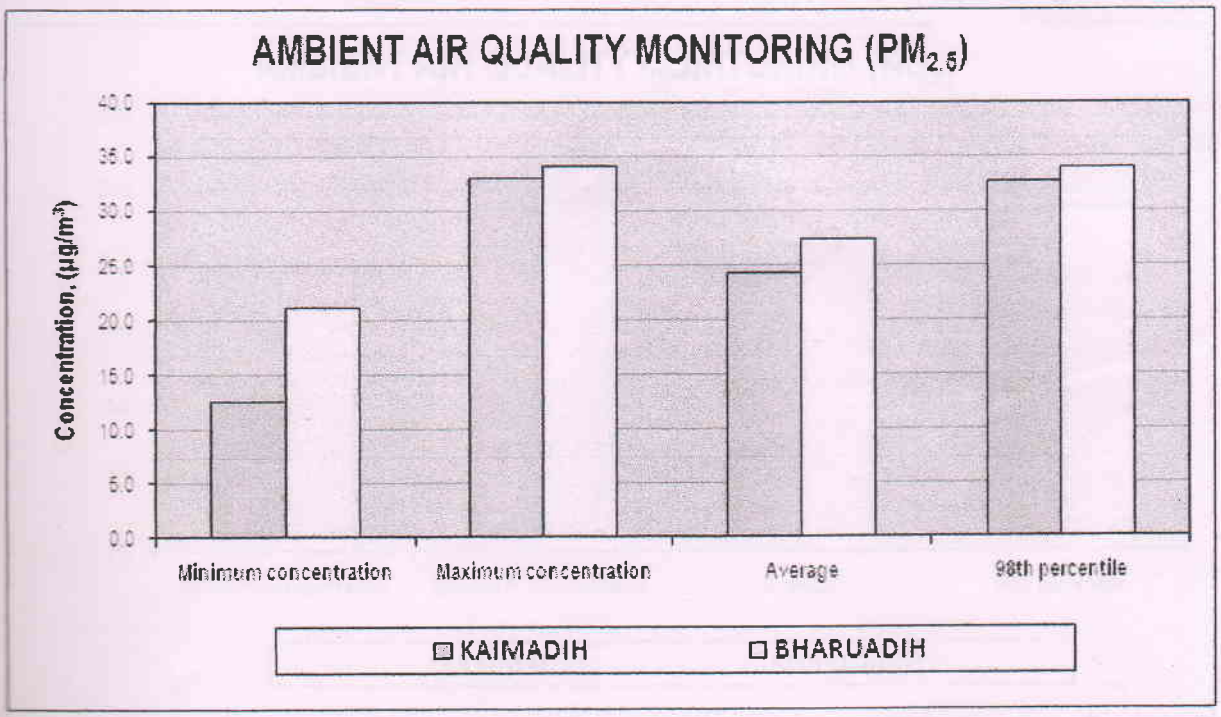
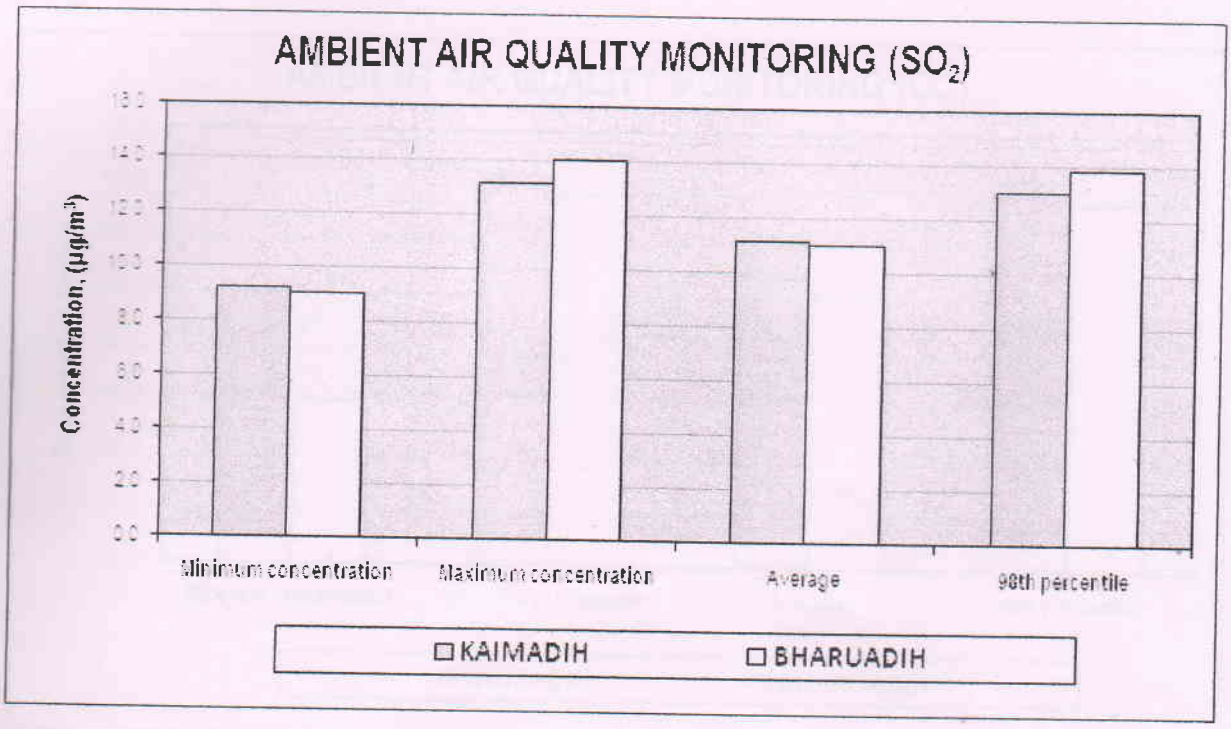
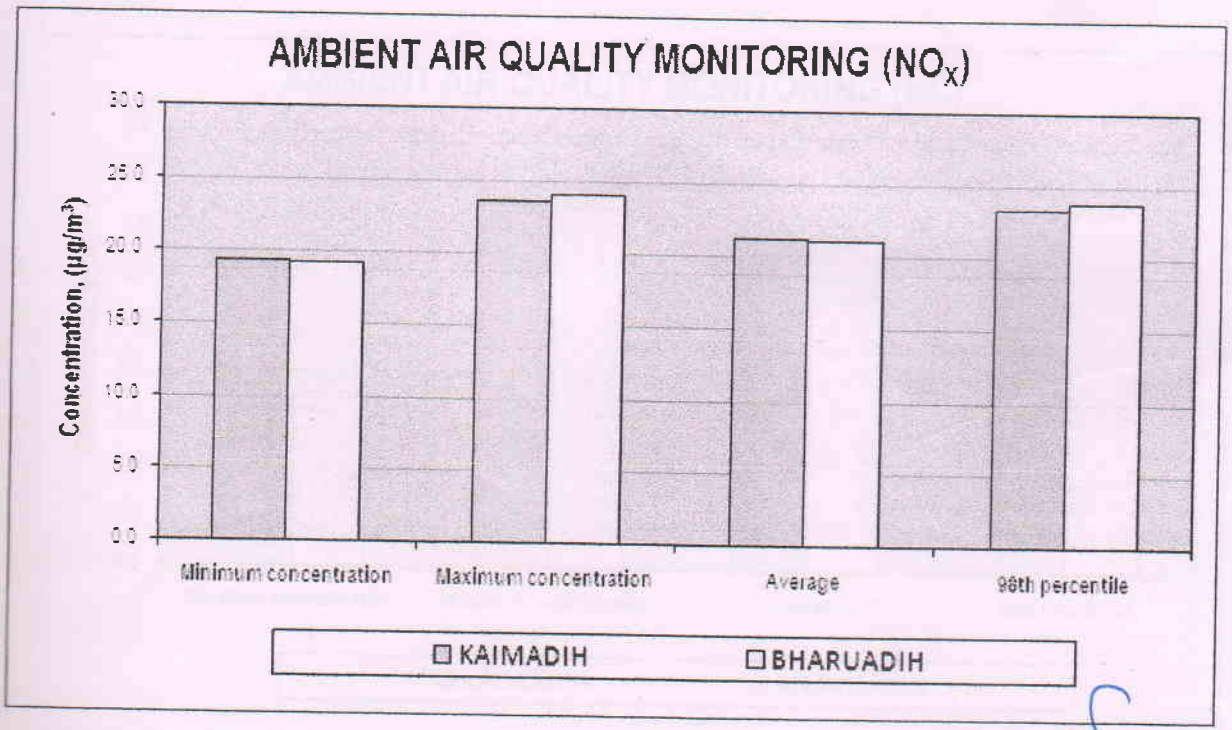
Conclusion:

The observed concentration of PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO, HC were found to be within prescribed standards of Central Pollution Control Board (CPCB) for Rural & Residential area.


AMBIENT AIR QUALITY MONITORING (PM_{10})
Concentration, (µg/m³)
Minimum concentration
Maximum concentration
Average
98th percentile
KAIMADIH
BHARUADIH


AMBIENT AIR QUALITY MONITORING ($PM_{2.5}$)
Concentration, (µg/m³)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Minimum concentration
Maximum concentration
Average
98th percentile
KAIMADIH
BHARUADIH





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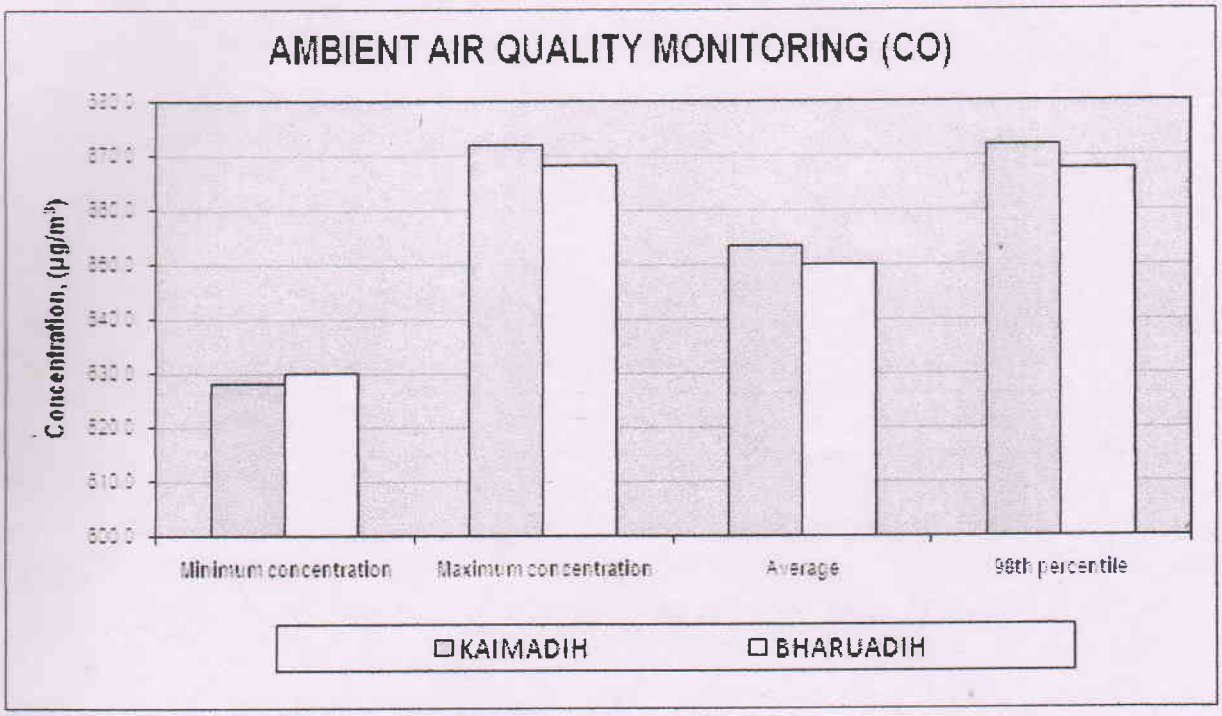

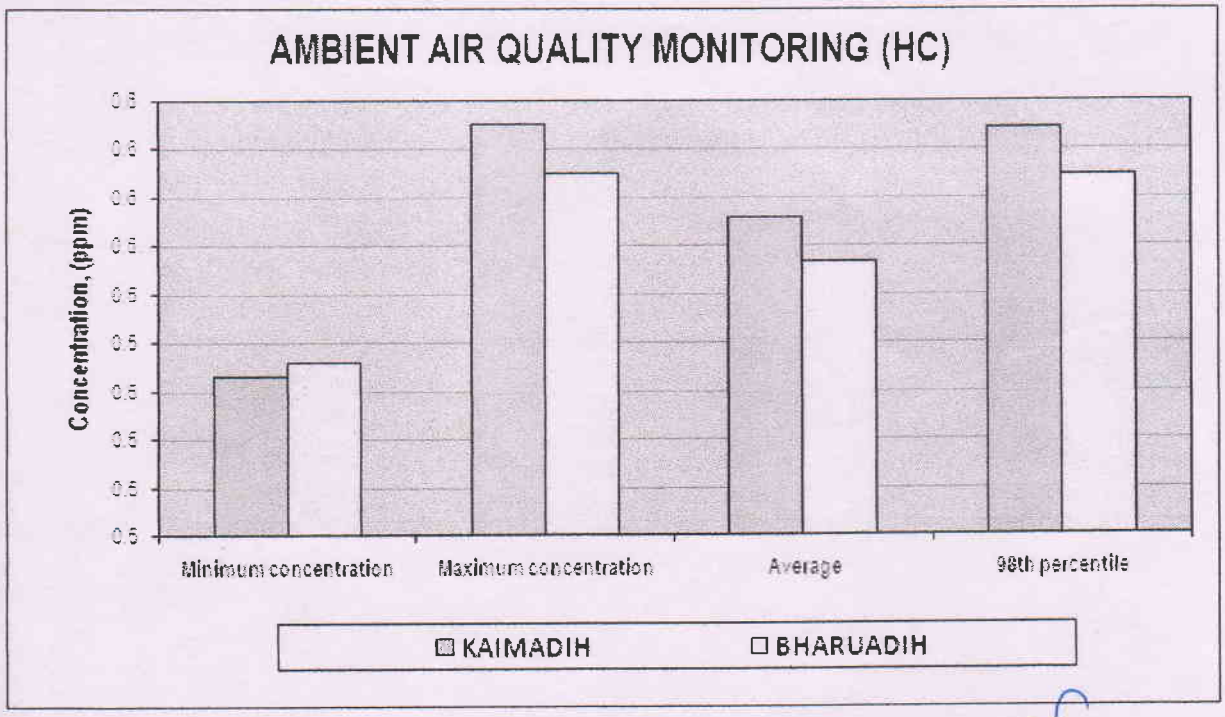

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NETEL

Continuation Sheet

ENVIRONMENTAL MONITORING AT SONTHI PAHAR, SIPAT

NAME OF CLIENT	:	SIPAT SUPER THERMAL POWER PROJECT NTPC LIMITED UJJWAL NAGAR SIPAT, DIST: BILASPUR CHHATISGARH ; 495555
NAME OF CONTRACTOR	:	NETEL (INDIA) LIMITED ENVIRONMENT MANAGEMENT SERVICES W-303,RABALE-MIDC' TTC INDUSTRIAL AREA, NAVIMUMBAI.
NATURE OF JOB	:	AMBIENT AIR QUALITY MONITORING AT SONTHI PAHAR RESERVE FOREST AREA, SIPAT DIST: BILASPUR, CHHATTISGARH
WORK ORDER	:	4000169592-037-1019; Date:16-7-2016
DURATION OF PROJECT	:	1 YEAR (12 MONTHS)

For NETEL (INDIA) LIMITED

NETEL (INDIA) LIMITED * Rabale * Navi Mumbai-400701

SRINIVASA RAO D.
REGIONAL MANAGER – EMS

पंकज शर्मा / Pankaj Sharma
उप महा प्रबंधक / Dy. General Manager
एन टी पी सी लिमिटेड, सीपत (बिलासपुर)
NTPC Ltd., Sipat (Bilaspur)

D. Srinivasa Rao
Regional Manager - EMS
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EIC
Sipat Super Thermal Power Project
NTPC Ltd., Sipat-Bilaspur

INDEX

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D. Sriuvasa Rao
Regional Manager - EMS
Netel (India) Limited

पंकज शर्मा / Pankaj Sharma
उप महा प्रबंधक / Dy. General Manager
एन टी पी सी लिमिटेड, सीपत (बिलासपुर)
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NTPC Ltd., Sipat-Bilaspur

TABLE: 01 Ambient Air Quality Monitoring Data

LOCATION : BHARUADIH			Concentration of Pollutants						
			PM_{10}	$PM_{2.5}$	SO_2	NO_X	O_3	CO	HC
			µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	ppm
PERMISSIBLE LIMITS			100	60	80	80	100	2.0	-
DATE OF MONITORING	1st & 2nd FORTNIGHT	02-06-2017	50.69	29.13	16.2	17.8	9.0	0.529	0.522
		06-06-2017	47.22	25.00	15.8	18.2	11.0	0.514	0.546
		09-06-2017	36.11	16.66	16.3	17.5	10.0	0.521	0.546
		13-06-2017	40.97	20.83	16.4	17.6	10.0	0.518	0.538
		16-06-2017	52.08	37.5	17.3	17.5	11.0	0.524	0.532
		20-06-2017	33.33	18.38	16.2	17.3	9.0	0.533	0.54
		23-06-2017	45.83	32.18	16.4	18.5	12.0	0.518	0.551
		27-06-2017	41.66	23.15	16.1	17.4	11.0	0.512	0.529
		30-06-2017	47.73	24.10	15.8	17.5	12.0	0.519	0.542
Minimum concentration			**33.33**	**16.66**	**15.80**	**17.30**	**9.00**	**0.512**	**0.522**
Maximum concentration			**52.08**	**37.50**	**17.30**	**18.50**	**12.00**	**0.533**	**0.551**
Average			**43.96**	**25.21**	**16.28**	**17.70**	**10.56**	**0.521**	**0.538**

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RESULTS & DISCUSSION ON OBSERVATIONS

Respirable Particulate Matter (PM_{10})

PM_{10} concentrations at **BHARUADIH** were observed
- Range 33.33 to 52.08 µg/m³, with the
- Mean value as 43.96 µg/m³ and the
- Limit: 100.0 µg/m³

Respirable Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ concentrations at **BHARUADIH** were observed
- Range 16.66 to 37.50 µg/m³,
- mean value as 25.21 µg/m³ and the
- Limit: 60.0 µg/m³

Sulphur Dioxide (SO_2)

SO_2 concentrations at **BHARUADIH** were observed
- Range 15.80 to 17.30µg/m³,
- The mean value as 16.28µg/m³
- Limit: 80.0 µg/m³

Oxides of Nitrogen (NO_x)

NO_X concentrations at **BHARUADIH** were observed
- Range 17.30 to 18.50 µg/m³,
- Mean value as 17.70 µg/m³
- Limit: 80.0 µg/m³

OZone (O_3)

O_3 concentrations at **BHARUADIH** were observed
- Range 9.00 to 12.00 µg/m³,
- Mean value as 10.56 µg/m³
- Limit: 100.0 µg/m³

NETEL (INDIA) LIMITED * Navi Mumbai-400701 * Rabale

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Carbon Monoxide (CO)

CO concentrations at **BHARUADIH** were observed
- Range 0.512 to 0.533 µg/m^3,
- Mean value as 0.521 µg/m^3
- Limit: 2.0 mg/m^3

Hydrocarbon as Methane (HC)

HC concentrations at **BHARUADIH** were observed
- Range 0.522 to 0.551 ppm,
- Mean value as 0.538 ppm
- Limit: No Limit Specified

Conclusion:

The observed concentration of PM_{10}, $PM_{2.5}$, SO_2, NO_X, O_3,CO and HC were found to be within prescribed standards of Central Pollution Control Board (CPCB) for Rural & Residential area.

NETEL (INDIA) LIMITED * Rabale * Navi Mumbai-400701

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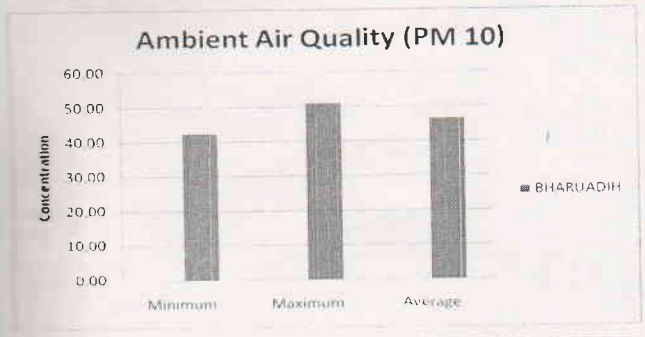
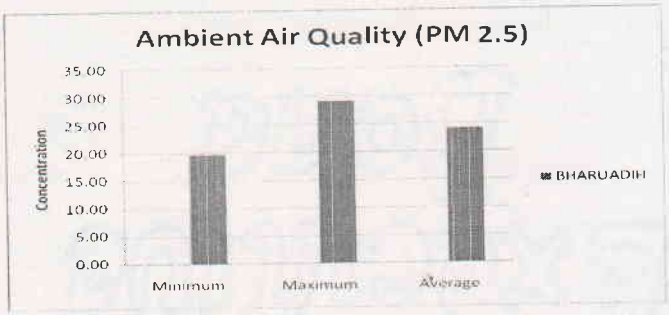
NTPC Ltd., Sipat-Bilaspur

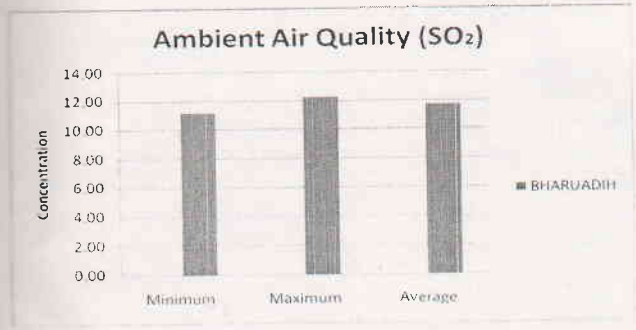
AMBIENT AIR QUALITY GRAPHS

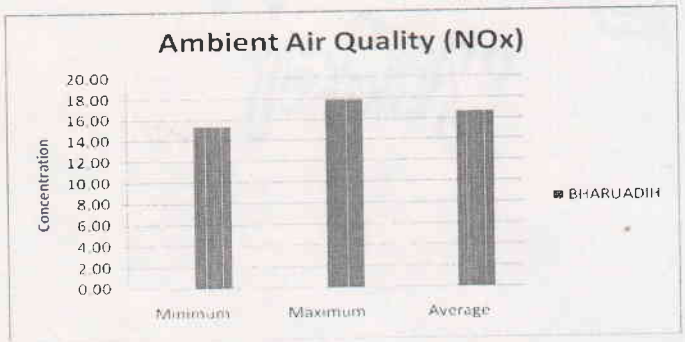
NETEL

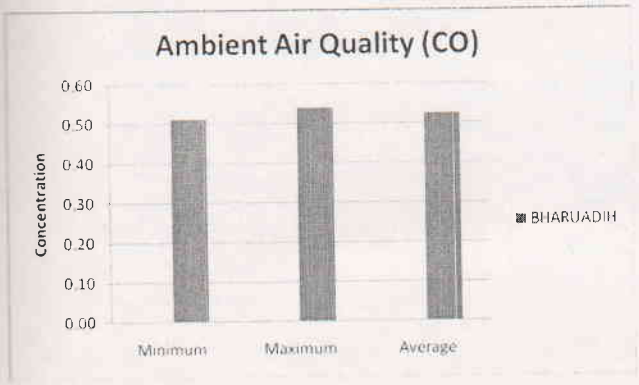
Continuation Sheet

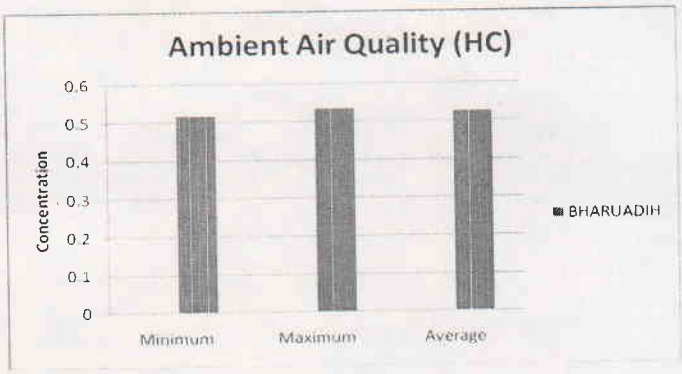


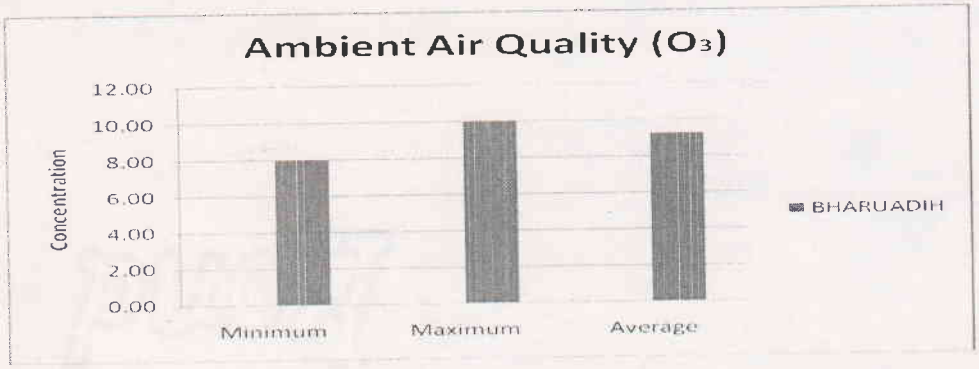












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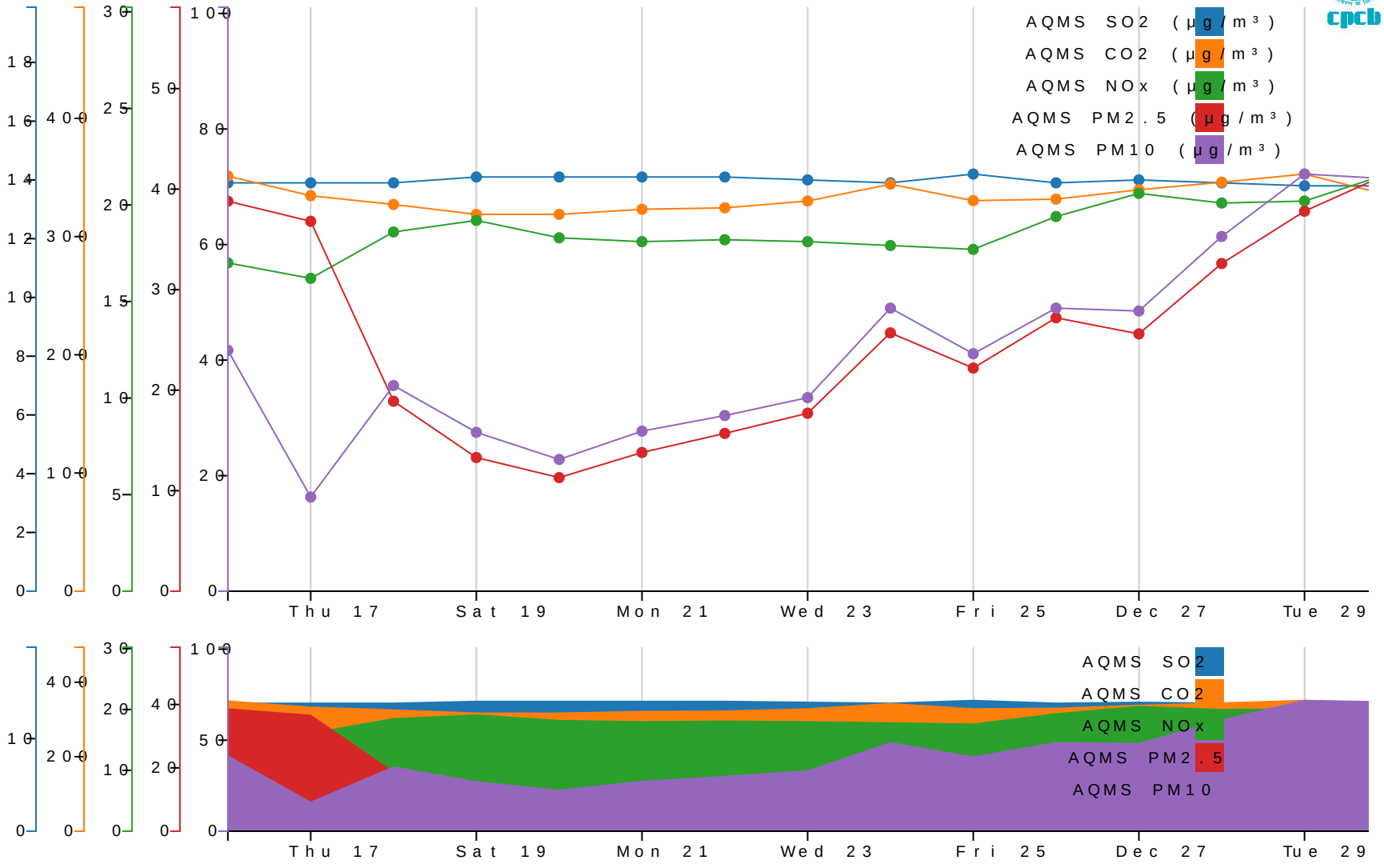
1 = U (Usable Data), 4 = C (Calibration Data), 5 = F (Faulty Dat = Z (Ze

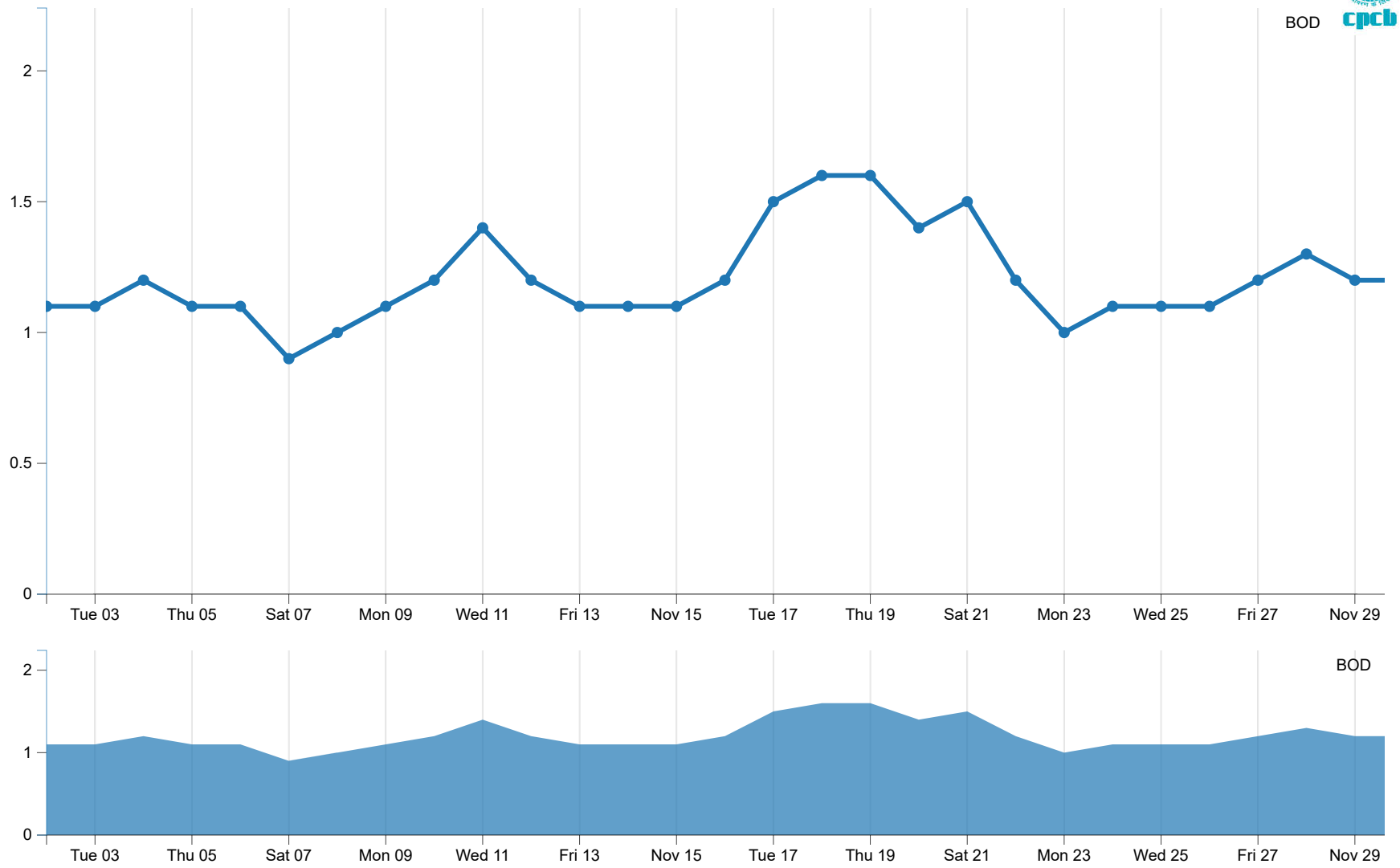


NTPC Limited Sipat Super Thermal Power EQMS-1

PO Ujjwal Nagar Bilaspur Chattisgarh 495555

Start Date - 2020-11-01
End Date - 2020-11-30
Average - daily

1=U (Usable Data), 4=C (Calibration Data),5=F (Faulty Data), 6=Z (ZeroCal Data)



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Registered Office
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Driven by Quality. Inspired by Science.

ISSUED TO:

NTPC LIMITED
SIPAT SUPER THERMAL POWER PROJECT
JAMWAL NAGAR, DIST- BILASPUR,
CHHATTISGARH-495555.

Report Number : VLL/VLS/17/07206/001
Issued Date : 2017-10-03
Your Ref and Date : 4000167860-057-1019 : 2016-06-24

Sample Particulars: AMBIENT AIR QUALITY MONITORING

Sample Particulars : Ambient Air Quality

Analysis starting date: 2017-09-26 Analysis Completion date: 2017-09-29

Tests required: PM2.5, PM10, SO_2, NO_2, CO, O_3, and HC;

SAMPLES COLLECTED BY VIMTA LABS LTD LAB REF.: EC

TEST RESULTS

S. No.	Date	PM2.5 (µg/m³)	PM10 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	CO (mg/m³)	HC (ppm)	Ozone (O_3) µg/m³
LOCATION: Sipat ((AAQ 1)								
1	2017/08/29	15.2	45.1	15.2	24.5	0.433	0.436	24
2	2017/08/31	20.0	43.5	17.2	21.1	0.416	0.419	15
3	2017/09/05	16.8	46.2	20.0	20.4	0.438	0.441	19
4	2017/09/07	17.4	46.5	14.2	24.2	0.421	0.424	22
5	2017/09/12	14.0	42.2	18.3	17.9	0.417	0.42	20
6	2017/09/14	16.5	45.1	15.7	22.4	0.408	0.411	25
7	2017/09/19	15.2	43.4	12.7	19.4	0.400	0.403	17
Minimum		14.0	42.2	12.7	17.9	0.400	0.403	15
Maximum		20.0	46.5	20.0	24.5	0.438	0.441	25
Average		16.4	44.6	16.2	21.4	0.419	0.422	20
LOCATION: Karra Village (AAQ 2)								
1	2017/08/29	15.0	39.9	18.2	19.7	0.404	0.426	14.3
2	2017/08/31	17.5	43.2	14.4	24.6	0.409	0.43	18.3
3	2017/09/05	13.4	39.2	15.9	20.3	0.416	0.439	16.4
4	2017/09/07	15.0	44.0	19.0	17.1	0.420	0.446	20.1
5	2017/09/12	14.2	41.4	12.7	21.1	0.410	0.437	16.5
6	2017/09/14	18.4	37.2	17.2	23.6	0.423	0.456	17.2
7	2017/09/19	14.8	39.9	14.4	20.4	0.436	0.422	21.1
Minimum		13.4	37.2	12.7	17.1	0.404	0.422	14
Maximum		18.4	44.0	19.0	24.6	0.436	0.456	21
Average		15.5	40.7	16.0	21.0	0.417	0.437	18
Limits As Per NAAQS		60	100	80	80	02	-	100
Test Methods		Gravimetric Method		Improved West & Geake	Modified Jacob & Hochheiser Method	NDIR spectroscopy method	Gas Chromatography	UV photometric method

- PM2.5, PM10, SO_2, NO_2, is monitored on 24 hrs. Basis & CO, ozone is monitored on 8 hrs basis.

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DGM(EMG)
एनटीपीसी लि. सीपत, बिलासपुर (छ.ग.)
NTPC Ltd. SIPAT, BILASPUR (C.G.)

Dr. Subba Reddy Mallampati
Group Leader- Environment

Life Sciences Campus, # 5, MN Science & Technology Park, Genome Valley, Shamirpet, Hyderabad - 500 101, India
T : +91 40 6740 4040 E : mdoffice@vimta.com URL : www.vimta.com
CIN : L24110TG1990PLC011977

Vimta Labs Limited
Registered Office
142, IDA Phase II, Cherlapally
Hyderabad-500 051, India
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Vimta
Driven by Quality. Inspired by Science.

ISSUED TO:

NTPC LIMITED
SIPAT SUPER THERMAL POWER PROJECT
UJWAL NAGAR, DIST- BILASPUR,
CHHATTISGARH-495555.

Report Number : VLL/VLS/17/07206/001
Issue Date : 2017-10-03
Your Ref : 4000167860-057-1019
and Date : 2016-06-24

Sample Particulars: AMBIENT AIR QUALITY MONITORING

Sample Particulars : Ambient Air Quality
Analysis starting date: 2017-09-26 Analysis Completion date: 2017-09-29
Tests required: PM2.5, PM10, SO_2, NO_2, CO, O_3, and HC;
SAMPLES COLLECTED BY VIMTA LABS LTD LAB REF.: EC

TEST RESULTS

S. No.	Date	PM2.5 (µg/m³)	PM10 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	CO (mg/m³)	HC (ppm)	Ozone (O_3) µg/m³
LOCATION: Janji (AAQ 3)								
1	2017/08/29	21.0	47.2	15.7	21.0	0.426	0.432	22
2	2017/08/31	18.0	40.3	17.0	16.1	0.436	0.442	16
3	2017/09/05	17.3	45.2	19.5	23.9	0.429	0.435	18
4	2017/09/07	14.1	48.2	15.3	25.8	0.414	0.420	24
5	2017/09/12	16.3	44.3	18.1	19.9	0.451	0.457	17
6	2017/09/14	15.5	46.2	21.4	26.1	0.397	0.403	20
7	2017/09/19	17.9	42.1	16.3	19.0	0.412	0.418	16
Minimum		14.1	40.3	15.3	16.1	0.397	0.443	16
Maximum		21.0	48.2	21.4	26.1	0.451	0.457	24
Average		17.2	44.8	17.6	21.7	0.424	0.430	19
Limits As Per NAAQS		60	100	80	80	02	-	100
Test Methods		Gravimetric Method		Improved West & Geake	Modified Jacob & Hochheiser Method	NDIR spectroscopy method	Gas Chromatography	UV photometric method

- PM2.5, PM10, SO_2, NO_2, is monitored on 24 hrs. Basis & CO, ozone is monitored on 8 hrs basis.

पंकज शर्मा
PANKAJ SHARMA
उप महाप्रबंधक (इ एम जी)
DGM(EMG)
एनटीपीसी लि. सीपत, बिलासपुर (छ.ग.)
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Report Number : VLL/VLS/17/07206/001
Issue Date : 2017-10-03
Your Ref : 4000167860-057-1019
and Date : 2016-06-24

Sample Particulars: AMBIENT AIR QUALITY MONITORING

Sample Particulars : Ambient Air Quality
Analysis starting date: 2017-09-26 Analysis Completion date: 2017-09-29
Tests required: Lead as Pb
SAMPLES COLLECTED BY VIMTA LABS LTD LAB REF.: EC

TEST RESULTS

LOCATION:	Date	PM2.5 (µg/m³)	PM10 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	Lead As Pb (µg/m³)	CO (mg/m³)
Yard Near Material Gate	21/09/2017	25.5	60.2	17.9	26.4	0.076	0.459
	21/09/2017	20.0	49.4	16.4	24.6	0.066	0.425
COLONY Near B-Type Quarter	21/09/2017	18.5	42.6	15.5	21.7	0.062	0.429
Limits As Per NAAQS		60	100	80	80	1.0	02
Test Methods		Gravimetric Method		Improved West & Geake	Modified Jacob & Hochheiser Method	AAS/ICP method	NDIR spectroscopy method

पंकज शर्मा
PANKAJ SHARMA
उप महाप्रबंधक (इं एम जी)
DGM(EMG)
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NTPC Ltd. SIPAT, BILASPUR (C.G.)

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CIN : L24117TG1990PLC011977

संदर्भ संख्या/Ref. No

दिनाँक/Date

Ref: No.Sipat/HR/Land/2005/4017 Dt.10.02.05

To

THE COLLECTOR
Bilaspur(CG)

Sub:- Identification of Land for Ash based Industries.

Dear Sir,

As you are aware National Thermal Power Corporation Ltd., is the largest Power Utility in India and a premier "Navratna" Public Sector Enterprise under Govt.of India supplying more than ¼ of the total electricity generated in the Country. Presently NTPC is operating 23 Plants (13-Coal based; 7-Gas based and 3 Joint Ventures with SAIL) with a total installed capacity of 22,249 MW located all over the country. The Corporation has an ambitious plan of Capacity addition with a challenging task of reaching 56000 MW by turn of 2017, while also embarking on generation of Hydro, Nuclear and Wind power. The Company has also stepped into various diverse activities viz., Distribution of Electricity, Consultancy, Power Trading etc.

Sipat Super Thermal Power Project is a mega Power Project of NTPC, being set up in two Stages at village Sipat, District Bilaspur, Chhattisgarh State. Foundation stone of this Project was laid by the then Hon'ble Prime Minister of India on 28th January 2002. Stage-I consists of three units of 660 MW each and stage-II consists of two units of 500 MW each, with an ultimate capacity of 2980 MW. Once completed, this shall be one of the largest and most modern Power Plants of India, making quality power available in plenty. For the first time in India, Super Critical Technology boilers of 660 MW capacity are going to be installed in this plant. Another unique feature being 765 KV Transmission network, first of its kind, shall be installed here to evacuate the electricity to Western Grid.

The project is being set up on war footing schedule with the challenging target of commissioning both the first units of Stage-I (660 MW) and Stage-II (500MW) within a period of 36 months i.e., March-2007, as against the commitment made to Government of India for commissioning of the said two units in the Xth Five Year Plan. Any delay in meeting the said target shall result in huge loss to National exchequer, besides shortfall in bridging the demand and supply gap.

...2/-

सीपत सुपर थर्मल पावर प्रोजेक्ट, पोस्ट ऑफिस, सीपत, जिला बिलासपुर 495 558 (छ.ग.) दूरभाष/Phone :
Sipat Super Thermal Power Project, Post Office, Sipat, Dist. - Bilaspur 495 558 (C.G.) फैक्स /Fax : 07752-85552
पंजीकृत कार्यालय : एन टी पी सी भवन, स्कोप कॉम्प्लेक्स, 07 इन्स्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली - 110 003

सदर्भ संख्या/ Ref.No. दिनाँक/ Date

Once Sipat plant becomes operational huge quantities of ash will be available which can be used for manufacturing of bricks, construction of roads and other purposes. In this regard we wish to bring to your notice that Ministry of Environment and Forests, (GOI) while giving the environmental clearance has laid down a condition that an additional land of 70 acres will be acquired by NTPC for setting up ash based industrial units. Clause No.ii & xii of the Environmental clearance given by Ministry of Environment and Forests, Govt. of India deals with the provision related to acquisition of 70 acres of land, a copy of which is enclosed for your kind reference.

May we therefore, request you to kindly arrange to identify 70 acres of land near to our project so that we will be in a position to initiate action to acquire the same.

We shall be very grateful for an early action on the matter.

Thanking you,

Yours faithfully,

(K.B.K.RAO)
DY.GENERAL MANAGER (HR)
NTPC-SIPAT.

छत्तीसगढ़ शासन
क्षेत्रीय उद्योग कार्यालय, बिलासपुर।

क्रमांक/क्षेउका-बिला/सम/07/1937 /बिलासपुर, दिनांक 27 अप्रेल, 07

प्रति,

उप-महाप्रबंधक,
(पुनर्वास)
एन0 टी0 पी0 सी0,
सीपत,
जिला-बिलासपुर।

विषय :- जिला निवेश प्रोत्साहन समिति / उद्योग संवर्धन एवं सहायता समिति की बैठक दिनांक 01-05-2007.

उपरोक्त विषयांतर्गत जिला निवेश प्रोत्साहन समिति/उद्योग संवर्धन एवं सहायता समिति की बैठक दिनांक 01-05-2007 को सायंकाल 5-00 बजे कलेक्टर महोदय की अध्यक्षता में कार्यालय कलेक्टर के सभाकक्ष में जिले के औद्योगिक गतिविधियों के विकास एवं सहायता हेतु आहूत की गई है। बैठक में आपकी उपस्थिति अनिवार्य है।

दिनांक 30-03-07 को सम्पन्न जिला निवेश प्रोत्साहन समिति / उद्योग संवर्धन एवं सहायता समिति की बैठक का कार्यवाही विवरण संलग्न प्रेषित है। कृपया आपके विभाग से संबंधित बिन्दुओं पर पालन प्रतिवेदन प्रेषित करने का कष्ट करें।

संलग्न- उपरोक्तानुसार.

संयुक्त संचालक उद्योग,
बिलासपुर।

पृ0क्रं0/जिव्याउके-बिला/सम/07/ /बिलासपुर, दिनांक अप्रेल, 2007

प्रतिलिपि :-

01- कलेक्टर, बिलासपुर (छ0ग0) की ओर सादर सूचनार्थ।

संलग्न- उपरोक्तानुसार.

संयुक्त संचालक उद्योग,
बिलासपुर।

जिला निवेश प्रोत्साहन समिति/ उद्योग सम्वर्धन एवं सहायता समिति की बैठक दिनांक 30–03–2007 का कार्यवाही विवरण

दिनांक 30–03–2007 को जिला निवेश प्रोत्साहन समिति/ उद्योाग सम्वर्धन एवं सहायता समिमि की बठक कलेक्टर महोदय की अध्यक्षता में संपन्न हुई। बैठक में उपस्थित सदस्यों का विवरण परिशिष्ट पर संलग्न है ।

जिला निवेश प्रोत्साहन समिति/ उद्योग सम्वर्धन एवं सहायता समिति की बैठक दिनांक 30–03–2007 में हुई चर्चा एवं लिये गए निर्णयों का कार्यवाही विवरण निम्नानुसार है:–

1– छ0ग0 स्टेट इड0कार्पो0लि0 के महाप्रबंधक श्री गोरे द्वारा बताया गया कि बी0ई0सी0 फर्टिलाईजार के सामने की भूमि 28.89 एकड़ का ले– आउट एवं प्राक्कलन तैयार कर लिया गया है । ले – आउट नगर एवं ग्राम 'निवेश से अनुमोदित हो चुका है तद्नुसार छ0ग0 स्टेट इण्ड0डेव्ह0कार्पो0लि0 के पास लम्बित भूमि संबंधी आवेदन पत्र जिनकी संख्या 61 थी , में से गिरगिटी औद्योगिक क्षेत्र के लिए प्राप्त 47 आवेदन पत्रों का निराकरण किया जा चुका है, शेष 14 आवेदन पत्र तिफरा औद्योगिक क्षेत्र के लिए है, जहां पर वर्तमान में भूमि उपलब्ध नहीं है । कलेक्टर महोदय द्वारा निर्देश दिए गए कि पुनः आवेदनकर्ताओं को छ0ग0 स्टेट इण्ड0 कार्पो0लि0 की ओर से ऑफर लेटर दे दिया जाए कि यदि वे सिरगिटी औद्योगिक क्षेत्र में भूमि प्राप्त करने हेतु इच्छुक हो तो तद्नुसार अवगत करावें। आवेदन पत्रों के निराकरण करेन संबंधी पत्रक छ0ग0 स्टेट इण्ड0डेव्ह0कार्पो0लि0द्वारा प्रस्तुत किया गया तथा बैठक मतें उपस्थित उद्योग संद्य के माननीय सदस्यों की भी वह नक्शा दिखाया गया। छ0ग0 स्टेट इण्ड0डेव्ह0कार्पो0लि0 के महाप्रबंधक द्वारा समिति को अवगत कराया गया कि उद्योग स्थापना के लिए भूमि की मांग के अतिरिक्त एक आवेदन पत्र पेट्रोल पम्प हेतु, एक आवेदन पत्र धर्मकांटा हेतु तथा एक आवेदन पब्लिक स्कूल के लिए प्राप्त हुआ । बैठक में उपस्थित सदस्यों द्वारा अपनी राय स्पष्ट करते हुए बताया गया कि स्कूल स्थापना के लिए भूमि उपलब्ध कराना उचित नहीं होगा वैसे भी वर्तमान में छ0ग0 स्अेट इण्ड0 डेव्ह0 कार्पो0 लि0 के पास जो भूमि राजस्व विभाग से प्राप्त हुई है वह मात्र 28 एकड़ ही है ।

2– महिला उद्यमियों को भूमि उपलब्ध कराने के संबंध में चर्चा की गयी। महाप्रबंधक , छ0ग0 स्टेट इण्ड0डेव्ह0कार्पो0लिमि0द्वारा बताया गया कि महिला उद्यमियों द्वारा तिफरा औद्योगिक क्षेत्र में भूमि मांग की है जहां वर्तमान में भू–खंण्ड उपलब्ध नहीं है, कलेक्टर महोदय द्वारा निर्देश दिए गऐ कि सर्वप्रथम इच्छुक उद्यमियों को सिरगिटी

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औद्योगिक क्षेत्र में उपलब्ध करा देने संबंधी ऑफर लेटर दे दिया जाए तत्पश्चात् आगामी बैठक में स्थिति की समीक्षा कर निर्णय लिया जावेगा ।

3– औद्योगिक क्षेत्र– गिरगिटी – सेक्टर – '' डी'' में उपलब्ध 141 एकड़ भूमि के उपयोग परिवर्तन के लिए अनुमति संबंधी विषय पर चर्चा हुई । बैठक में उपस्थित महाप्रबंधक, छ0ग0 स्टेट इण्ड0 डेव्ह0कार्पो0 लि0 द्वारा अवगत कराया गया ककि बहुत ही जल्द संचालक , नगर एवं ग्राम निवेश विभाग से स्वीक1ति/ अनुमति प्राप्त होने की सम्भावना हैं । कलेक्टर महोदय द्वारा संयुक्त संचालक उद्योग को निर्देश दिए गए कि एक सप्ताह के अन्दर यदि स्वीकृति/ अनुमति प्राप्त नहीं होती है । तो उनहें स्मरण कराया जाए ताकि उनकी ओर से अर्द्ध शासकीय पत्र संचालक, नगर एवं ग्राम निवेश विभाग को प्रेषित किया जा सके ।

4– आई0आई0डी0सी0 योजना के अन्तार्गत औद्योगिक क्षेत्र की स्थापना के संबंध में श्री गोरे, महाप्रबंधक, छ0ग0 स्टेट इण्ड0डेव्ह0कार्पो0 लि0 द्वारा अवगत कराया गया कि छ0ग0 स्टेट इण्ड0 डेव्ह0 कार्पो0 लि0 की ओर से प्रस्ताव भारत शासन को प्रेषित किया जा चुका है जहां वे स्वीकति शीध्र ही प्राप्त होने की सम्भावना है ।

5– औद्योगिक क्षेत्र सिरगिटी सेक्टर – ''बी'' में रेल्वे लाईन के समीप अतिशेष भूमि का ले–आउट छ0ग0 सटेट इण्ड0 कार्पो0लि0 द्वारा संयुक्त संचालक , नगर एवं ग्राम निवेश विभाग को प्रेषित किया जा चुका है । अनुमोदन के संबंध में जानकारी प्राप्त नहीं हुई है । कलेक्टर महोदय द्वारा महाप्रबंधक श्री गोरे को निर्देश दिए गए कि तत्संबंध में शीध्रातिशीध्र अनुमोदन प्राप्त किया जाए ताकि उद्यमियों को भूमि आबंटित किया जा सके ।

6– मनियारी नदि के किनारे ग्राम–सांवा , रामबोड़ , धमनी, बावली, एवं पेण्ड्री की शासकीय भूमि के हस्तांतरण के संबंध में महाप्रबंधक, जिला व्यापार एवं उद्योग केन्द्र द्वारा बताया गया कि उक्त भूमि के संबंध में दिनांक 10–03–07 को ईश्तहार प्रकाशित कर सर्व संबंधितों को प्रेषित किया जा चुका है । प्रकरण में अग्रिम कार्यवाही अनुविभागीय अधिकारी (रा0) , मुंगेली से अपेक्षित है । कलेक्टर महोदय द्वारा महाप्रबंधक, जिला व्यापार एवं उद्योग केन्द्र को निर्देश दिए गए कि प्रकरण में अनुसरण की कार्यवाही कर शीध्रातिशीध्र प्रकरण प्रस्तुत करावें ।

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7– एन0टी0पी0सी0 , सीपत के पास ग्राम–सेलर में शासकीय भूमि के हस्तांतरण के प्रस्ताव पूर्व में दिये जा चुके है । अनुविभागीय अधिकारी (रा0) , द्वारा पिछली बैठक में बताया गया था कि उद्योग विभाग को लगभग 65 एकड़ भूमि ही हस्तांतरित किया जाना सम्भव होगा । बैठक में उपस्थित क्षेत्रीय अधिकारी, छ0ग0 पर्यावरण – संरक्षण मंण्डल के श्री जान लाकरा से इस संबंध में राय चाही गयी, उनके द्वारा विस्तार से प्रदूषण नियंत्रण संबंधी निर्देशों के संबंध में जानकारी प्रस्तुत की गयी तथा बताया गया कि फ्लाई ऐश ब्रिक्स इण्डस्ट्रीज की स्थापना के संबंध में किसी प्रकार का व्यवधान उत्पन्न नहीं होगा, उन्हें उद्योग स्थापना की अनुमति दी जा सकती है । इस संबंध में जिला व्यापार एवं उद्योग केन्द को भी पत्र के माध्यम से अवगत कराया जा रहा है । बैठक में एन0टी0पी0सी0 के महाप्रबंधक एवं उप– महाप्रबंधक भी उपस्थित थे, उनके द्वारा आश्वासन दिया गया कि औद्योगिक क्षेत्र के विकास हेतु वे अपनी ओर से भी आवश्यक सहयोग देंगें । कलेक्टर महोदय द्वारा उनके इस प्रस्ताव पर प्रसन्नता व्यक्त की गयी तथा बैठक में उपस्थित महाप्रबंधक, छ0ग0 स्टेट इण्ड0 डेव्ह0 कार्पो0 लि0 को निर्देशित किया गया कि वे 05 अप्रैल , 07 तक संदर्भित भूमि का ले – आउट व स्टीमेट उनके समक्ष प्रस्तुत किया जाना सुनिश्चित् करें । ताकि उन्हें एन0टी0पी0सी0 के अधिकारियों को प्रेषित की जा सकें और आवश्यक सहयोग प्राप्त किया जा सके ।

8– दक्षिण पूर्व कोयला प्रक्षेत्र पर आधारित सहायक उद्योगों के विकास के संबंध में बैठक में संयुक्त संचालक उद्योग द्वारा अवगत कराया गया कि दिनांक 27–09–06 को प्रकाशित 12 आयटम्स के विज्ञापन के परिप्रेक्ष्य में प्राप्त कुल 34 आवेदनों के आवेदकों को दिनांक 12 एवं 13 अप्रेल ,07 को साक्षत्कार हेतु पत्र जारी किए जा चुके है इसके अतिरिक्त दक्षिण पूर्व कोयला प्रक्षेत्र द्वारा नवीन 12 आयटम्स हेतु 15 सहायक उद्योगों की स्थापना की सम्भावना को दृष्टिगत रखते हुए दक्षिण पूर्व कोयला प्रक्षेत्र, बिलासपुर द्वारा उद्योग संचालनालय को पत्र क्रमांक– 5376 दिनांक 21–03–07 द्वारा विज्ञापन हेतु लिखा जा चुका है जो शीध्र ही प्रकाशित होने की सम्भावना सहायक उद्योगों के लिए विस्तृत प्रचार– प्रसार किया जाए तथा इन उद्योगों की स्थापना हेतु छ0ग0 स्टेट इण्ड0डेव्ह0कार्पो0लि0 द्वारा भूमि की भी व्यवस्था अग्रिम रुप से कर लें साथ ही इस संबंध में सेमीनार का आयोजन 28 अथवा 30 अप्रैल को किया जावें जिसमें उद्योग से जुड़े सभी शासकीय / अशासकीय संस्थओं , वृहद उपक्रम, एस0ई0सी0एल0, एन0टी0पी0सी0, छ0ग0राज्य विद्युत मंण्डल, तथा रेल्वे सम्मिलित हो।

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9— एन0टी0पी0सी0 , सीपत के सहायक उद्योगों के विकास के संबंध में बैठक में उपस्थित एन0टी0पी0सी0 सीपत, के महाप्रबंधक एवं उप महाप्रबंधक द्वारा उपस्थित सदस्यों को आश्वस्त किया गया कि सहायक उद्योगों की स्थापना हेतु जो भी वांच्छनीय सहयोग होगा उनके द्वारा समुचित प्रयास किया जावेगा । इस संबंध में कलेक्टर महोदय द्वारा निर्देश दिए गए कि संयुक्त संचालक उद्योग, छ0ग0 स्टेट इण्ड0 डेव्ह0 कोर्पो0 लिमि0 के महाप्रबंधक आदि उद्योग विभाग के अधिकारी एन0टी0पी0सी0 , प्रबंधन से भेंट कर सहायक उद्योगों की स्थापना हेतु आयटम्स की पहचान कर आगामी बैठक में प्रस्तुत करें ।

बैठक के अन्त में उपस्थित सदस्यों को धन्यवाद ज्ञापित करते हुये बैठक समाप्ति की घोषणा की गयी ।

संयुक्त संचालक उद्योग 4/4/07
बिलासपुर ।

जिला निवेश प्रोत्साहन समिति/ उद्योग सम्वर्धन एवं सहायता समिति की सम्पन्न बैठक दिनांक 30–03–07 में उपस्थितों का उपस्थिति पत्रक.

01– कलेक्टर, बिलरसपुर (छ0ग0) ।

02– संयुक्त संचालक उद्योग, क्षेत्रीय कार्यालय, बिलासपुर ।

03– सहायक महाप्रबंधक, भारतीय स्टेट बैंक, क्षेत्रीय कार्यालय, बिलासपुर ।

04– महाप्रबंधक, छ0ग0 स्टेट इण्ड0 कार्पो0लि0, शाखा कार्यालय तिफरा , बिलासपुर ।

05– अग्रणी बैंक अधिकारी, अग्रणी बैंक कार्यालय, भारतीय स्टेट बैंक, बिलासपुर ।

06– संयुक्त संचालक नगर एवं ग्रामीण निवेश, बिलासपुर ।

07– क्षेत्रीय अधिकारी, छ0ग0 पर्यावरण एवं संरक्षण मंण्डल, बिलासपुर ।

08– महाप्रबंधक, एन0टी0पी0सी0 , सीपत. बिलासपुर ।

09– उप– महाप्रबंधक, एन0टी0पी0सी0 , सीपत, बिलासपुर ।

10– अनुविभागीय अधिकारी (रा0) बिलासपुर ।

11– श्री हरीश केडिया, अध्यक्ष, छ0ग0 लद्यु एवं सहायक उद्योग संद्य, बिलासपुर ।

12– श्री अनिल अग्रवाल , अध्यक्ष , जिला उद्योग संद्य, बिलासपुर ।

13– महाप्रबंधक, जिला व्यापार एवं उद्योग केन्द्र, बिलासपुर ।

14– प्रबंधक , छ0ग0 स्टेट इण्ड0डेव्ह0कार्पो0लि0, शाखा कार्यालय, बिलासपुर ।

(1)

छत्तीसगढ़ स्टेट इण्डस्ट्रियल डेव्हलपमेंट कार्पोरेशन लिमिटेड

(छत्तीसगढ़ शासन का एक उपक्रम)
प्रथम तल, उद्योग भवन, रिंग रोड नम्बर–1, तेलीबांधा, रायपुर–492006 (छत्तीसगढ़) फोन नम्बर 0771–2583792, फैक्स–2583794
Website: www.csidc.in Email address:csidc.cg@nic.in,csidc_raipur@yahoo.com
PAN : **AABCM6288N, ST Regn No. AABCM6288NSD004**

कार्यकारी निदेशक सचिवालय E.D. Secretariat NTPC - SIPAT एन.टी.पी.सी.-सीपत 3/24/14

क्रमांक : सीएसआईडीसी/भू–अर्जन./14/ रायपुर, दिनांक /03/2014

प्रति,

संचालक उद्योग
उद्योग संचालनालय
उद्योग भवन
रायपुर (छ.ग.)

विषय :– ग्राम सेलर जिला बिलासपुर की 70 एकड़ शासकीय भूमि के आबंटन विषयक ।
सन्दर्भ :– उद्योग संचालनालय का पत्र क. अधोविक/भूअ/2014/2924 दिनांक 10/3/14

महोदय,

विषयांतर्गत संदर्भित पत्र के संबंध में निवेदन है कि, आपने ग्राम सेलर की 70 एकड़ शासकीय भूमि का आबंटन मे.एनटीपीसी को किए जाने हेतु लेख किया गया है । उपरोक्त भूमि का आधिपत्य वर्तमान में निगम को अप्राप्त है ।

पत्र सूचनार्थ प्रेषित ।

धन्यवाद

भवदीय

कार्यपालक संचालक

पृ.क्रमांक/सीएसआईडीसी/भू–अर्जन./14/16963 रायपुर, दिनांक 19/03/2014

प्रतिलिपि :–

मे. नेशनल थर्मल पावर कार्पोरेशन लि., सीपत सुपर थर्मल पावर प्रोजेक्ट, पोस्ट–उज्वल नगर, सीपत जिला बिलासपुर को सूचनार्थ ।

कार्यपालक संचालक

Hotel 24/03 Shubham 24/3/2014 25.3.14

Sh. Sanjabh

shakir-3-14

120

छत्तीसगढ़ शासन
जिला व्यापार एवं उद्योग केन्द्र,
न्यू कम्पोजिट बिल्डिंग, प्रथम तल, कलेक्टोरेट परिसर
बिलासपुर (छ0ग0) 495001
दूरभाष– 07752–250082, 83, ई–मेल– **dtic-bilaspur.cg@gov.in**

कमॉक / जिव्याउके–बिला / अधो0वि0क0 / 2016 /232 / बिलासपुर, दिनॉक 2 / 06 / 16

प्रति,

संचालक उद्योग,
(अधोसंरचना विकास कक्ष)
उद्योग संचालनालय,छत्तीसगढ़,
उद्योग भवन,रिंग रोड नं0–1,
तेलीबॉधा,रायपुर (छ0ग0)

विषय :– नवीन औद्योगिक क्षेत्र की स्थापना हेतु ग्राम– सेलर, तहसील व जिला– बिलासपुर की शासकीय भूमि का आधिपत्य सीएसआईडीसी को सौंपने बाबत्।

संदर्भ :– उद्योग संचालनालय,छत्तीसगढ़,रायपुर का पत्र कमांक / 162 / (6) अधो0वि0क0 / भू0अ0 / 2004 / 9351 रायपुर दिनांक 11 / 05 / 2016

–00–

4 JUN 2016 उपरोक्त विषयान्तर्गत संदर्भित पत्र के निर्देशानुसार औद्योगिक क्षेत्र की स्थापना हेतु ग्राम– सेलर, तहसील व जिला– बिलासपुर की खसरा नं0 1297 रकबा 95.028 एकड़ शासकीय भूमि का आधिपत्य सीएसआईडीसी को दिनांक 24 / 05 / 2016 को सौंपा गया। आधिपत्य प्रमाण पत्र की छायाप्रति संलग्न प्रेषित है।

संलग्नः– उपरोक्तानुसार.

प्र0 मुख्य महाप्रबंधक,
जिला व्यापार एवं उद्योग केन्द्र,
बिलासपुर (छ0ग0)

कमॉक / जिव्याउके–बिला / अधो0वि0क0 / 2016 / / बिलासपुर, दिनॉक / 06 / 16

प्रतिलिपिः–

1– प्रबंध संचालक, सीएसआईडीसी, उद्योग भवन, द्वितीय तल, तेलीबांधा, रिंग रोड नं.–1, रायपुर (छ0ग0) की ओर सूचनार्थ प्रेषित।
2– प्रभारी, सीएसआईडीसी, शाखा कार्यालय तिफरा, बिलासपुर (छ0ग0) की ओर सूचनार्थ प्रेषित।

प्र0 मुख्य महाप्रबंधक,
जिला व्यापार एवं उद्योग केन्द्र,
बिलासपुर (छ0ग0)

—:: आधिपत्य प्रमाण—पत्र ::—

उद्योग संचालनालय, छत्तीसगढ़, रायपुर के पत्र क्रमांक 162 (6)/अधो0वि0क0/भू0अ0/2004/9351, दिनांक 11/05/2016 द्वारा दिये गये निर्देशानुसार ग्राम— सेलर, तहसील व जिला बिलासपुर स्थित शासकीय भूमि खसरा नं0— 1297 कुल रकबा 95.028 एकड़ शासकीय भूमि का आधिपत्य छत्तीसगढ़ स्टेट इण्डस्ट्रीयल डेव्हलेपमेन्ट कार्पोरेशन लिमिटेड, बिलासपुर को औद्योगिक क्षेत्र की स्थापना हेतु आज दिनांक 25/05/16 को निम्नांकित शर्तों के अधीन सौंपा गया :—

1) राज्य शासन की आदर्श पुनर्वास नीति 2005 (यथासंशोधित— 2007) का पालन सुनिश्चित कराया जावे।

2) भूमि के औद्योगिक प्रयोजन में उपयोग से पूर्व यथा समय कलेक्टर द्वारा पारित हस्तान्तरण आदेश की शर्तों का पालन सुनिश्चित कराया जावे। इन शर्तों के अनुरूप लीजडीड में प्रावधान करें तथा शासन को उसका पालन प्रतिवेदन उपलब्ध करांवे।

3) उक्त सहमति केवल राजस्व विभाग की भूमि हेतु (यदि कोई शासकीय परिसम्पत्ति तथा सार्वजनिक प्रयोजन के स्थल प्रश्नाधीन भूमि पर हो तो उसे छोड़कर) दी जाती है।

4) शासन द्वारा समय—समय पर जारी निर्देशों का पालन सुनिश्चित कराया जाये।

5) सक्षम राजस्व अधिकारी से स्थल निरीक्षण सत्यापित कराया जाये। मुख्य महाप्रबंधक/महाप्रबंधक द्वारा मौके पर भूमि का सत्यापन कर आधिपत्य लिया जाये।

6) यदि प्रश्नांधीन भूमि के किसी भी भाग हेतु किसी अन्य सक्षम प्राधिकारी की अनुमति आवश्यकता हो तो प्राप्त किया जाये।

7) प्रश्नांधीन भूमि पर निवेशक द्वारा निर्माण करते समय यह घ्यान रखा जायेगा कि वह आस—पास की शासकीय परिसम्पत्तियों (यदि कोई हो) को निर्माण कार्य के दौरान एवं भविष्य में भी नुकसान न पहुँचाये।

8) निवेशक को भूमि आबंटन के समय यदि पूर्व में कोई भूमि आबंटन हुआ है, तो उक्त आबंटित भूमि के उपयोग को घ्यान में रखकर परियोजना की आवश्यकतानुसार ही भूमि आबंटित की जावे। ऐसी दशा में, निवेशक को भूमि आबंटित किए जाने के मामले में पहले पूर्व आबंटित भूमि का नियमानुसार उपयोग हुआ है कि नही, सुनिश्चित किया जावे। आवश्यकतानुसार राज्य निवेश प्रोत्साहन बोर्ड, रायपुर का अभिमत लिया जावे।

9) भूमि आबंटन के समय यह सुनिश्चित करें कि राज्य की अनुमोदित परियोजना हो।

आधिपत्य लेने वाले का नाम, पद एवं हस्ताक्षर 25/05/16

उषा गाण्डेय
प्रबंधक
जिला व्यवसाय उद्योग केन्द्र

आधिपत्य देने वाले का नाम, पद एवं

कार्यालय संयुक्त संचालक, नगर तथा ग्राम निवेश
क्षेत्रीय कार्यालय बिलासपुर, छत्तीसगढ़

पता– नई कंपोजिट बिल्डिंग
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क्रमांक /7874 /धा.23क/न.ग्रा.नि/2019 बिलासपुर दिनांक 7/9/19

प्रति,

संचालक,
नगर तथा ग्राम निवेश,
इन्द्रावती भवन, नवा रायपुर,
अटल नगर, रायपुर (छ0ग0)

विषय– सीपत विकास योजना 2031 के ग्राम सेलर में उपांतरण बाबत।
संदर्भ– आपका पत्र क्रमांक/2172/साडा–2(4)/नग्रानि./2019 अटल नगर, दि. 28.06.19.

उपरोक्त विषय के संदर्भ में लेख है कि सीपत विकास योजना 2031 के अंतर्गत ग्राम सेलर स्थित भूमि का कृषि से औद्योगिक भू–उपयोग का उपांतरण की सूचना स्थानीय समाचार पत्रों हरिभूमि एवं नईदुनिया में दिनांक 08.06.2019 को प्रकाशित किया गया था। नियत समयावधि के भीतर कार्यालय कलेक्टर बिलासपुर, कार्यालय जिला पंचायत बिलासपुर एवं नगर पालिक निगम बिलासपुर में सीपत विकास योजना 2031 के ग्राम सेलर में कृषि से औद्योगिक करने के संबंध में कोई आपत्ति/सुझाव प्राप्त नही हुए है, की जानकारी से अवगत कराया गया है। संबंधित कार्यालयों से प्राप्त जानकारी एवं उक्त प्रकाशित समाचार पत्र की कतरन की छायाप्रति संलग्न कर आवश्यक कार्यवाही हेतु सादर सम्प्रेषित है।

संलग्न : उपरोक्तानुसार।

प्र.उप संचालक
नगर तथा ग्राम निवेश
बिलासपुर (छ0ग0)

ANNEXURE-09

Report from CAAQMS Station						
Station:	TRACK HOPPER					
Date:	10-2020					
Report Type:	Mean					
Time Base:	24 Hour					
Date	Time	SO2	NOX	PM2.5	PM10	CO2
		ug/m3	ug/m3	ug/m3	ug/m3	PPM
01-10-2020	24:00	10.9	14.3	29.4	68.6	312
02-10-2020	24:00	11	14.3	42.4	98.9	300.9
03-10-2020	24:00	11.1	14.3	27.5	64.2	324.2
04-10-2020	24:00	11.4	14.3	9.7	22.6	382.2
05-10-2020	24:00	11.4	14.3	12.1	28.3	276.1
06-10-2020	24:00	11.3	14.3	18.2	42.4	310
07-10-2020	24:00	11.4	14.3	11.2	26	343.6
08-10-2020	24:00	11.5	14.3	8.4	19.6	308.4
09-10-2020	24:00	11.6	14.3	22	51.2	301.7
10-10-2020	24:00	11.6	14.3	26.9	62.6	320.1
11-10-2020	24:00	11.5	14.3	21.9	51	297.1
12-10-2020	24:00	11.3	14.3	22.2	51.6	328.7
13-10-2020	24:00	11.1	14.3	11.2	26.2	350.3
14-10-2020	24:00	11	14.3	10.3	24.1	336.6
15-10-2020	24:00	11	14.3	11	25.7	316.7
16-10-2020	24:00	10.9	14.3	13.2	30.8	324
17-10-2020	24:00	10.9	14.3	18	41.9	334.7
18-10-2020	24:00	10.9	14.3	23.6	55	347.4
19-10-2020	24:00	10.9	14.3	30.1	70.1	338.4
20-10-2020	24:00	10.8	14.3	30.8	71.8	329.1
21-10-2020	24:00	10.9	14.3	37.7	87.8	338.3
22-10-2020	24:00	10.8	13.7	40.9	95.3	339
23-10-2020	24:00	11	12.7	33.7	78.4	347.2
24-10-2020	24:00	11.1	13.4	25.6	59.6	317.8
25-10-2020	24:00	11	13.7	30.2	70.3	336.3
26-10-2020	24:00	11.1	14.1	36.4	84.7	338.1
27-10-2020	24:00	10.7	14.3	34.8	81.1	345.6
28-10-2020	24:00	10.8	14.2	36.1	84.2	341.3
29-10-2020	24:00	10.9	14.3	131.8	307	344.9
30-10-2020	24:00	10.9	14.3	32.5	75.7	356.6
31-10-2020	24:00	10.8	14.3	30.1	70	328.5

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एनटीपीसी लि. सीपत, बिलासपुर (छ.ग.)
NTPC Ltd. SIPAT, BILASPUR (C.G.)

Station:	SWITCHYARD					
Date:	Oct-2020					
Report Type:	Mean					
Time Base:	24 Hour					
Date	Time	SO2	NOX	PM2.5	PM10	CO2
		ug/m3	ug/m3	ug/m3	ug/m3	PPM
01-10-2020	24:00	18	14.4	32.5	36.8	226.7
02-10-2020	24:00	18.1	13.5	44.7	46.9	220.6
03-10-2020	24:00	18.3	14.6	29.4	29.5	241.2
04-10-2020	24:00	18.3	11.8	9.1	6.9	216.4
05-10-2020	24:00	18.4	11.1	12.7	11.5	208
06-10-2020	24:00	18.3	11.6	20.1	26.8	231.3
07-10-2020	24:00	18.3	12.2	17.6	15.4	231.9
08-10-2020	24:00	18.3	11.7	13.4	11.9	229.8
09-10-2020	24:00	18.3	12.6	29.5	25.8	232.6
10-10-2020	24:00	18.3	12.9	35.5	28.4	245.5
11-10-2020	24:00	18.4	12.6	28.5	22.9	231.1
12-10-2020	24:00	18.4	13.7	25.6	26.6	246.1
13-10-2020	24:00	18.3	14.6	9	13.5	280.7
14-10-2020	24:00	18.1	14	7.8	12.2	254.2
15-10-2020	24:00	17.7	14.1	8.3	12.8	226
16-10-2020	24:00	18.2	14.3	11.2	17.9	227.5
17-10-2020	24:00	18.2	14.8	14.1	22.4	237
18-10-2020	24:00	18.1	15.4	17.6	25.8	248.8
19-10-2020	24:00	18	16	23	32.7	237.1
20-10-2020	24:00	18.2	14.7	22.9	33.3	242.4
21-10-2020	24:00	18.1	15.4	28	39.4	250.2
22-10-2020	24:00	18.2	13.5	31.6	46.5	236
23-10-2020	24:00	18.4	11.7	30.6	42.1	222.2
24-10-2020	24:00	18.4	11.9	23.9	34.5	223.1
25-10-2020	24:00	18.4	11.5	27.2	38.5	225.6
26-10-2020	24:00	18.4	11.5	34.9	49.2	237.4
27-10-2020	24:00	18.5	11.2	38.3	48.9	245.8
28-10-2020	24:00	18.4	11.7	40.3	52.6	248.3
29-10-2020	24:00	18.4	12	35.7	48.9	235.3
30-10-2020	24:00	18.2	17.2	31.4	41.5	234.5
31-10-2020	24:00	17.7	30.6	26.9	6	257.6

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Station:	B TYPE					
Date:	10-2020					
Report Type:	Mean					
Time Base:	24 Hour					
Date	Time	SO2	NOX	PM2.5	PM10	CO2
		ug/m3	ug/m3	ug/m3	ug/m3	PPM
01-10-2020	24:00	15	23.8	31.2	58.3	165
02-10-2020	24:00	15	24.2	41.6	74.8	147
03-10-2020	24:00	15	24.3	25.7	39.2	159
04-10-2020	24:00	14.9	24.8	8.2	11.5	141
05-10-2020	24:00	14.9	24.9	10	14.9	144
06-10-2020	24:00	15	24.3	12.4	20.1	153
07-10-2020	24:00	15	24.1	9.9	15.6	152
08-10-2020	24:00	14.9	24.8	9.2	12	152
09-10-2020	24:00	15	24.4	16.6	23.3	162
10-10-2020	24:00	15	24.2	20.4	28.4	166
11-10-2020	24:00	15	24.7	18.3	24.3	155
12-10-2020	24:00	15	24.6	17.9	27.8	174
13-10-2020	24:00	15	25	9.8	16.4	156
14-10-2020	24:00	14.9	25.5	10.7	16.7	155
15-10-2020	24:00	14.9	26.2	9.3	15.9	152
16-10-2020	24:00	14.9	26.7	12.4	19.5	165
17-10-2020	24:00	14.9	27	15.7	25.1	165
18-10-2020	24:00	14.9	27.1	19.2	28.4	172
19-10-2020	24:00	14.8	26.9	23.8	38.8	158
20-10-2020	24:00	14.8	27.2	24.5	37	161
21-10-2020	24:00	14.9	27.7	29.5	48.3	172
22-10-2020	24:00	14.8	29	31.9	54.7	153
23-10-2020	24:00	14.7	29.5	30.4	53.7	148
24-10-2020	24:00	14.8	30.5	23.4	38.4	162
25-10-2020	24:00	14.8	31.7	26.9	46.4	173
26-10-2020	24:00	14.8	33	32	52.3	179
27-10-2020	24:00	14.8	34.4	37.1	58.3	190
28-10-2020	24:00	14.9	23.4	38.2	63.3	183
29-10-2020	24:00	15	13	33.8	58.2	167
30-10-2020	24:00	14.9	14.2	27.9	47.6	166
31-10-2020	24:00	14.9	14.2	23.9	44.4	148

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Report from CAAQMS Station						
Station:	B TYPE					
Date:	11/2018					
Report Type:	Mean					
Time Base:	24 Hour					
Date	Time	SO2	NOX	PM2.5	PM10	CO2
		ug/m3	ug/m3	ug/m3	ug/m3	PPM
01/11/2018	24:00	17.8	8.5	21.3	53.4	325.5
02/11/2018	24:00	7.2	8.4	29.8	71.9	336.3
03/11/2018	24:00	7.2	8.2	31.5	79	345.7
04/11/2018	24:00	12.3	8.4	27.6	68.7	343.2
05/11/2018	24:00	7.3	8.5	30.9	79.6	349.3
06/11/2018	24:00	7.3	8.4	40.2	102.5	352.6
07/11/2018	24:00	7.3	8.4	62.1	135	319.1
08/11/2018	24:00	11.7	8.4	54.8	127.7	322.2
09/11/2018	24:00	7.1	8.4	45.4	106.7	332.2
10/11/2018	24:00	6	8.4	53.4	130.9	327
11/11/2018	24:00	12.3	8.1	55.6	126.6	329.8
12/11/2018	24:00	4.5	1.3	50.9	123.2	328.4
13/11/2018	24:00	7.2	1.5	55.8	143.3	336.9
14/11/2018	24:00	12.3	5	45.3	134	343.7
15/11/2018	24:00	7.2	6.8	48.9	135.7	346.6
16/11/2018	24:00	7.2	6.9	37.8	106.8	339
17/11/2018	24:00	14	6.9	40.9	105	336.4
18/11/2018	24:00	13.9	6.9	45.7	121.5	331.6
19/11/2018	24:00	13.9	6.9	46.9	121.6	329
20/11/2018	24:00	14	6.9	50.6	123.1	332.8
21/11/2018	24:00	7.3	6.9	41.8	107.9	331.7
22/11/2018	24:00	7.3	6.9	31.7	85	324.9
23/11/2018	24:00	7.3	6.9	32.2	95.3	347.4
24/11/2018	24:00	12.5	8.6	41.3	88.2	460.4
25/11/2018	24:00	24.9	13.4	30	85.7	351.5
26/11/2018	24:00	22.3	13.4	35.4	102.9	332.3
27/11/2018	24:00	22.2	13.4	42.6	113.9	326.7
28/11/2018	24:00	17.8	13.5	53.4	134.1	367.2
29/11/2018	24:00	13.2	13.5	60.2	139.2	337.2
30/11/2018	24:00	10.3	13.6	61.7	144.7	326.9

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NTPC Ltd. SIPAT, BILASPUR (C.G.)

Report from CAAQMS Station

Station: SWITCH YARD
Date: 11/2018
Report Type: Mean
Time Base: 24 Hour

Date	Time	SO2 ug/m3	NOX ug/m3	PM2.5 ug/m3	PM10 ug/m3	CO2 PPM
01/11/2018	24:00	10.4	13.7	31.2	63.7	363.7
02/11/2018	24:00	10.4	13.7	40.6	76.1	379.4
03/11/2018	24:00	10.3	13.8	46.9	83.1	386.2
04/11/2018	24:00	10.4	13.8	39.5	83.2	385.3
05/11/2018	24:00	10.4	13.7	49	96.9	384.9
06/11/2018	24:00	10.6	13.7	64.1	115.8	393.4
07/11/2018	24:00	10.4	13.8	110.5	160.5	372.9
08/11/2018	24:00	10.4	14	86.1	126	365.3
09/11/2018	24:00	10.4	14.1	68.9	113.6	368.4
10/11/2018	24:00	10.4	14.9	81.5	133.5	371.4
11/11/2018	24:00	10.4	14.1	89.9	143.9	372
12/11/2018	24:00	10.4	14	78.3	137	378.5
13/11/2018	24:00	10.4	15.1	85	150	386.7
14/11/2018	24:00	RS232	RS232	RS232	RS232	RS232
15/11/2018	24:00	10.1	24.5	68.7	113.6	452.4
16/11/2018	24:00	10.4	29.5	58.1	114.9	423.1
17/11/2018	24:00	10.2	32.5	62.3	118.1	411.7
18/11/2018	24:00	10.3	33.1	63.9	109.9	402.8
19/11/2018	24:00	10.7	21.7	76.4	146.9	444.5
20/11/2018	24:00	11	13.6	86.4	179.9	400.8
21/11/2018	24:00	10.9	13.9	67.3	119.3	366.9
22/11/2018	24:00	11.7	14.5	47.7	123.7	412.6
23/11/2018	24:00	13.4	15.3	48.4	112.8	460.9
24/11/2018	24:00	13.9	15.8	57.2	121.6	432
25/11/2018	24:00	14.7	17.7	51.4	111.2	429.9
26/11/2018	24:00	16.4	19.6	56.4	114.4	440.9
27/11/2018	24:00	16.2	18.5	57.9	104.4	435.2
28/11/2018	24:00	16.2	15.5	78.8	146.3	437.9
29/11/2018	24:00	17.1	65.6	87.5	142	445.4
30/11/2018	24:00	18.5	16.3	95.4	205.7	448.1

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NTPC Ltd. SIPAT, BILASPUR (C.G.)

Report from CAAQMS Station

Station: TRACK HOOPER
Date: 11/2018
Report Type: Mean
Time Base: 24 Hour

Date	Time	SO2 ug/m3	NOX ug/m3	PM2.5 ug/m3	PM10 ug/m3	CO2 PPM
01/11/2018	24:00	15.3	13	16.7	61.9	354.7
02/11/2018	24:00	14	13.1	22.1	81.7	362.6
03/11/2018	24:00	13.6	13	24.5	90.8	360.8
04/11/2018	24:00	13.3	13.1	25.2	93.4	378.3
05/11/2018	24:00	13.3	13.1	28.5	105.7	376.4
06/11/2018	24:00	13.6	13.1	33.5	123.9	383
07/11/2018	24:00	19.2	13.3	41.2	152.7	358.1
08/11/2018	24:00	21.1	13.7	38.2	141.5	380
09/11/2018	24:00	17.6	14	33.3	123.2	405.7
10/11/2018	24:00	18.1	14.2	38.8	143.5	392.8
11/11/2018	24:00	22.3	14	39.8	147.3	400.3
12/11/2018	24:00	11.7	14.3	52.4	142.5	406.3
13/11/2018	24:00	7.1	14.3	60.4	157.6	428
14/11/2018	24:00	6	14.2	61	164.2	411.9
15/11/2018	24:00	12.3	14	61.5	154.4	409.3
16/11/2018	24:00	4.5	14	52.3	131.6	398.9
17/11/2018	24:00	1.7	14.1	55	130	393.8
18/11/2018	24:00	4.9	14	59	148.1	388.5
19/11/2018	24:00	7.8	13.9	61	148.8	389.6
20/11/2018	24:00	4.8	13.9	66.7	146.1	390.7
21/11/2018	24:00	13.9	14	54.1	129.8	392.5
22/11/2018	24:00	6.8	15.4	44.7	105.6	412.4
23/11/2018	24:00	1.1	17.1	41.3	97.5	393.6
24/11/2018	24:00	0.9	17.1	45	99.3	383.5
25/11/2018	24:00	0.7	17.1	35.7	98	388.3
26/11/2018	24:00	12.3	17	0	128.6	438.3
27/11/2018	24:00	7.5	17.1	32.8	132.6	439.6
28/11/2018	24:00	7.8	17.2	68.1	124.5	400
29/11/2018	24:00	7.4	17.3	75.8	90.4	407
30/11/2018	24:00	10.7	17.2	82.2	168.1	411.9

पंकज शर्मा
PANKAJ SHARMA
उप महाप्रबंधक (इ (प(जं)
DGM(ENG)
एनटीपीसी लि. सीपत, बिलासपुर (छ.ग.)
NTPC Ltd, SIPAT, BILASPUR (C.G.)

Station: TRACK HOOPER
Date: 03/2013
Report Type:Mean
Time Bas 24 Hour

Station: B TYPE
Date: 03/2013
Report Type: Mean
Time Base: 24 Hour

Station: SWITCH YARD
Date: 03/2013
Report Type: Mean
Time Base: 24 Hour

Date	Time	SO2	NOX	PM2.5	PM10	CO2	Wind Speed	Wind Dir	TEMP	RH	Solar Rad	Rain	SO2	NOX	PM2.5	PM10	CO2	SO2	NOX	PM2.5	PM10	CO2
		ug/m3	ug/m3	ug/m3	ug/m3	PPM	m/s	Deg	C°	%	W/M2	mm	ug/m3	ug/m3	ug/m3	ug/m3	PPM	ug/m3	ug/m3	ug/m3	ug/m3	PPM
01/03/2013	24:00	24.5	19.6	12.9	39.9	390.6	1.7	305.4	26.4	28.1	52.5	0	6.5	0	6.4	19.6	319.2	6.9	8.8	7	19.1	384.2
02/03/2013	24:00	20.9	19.2	12.3	60.4	391.2	1.2	287.9	25.9	22.9	49.6	0	8.7	75	5.1	17.3	320.2	8.1	9	5.6	17.1	384.6
03/03/2013	24:00	31.1	28.9	11.4	60.1	396.7	1.1	262.7	26.2	24.9	52.9	0	6.3	56.4	5.7	16.3	330.3	6.3	RS232	6.7	17.4	387.5
04/03/2013	24:00	21.6	25.1	19.9	52.8	399.4	1.1	212.3	26.1	27.7	52.8	0	7.2	0	8.7	32.3	358.9	6.7	RS232	10.2	0.1	392.2
05/03/2013	24:00	60.4	36.7	29.8	60.4	407.4	1.2	147.1	11	31	47.9	0	54.8	Down	13	13.5	349.6	37	RS232	16.2	40.9	398
06/03/2013	24:00	34.7	28.1	27.7	95.2	406.2	0.8	176.9	25.9	31.6	54.2	0	38.3	Down	15.9	42.3	359.4	47.9	RS232	18.3	49.5	401.2
07/03/2013	24:00	19.1	20.2	15.9	61.4	393.3	0.9	187.5	0	22.8	53.4	0	14.6	Down	7.5	24.9	321	12.5	RS232	9.6	31.5	390.6
08/03/2013	24:00	24.6	23.7	24.9	54.5	391.3	0.7	195.2	0	29	56.3	0	35.9	33.7	12.6	34.8	332.6	14.9	RS232	15.7	29.3	388.5
09/03/2013	24:00	21.1	21.3	21	82.3	394.9	0.9	219.5	0	28.7	57.1	0	17.5	27.6	10.3	27.9	327.6	9.2	RS232	13.2	0	393.9
10/03/2013	24:00	17.2	18.4	27	57.7	403.6	0.7	152.5	0	28.3	59.5	0	18.5	29.5	12.8	35.6	347.7	26.8	RS232	14.9	0	403.7
11/03/2013	24:00	23.5	19.3	42.3	85.6	408.2	1.4	148	0	33.2	52.2	0	27.8	33.7	19.2	48.6	369.9	22.5	RS232	20.5	0	402.9
12/03/2013	24:00	15.4	23.8	32.8	87.2	417	0.8	205	0	36.1	56.9	0	47.6	40.3	16.6	47.7	384.1	12.4	RS232	19.9	26.7	409.1
13/03/2013	24:00	22.4	21	35.8	63.8	402.9	0.9	158.6	0	33.4	55.6	0	30.2	32.5	20.9	61.5	360.5	28.5	RS232	22.6	67.1	402.2
14/03/2013	24:00	11.6	20	26.3	67.6	397	1.3	172.9	0	45.9	45.1	0	8.9	29.1	15.5	41.7	358.9	10.7	RS232	16.1	2.2	395.9
15/03/2013	24:00	18.7	16.3	25.5	72.6	391.8	1.6	183.9	0	46.6	54.3	0	17.6	29.8	13.6	34.3	343.1	24.5	RS232	16.5	47.4	392.4
16/03/2013	24:00	17.7	23.5	16.7	40.1	393.2	1.4	146.5	26	58.1	114.4	0	11.4	34.1	10.1	17.3	362.5	11.1	RS232	10.6	23.4	389.6
17/03/2013	24:00	17	16.8	15.2	55.5	387.3	0.8	114	27.7	52.7	187	0	7	25.3	6.4	13.9	338.6	6.5	RS232	8.2	17.4	387.9
18/03/2013	24:00	7.4	13.3	16.9	54.3	395.9	0.8	161.6	27.7	46.2	137.6	0	7.2	26.8	8.6	21.4	347.5	6.8	RS232	11.7	27.1	398.5
19/03/2013	24:00	8.9	17.8	20.8	64.4	400.1	0.8	205.8	27.6	33.1	54.9	0	21.1	32.2	9.9	28.7	354.2	7.5	RS232	13.4	38.3	403.5
20/03/2013	24:00	17.9	24.9	30.3	63.5	409	1	183.6	29	31.5	56.3	0	26.8	35.7	15	42.7	379.6	18.3	RS232	21.7	1.5	411.3
21/03/2013	24:00	11.6	20.1	37.7	61.8	409	1	210.8	29.6	35.9	56.9	0	15	32.3	29.3	82.9	383.4	17.6	15.6	42.9	67.7	408.9
22/03/2013	24:00	12.2	16.7	27.4	76.7	374.1	1.2	199.6	29.8	37.5	46.3	0	25	26.3	42	144.5	360.4	9.2	11	43.8	111	412.4
23/03/2013	24:00	14.9	14	34.9	64.3	334.5	1.9	85.8	31.6	27.1	42	0	20.9	32.1	25.7	83.2	337.8	20.5	10.3	20.4	45.1	399.2
24/03/2013	24:00	58.5	21.9	44.3	52.9	354.3	0.9	207.8	30.2	35.9	47.5	0	14	37.1	25.3	62	369.4	14.9	11.6	27.6	57.4	413.6
25/03/2013	24:00	19.2	18.5	43.3	100.8	345.1	1.7	223.3	31.2	35.6	44.8	0	14	36.4	18.5	47.3	350	8.7	10.6	24.1	51.3	405.9
26/03/2013	24:00	22	13.4	31.1	60.8	340.5	1.2	219.3	32	32.5	53.8	0	20.2	36.5	18.1	44.3	355.1	8.5	9.4	19.9	41.7	402.8
27/03/2013	24:00	26.5	13.8	29.7	51.3	335.1	0.8	164.1	32.1	30.5	52.1	0	16.4	33.5	16.6	36.7	343.8	8.8	9.2	18.3	32.6	401.8
28/03/2013	24:00	28.3	16.3	34.3	61.5	331.4	1.2	156.4	31.8	30.9	50	0	30.7	36.1	18.2	45.7	345.9	25.7	9.9	19.2	39.7	395.8
29/03/2013	24:00	65.7	12.7	27.3	57.1	326.4	1.4	92.6	29.1	44	51.9	0	15.8	32.2	15	33.2	338.9	37.5	11.9	16	27.1	396.3
30/03/2013	24:00	60.1	18.6	31.4	81.9	333	1.1	192.8	31.3	39.7	57.6	0	27.3	30.6	18	39.1	409.5	14.8	10.6	19.2	36.5	399.1
31/03/2013	24:00	62	12.7	19.5	64.4	326.9	1.5	243.3	31.6	27.5	59	0	29	32.2	10.7	29.2	427.2	11.1	9.1	11.7	23.7	393.6
Min		**7.4**	**12.7**	**11.4**	**39.9**	**326.4**	**0.7**	**85.8**	**25.9**	**22.8**	**42.0**	**0.0**	**6.3**	**25.3**	**5.1**	**13.5**	**319.2**	**6.3**	**8.8**	**5.6**	**0.0**	**384.2**
Date		18/03	31/03	03/03	01/03	29/03	08/03	23/03	06/03	07/03	23/03	01/03	03/03	17/03	02/03	05/03	01/03	03/03	01/03	02/03	09/03	01/03
Time		24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00
Max		**65.7**	**36.7**	**44.3**	**100.8**	**417.0**	**1.9**	**305.4**	**32.1**	**58.1**	**187.0**	**00**	**54.8**	**75.0**	**42.0**	**144.5**	**427.2**	**47.9**	**15.6**	**43.8**	**111.0**	**413.6**
Date		29/03	05/03	24/03	25/03	12/03	23/03	01/03	27/03	16/03	17/03	03/03	05/03	02/03	22/03	22/03	31/03	06/03	21/03	22/03	22/03	24/03
Time		24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00	24:00
AVG		**26.4**	**19.9**	**26.7**	**64.9**	**380.2**	**1.1**	**187.8**	**18.7**	**34.5**	**61.7**	**00**	**20.7**	**30.17**	**15.2**	**41.0**	**354.4**	**16.2**	**10.5**	**17.5**	**31.9**	**398.3**
Num		31	31	31	31	31	31	31	31	31	31	31	31	28	31	31	31	31	13	31	31	31
Data[%]		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	90.3	100.0	100.0	100.0	100.0	41.9	100.0	100.0	100.0
STD		16.47	5.247	8.999	35.4	29.46	0.329	48.44	13.72	8.349	29.57	194.1	11.9	31.54	7.682	25.63	24.01	10.41	1.747	8.612	23.91	8.022

ANNEXURE-10

Government of India
Bhabha Atomic Research Centre
Health Physics Division

Ref: HPD/ESS/RAL/2018/ March 28, 2018

Sub: **Comprehensive Radiological Survey around Sipat Super Thermal Power Project, NTPC Ltd., Ujwal Nagar, Bilaspur, Chhattisgarh**

Please find herewith the radiological study report entitled "**Comprehensive Radiological Survey around Sipat Super Thermal Power Project, NTPC Ltd., Ujwal Nagar, Bilaspur, Chhattisgarh**" prepared by Health Physics Division, Health Safety & Environment Group, Bhabha Atomic Research Centre, Mumbai.

R.M. Tripathi 28/3/2018

(R.M. Tripathi)
Head, Health Physics Division

Shri Pankaj Sharma
DGM, EMG
Sipat STPP, NTPC Ltd.
Ujwal Nagar, Bilaspur
Chhattisgarh - 495555

cc: Dr. Sudhir Dahiya, Dy. General Manager (EMG), CC-EMG, EOC, Noida

Report on Comprehensive Radiological Survey around Sipat Super Thermal Power Station, NTPC Ltd., Bilaspur, Chhattisgarh, India

Report submitted to

Sipat Super Thermal Power Station

NTPC Ltd

Bilaspur, Chhattisgarh

Studied by

Health Physics Division

Health, Safety & Environment Group

Bhabha Atomic Research Centre,

Trombay, Mumbai – 400085

Bhabha Atomic Research Centre

2018

II

Report on Comprehensive Radiological Survey around Sipat Super Thermal Power Station, NTPC Ltd., Bilaspur, Chhattisgarh, India

Health Physics Division, Health, Safety & Environment Group,
Bhabha Atomic Research Centre, Trombay, Mumbai – 400 085

Executive Summary

NTPC Ltd. of India is operating a Super Thermal Power Plant in the village of Sipat, Masturi tehsil, Bilaspur district of Chhattisgarh to meet the power demand of the region. NTPC Sipat Super Thermal Power Plant (SSTPP) has 3 x 660 MW and 2 x500 MW coal based thermal power plants and the total installed capacity of plant is 2980 MW. NTPC authorities decided to have a comprehensive radiological baseline data in and around the Sipat plant site. Health, Safety and Environment Group (HS&EG), Bhabha Atomic Research Centre (BARC), Trombay, Mumbai was entrusted the work to carry out the required radiological study. The observed data will be the present reference radiological scenario for the plant site that will be compared with later stages of operation.

The radiological survey in and around the site was carried out during July 25 – 30, 2016 by a team of officers from Health Physics Division, HS&EG, BARC. During the time of survey, the plants are operational at their rated capacity.

The following NTPC officials provided all the logistic supports and help during the study

1. Shri Pankaj Sharma, DGM, EMG
2. Shri Nishant Parmar, Dy. Manager, EMG

The following BARC Team members for the radiological survey around the site

1. Dr. Rajesh Kumar, HPD, BARC, Turamdih
2. Shri Sunil K. Sahoo, HPD, BARC, Mumbai

The radiological survey is carried out as per the NTPC PO no. 8200 164069 dt. 22.02.2016 and the sampling locations are selected in consultation with the NTPC officials. The sampling locations are selected on the basis of higher occupancy of the workers in the plant areas and surrounding villages. Soil and groundwater samples around the Ash Dyke Area are collected as per the guidance of the NTPC officials.

The locations in and around the plant site was surveyed using gamma radiation survey meter, professional radon monitor and electronic radon detector as per the standard protocols. Soil, groundwater, surface water, drinking water and food samples were collected, processed and analyzed as per the BARC standard procedure and protocol. The ^{238}U, ^{232}Th, ^{226}Ra, ^{210}Pb and

^{40}K radioisotopes in soil and food samples was analyzed using high purity germanium (HPGe) detector. Alpha spectrometer was used for analysis of ^{238}U and ^{232}Th in water samples, emanometric technique for ^{226}Ra, Liquid Scintillation Analyser (LSA) for ^{210}Pb and double beam atomic absorption spectrophotometer (AAS) for potassium (^{40}K estimation indirectly) analysis. The strict quality assurance and quality control steps are adopted during the study.

The ambient gamma radiation levels in the plant premises were in the range of 50-140 nSv/hr, with an average value of 88.6 ± 26 nSv/hr at 95% confidence interval. The ambient gamma radiation levels in the surrounding villages up to 10 km radius of the plant site are observed in range of 60-160 nSv/hr, with an average value of 97±23 nSv/hr at 95% confidence interval.

The observed outdoor radon and thoron gas levels in the plant premises were in the range of 5 - 19 Bq/m^3 and <10 Bq/m^3, respectively. The indoor radon and thoron levels in the plant and surrounding villages were in the range of 45 - 80 Bq/m^3 (59 ±10) and 12 – 28 Bq/m^3 (19 ± 5).

The naturally occurring radionuclides like ^{238}U, ^{226}Ra and ^{232}Th levels in the soil samples were observed in the range of 45.5 – 105.6 Bq/kg (Mean: 70.3 ± 18.9); 43.5 – 74.6 Bq/kg (Mean: 55.4 ± 5.6) and 69.8 – 184.9 Bq/kg (Mean: 97.6 ± 8.7) respectively. ^{40}K activity in soil samples was found to be in the range of 291.8 – 652.6 Bq/kg (Mean: 443.55 ± 17.65 Bq/kg).

The activity concentration of ^{238}U, ^{226}Ra, ^{232}Th and ^{40}K levels in the coal samples were observed in the range of 46.4 – 53.7 Bq/kg (Mean: 49.2±4.8); 49.3 – 59.0 Bq/kg (Mean: 54.5±3.8); 60.4 – 70.1 Bq/kg (Mean: 61.5±5.3) and 130.3 – 186.5 Bq/kg (Mean: 149.5±8.6) respectively. The activity concentration of ^{238}U, ^{226}Ra, ^{232}Th and ^{40}K levels in the fly ash samples were observed in the range of 73.6 – 89.2 Bq/kg (Mean: 83.2±9.5); 72.8 – 85.9 Bq/kg (Mean: 80.0±4.0); 101.4 – 1318.8 Bq/kg (Mean: 114.9±6.3) and 339.0 – 400.3 Bq/kg (Mean: 374.9±10.4) respectively.

The activity concentration of ^{238}U, ^{226}Ra, ^{232}Th and ^{210}Pb in locally grown vegetation samples collected around the site were observed less than the minimum detection levels of the analytical technique. ^{40}K concentrations in vegetation samples were observed in the range of 11.19 to 210 Bq/kg of fresh weight basis.

The activity concentration of ^{238}U, ^{226}Ra, ^{232}Th and ^{210}Pb in flora and fauna samples collected around the site were observed less than the minimum detection levels of the analytical technique. ^{40}K concentration in vegetation samples were observed in the range of 50.69 to 113.98 Bq/kg of fresh weight basis.

The activity concentration of ^{232}Th and ^{210}Pb in 8 drinking water samples in villages collected around the plant were observed less than the minimum detection levels of the analytical technique. The activity concentration of U (Nat.) and ^{226}Ra were found in the range of 0.2 – 4.2 ppb and < 4.5 - 57 mBq/l. The ^{40}K activity concentration in 8 drinking water samples in villages collected around the plant were found to be in the range of 1.0 – 14.2 mBq/l.

The ^{40}K activity concentration in groundwater around ash dyke area, surface water and drinking water samples were found to be in the range of 2.3 – 38.6; 6.4 – 36.4 and 5.6 –7.9 mBq/l respectively. ^{226}Ra activity concentration in water samples were in the range of < 4.5 – 26 mBq/l which is well below the WHO action level (1000 mBq/l).

From the present study, it is revealed/concluded that the radiological levels around the NTPC Ltd., Sipat site is comparable with the national average values and the NORM levels in groundwater / surface water / drinking water samples is observed well below the AERB and World Health Organization (WHO) prescribed limit / guideline values.

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Report On
Comprehensive Radiological Survey around Sipat Super Thermal Power Station, NTPC Ltd., Bilaspur, Chhattisgarh, India

Health Physics Division, Health, Safety & Environment Group,
Bhabha Atomic Research Centre, Trombay, Mumbai – 400 085
Tel.: +91-22-2559 2665 / 2664, Fax: +91-22-2550 5313

1. Introduction

NTPC Ltd. Has set up Sipat Super Thermal Power Project in the village of Sipat in Bilaspur district of Chhattisgarh for meeting the regional power demand. Stage-I of Sipat Super Thermal Station comprises of 3 X 660 MW and stage-II is 2 X 500 MW, and have ultimate capacity of 2980 MW. Health, Safety & Environment Group, Bhabha Atomic Research Centre, Trombay, Mumbai has initiated the radiological study at the Sipat STPP, Bilaspur - on request from NTPC Ltd. The observed values will be used as baseline data for Bilaspur Site for future reference if any. The radiological survey at and around the site was carried out during July 25 - 30, 2016 by a team comprising of Dr. Rajesh Kumar, HPD, BARC, Turamdih and Shri Sunil K. Sahoo of Health Physics Division, HS&EG, BARC, Mumbai. During the time of survey, the plants are operational at their rated capacity. . The environmental radiological levels associated with coal fired thermal power plants and associated fly ash has been studied by environmentalists from time to time (U. C. Mishra, 2004). Furthermore fly ash brick is one of the major construction materials in modern days and radioactivity content and radon emanation if any from fly ash has also been studied extensively (Shukla et al., 1995). The data generated from this study will be used as a baseline data for future reference if any.

2. Objective of the Study

The major objectives and scope of the study are given below

a. Measurement of external ambient gamma radiation level in the plant premises
b. Measurement of atmospheric radon and thoron level in the plant premises
c. Measurement of external gamma radiation level in the villages surrounding the site upto 10 km radius
d. Measurement of Indoor radon and thoron level in houses in the surrounding villages
e. Measurement of naturally occurring radionuclides in soil and groundwater samples around the ash dyke area
f. Measurement of naturally occurring radionuclides in drinking water, surface water and locally grown food matrices

3. Literature Review on Natural Radiation and Radioactivity

Radiation is a form of energy, emitted from unstable nucleus due to spontaneous transformation. It is emitted either in the form of particles like alpha, beta, neutron or electromagnetic radiation like X-rays and gamma rays. Radioactivity is the phenomenon in which an unstable nucleus undergoes spontaneous transformation or decay process. The unit of radioactivity is Becquerel (Bq) which is equivalent to one disintegration per second.

Radioactivity is classified as natural and artificial depending upon its origin. Natural occurring radioactive materials (NORM) are primordial in origin consisting uranium, thorium along with their series radionuclides and single radioactive elements like potassium. Artificial radioactivity arises due to various anthropogenic activities. Release of low levels of natural and artificial radionuclides can occur to the environment during the normal operations of nuclear facilities like ore processing, enrichment, fuel fabrication, power reactors, particle accelerators and the production and application of radioisotopes in the fields of nuclear medicine, industry, research and agriculture (UNSCEAR, 2000). The amount of release depends upon the type of facility, engineering control measures, safety standards adopted and waste management system associated with it. Similarly many other industries which do not involve direct handling of radioactive material yet may have potential to enhance or alter the natural radioactive levels in the environment. Coal fired thermal power plant is one among such industries where coal is used to produce energy and in the process fly ash is generated. Due to the reduction in volume from coal to fly ash, buildup of natural radioactivity occurs in fly ash.

Exposure, due to natural radiation, is of particular importance because it accounts for the largest contribution to the total collective radiation dose to the world population (UNSCEAR, 2000).Exposures from natural sources are due to (a) external source of extra-terrestrial origin (cosmic rays), (b) source of terrestrial origin (radioactive nuclides present in the Earth's crust, in atmosphere and in building materials), (c) internal exposure from radionuclides taken into the body through ingestion of food materials etc., and (d) indoor & outdoor inhalation exposures due to radon (^{222}Rn), thoron (^{220}Rn) and their daughters. Some of these exposures are relatively constant and uniform for all individuals throughout the world; while others vary depending on the geography and geology of the location and due to elevated levels of naturally occurring radioactive substances like uranium (^{238}U) and thorium (^{232}Th) in specific localized areas. All exposures, except those from the direct cosmic radiation, are produced by the radioactivity of the natural radionuclides present in the environment. Extent of exposure to natural sources depends on occupation, type of dwelling and construction material used, location of habitation, ventilation rate, life style and food habit, etc.

3.1. Cosmic Radiation

A major contribution to external exposure comes from cosmic rays. Cosmic rays consist of protons (85%), alpha particles (14%) and about 1% from nuclei of atomic number between 4 and 26. These particles are highly penetrating and have high energy. Cosmic radiation varies from 0.03μSv.h^{-1} at sea level to 0.1 μSv.h^{-1} at Bangalore City at an altitude of about 1 km. This becomes 1 μSv.h^{-1} at an altitude of 6.7 km (at the Himalayan peaks) increasing to 5 μSv.h^{-1} at an altitude of 10 km (aircraft cruising altitude) and 10 μSv.h^{-1} at the supersonic jet flying

altitude of 15 km (IAEA, 1996). The annual effective dose from cosmic rays ranges between 260 $\mu Sv.y^{-1}$ at sea level to ~ 1070 $\mu Sv.y^{-1}$ at an altitude of 3.4 km (UNSCEAR, 2000). In general, the individual annual effective dose from cosmic rays around the world ranges between 0.26 to 2.00 $mSv.y^{-1}$ with a mean value of 0.380 $mSv.y^{-1}$. Average effective dose from cosmic radiation in India is estimated to be about 0.355$mSv.y^{-1}$ (Mishra et al., 1971).

3.2. Terrestrial Radiation

Naturally occurring primordial radionuclides are present in the earth, since its origin. These are mostly isotopes of heavy elements and their decay products. These are of two types, viz. "single" and "series". "Single" isotopes are those, which are naturally occurring and have stable decay products e.g. ^{40}K, ^{87}Rb, ^{147}Sm, ^{115}Ln, ^{138}La, ^{176}Lu, etc.. Most of them are beta or beta-gamma emitters. "Series" isotopes are members of a series of radioactive parent and daughters, which finally decay into a stable daughter product. There are three natural "series", viz. the Uranium-235, Uranium-238 and Thorium-232 series. After successive alpha and beta emissions, along with the associated gamma rays, they end up as a stable isotope of lead. The members of the series include the isotopes of the inert gas, Radon (Rn-219, Rn-222 and Rn-220). The Radon gas diffuses through the soil and emanates into the atmosphere. The decay products of Radon being solids, they condense on the atmospheric dust particles of sub-micron sizes and form radioactive aerosols. The radionuclides of the Uranium and Thorium decay series are present at varying concentration levels in all compartments of the environment. The variations in their concentrations in different soils are related to the type of rock from which the soils originate. Higher levels are associated with igneous rocks such as granite and lower levels with sedimentary rocks. Some shale and Phosphate rocks have relatively higher radionuclide concentrations (IAEA, 1978). In view of the different physical, chemical and radiological properties of the members of a decay chain, all of them may not be in equilibrium in the soil. These radionuclides in soil give rise to external radiation exposures. As building materials are derived from rocks and soils, they too contain radionuclides, sometimes at relatively higher concentrations.

The varying quantities of radioactivity in rocks and soils result in the variation of natural radiation levels. The natural radiation exposure levels in different parts of India from terrestrial and cosmic radiation vary from the lowest value of 0.3$mSv.y^{-1}$ in Lakshadweep to the highest level of1.4$mSv.y^{-1}$ in Kerala (Nambi et al., 1986). The average radiation exposure levels in different states of India are shown in Figure 1. The national and global averages are also given in the figure.

3.3. Inhalation Exposure Due to Radon, Thoron and their Progeny

Major contribution of natural radiation dose arises from the inhalation of ^{222}Rn, ^{220}Rn and their short lived progeny. ^{222}Rn and ^{220}Rn are ubiquitous, and are produced in the course of decay of ^{238}U and ^{232}Th series. Being inert gases, they escape through the pores of the soil and diffuse into the atmosphere depending up on the radioactive content in the soil, type of the soil, the prevailing atmospheric conditions, etc. They arealso emanated from building materials.

Typical worldwide outdoor levels of ^{222}Rn and ^{220}Rn are about 10 $Bq.m^{-3}$; while that of indoor radon and thoron are estimated to be 40 and 10 $Bq.m^{-3}$,respectively (UNSCEAR, 2000).

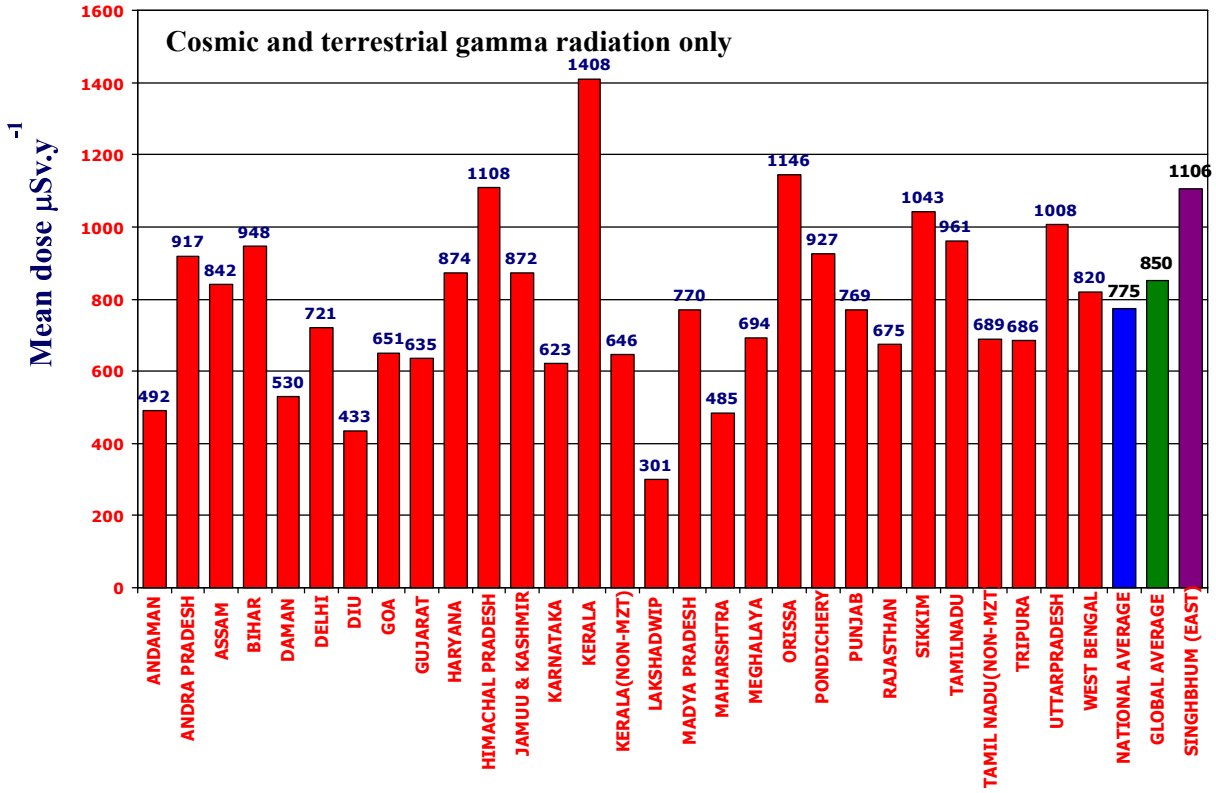

Fig.1: Average radiation exposure levels in different states of India

In India, a countrywide survey of indoor ^{222}Rn and ^{220}Rn, covering more than 2000 houses and more than 4000 quarterly measurements has yielded a national average value for the inhalation dose due to ^{222}Rn, ^{220}Rn and their progenies equal to 1.235 mSv/y (Ramachandran et al., 2003; Ramachandran et al., 2003a). This extensive survey included houses made out of different types of construction materials spreading over 130 locations at different parts of the country. Solid state nuclear track detector (SSNTD) based twin chamber ^{222}Rn-^{220}Rn dosimeters were employed for measurements in this survey conducted for a period of three years. This estimate is based on the assumption that a person spends about two third of the day indoors and the remaining period outdoors. Contribution due to ^{220}Rn and its progeny works out to be nearly 15% of the total inhalation dose. This dose rate is comparable with the global value of 1.275mSv/y (Puranik et al., 2005).

3.4. Internal Exposure due to Ingestion

Internal exposure is due to the ingestion of ^{238}U, ^{232}Th and the radionuclides produced by the decay of these as well as ^{40}K, through dietary intake. It is estimated that on a global average the ingestion dose due to intake of food containing ^{238}U and ^{232}Th series nuclide works out to be 0.140mSv.y^{-1} and that due to ^{40}K is 0.170mSv.y^{-1}. Total dose received through ingestion pathway of dietary intake of long-lived radionuclides of the^{238}U and ^{232}Th series as well as ^{40}K works out to be 0.310 mSv.y^{-1} globally (Puranik et al., 2005) and for India it estimated to be 0.315 mSv.y^{-1}.Total annual effective doses from natural sources to members of the Indian public works out to be 2.3 mSv.y^{-1} (Table-1); which can be compared with the global value of 2.4 mSv.y^{-1} (Table-2).

3.5. Radiation Exposure and Dose Limits

The radiation dose limits to workers and the members of the public from anthropogenic activities are recommended by the International Commission on Radiological Protection (ICRP), a non-governmental international organization comprising of eminent professionals. The International Atomic Energy Agency (IAEA) adopts these limits after a detailed review. The dose limits are published in the International Atomic Energy Agency Basic Safety Standards (BSS, 1996). The Atomic Energy Regulatory Board (AERB) of India, the national nuclear regulatory authority which regulates all operations involving exposure to ionizing radiation, has stipulated dose limits to occupational workers and the public, based on these recommendations. It should also be noted that in some respects the limits stipulated by the AERB are even more stringent as compared to the limits specified by the ICRP (ICRP, 2007). The annual dose limit for occupational workers is 20 mSv whereas for members of the public, the limit is 1 mSv over and above natural background radiation.

Table 1: Radiation Exposures to Indian population from Different Natural Sources and its Comparison with Reported Global value (UNSCEAR, 2008)

Radiation Sources	India		World	
	Annual Effective dose (mSv/y)	**Percent contribution**	**Annual Effective dose (mSv/y)**	**Percent contribution**
External:				
Cosmic radiation	0.355	15.44	0.380	16.14
Terrestrial	0.379	16.48	0.480	19.55
Internal:				
Cosmogenic nuclide (inhalation)	0.015	0.65	0.010	0.41
^{222}Rn and ^{220}Rn (inhalation)	1.235	53.72	1.275	51.94
Terrestrial	0.315	13.70	0.310	12.63
Total (ROUNDED OFF)	2.30	100.0	2.45	100.0

Table 2: Global mean radiation exposure to members of the public (UNSCEAR, 2008)

Sl. No.	Source of exposure		Annual effective dose (mSv)	
			Average	Typical range
1	Cosmic radiation	Cosmic and cosmogenic radionuclides	0.39	0.3 – 1.0[a]
2	External terrestrial radiation	Outdoors	0.07	
		Indoors	0.41	
		Total external terrestrial radiation	0.48	0.3 – 1.0[b]
3	Inhalation	Uranium and thorium series	0.006	
		Radon (^{222}Rn)	1.15	
		Thoron (^{220}Rn)	0.1	
		Total inhalation exposure	1.26	0.2 – 10[c]
4	Ingestion	^{40}K	0.17	
		Uranium and thorium series	0.12	
		Total ingestion exposure	0.29	0.2 – 1.0[d]
		Total	2.4	1.0 – 13

a Range from sea level to high ground elevation.
b Depending on radionuclide composition of soil and building material.
c Depending on indoor accumulation of radon gas.
d Depending on radionuclide composition of foods and drinking water.

4. Study Site Description

4.1. Site description

Sipat Super Thermal Power Project is located near Sipat village in Masturi Tehsil of Bilaspur District Chhattisgarh. The plant is situated about 15-Km Northeast of Bilaspur city (District Headquarter) and is accessible via Bilaspur-Baloda State Highway, which passes through Sipat.

Main Plant Area and Township of NTPC Sipat is bounded by North latitudes from 22°07'00" N to 22°08'53.40" N and by East longitudes from 82°16'43" E to 82°18'49.37" E ,where as Ash disposal area is in between 22°03'37.63" N to 22°05'16.59" N and 82°16'22.42" E to 82°17'39.18" E ,falling in the Survey of India toposheets Nos. 64 J/4 and 64 J/8. Nearest railway station is Bilaspur of South Eastern Railway, located at a distance of about 15-Km.Nearest Airport is Raipur airport which is 150 Km from NTPC Sipat.

4.2. Topography:

The topography of the study area extremely varied though, in general uneven to flat with an average elevation of 265-m above mean sea level. There are two hillocks, Sonthi Pahar (Reserved Forest) in the Northeast part and Dalha Pahar (Protected Forest) in the Southeastern part. The Dalha rises abruptly neat Akaltara and is visible from long distance. The general slope of the study area is from north-west to south-east. The major portion of the plain contains clay loam and sandy soil of lateritic origin.

4.3. Geographical Features

The Sipat STPP is located on the Chhattisgarh Basin geological formation, which is made up of sediments of calcareous, argillaceous and arenaceous facies represented by limestone, shales and sandstones of the Raipur series of the Cuddapah system. The site is mostly located on hard rock terrain, underlain of Charmuria limestone and Gunderdehi shales.

The area is drained by the Kharung, Lilagarh and Arpa rivers. The flow of these rivers is from north to south. Kharung and Lilagarh rivers are perennial but have little discharges in summer season/dry season. Kharung and Lilagarh rivers flow through quartzite, limestone, shale and dolomite rock formation and Arpa River flows through the limestone formation. These rivers form dendritic drainage pattern in the area.

The area under investigation is mostly hard rock terrain comprising like limestone, shale and sandstone of Raipur series of Cuddapah system. The northern part of the area is occupied by granites and gneisses of Archaean age. At places, capping of alluvial soil of recent age is also found.

4.4. Climate of the site

The climate of the study area is sub-tropical, semi arid, continental and monsoon type. Thus, it has hot summers, cool winters and small rainy season. The winter season starts towards the letter half of November and extends till about the middle of March followed by summer, which continues till about the middle of June when maximum temperature reaches up to 45°C and

dust cyclones are common. After it, southwest monsoon arrives. The rainy season starts around middle of the June and continues till September. The post monsoon months October and November constitute a transitional period from monsoon to winter season.

The climate is ideal for agriculture development, particularly for wheat, rice, sugarcane and cotton crops. Limited rainy season, good and healthy climate is suitable for industrial development also.

4.5. Ground Water in Study Area

The main source of ground water recharge in the study area is rain water which infiltrates into the ground through carious litho logical horizons present in the area. Secondary source of recharge is due to seepages of surface irrigation water applies to agriculture fields through the various distributaries of Kharung Left Bank Canal as well as seepage from the canal.

The movement of ground water depends upon the porosity and permeability of rock formation and local topography of the area whereas the direction of movement depends upon the hydraulic gradient. The maximum infiltration of rain water occurs in porous and permeable zone of geological formation where the topography is almost plain.

4.6. Hydrology

Introduction

Water resources in the study area can be broadly classified into two categories:

(i) **Surface Water Bodies:** Rivers, stream, canal, ponds, etc. which include Arpa, Kharung and Lilagarh rivers; Tumgarh tributary of Kharung and other small nallahs. In addition, there is also a Canal (Kharung Left Bank) and several ponds in the area.

(ii) **Ground Water Bodies:** It includes shallow aquifers as well as deep aquifers.

The only source of recharging for surface water and ground water resources is precipitation (rainfall). The study area receives maximum rainfall during monsoon months which extends from June to September.

Surface Water Hydrology

Drainage Pattern

The study area lies in the catchments area of Mahanadi River. The study area is drained by Arpa, Kharung and Lilagarh rivers, which flow in southern direction, with a gradient of about 1.00-m/Km.

The north south tending high ground of the area acts as a surface water divide between the drainage system of Kharung and Lilagarh rivers, Kharung flows west of the plant and joins Arpa. Lilagarh and Kharung rivers have relatively narrow and shallow channels. Arpa River has wide and shallow channel. The high drainage in the central high ground indicates the presence of low permeable sub-zones with sporadic vegetation in the area.

5. Sampling, Sample Processing and Analysis

The sampling locations were selected based on public habitation details and meteorological data of the site. The no. of samples collected and locations surveyed for ambient gamma radiation and atmospheric radon and thoron levels are as per the work order of NTPC, Sipat site.

5.1. Gamma radiation survey and environmental sample collection

Gamma radiation levels were measured using radiation survey meter (Make/model: Target Identifinder-N) at one meter height from the ground. At each location, 4 – 5 readings were recorded. After statistical analysis of observations range and mean of gamma radiation level is estimated.

Atmospheric outdoor radon and thoron levels were measured using Professional Radon monitor (Make/model: Genitron Alpha Guard) and Electronic Radon detector (Make/Model: Durridge RAD7). Both the instruments have been used for outdoor radon and thoron measurement as per the protocol specified in the manufacturer's manual. The Professional Radon monitor used in diffusion mode for 10 minute cycle and measurement done for a period of about 1 hour time at each location. The electronic radon detector was used for thoron monitoring in active thoron mode in 15 minute cycle.

Indoor integrated radon and thoron gas levels were measured using solid-state nuclear track detector (SSNTD) based single entry passive dosimeters. The dosimeters were deployed in the houses at each location minimum 1 meter distant from wall and one foot from roof for about 30 days. The dosimeters placed in house at location away from the door / window, in front of fan / AC, etc. Other precautions were also taken to keep it away from direct sunlight / dust exposure and not being disturbed by other factors regularly. The date and time of deployment and retrieval were registered for calculation of exposure duration. After 90 days of exposures, the radon-thoron dosimeters were retrieved by NTPC official and sent to Health Physics Division, BARC, Mumbai for further analysis of the SSNTD films.

Groundwater, surface water and drinking water samples were collected in pre-acid cleaned polythene carboys (5 liter capacity each). Before collection of the water samples, the cleaned carboys rinsed with the water to be collected and carboys were filled fully. Groundwater samples collected from bore well / hand pumps around the proposed ash dyke area and surrounding villages up to 10 km distance from the NTPC site.

The nearby surface water source is Leelagarh river from where the surface water is collected that is final recipient of storm water drain. During the sampling duration, both Lagoon 2 and 3 were in service for ash slurry discharge and decanted water of both the lagoons were collected in an overflow lagoon which is pumped back to plant through AWRS pumps.

Surface soil samples were collected from an undisturbed site (1 m x 1m) as per the procedure mentioned in IAEA TRS 259. One kg of surface soil samples collected from each location in clean polythene bags.

Number of gamma radiation survey, environmental sampling, radon - thoron monitoring in and around plant area and surrounding villages are summarized in Table-3. Location details where radon - thoron twin cup dosimeters are deployed are given in Table-4.

Table 3: No. of locations surveyed and samples collected in and around NTPC Sipat Site

Sl. No.	Description	Numbers
1a	Gamma radiation levels measured in plant premises	11
1b	Atmospheric radon and thoron levels measured in plant premises	10
2	Radon-thoron samples in houses	10
3	External gamma radiation levels in villages upto 10 km radius	16
4	Soil samples around the ash dyke area	6
5	Groundwater samples around the ash dyke area	6
6	AWRS water/ Toe drain water/ Surface water from water bodies nearby ash dyke area	3
7	Locally grown food samples (Grains/ vegetable)	6
8	Drinking water from nearby villages	7
9	Coal from yard/ coal as fired (mill)/ fly ash, bottom ash and fly ash bricks	6
10	Stack particulates	1
11	Flora from ash dyke and AWRS	4
12	Fauna from ash dyke and AWRS	2
13	Drinking water samples from plant area/ township/ Raw water	3

Table 4: Deployment of Indoor Radon – Thoron dosimeters around NTPC Sipat Site

Sl. No.	Code of dosimeter	Location / Village name	Location details
1	CG-SPT-0716-DS01	Control room stage-I	Plant Site
2	CG-SPT-0716-DS02	Administrative building	Plant Site
3	CG-SPT-0716-DS03	Fly ash brick plant	Plant Site
4	CG-SPT-0716-DS04	Sipat	Village around the plant
5	CG-SPT-0716-DS05	Karra	Village around the plant
6	CG-SPT-0716-DS06	Janji	Village around the plant
7	CG-SPT-0716-DS07	Darrabhata	Village around the plant
8	CG-SPT-0716-DS08	Ralia	Village around the plant
9	CG-SPT-0716-DS09	NTPC township, B-type quarter	NTPC Township
10	CG-SPT-0716-DS10	NTPC township, D-type quarter	NTPC Township

5.2. Sample processing

Soil, groundwater, surface water, drinking water and food matrices are processed at Radio-analytical Laboratory of Health Physics Division, BARC Hospital, Anushaktinagar, Mumbai as per the standard protocols.

5.2.1. Water sample processing

Water quality parameters such as pH, Electrical Conductivity (EC), Total dissolved solids (TDS), Salinity, Temp., Oxidation Reduction Potential (ORP) were measured in-situ, using portable sensors (Make/Model: Eutech PCS35 and ORP meter). The sensors were calibrated daily prior to use in the field. The samples were filtered and acidified with concentrated Nitric acid till pH <2 to avoid wall adsorption. The collected samples were processed as per standard protocol of BARC for analysis ^{238}U, ^{232}Th, ^{226}Ra, ^{210}Pb and ^{40}K.

5.2.2. Soil sample processing

Stones, pebbles and other unwanted items were removed from the soil samples, oven dried at a temperature of 110ºC for 24 h for the removal of moisture. Further, samples were crushed into fine powder by using mortar and pestle, homogenized and sieved through 100 µm mesh size. A representative sample of 300 gram weight collected from the bulk by coning and quartering technique. Each sample was packed and sealed, completely airtight, in a cylindrical polyethylene container of 6.5 cm diameter and 7.5 cm height and stored for about one month to attain secular equilibrium between ^{226}Ra and ^{232}Th with their respective daughter products.

5.2.3. Food sample processing

The food samples were washed with ultrapure water to remove dust and adhered soil particles and then allowed to be air-dried. The fresh weight was registered and kept in muffle furnace at 300ºC for a Period of one week for volume reduction. The fresh weight of about 5 kg is reduced to around 300 gram and sealed in standard geometry. These samples were kept for a period of six months to attain radioactive equilibriums. After six months, the samples were counted using p-type High Purity Germanium detector of 50% relative efficiency for gamma emitters.

5.3. Sample analysis

5.3.1. Analysis of NORM in soil and food samples using HPGe detector

Soil samples were analysed by using a high resolution gamma spectrometry system consisting of a coaxial p-type high purity germanium detector (HPGe) having 50% relative efficiency with respect to 7.6 × 7.6 cm NaI(Tl) detector for the 1332 keV gamma radiation of ^{60}Co and for a source-detectors distance of 25 cm, coupled with a 8K MCA and computer. The resolution of the detector was 1.85keV for the 1332 keV gamma radiation of ^{60}Co. The detector is housed in 10cm thick circular rings of lead shield to reduce the background contribution from the surrounding. Spectrums were acquired for 60,000 seconds for soil samples and for 100,000

seconds in case of food samples. Spectrum analysis was done by SpectraLine GP software (Baltic Scientific Instruments). IAEA Certified Reference Materials, RGU-1 and RGTh-1 were used for energy and efficiency calibration in the– identical geometry similar to the sample geometry. The gamma spectrometry system was calibrated in the energy range of 40 to 3000keV. ^{238}U, ^{232}Th, ^{226}Ra, ^{210}Pb and ^{40}K activity are measured from 1001 (^{234m}Pa), 2614 (^{204}Tl), 1764 (^{214}Bi), 46.53 (^{210}Pb) and 1460.8 keV(^{40}K) gamma energy, respectively. Necessary self-absorption corrections were carried out for density and matrix differences between the standards and samples. The quality control of the analysis was carried out by analysing the IAEA standard reference materials and the precision of the analyses was within 8 % of the certified values.

5.3.2. Analysis of ^{238}U and ^{232}Th in water samples using Alpha Spectrometer

Aliquots of water samples were radiochemically processed for uranium and thorium and electroplated. Known amount of radioactive tracers of uranium and thorium (^{232}U and ^{229}Th) were used for the estimation of elemental recovery for the respective analyses. Samples were analysed for ^{238}U (4.197 MeV) and ^{232}Th (4.013 MeV) alpha activity using a passivated ion-implanted planar silicon (PIPS) detector based eight chamber alpha spectrometer.

5.3.3. Analysis of ^{226}Ra in water samples using Emanometric technique

About 2 liter of sample was pre-concentrated by thermal heating over hot plate to about 50 ml and the concentrated sample was loaded in glass bubblers of emanometric technique. After loading, samples were purged to remove dissolved radon gas, if any and then the sample is allowed to remain in sealed condition of about 20 - 30 days. After delay period, the built up radon gas in the glass bubbler, due to decay of ^{226}Ra in the sample, was collected in pre-evacuated background counted scintillation cells. After equilibrium period of 180 min, the scintillation cells were counted for alpha activity using PMT and digital counter. From the alpha counts, background counts, efficiency, delay period, counting time, the ^{226}Ra activity is estimated.

5.3.4. Analysis of ^{210}Pb in water samples using Liquid Scintillation Analyser

An aliquot of water sample was processed radiochemically for separation of lead from other decay products of ^{238}U. The lead sulphate precipitate dissolved and mixed with 12 ml scintillation cocktail (Ultima Gold) and counted in triple to dual coincidence ratio (TDCR) based liquid scintillation analyser (Make / Model: Hidex 300 SL) for 500 minutes. The analyser was calibrated with ^{210}Pb standards (NPL, UK) and the quality of the analysis is ensured by replicate analysis and spike recovery analysis. The minimum detectable level activity in this method is 35 mBq/l. The precision of the analyses was within ±8 %.

5.3.5. Analysis of ^{40}K in water samples using Atomic Absorption Spectrophotometer

An aliquot of water sample was digested using concentration nitric acid and perchloric acid for analysis of total potassium using double beam atomic absorption spectrophotometer (Make/Model : GBC Avanta). The analytical wavelength of 769.9 nm was used for K estimation and ionization effect is suppressed with addition of excess cesium. From the total

potassium concentration, the ^{40}K activity concentration was estimated using the isotopic composition of ^{40}K in potassium and specific activity of ^{40}K. By theoretical calculation, 1 ppm of Potassium (K) in water is equal to 29.75 mBq/l of ^{40}K in the water sample is used for conversion.

5.3.6. Analysis of SSNTD films for indoor radon and thoron levels

After retrieval of the dosimeter, the SSNTD films were chemically etched in 6.0N NaOH solution for 90 minutes followed by counting for number of tracks using spark counter. Also few chemically etched films were counted in optical microscope to corroborate the counts observed in spark counter. Using the standardized calibration factor, the indoor, radon and thoron levels were estimated.

6. Quality assurance and quality control

The accuracy and reliability of the method is verified by cross method analysis, replicate analysis and spike recovery study. All laboratory glasswares used for sample processing were soaked in 10% nitric acid for 15 days and then rinsed thoroughly twice with ultra pure water (resistivity 18.1 MΩ, Thermo nano pure diamond TII water purification system) before use. Various precautions were taken in order to avoid cross contamination.

7. Results and discussion

The results obtained in the present radiological study are presented in this section. The data obtained under this study are comparable and in the same order, therefore, arithmetic means and standard deviations are preferred.

7.1. Results of radiological survey around the SSTPP site, NTPC Ltd., Sipat

The ambient gamma radiation levels inside the plant premises and the surrounding villages up to 10 km radius of the plant site are summarized in Table 5 and Table 6, respectively. The ambient gamma radiation dose rates in the plant premises and the surrounding villages up to 10 km radius of the plant site varied from 50 to 140 nSv/h with arithmetic mean value of 88 ± 28 nSv/h at 95% confidence interval and 60-160 nSv/hr, with an average value of 97 ± 18 nSv/hr at 95% confidence interval respectivily. Gamma radiation dose rate levels were measured along the MGR track of SIPAT site and the results were tabulated in Table 7 (range of 60 – 100 nSv/h with a mean of 79 ± 9). The observed range of gamma radiation levels were comparable with the range reported for the country 60-150 nSv/h and global range of 68-228 nSv/h. The average gamma radiation dose rate levels were found to be very close to national average value of 88 nSv/h (Nambi et al., 1987) and below to the global average value of 103 nSv/h (UNSCEAR, 2008). The levels observed in villages are comparable to other parts of the country.

The radon (^{222}Rn) and thoron (^{220}Rn) gas levels at different locations inside the plant varied from 5-19 Bq/m^3 and <10 Bq/m^3, respectively (Table 8). The average radon activity concentration observed in the plant premises (12.4 ± 6.5 Bq/m^3) is below the average value (AM: 23 Bq/m^3) reported for India (Ramachandran et al., 2003) and global average value of

40 Bq/m^3 (UNSCEAR, 2000). The IAEA BSS has recommended an action level of 200 Bq/m^3 for indoor ^{222}Rn concentration in dwellings. The thoron (^{220}Rn) activity concentration in 10 locations was found to be less than method detection level and also lower than global average value of 10 Bq/m^3(UNSCEAR, 2000).

The integrated indoor radon and thoron levels were measured at 10 locations using SSNTD based single entry pinhole, twin cup dosimeter; the data is presented in Table 9. The indoor radon levels was found to vary from 45 – 61 Bq/m^3 at three locations in plant premises, about 70 – 80 Bq/m^3 in NTPC township quarters and 54 – 60 Bq/m^3 in the dwellings in five selected villages around the site. The indoor radon concentrations were much less than the action level of 200 Bq/m^3 prescribed by Basic Safety Standards of IAEA (IAEA BSS 115, 1996). The thoron concentration varied from 12 - 28 Bq/m^3 with an average value of 19 ± 5 (at 95% confidence interval).

Table 10 presents the activity concentration of naturally occurring radionuclides in soil samples collected from the study area. The ^{238}U, ^{226}Ra and ^{232}Th activity concentration varied from 45.5 – 105.6 Bq/kg (Mean: 70.3 ± 18.9); 43.5-74.6 Bq/kg (Mean: 55.4 ± 5.6) and 69.8 – 184.9 Bq/kg (Mean: 97.6 ± 8.7) respectively. ^{40}K activity in soil samples was found to be in the range of 291.8 – 652.6 Bq/kg with an arithmetic mean of 443.5 ± 17.6 Bq/kg. The average activity concentration of 70.3 ± 18.9 Bq/kg of ^{238}U in soil samples observed around the NTPC Sipat site is higher than the national average value of 29 Bq/kg (UNSCEAR, 2008) and the global average value of 33 Bq/kg (UNSCEAR, 2008). The average ^{226}Ra activity concentration of 55.4 ± 5.6 Bq/kg found in the soil samples collected around the study site was found to be higher than the National (29 Bq/kg) and global average value (30 Bq/kg) (UNSCEAR, 2008).

The activity concentration of ^{238}U, ^{226}Ra, ^{232}Th and ^{40}K levels in the coal samples were observed in the range of 46.4 – 53.7 Bq/kg (Mean: 49.2±4.8); 49.3 – 59.0 Bq/kg (Mean: 54.5±3.8); 60.4 – 70.1 Bq/kg (Mean: 61.5±5.3) and 130.3 – 186.5 Bq/kg (Mean: 149.5±8.6) respectively. The activity concentration of ^{238}U, ^{226}Ra, ^{232}Th and ^{40}K levels in the fly ash samples were observed in the range of 73.6 – 89.2 Bq/kg (Mean: 83.2±9.5); 72.8 – 85.9 Bq/kg (Mean: 80.0±4.0); 101.4 – 1318.8 Bq/kg (Mean: 114.9±6.3) and 339.0 – 400.3 Bq/kg (Mean: 374.9±10.4) respectively (Table 11).

Six locally grown food samples were analysed for naturally occurring radionuclides. The naturally occurring radionuclides such as ^{238}U, ^{232}Th, ^{226}Ra and ^{210}Pb were found to be less than method detection level of high resolution gamma spectrometer system as shown in Table 12. The global reference concentration of ^{238}U, ^{232}Th, ^{226}Ra and ^{210}Pb in grain products is 0.02, 0.003, 0.08 and 0.05 Bq/kg, respectively. Only ^{40}K was detected in the cereal, pulses and vegetable samples and the activity concentration of ^{40}K was observed in the range of 11 to 210 Bq/kg of fresh weight. Generally, ^{40}K concentration in the samples is correlated with total potassium in the food matrix as radio-potassium (^{40}K) has a natural abundance of 0.012% of total potassium. Pulses have a higher percentage of minerals and potassium that reflects in ^{40}K activity concentration. The activity concentration of ^{40}K was found to be higher in pulses than cereals and vegetable samples collected around the site.

The activity concentration of ^{238}U, ^{226}Ra, ^{232}Th and ^{210}Pb in flora and fauna samples (Table 13 & 14) collected around the site were observed less than the minimum detection levels of the analytical technique. ^{40}K concentrations in vegetation samples were observed in the range of 50.7 to 113.9 Bq/kg of fresh weight basis.

Twenty five water samples comprising of 6 groundwater samples (Table 15) around ash dyke area; 3 water samples (Table 16) from Toe drain/AWRS/surface water from Leelaghar River; 3 drinking water samples (Table 17) collected from Plant and Guest house; 8 drinking water samples (Table 18) from villages around the plant; 5 drinking water samples (Table 19) beyond five km distance from the NTPC site/Ash Dyke area as control samples to assess the natural radioactivity levels. The activity concentrations of ^{238}U, ^{226}Ra, ^{232}Th, ^{210}Pb and ^{40}K in groundwater, surface water and drinking water are given in Table 15, 16 and 17, respectively. The activity concentrations of ^{232}Th and ^{210}Pb in the water samples collected around the site were found to be less than the method detection level of the analysis technique. The activity concentration (in mBq/l) of ^{238}U, ^{226}Ra, ^{232}Th and ^{210}Pb in all the water samples is found to be less than World Health Organization (WHO) guideline level of 10 Bq/l (radiological toxicity), 1 Bq/l, 1 Bq/l and 0.1 Bq/l, respectively. ^{238}U activity concentrations in drinking water samples were in the range of 2.5 – 70 mBq/l which is well below the WHO guideline level of 10000 mBq/l. The ^{226}Ra activity concentration were found to be in the range of <4.5 – 57 mBq/l which is well within the WHO guideline value of 1000 mBq/l/. The ^{40}K activity concentration in groundwater around ash dyke area, surface water and drinking waters were found to be in the range of 2.3 – 38.6; 6.4 – 36.4 and 5.6 –7.9 mBq/l respectively.

Table 5: Ambient gamma radiation levels in NTPC Sipat Plant areas

Sl. No.	Plant location	GPS	Gamma radiation level (nSv/h)
1	Administrative building	N 22º 08.135’ E 82º 17.974’	80-120 (100)
2	Auxiliary Pump House area	N 22º 07.758’ E 82º 17.538’	80-130 (105)
3	ESP area, Unit-I	N 22º 07.831’ E 82º 17.607’	50-80 (65)
4	CHP control room	N 22º 07.194’ E 82º 17.329’	100-120 (110)
5	Coal yard (Between TP-15 & 17)	N 22º 07.311’ E 82º 17.370’	50-90 (70)
6	Control room stage-I	N 22º 07.982’ E 82º 17.667’	100-140 (120)
7	Control room stage-II	N 22º 07.972’ E 82º 17.442’	80-100 (90)
8	Switchyard control room	N 22º 08.174’ E 82º 17.289’	60-80 (70)
9	Janji gate	N 22º 07.283’ E 82º 16.740’	60-90 (75)
10	Fly ash brick plant	N 22º 08.010’ E 82º 17.018’	60-110 (85)
11	Main gate security	N 22º 08.062’ E 82º 18.072’	60-110 (85)
Average gamma radiation levels			89 ± 18
National average levels reported (Except NHBRA)			**60-150**
Global average levels reported (Except NHBRA)			**68 - 228**
Prescribed Regulatory limit			**No National and International limits**

Table 6: Ambient gamma radiation levels in villages around NTPC Sipat Plant site

Sl. No.	Village name	GPS	Elevation (m)	Gamma radiation level (nSv/h)
1	Sipat	N 22º 09.193' E 82º 17.103'	252	140-160
2	Janji	N 22º 07.861' E 82º 16.708'	289	70-90
3	Darrabhata	N 22º 07.539' E 82º 19.424'	251	90-100
4	Ralia	N 22º 03.980' E 82º 17.668'	271	100-110
5	Kanda	N 22º 09.156' E 82º 20.619'	268	60-120
6	Dahina	N 22º 09.045' E 82º 21.220'	269	70-90
7	Nargora	N 22º 10.579' E 82º 18.113'	283	100-120
8	Karra	N 22º 08.575' E 82º 19.044'	274	80-90
9	Baruhdih	N 22º 11.720' E 82º 19.643'	288	60-100
10	Bhilai	N 22º 03.139' E 82º 17.010	268	70-100
11	Gautara	N 22º 04.314' E 82º 15.217'	275	90-130
12	Mopka	N 22º 05.273' E 82º 12.262'	278	90-120
13	Khaira	N 22º 05.141' E 82º 14.072'	262	80-120
14	Lagara	N 22º 06.305' E 82º 13.999'	280	80-100
15	Nagoi	N 22º 08.624' E 82º 11.620'	275	70-90
16	Pipra	N 22º 1..754' E 82º 13.223'	279	90-120
17	Sankar	N 22º 06.165' E 82º 21.347'	276	90-120
Average gamma radiation levels				97 ± 18
Prescribed Regulatory limit				**No National and International limits**

Table 7: Radiation Survey of MGR Track at Sipat (Merry Go Round)

Sl. No.	Plant location	Gamma radiation level (nSv/h) Range (mean)
1	MGR Workshop	85 – 95 (90)
2	NTPC Exit Gate	75 – 85 (80)
3	Towards Dipka mine – 1 km away	95 – 100 (97.5)
4	Towards Dipka mine – 2 km away	90 – 100 (95)
5	Towards Dipka mine – 3 km away	65 – 75 (70)
6	Towards Dipka mine – 4 km away	65 – 75 (70)
7	Towards Dipka mine – 5 km away	65 – 75 (70)
8	Towards Dipka mine – 6 km away	60 – 70 (65)
9	Towards Dipka mine – 7 km away	70 – 80 (75)
10	Towards Dipka mine – 8 km away	75 – 85 (80)
11	Towards Dipka mine – 9 km away	70 – 80 (75)
12	Towards Dipka mine – 10 km away	75 – 85 (80)
13	Wagon Loading area, Near Dipka mine	70 – 90 (80)
14	Around Coal Loaded Wagon	70 – 90 (80)
15	Wagon Tippler area	70 – 90 (80)
Average gamma radiation levels		79.2 ± 9.2
National average levels reported (Except NHBRA)		**60-150**
Global average levels reported (Except NHBRA)		**68 - 228**
Prescribed Regulatory limit		**No National and International limits**

Table 8: Ambient Radon-Thoron levels in NTPC Sipat Plant premises

Sl. No.	Plant location	GPS	Radon level (Bq/m^3)	Thoron level (Bq/m^3)	RH (%)	Temp (^oC)	P (mbar)
1	Administrative building	N 22º 08.135' E 82º 17.974'	19 ± 8	< 10	65	25	972
2	Auxiliary Pump House area	N 22º 07.758' E 82º 17.538'	10 ± 6	< 10	59	26	971
3	ESP area, Unit-I	N 22º 07.831' E 82º 17.607'	5 ± 4	< 10	86	30	971
4	CHP control room	N 22º 07.194' E 82º 17.329'	18 ± 8	< 10	79	28	971
5	Coal yard (Between TP-15 & 17)	N 22º 07.311' E 82º 17.370'	8 ± 5	< 10	84	30	972
6	Control room stage-I	N 22º 07.982' E 82º 17.667'	10 ± 6	< 10	72	26	973
7	Control room stage-II	N 22º 07.972' E 82º 17.442'	10 ± 6	< 10	62	24	973
8	Switchyard control room	N 22º 08.174' E 82º 17.289'	17 ± 8	< 10	73	39	974
9	Janji gate	N 22º 07.283' E 82º 16.740'	10 ± 6	< 10	66	35	974
10	Fly ash brick plant	N 22º 08.010' E 82º 17.018'	17 ± 8	< 10	77	30	972
Average			12.4 ± 6.5				
Indoor action level (BSS 115)			**200**	**-**	**-**	**-**	**-**
National average value (GM)			**23**	**12.2**	**-**	**-**	**-**
Global average value (AM)			**40**	**10**	**-**	**-**	**-**

Table 9: Indoor Radon-Thoron levels in plant and villages around SSTPP Plant site

Sl. No.	Code of dosimeter	Location / Village name	Radon level (Bq/m^3)	Thoron level (Bq/m^3)
Plant area				
1	CG-SPT-SO1	Control room stage-I	52 ± 5	15 ± 3
2	CG-SPT-SO2	Administrative building	45 ± 4	26 ± 5
3	CG-SPT-SO3	Fly ash brick plant	61 ± 5	28 ± 4
NTPC Township				
4	CG-SPT-SO9	B-type quarter	80 ± 6	23 ± 4
5	CG-SPT-SO10	D-type quarter	70 ± 5	15 ± 4
Villages around the plant				
6	CG-SPT-SO4	Sipat	56 ± 9	12 ± 3
7	CG-SPT-SO5	Karra	58 ± 5	20 ± 4
8	CG-SPT-SO6	Janji	57 ± 5	17 ± 5
9	CG-SPT-SO7	Darrabhata	54 ± 7	16 ± 3
10	CG-SPT-SO8	Ralia	60 ± 5	17 ± 4
		Range	**45 - 80**	**12 - 28**
		Average	**59 ± 10**	**19 ± 5**
		National average (GM)	**23**	**12.2**
		Global average	**40**	**10**

Table 10: Natural radioactivity levels in soil samples around ash dyke area

Sl. No.	Sample code	Villages	Activity levels (Bq/kg)			
			^{238}U	^{226}Ra	^{232}Th	^{40}K
1	CG-SPT-0716-S01	Rankh	71.4 ± 7.4	54.9 ± 1.7	84.6 ± 2.6	460.9 ± 5.8
2	CG-SPT-0716-S02	Koriya	52.5 ± 2.8	48.5 ± 1.8	91.9 ± 2.9	652.6 ± 7.3
3	CG-SPT-0716-S03	Sukripalli	45.5 ± 2.5	49.7 ± 1.8	78.5 ± 2.6	397.1 ± 5.8
4	CG-SPT-0716-S04	Hardadih	105.6 ± 8.7	55.9 ± 1.7	92.0 ± 2.6	341.1 ± 5.1
5	CG-SPT-0716-S05	Ralia	70.0 ± 7.6	65.3 ± 1.9	93.5 ± 2.7	407.8 ± 5.5
6	CG-SPT-0716-S06	Bharwadih	72.0 ± 6.6	43.5 ± 1.6	69.8 ± 2.4	348.1 ± 5.2
7	CG-SPT-0716-S07	Gataura	63.0 ± 3.1	53.4 ± 1.8	106.5 ± 3.0	563.4 ± 6.7
8	CG-SPT-0716-S08	Mopka	66.2 ± 6.1	45.5 ± 1.5	79.2 ± 2.4	438.1 ± 5.5
9	CG-SPT-0716-S09	Daganya	93.3 ± 7.5	74.6 ± 1.9	184.9 ± 3.4	534.6 ± 5.7
10	CG-SPT-0716-S10	Sankar	63.4 ± 2.8	62.6 ± 1.9	95.0 ± 2.7	291.8 ± 4.8
Range			45.5 – 105.6	43.5 – 74.6	69.8–184.9	291.8 – 652.6
Average			70.3 ± 18.9	55.4 ± 5.6	97.6 ± 8.7	443.55±17.65
Global average value (UNSCEAR, 2008)			**7 – 81 (29)**	**7 – 81 (29)**	**14 – 160 (64)**	**38 – 760 (400)**

Table 11: Natural radioactivity levels in coal and fly ash samples

Sl. No.	Sample code	Sample Location	Activity levels (Bq/kg)			
			^{238}U	^{226}Ra	^{232}Th	^{40}K
1	CG-SPT-0716-C01 (Coal)	Stockyard stage-I	53.7 ± 2.7	55.3 ± 2.2	60.4 ± 3.1	130.3 ± 5.0
2	CG-SPT-0716-C02 (Coal)	Stockpile stage-II	46.4 ± 2.5	49.3 ± 2.1	54.0 ± 2.9	131.6 ± 4.8
3	CG-SPT-0716- C 03 (Coal)	Feeder coal Unit-I	47.5 ± 3.1	59.0 ± 2.2	70.1 ± 3.2	186.5 ± 5.1
4	CG-SPT-0716- C 04 (Fly ash)	Bottom ash Unit-I	86.9 ± 3.9	85.9 ± 2.5	131.8 ± 4.1	400.3 ± 6.6
5	CG-SPT-0716- C 05 (Fly ash)	Fly ash stage-II	73.6 ± 3.3	72.8 ± 2.2	111.6 ± 3.5	339.0 ± 5.6
6	CG-SPT-0716- C 06 (Fly ash)	Fly ash brick	89.2 ± 8.0	81.4 ± 2.2	101.4 ± 3.3	385.3 ± 5.7
Global average value (UNSCEAR, 2008)			**7 – 81 (29)**	**7 – 81 (29)**	**14 – 160 (64)**	**38 – 760 (400)**

Table 12: Natural radioactivity levels in locally grown food samples

Sl. No.	Sample ID	Sample details	Activity Concentration (Bq/kg of fresh wt)				
			^{238}U	^{226}Ra	^{232}Th	^{40}K	^{210}Pb
1	CG-SPT-0716-F01	Rice	<0.07	<0.03	<0.03	12.64 ± 0.41	<0.5
2	CG-SPT-0716-F02	Rice	<0.07	<0.03	<0.03	11.19 ± 0.34	<0.5
3	CG-SPT-0716-F03	Poi Sag	<0.07	<0.03	<0.03	93.73 ± 0.64	<0.5
4	CG-SPT-0716-F04	Brinjal	<0.07	<0.03	<0.03	80.07 ± 0.48	<0.5
5	CG-SPT-0716-F05	Ladies Finger	<0.07	<0.03	<0.03	95.33 ± 0.63	<0.5
6	CG-SPT-0716-F06	Pulses	<0.07	<0.03	<0.03	210.00 ± 1.58	<0.5

*MDAs for food samples are calculated for a sample size of 5 kg and for a time of 1 lac seconds and for 250 ml standard geometry.

Table 13: Natural radioactivity levels in flora samples around the site

Sl. No.	Sample ID	Sample details	Activity Concentration (Bq/kg of fresh wt)				
			^{238}U	^{226}Ra	^{232}Th	^{40}K	^{210}Pb
1	CG-SPT-0716-FL01	Elephant grass from drain of Dyke	<0.07	<0.03	<0.03	103.38 ± 0.70	<0.5
2	CG-SPT-0716-FL02	Amori from drain of Dyke-2	<0.07	<0.03	<0.03	50.69 ± 0.49	<0.5
3	CG-SPT-0716-FL03	Elephant grass inside dyke	<0.07	<0.03	<0.03	113.98 ± 0.78	<0.5
4	CG-SPT-0716-FL04	Amori from inside dyke	<0.07	<0.03	<0.03	111.57 ± 0.73	<0.5

*MDAs for flora samples are calculated for a sample size of 5 kg and for a time of 1 lac seconds and for 250 ml standard geometry.

Table 14: Natural radioactivity levels in fauna samples around the site

Sl. No.	Sample ID	Sample details	Activity Concentration (Bq/kg of fresh wt)				
			^{238}U	^{226}Ra	^{232}Th	^{40}K	^{210}Pb
1	CG-SPT-0716-FN01	Chicken sample from weekly market	<0.07	<0.03	<0.03	107.09 ± 0.84	<0.5
2	CG-SPT-0716-FN02	Fish sample from weekly market	<0.07	<0.03	<0.03	75.47 ± 0.67	<0.5

*MDAs for fauna samples are calculated for a sample size of 5 kg and for a time of 1 lac seconds and for 250 ml standard geometry.

Table 15: Natural radioactivity levels in 6 groundwater samples around ash dyke area

Sl. No.	Samples code	Village name	Activity levels (mBq/L)				
			^{238}U	^{226}Ra	^{232}Th	^{210}Pb	^{40}K
1	CG-SPT-07-W03	Rank	6.3	<4.5	< 6	< 20	2.3
2	CG-SPT-07-W04	Kaudia	8.8	26	< 6	< 20	38.6
3	CG-SPT-07-W05	Hardadih	11.3	<4.5	< 6	< 20	5.8
4	CG-SPT-07-W06	Sukhirpali	6.3	<4.5	< 6	< 20	17.8
5	CG-SPT-07-W07	Relia	3.8	<4.5	< 6	< 20	22.6
6	CG-SPT-07-W19	Gautara	20.0	7	< 6	< 20	35
World Health Organization Guideline Level (2011) *** Radiological toxicity #Chemical toxicity**			**10,000* 375#**	**1000**	**1000**	**100**	**No guideline value**

Table 16: Natural radioactivity levels in three water samples from drain / AWRS / surface water (Leelaghar River)

Sl. No.	Sample code	Village/ Location name	Activity levels (mBq/l)				
			^{238}U	^{226}Ra	^{232}Th	^{210}Pb	^{40}K
1	CG-SPT-07-W01	TOE Drain Overflow Lagoon-2	10.0	<4.5	< 6	< 20	6.4
2	CG-SPT-07-W02	DYKE-02 Overflows	60.0	5	< 6	< 20	36.4
3	CG-SPT-07-W08	Leelagar River	21.3	19	< 6	< 20	9.5
World Health Organization Guideline Level (2011) *** Radiological toxicity #Chemical toxicity**			**10,000* 375#**	**1000**	**1000**	**100**	**No guideline value**

Table 17: Natural radioactivity levels in three drinking water samples collected from Plant area and Guest house

Sl. No.	Sample code	Village/Location name	Activity levels (mBq/l)				
			^{238}U	^{226}Ra	^{232}Th	^{210}Pb	^{40}K
1	CG-SPT-07-W10	NTPC Guest House Tap Water	5.0	<4.5	< 6	< 20	7.1
2	CG-SPT-07-W11	Drinking Water from Plant Area	7.5	<4.5	< 6	< 20	5.6
3	CG-SPT-07-W12	RAW Water from Plant Area	2.5	<4.5	< 6	< 20	7.9
World Health Organization Guideline Level (2011) *** Radiological toxicity #Chemical toxicity**			**10,000* 375#**	**1000**	**1000**	**100**	**No guideline value**

Table 18: Natural radioactivity levels in 8 drinking waters from villages around the plant

Sl. No.	Sample code	Village name	Activity levels (mBq/l)				
			^{238}U	^{226}Ra	^{232}Th	^{210}Pb	^{40}K
1	CG-SPT-07-W09	Darrabhata	5.0	<4.5	< 6	< 20	1.0
2	CG-SPT-07-W14	Nargora	12.5	21	< 6	< 20	14.2
3	CG-SPT-07-W15	Gudi	10.0	34	< 6	< 20	13.7
4	CG-SPT-07-W16	Dahina	2.5	57	< 6	< 20	10.5
5	CG-SPT-07-W17	Kanda	7.5	<4.5	< 6	< 20	6.5
6	CG-SPT-07-W18	Karra	22.5	35	< 6	< 20	34
7	CG-SPT-07-W20	Mopka	25.0	12	< 6	< 20	11.6
8	CG-SPT-07-W21	Lagara	52.5	25	< 6	< 20	9
World Health Organization Guideline Level (2011) *** Radiological toxicity #Chemical toxicity**			**10,000* 375#**	**1000**	**1000**	**100**	**No guideline value**

Table 19: Natural radioactivity levels in 5 drinking water samples beyond five km from NTPC site / ash dyke area as control samples

Sl. No.	Samples collected	Location Name	Activity levels (mBq/l)				
			^{238}U	^{226}Ra	^{232}Th	^{210}Pb	^{40}K
1	CG-SPT-07-W13	Baruhdih	7.5	7	< 6	< 20	7.1
2	CG-SPT-07-W22	Nagoi	70.0	18	< 6	< 20	34
3	CG-SPT-07-W23	Daganya	28.8	32	< 6	< 20	11.4
4	CG-SPT-07-W24	Tikripara	12.5	11	< 6	< 20	5.0
5	CG-SPT-07-W25	Aamlipali	23.8	8	< 6	< 20	6.1
World Health Organization Guideline Level (2011) *** Radiological toxicity #Chemical toxicity**			**10,000* 375#**	**1000**	**1000**	**100**	**No guideline value**

7.2.1. Radium equivalent activity and radiological hazard indices

Assessment of various radiation health hazard indices were carried out to arrive at a safe conclusion on the health status of exposed human population or environment. To represent the activity levels of ^{226}Ra, ^{232}Th and ^{40}K by a single quantity, which takes into account the radiation hazards associated with each component, a common radiological index has been introduced [40] which is termed as radium equivalent (Ra_{eq}) activity. Ra_{eq} activity is mathematically defined as [2, 41] follows:

$$Ra_{eq} \text{ activity } (Bqkg^{-1}) = (1.43 \times A_{Th}) + A_{Ra} + (A_K \times 0.077) \quad (1)$$

Where, A_{Ra}, A_{Th} and A_K are the activity concentrations of ^{226}Ra, ^{232}Th and ^{40}K in soil, respectively. Ra_{eq} activity has been used for assessment of radiological hazards of natural radioactivity in the environment. In the above relation, it has been assumed that 10 Bq/kg of ^{226}Ra, 7 Bq/kg of ^{232}Th and 130 Bq/kg of ^{40}K, produce equal amount of gamma radiation dose. Ra_{eq} activity in soils was calculated by using Eq. (1) and it varied from 170.1 to 249.1 Bq/kg with a mean value of 212.3 ± 12.6 Bq/kg, which is well below than 370 Bq/kg, the recommended maximum level of Ra_{eq} activity in soils. Thus, from the results it can be stated that the soils are suitable for use as building materials and for other purposes without any significant radiological hazards to the population residing in the study region.

7.2.2. Indoor inhalation dose due to radon, thoron and their daughter products

In the present study, radon and thoron activity concentration is measured during one quarter during July – Sep, 2016. The indoor radon and thoron concentration has diurnal and seasonal variation. The annual effective dose due to radon and thoron and their daughter products is

estimated in the present study from the measured activity concentration, with the assumption that the activity concentration is similar over the year. For the estimation of dose due to radon and its progenies equilibrium factor and occupancy factor are needed. UNSCEAR, 2000 has suggested an occupancy factor of 7000 h/y for indoors and 1760 h/y for outdoor. The indoor radiation dose to members of the public due to radon, thoron and their progenies is found to be in the range of 0.80 – 1.42 mSv/y, average dose is 1.05 ± 0.18 mSv/y, which is slightly lower than the global and Indian average value**.**

$$D\,(mSvy^{-1}) = \frac{C_{Rn} \times F_{Rn} \times O.F \times DCF}{3700 \times 170}$$

Where,

C_{Rn} is the radon/thoron concentration in Bqm^{-3}

F_{Rn} is the equilibrium factor (0.4 for ^{222}Rn and 0.002 for ^{220}Rn)

O.F is the occupancy factor

DCF is the dose conversion factor

4 mSv/WLM for public for radon daughters

1.67 mSv/WLM for workers and public for thoron daughters

8. Conclusions

The ambient gamma radiation levels in the plant premises is observed to be in the range of 50-140 nSv/hr, with an average value of 88.6 ± 26 nSv/h at 95% confidence interval. The atmospheric radon and thoron gas levels in found to be in the range of 5 – 19 Bq/m^3 and < 10 Bq/m^3, respectively. The ambient gamma radiation levels in the surrounding seventeen villages upto 10 km radius of the plant site is found to vary from 60 to 160 nSv/h with an average value of 97 ± 23 nSv/h (at 95% confidence interval).

The indoor radon and thoron levels in the surrounding villages are observed to be in the range of 45- 80 Bq/m^3 and 12 - 28 Bq/m^3, respectively.

The naturally occurring radioactive material (NORM) like ^{238}U, ^{226}Ra, ^{232}Th and ^{40}K levels in the soil samples is observed in the range of 45.5 – 105.6 Bq/kg (Mean : 70.3 ± 18.9); 43.5-74.6 Bq/kg (Mean : 55.4 ± 5.6) and 69.8 – 184.9 Bq/kg (Mean : 97.6 ± 8.7) and 291.8 – 652.6 Bq/kg (A. Mean: 443.55 ± 17.65 Bq/kg), respectively.

From the present study, it is concluded that the radiation levels in and around the Sipat Super Thermal Power Station of NTPC Ltd., is comparable with the National average values. The naturally occurring radionuclide levels in groundwater / surface water / drinking water samples is observed well below the Atomic Energy Regulatory Board (AERB) and World Health Organization (WHO) prescribed limit / guideline values. The activity concentration of naturally occurring radionuclides in soil, food matrices, flora and fauna is comparable to the national background levels.

9. References

BSS (1996), International Basic Safety Standards for Protection against Ionizing Radiation and for Safety of Radiation Sources, IAEA Safety Series no. 115.

IAEA, (1996), Radiation Safety, Division of Public Information, International Atomic Energy Agency, Vienna, 1996.

IAEA, (1978). Control of Radioactive Waste Disposal into the Marine Environment, Safety Series No.61., International Atomic Energy Agency, Vienna.

ICRP, 2007. Publication 103, Recommendations of ICRP, International Commission on Radiological Protection, New York

Mishra, U.C., and Sadasivan, S., (1971). Natural Radioactivity Levels in Indian Soil, J.Sci. and Indus. Res., 30, 59 – 62.

Mishra, U.C., (2004). Environmental impact of coal industryand thermal power plants in India, Journal of Environmental Radioactivity, 72, 35-40

Nambi, K. S. V., Bapat, V.N., David, M., Sundaram, V.K., Sunta, C.M., and Soman, S.D., (1986). Natural Background Radiation and Population Dose Distribution in India., Health. Phys. Divn. Report.

Puranik V.D. and Ramchandran T.V. (2005). Natural and man-made environmental background radiation exposure levels: A review, Journal of Environmental Geochemistry, Vol.8, No. 1&2, pp. 60-74.

Ramachandran, T.V., Eappen, K.P., Nair, R.N., Mayya, Y.S and Sadasivan, S., (2003). Radon-Thoron Levels and Inhalation Dose Distribution Patterns in Indian Dwellings, BARC Report No. BARC/2003/E/026.

Ramachandran, T.V., Eappen, K.P., Nair, R.N., Shaikh, A.N., Mayya, Y.S., and Puranik, V.D., (2003a). Estimation of Inhalation Dose Due to Radon and Thoron and Their Progenies in Indian Dwellings., Rad. Prot. &Envir., 26, 139 – 141.

Ramachandran, T.V., Satish, L. A., (2011). ^{220}Rn in Indoor Environment and Workplaces: A Review, Proceedings of International AARST Symposium, Oct.16-19, 2011, Florida.

Shukla, V.K., Sadasivan, S., Sundaram, V.K. and Nambi, K.S.V., (1995), Assessment of Gamma Radiation Exposure inside a Newly Constructed Building and a Proposed Regulatory Guideline for Exposure Control from Natural Radioactivity in Future Buildings, Rad. Prot. Dosm., 59 (2), pp. 127 – 133.

UNSCEAR, (2000). United Nations Scientific Committee on the Effect of Atomic radiation, Vol. 1, United Nations General Assembly, United Nations, New York.

UNSCEAR, (2008). United Nations Scientific Committee on the Effect of Atomic radiation, Vol. 1, United Nations General Assembly, United Nations, New York.

WHO, (2011). Guidelines for Drinking Water Quality, Fourth Edition, World Health Organisation, Geneva

Few photographs during sampling program around KuSTPP, NTPC Ltd., Sipat

Sampling team members at Janji gate of site

Radiation survey at Ash Dyke Area




Water and Soil Sample collection and in-situ monitoring of Radiation levels.

List of Contributors

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7. Shri S. K. Sahoo
8. Shri Anil Gupta
9. Shri PradyumnaLenka
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12. Shri C.G. Sumesh

Sipat Super Thermal Power Plant, NTPC Ltd., Sipat

1. Shri Pankaj Sharma, DGM, EMG
2. Shri Nishant Parmar, Dy. Manager, EMG

Note:

For any technical clarification, you may contact Shri S. K. Sahoo, Health Physics Division, Bhabha Atomic Research Centre, Mumbai, Email: sksbarc@barc.gov.in; Tel. 022 – 25598267 / 78.

BY SPEED POST

ANNEXURE-11

INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY

(Council of Scientific & Industrial Research)
HYDERABAD- 500007

CSIR-IICT

Dr.R.Srinivas
Chief Scientist & Head
Analytical Chemistry Division

Phone No: 040-27191342
Fax No: +91-040-27193156
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Ref: ACMS/NTPC/2017

Date: 29-05-2017

To:
Mr.Pankaj Sharma,
Dy .General Manager (EMG),
Sipat Super Thermal Power Station,
Ujjawal Nagar(P.O),
SIPAT,
Bilaspur Distt,
Chhattisgarh-495 555.

06.06.17 - manager (EMG)

Dear Sir,

This is with your reference no :Sipat/Envt./2017/1352 and letter dated 07-02-2017 regarding the analysis of Coal, Fly ash and Bottom ash samples and the report for the same is given below.

Analysis Report

S.No	Parameters	Coal Fried Unit#1	Coal Fried Unit#4	Fly Ash	Fly Ash Silo Stage Unit #4	Bottom Ash Unit#1	Bottom Ash Unit#4
1	Al (% by mass)	2.35	1.52	3.38	9.78	6.34	6.55
2	As (µg/g)	13.89	7.26	25.60	30.33	26.70	18.92
3	Cd(µg/g)	0.27	0.14	0.79	0.53	0.21	0.19
4	Co(µg/g)	10.59	13.79	19.62.	20.83	10.97	11.11
5	Cr(µg/g)	64.87	45.87	96.03	101.25	69.40	73.21
6	Cu(µg/g)	15.85	148.88	58.35	62.31	33.15	29.11
7	Fe (% by mass)	1.24	1.72	1.89	1.75	0.83	2.54
8	Mn(µg/g)	70.60	308.36	67.21	139.54	158.58	148.83
9	Hg(µg/g)	1.11	0.48	0.64	0.85	B.D	B.D
10	Ni(µg/g)	28.14	26.25	27.88	31.78	16.30	17.32
11	Pb(µg/g)	15.46	15.62	20.11	36.05	7.98	11.86
12	Zn(µg/g)	57.25	18.10	38.40	41.38	31.75	19.32

B.D: Below Detection Limit

Analyzed by

Scientist-in-Charge

for Director

1. This Certificate refers to sample(s) examined only.
2. These Results should not be used for commercial purpose (Advertisement).

Mahabal Enviro Engineers Pvt. Ltd.

Pollution monitoring, Engineers & Contractors in Environmental Management

13/14, OPP. Patel Pump, Chhindwara Road, Koradi, Dist – Nagpur – 441111

Phone: 91-0712-3240365, Tele Fax: 2612212, Email: Nagpur@mahabal.com

Client : NTPC Ltd, SipatUjwalNagar,DistBilaspur (C.G)	Test Report No & Issue Date : MEEPL/ SIPAT-NTPC/2020/SW-525 DATE-29-11-2020
Sample Particulars : Surface Water (Pond)	
Test Method : IS 3025 & APHA 23rd Edition	
Packing : plastic bottle	
Date of Sampling : 05.11.2020	
Test Required : As given below	

SAMPLE LOCATION

S No.	Parameters	UOM	Desirable/ Permissible Limit	Hardadih	Sukhripali	Raliya	Bhilai	Gatura	Raank
01	pH Value	-	6.5-8.5	7.4	7.5	7.3	7.6	7.2	7.7
02	Temperature	°C	-	25.1	26.3	26.2	26.0	25.8	26.4
03	Conductivity	µs/cm	-	402	420	436	416	546	610
04	T.D.S.	mg/l	500	268	280	290	227	364	406
05	T.S.S.	mg/l	100	14	15	18	12	17	19
06	B.O.D.(at 27°C for 3 days)	mg/l	30	09	10	08	10	11	12
07	C.O.D.	mg/l	250	30	36	40	38	48	46
08	Chloride	mg/l		38	48	43	53	46	54
09	Fluoride (as F)	mg/l	1.5	0.3	0.2	0.4	0.5	0.2	0.3
10	Calcium Hardness as CaCo3	mg/l	-	108	122	116	108	118	130
11	Magnesium Hardness as CaCo3	mg/l	-	76	86	90	82	92	94
12	Boron (as B)	mg/l	0.5	0.03	0.05	0.04	0.05	0.05	0.06
13	Aluminium	mg/l	0.2	0.022	0.024	0.023	0.026	0.025	0.025
14	Fecal coliform	MPN/ 100 ml	230	14	13	20	17	21	14
15	E-coli	MPN/ 100 ml	100	1.6	2.0	2.2	2.3	1.9	2.6

COMPANY NAME : MAHABAL ENVIRO ENGINEERS PVT.LTD.

SIGN
NAME Abhishek Bhargava
POST

पंकज शर्मा
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Plot No. F-7, Road No. 21, Wagle Estate, Thane West - 400604, Maharashtra, India
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Mahabal Enviro Engineers Pvt. Ltd.

Pollution monitoring, Engineers & Contractors in Environmental Management
13/14, OPP. Patel Pump, Chhindwara Road, Koradi, Dist -- Nagpur – 441111
Phone: 91-0712-3240365, Tele Fax: 2612212, Email: Nagpur@mahabal.com

Client : NTPC Ltd, SipatUjwalNagar,DistBilaspur (C.G)	Test Report No & Issue Date : MEEPL/ SIPAT-NTPC/2020/SW-526 DATE-29-11-2020
Sample Particulars : Surface Water (Pond)	
Test Method : IS 3025 & APHA 23rd Edition	
Packing : plastic bottle	
Date of Sampling : 05.11.2020	
Test Required : As given below	

S No.	Parameters	UOM	Desirable/ Permissible Limit	SAMPLE LOCATION				
				Janji	Kaudia	Darrabhata	Deori	Navadih
01	pH Value	-	6.5-8.5	7.4	7.2	7.5	7.3	7.5
02	Temperature	°C	-	26.2	26.0	26.1	26.3	25.8
03	Conductivity	µs/cm	-	446	534	486	578	462
04	T.D.S.	mg/l	500	297	356	324	385	308
05	T.S.S.	mg/l	100	14	18	17	15	13
06	B.O.D.(at 27°C for 3 days)	mg/l	30	08	14	12	12	10
07	C.O.D.	mg/l	250	30	40	34	36	32
08	Chloride	mg/l	-	43	47	40	52	47
09	Fluoride (as F)	mg/l	1.5	0.4	0.5	0.6	0.3	0.4
10	Calcium Hardness as CaCo3	mg/l	-	108	120	110	98	104
11	Magnesium Hardness as CaCo3	mg/l	-	66	76	68	56	58
12	Boron (as B)	mg/l	0.5	0.02	0.03	0.04	0.04	0.06
13	Aluminium	mg/l	0.2	0.021	0.024	0.026	0.026	0.025
14	Fecal coliform	MPN/ 100 ml	230	17	21	20	26	22
15	E-coli	MPN/ 100 ml	100	1.8	2.6	2.4	2.1	2.6

COMPANY NAME : MAHABAL ENVIRO ENGINEERS PVT.LTD.
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13/14, OPP. Patel Pump, Chhindwara Road, Koradi, Dist – Nagpur – 441111
Phone: 91-0712-3240365, Tele Fax: 2612212, Email: Nagpur@mahabal.com

Client : NTPC Ltd, SipatUjwalNagar,DistBilaspur (C.G)	Test Report No & Issue Date : MEEPL/ SIPAT-NTPC/2020/SW-527 DATE-29-11-2020
Sample Particulars : Surface Water	
Test Method : IS 3025 & APHA 23rd Edition	
Packing : plastic bottle	
Date of Sampling : 05.11.2020	
Test Required : As given below	

SAMPLE LOCATION

S No.	Parameters	UOM	Desirable/ Permissible Limit	Leelagar River up Stream	Leelagar River Down Stream	Kharang River	Toe Drain (Effluent) NO -1	Toe Drain (Effluent) NO-2
01	pH Value	-	6.5-8.5	7.4	7.5	7.1	7.6	7.0
02	Temperature	°C	-	26.2	26.5	26.4	26.1	25.8
03	Conductivity	µs/cm	-	480	484	405	510	560
04	T.D.S.	mg/l	500	320	322	270	340	373
05	T.S.S.	mg/l	100	18	22	15	14	16
06	B.O.D.(at 27°C for 3 days)	mg/l	30	13	10	08	11	07
07	C.O.D.	mg/l	250	38	34	30	32	28
08	Chloride	mg/l	-	44	40	39	42	37
09	Fluoride (as F)	mg/l	1.5	0.3	0.2	0.5	0.4	0.5
10	Calcium Hardness as CaCo3	mg/l	-	100	110	108	102	100
11	Magnesium Hardness as CaCo3	mg/l	-	92	74	54	70	66
12	Boron (as B)	mg/l	0.5	0.06	0.09	0.08	0.06	0.04
13	Aluminium	mg/l	0.2	0.020	0.025	0.023	0.025	0.022
14	Fecal coliform	MPN/ 100 ml	230	20	24	28	22	20
15	E-coli	MPN/ 100 ml	100	2.4	2.7	2.6	2.2	2.0

COMPANY NAME : MAHABAL ENVIRO ENGINEERS PVT.LTD.
SIGN
NAME
POST Abhishek Bhargava

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NTPC Ltd. SIPAT, BILASPUR (C.G.)

ANNEXURE-13

छत्तीसगढ़ शासन
जल संसाधन विभाग
मंत्रालय,
महानदी भवन, केपिटल कॉम्पलेक्स,
नया रायपुर (छ.ग.)

क्र.....6236/29/4/96/म/31/औजप्र/डी–4, नया रायपुर, दिनांक 11/12/2017

प्रति,

मुख्य अभियंता,
मिनीमाता (हसदेव) बांगो परियोजना,
जल संसाधन विभाग,
बिलासपुर (छ.ग.)

विषय :– एन.टी.पी.सी.लिमिटेड द्वारा बिलासपुर जिले में स्थापित 2980 मेगावाट सीपत सुपर थर्मल पॉवर प्रोजेक्ट हेतु हसदेव बांगो परियोजना की दांयी मुख्य नहर से स्वीकृत 120.00 मि.घ.मी. वार्षिक जल आबंटन को कम कर 93.00 मि.घ.मी. वार्षिक करने की स्वीकृति।

संदर्भः–
1. शासन का पत्र क्रमांक–6493–6494/29/4/96/म/31/औजप्र/डी–4, दिनांक 31.10.2009.
2. प्रमुख अभियंता का पत्र क्र.–3451141/औजप्र/छ.ग./017/4040–4041, दिनांक 20.03.2017.
4. शासन का पत्र क्रमांक–5359–5360/7/जसं./तशा/औजप्र/01/डी–4, दिनांक 18.10.2017.

––00––

उपरोक्त विषय के संदर्भ में, राज्य जल संसाधन उपयोग समिति, छत्तीसगढ़ की 41वीं बैठक, दिनांक 11.10.2017 में लिये गये निर्णयानुसार, एन.टी.पी.सी. लिमिटेड, सीपत, बिलासपुर (संस्थान) द्वारा जिला–बिलासपुर में स्थापित 2980 मेगावाट सीपत सुपर थर्मल पॉवर प्रोजेक्ट हेतु, हसदेव बांगो परियोजना की दांयी मुख्य नहर से स्वीकृत 120.00 मि.घ.मी. वार्षिक जल आवंटन की मात्रा को, संस्थान के अनुरोध पर कम कर 93.00 मि.घ.मी. वार्षिक करने की स्वीकृति निम्नलिखित शर्तों के साथ प्रदान की जाती है :–

1. संस्थान के 2980 मे.वा. सीपत सुपर थर्मल पॉवर प्रोजेक्ट हेतु जल आबंटन को कम करने बाबत् शासन द्वारा जारी किये जाने वाला आदेश, संस्थान द्वारा दि. 25.11.2009 को विभाग से किये गये अनुबंध का भाग होगा एवं प्रकरण में पुनरीक्षित 93.00 मि.घ.मी. वार्षिक जल आबंटन, संस्थान द्वारा प्रकरण में समस्त बकाया राशि (यदि कोई होगी तो) जमा करने के दिनांक से लागू होगा।

2. संस्थान को आबंटित पुनरीक्षित 93.00 मि.घ.मी. वार्षिक जल उपयोग के एवज में शासन द्वारा समय–समय पर शासकीय स्त्रोत से जल प्रदाय हेतु निर्धारित जलदर पर देय योग्य जलकर का नियमानुसार भूगतान करने की संस्थान को बाध्यता होगी।

3. प्रकरण में जल प्रदाय की शेष शर्तें, शासन के मूल स्वीकृति पत्र क्रमांक–6493–6494/29/4/31/96/म/औजप्र/डी–4, दिनांक 31.10.2009 के अनुसार यथावत रहेगी।

सहपत्र :–शून्य।

(याकुब खैरूल)
संयुक्त सचिव
जल संसाधन विभाग

कार्यपालन अभियंता
हसदेव वरौंज जल प्रबंध संभाग,
रामपुर/कोरबा (छ.ग.)

31/3/18

पृ. क्र. 6237/29/4/96/म/31/औजप्र/डी–4, नया रायपुर, दिनांक 11/12/2017

प्रतिलिपि :–

1. प्रमुख अभियंता, जल संसाधन विभाग, सिहावा भवन, रायपुर को संदर्भित पत्रों के परिप्रेक्ष्य में सूचनार्थ अग्रेषित।
2. अधीक्षण अभियंता, हसदेव परियोजना मंडल, रामपुर/कोरबा एवं
3. कार्यपालन अभियंता, हसदेव बैराज जल प्रबंध संभाग, रामपुर/कोरबा को सूचनार्थ एवं शीघ्र आवश्यक कार्यवाही हेतु अग्रेषित।
4. विशेष सचिव, छ.ग. शासन, ऊर्जा विभाग, मंत्रालय, नया रायपुर को सूचनार्थ अग्रेषित।
5. महाप्रबंधक, एन.टी.पी.सी. लिमिटेड, सीपत सुपर थर्मल पॉवर स्टेशन, पोस्ट–उज्जवल नगर–सीपत–495555, जिला–बिलासपुर (छ.ग.), को उनके पत्र क्र.–Sipat/HOS/18/2016/1458, दिनांक 30.03.2016 के संदर्भ में सूचनार्थ एवं आवश्यक कार्यवाही हेतु अग्रेषित।
6. विशेष सहायक, माननीय मंत्रीजी, छत्तीसगढ़ शासन, जल संसाधन, आयाकट, कृषि, पशुपालन, मछलीपालन, धार्मिक न्यास एवं धर्मस्व विभाग, मंत्रालय, नया रायपुर को उनके नोटशीट क्र.–17/OFF/मंत्री/ज.सं./आ./कृ.प.म./धा., दिनांक 28.01.2014 के परिप्रेक्ष्य में सूचनार्थ अग्रेषित।

सहपत्र :– शून्य।

11/12/17
संयुक्त सचिव
जल संसाधन विभाग
मंत्रालय, नया रायपुर

रा.–1/रा.–2/रा.–3/बजट/स्था.रा.–1
स्था.रा.–2/स्था.रा.–3/स्था.मु.–1/स्था.मु.–2
स्टेनो/पी.एम.ई./कार्य/गु.नि./मु.लि./वि.प्र./ज.सू./आवास

ले.अधि. यां.प्र.अधि. अधि.अभि.

6869
20-12-17

कार्यालय अधीक्षण अभियंता हसदेव परियोजना मंडल
रामपुर/कोरबा
आवक क्रमांक 21-22/23/12/17
(रा.) / (रा.रा.) / बजट / कार्य / मु.लि. / कार्य अभि (ह.)
सहा.ग्रे. (स्था.)
कार्यपालन अभियंता(ह.) अधि.एक.अभियंता

कार्यपालन अभियंता
हसदेव बैराज जल प्रबंध संभाग,
रामपुर/कोरबा (छ.ग.)

31/12/18

असीम कुमार सामंता
ASIM KUMAR SAMANTA
समूह महा प्रबंधक
Group General Manager
एन टी पी सी लि. सीपत, बिलासपुर (छ.ग.)
NTPC LTD. SIPAT, BILASPUR (C.G.)

CSR Budget during last five years and activities carried out

FY	Annual Budget (Rs. Lakh)	Main Activities undertaken
2015-16	**750.5**	• Skill development training like Stitching, beautician, data entry operator, Mobile repairing. • Coaching and crash course for students • Installations Hand pump / RO water ATM in affected villages. • Distribution of sports kit, books, bags • Installation of solar lights in nearby villages • Organised Yoga camp, Health camp
2016-17	**1113.5**	• Skill development training like Stitching, beautician, data entry operator, Mobile repairing. • Distribution of sports kit, books, bags etc for Baiga tribes students • Provided solar operated potable water facility. • Construction of CC roads and Community Hall in nearby villages • livestock and fodder development, cattle breed enhancement through Integrated centre. • Participation in Rajyotsav and Vypar Mela. • Installation of solar lights in nearby villages • Conducted State level Football tournament for girl
2017-18	**851**	• Infrastructure development including purchasing of Machine, electrification and Hostel construction for ITI Baloda. • Installation of solar water system, RO water ATM in affected villages schools. • Skill development training like Stitching, embroidery, beautician, data entry operator, Mobile repairing. • Distribution of sports kit, books, bags • Provided solar operated potable water facility. • Construction of CC roads and Community Hall in nearby villages • livestock and fodder development, cattle breed enhancement through Integrated centre. • Participation in Rajyotsav and Vypar Mela. • " Run for Green " and Plantation campaign under Green Bilaspur Mission.
2018-19	**658**	• Development of Play Ground in Darrabhata Village. • Procurement of Machines for (Welder, Turner and Diesel mechanic trade) ITI Baloda. • Organising coaching camp and state level football tournament for girls. • Skill development training like Stitching, embroidery, beautician, data entry operator, Mobile repairing.

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NTPC Limited

(A Government of India Enterprise)

Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : **L40101DL1975GOI007966**

Purchase Order No. : **4000206020-185-1019** Date : **29.06.2018** (version : 0)

To

Vendor Code : **1035822**

MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Subject: : **Tree Plantation in NTPC Land along the CHR Track. [LOA REF.NO.SIPAT/CS/2018-19/18062/1839128 DATED:26.06.2018]**
NIT NO. : **Dated**
Your Offer No. :
Your Reference : **1. Your letter No.VVN/R/Expenditure/2018/955 dated: 19.06.2018**
Our Reference : **LOA REF.NO.SIPAT/CS/2018-19/18062/1839128 DATED:26.062018**

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on turnkey the work of Tree Plantation in NTPC Land along the CHR Track. [LOA REF.NO.SIPAT/CS/2018-19/18062/ 1839128 DATED:26.06.2018]of total value INR 25,258,668.76 (Rupee TWO CRORE FIFTY-TWO LAKH FIFTY-EIGHT THOUSAND SIX HUNDRED SIXTY-EIGHT POINT SEVENTY-SIX ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 27.06.2018 to 31.03.2023. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. SRI A.K.RAI, DGM(CHR) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of issue of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

[R.K.JAIN]
SR.MANAGER(CS)

Enclosures :
BILL OF QUANTITIES, SCOPE OF WORK, TERMS AND CONDITIONS

(Bill of Quantity)

Name of Work: **Tree Plantation in NTPC Land along the MGR Track. [LOA REF.NO.SIPAT/CS/2018-19/18062/1839128 DATED:26.06.2018]**

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:

1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507

Invoicing to be done on

GST No. : **22AAACN0255D4ZX**

10		**Tree Plantation along MGR Track (Part-A)**	**AU**	**1.000**	**18,517,850.00**	**18,517,850.00**	

Tax: **NIL** Extra

10 .10		**First year plantation &its maintenance**	**NO**	**22,975**	**365.0000**	**8,385,875.00**	
10 .20		**Second Year Maintenance**	**NO**	**22,975**	**140.0000**	**3,216,500 .00**	
10 .30		**Third Year Maintenance**	**NO**	**22,975**	**131.0000**	**3,009,725. 00**	
10 .40		**Fourth Year Maintenance**	**NO**	**22,975**	**127.0000**	**2,917,825 .00**	
10 .50		**Fifth Year Maintenance**	**NO**	**22,975**	**43.0000**	**987,925.00**	

TOTAL OF BOQ PART : 00010 **INR 18517850.00**

Amount 18517850.00

Other Charges **0.00**

Net Amount on BOQ PART : 00010 **INR 18517850.00**

20		**Fencing RCC Pole with Barbed Wire(Part-B**	**AU**	**1.000**	**6,740,818.76**	**6,740,818.76**	

Tax: **NIL** Extra

20 .10		**Fencing RCC Pole with barbed wire (3x3M**	**RM**	**14,956**	**450.7100**	**6,740,818.76**	

TOTAL OF BOQ PART : 00020 **INR 6740818.76**

Amount 6740818.76

Other Charges **0.00**

Net Amount on BOQ PART : 00020 **INR 6740818.76**

Net Total Amount **INR 25,258,668.76**

Less Rebate/Amount **INR 0.00**

Grand Total **INR 25,258,668.76**

INR TWO CRORE FIFTY-TWO LAKH FIFTY-EIGHT THOUSAND SIX HUNDRED SIXTY-EIGHT AND SEVENTY-SIX PAISA ONLY

[R.K.JAIN]
SR.MANAGER(CS)

NTPC Limited

(A Government of India Enterprise)

Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : **L40101DL1975GOI007966**

Purchase Order No. : **4600057825-185-1019** Date : **21.09.2019** (version : 0)

To

Vendor Code : **1035822**

MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Subject : **Tree Plantation (25000 nos), Fencing and its Maintenance for 5 Years along the CR Track in NTPC Land on Deposit basis. [LOA REF.NO.SIPAT/CS/2019-20/19048/P-258440/1939070 DATED:19.09.2019]**

NIT NO. : **800043231 Dated**

Your Offer No. :

Your Reference : **1. Your letter Ref. ##2019/1996 # ##04.09.2019**

Our Reference : **LOA REF.NO.SIPAT/CS/2019-20/19048/P-258440/1939070 DATED:19.09.2019**

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on the work of Tree Plantation (25000 nos), Fencing and its Maintenance for 5 Years along the CR Track in NTPC Land on Deposit basis. [LOA REF.NO.SIPAT/CS/2019-20/19048/P-258440/1939070 DATED:19.09.2019] of total value INR 42,653,263.00 (Rupee FOUR CRORE TWENTY-SIX LAKH FIFTY-THREE THOUSAND TWO HUNDRED SIXTY-THREE ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 23.09.2019 to 22.09.2024. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. SRI A.K.RAI, DGM(CR) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of issue of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For &on behalf of NTPC Limited.

[G.P. PATLEY]
MANAGER(CS)

Enclosures :
BILL OF QUANTITIES, TERMS AND CONDITIONS

(Bill of Quantity)

Name of Work: **Tree Plantation (25000 nos), Fencing and its Maintenance for 5 Years along the CHR Track in NTPC Land on Deposit basis. [LOA REF.NO.SIPAT/CS/2019-20/19048/P-258440/1939070 DATED:19.09.2019]**

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:

1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507

Invoicing to be done on

GST No. : **22AAACN0255D4Z**

10		**Tree Plantation along CHR Track**	**AU**	**1.000**	**42,653,263.00**	**42,653,263.00**	

Tax: **NIL** Extra

10 .10		**First year plantation &its maintenance**	**NO**	**25,000**	**382.2500**	**9,556,250.00**	
10 .20		**Second Year Maintenance**	**NO**	**25,000**	**173.3800**	**4,334,500 .00**	
10 .30		**Third Year Maintenance**	**NO**	**25,000**	**161.7900**	**4,044,750. 00**	
10 .40		**Fourth Year Maintenance**	**NO**	**25,000**	**158.2400**	**3,956,000 .00**	
10 .50		**Fifth Year Maintenance**	**NO**	**25,000**	**82.8700**	**2,071,750.0 0**	
10 .60		**fencing RCC pole with barbes wire 1st yr**	**RM**	**38,040**	**491.3300**	**18,690,193.20**	

TOTAL OF BOQ PART : 00010 **INR 42653443.20**

Discount (Value) **180.20-**

Amount 42653263.00

Other Charges **0.00**

Net Amount on BOQ PART : 00010 **INR 42653263.00**

Net Total Amount **INR 42,653,263.00**

Less Rebate/Amount **INR 0.00**

Grand Total **INR 42,653,263.00**

INR FOUR CRORE TWENTY-SIX LAKH FIFTY-THREE THOUSAND TWO HUNDRED SIXTY-THREE ONLY

[G.P. PATLEY]
MANAGER(CS)

NTPC Limited

(A Government of India Enterprise)
Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4000209233-054-1019 Date : 20.08.2018 (version : 1 Date : 22.08.2018)

To
MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Vendor Code : 1035822

Subject: : Plantation, maintenance & watch and ward including fencing of 2000 Plants in ash Dyke area for five year at NTPC Sipat.
Version 1: Purchase Grp changed to 054.

NIT NO. : Dated
Your Offer No. :
Your Reference : Your offer letter Ref. No. VVN/KP/vyay/2017/909 dated 22.05.2017
Our Reference : Ref. No. SIPAT/CS//18192

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Plantation, maintenance & watch and ward including fencing of 2000 Plants in ash Dyke area for five year at NTPC Sipat. Version 1: Purchase Grp changed to 054. of total value INR 4,103,991.57 (Rupee FORTY-ONE LAKH THREE THOUSAND NINE HUNDRED NINETY-ONE POINT FIFTY-SEVEN ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 14.08.2018 to 13.08.2023. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. Sh. Shahid Nasim, Sr. Manager (AHP) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

Rajeev Verma
DGM (CS)

Enclosures :
Payment Details, Terms and Conditions and Drawing as per Annexure-A.

(Bill of Quantity)

Name of Work: Plantation, maintenance & watch and ward including fencing of 2000 Plants in ash Dyke area for five year at NTPC Sipat.
Version 1: Purchase Grp changed to 054.

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:

1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507

Invoicing to be done on

GST No. : 22AAACN0255D4Z5

10		Plantation in Ash Dyke area	AU	1.000	4,103,991.57	4,103,991.57	

Tax: NIL Extra

10 .110		1st year plantation & maintenance	NO	2,000	401.0000	802,000.00	
10 .120		Fencing RCC with Chain link 1st year	RMT	4,553	450.6900	2,051,991.57	
10 .130		Second year Plantation maintenance	NO	2,000	178.0000	356,000.00	
10 .140		Third year Plantation maintenance	NO	2,000	174.0000	348,000.00	
10 .150		Fourth year PLANTATION maintenance	NO	2,000	172.0000	344,000.00	
10 .160		Fifth year plantation maintenance	NO	2,000	101.0000	202,000.00	

TOTAL OF BOQ PART : 00010 INR 4103991.57

Amount 4103991.57
Other Charges 0.00

Net Amount on BOQ PART : 00010 INR 4103991.57

Net Total Amount INR 4,103,991.57
Less Rebate/Amount INR 0.00
Grand Total INR 4,103,991.57

INR FORTY-ONE LAKH THREE THOUSAND NINE HUNDRED NINETY-ONE AND FIFTY-SEVEN PAISA ONLY

Rajeev Verma
DGM (CS)

NTPC Limited

(A Government of India Enterprise)

Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4600058009-054-1019 **Date :** 05.10.2019 **(version : 0)**

To
MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Vendor Code : 1035822

Subject: : Plantation, maintenance & watch and ward including fencing of 5000 plants in Ash Dyke area for five years for the year 2019-2024.
[LOA REF.NO.SIPAT/CS/2019-20/19086/P-279066/1939077 DATED:03.10.2019]

NIT NO. : 800043350 Dated
Your Offer No. :
Your Reference : 1. Your letter Ref. #/#####/######/####/2019/4152 ######## ###### 12.02.2019
2. Your letter Ref. #/#####/######/####/2019/2235 ######## ###### 24.09.2019
3. Your letter Ref. #/#####/######/####/2019/2237 ######## ###### 24.09.2019

Our Reference : LOA REF.NO.SIPAT/CS/2019-20/19086/P-279066/1939077 DATED:03.10.2019

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Plantation, maintenance & watch and ward including fencing of 5000 plants in Ash Dyke area for five years for the year 2019-2024. [LOA REF.NO.SIPAT/CS/2019-20/19086/P-279066/1939077 DATED:03.10.2019] of total value INR 10,434,693.30 (Rupee ONE CRORE FOUR LAKH THIRTY-FOUR THOUSAND SIX HUNDRED NINETY-THREE POINT THIRTY ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 09.10.2019 to 08.10.2024. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. SHRI SHAHID NASIM, SR.MANAGER (AHP) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

[G. P. PATLEY]
MANAGER(CS)

Enclosures :
BILL OF QUANTITIES, SCOPE OF WORK, TERMS AND CONDITIONS

(Bill of Quantity)

Name of Work: Plantation, maintenance & watch and ward including fencing of 5000 plants in Ash Dyke area for five years for the year 2019-2024.
[LOA REF.NO.SIPAT/CS/2019-20/19086/P-279066/1939077 DATED:03.10.2019]

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:

1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507
Invoicing to be done on
GST No. : 22AAACN0255D4Z5

10		Plantation of 5000Trees in Ash Dyke area	AU	1.000	10,434,693.30	10,434,693.30	

Tax: NIL **Extra**

10 .10		1st year plantation & maintenance	NO	5,000	405.2000	2,026,000.00	
10 .20		Fencing RCC with Chain link 1st year	RMT	5,110	829.0300	4,236,343.30	
10 .30		Second year Plantation maintenance	NO	5,000	229.1800	1,145,900.00	
10 .40		Third year Plantation maintenance	NO	5,000	220.7500	1,103,750.00	
10 .50		Fourth year PLANTATION maintenance	NO	5,000	226.3700	1,131,850.00	
10 .60		Fifth year plantation maintenance	NO	5,000	158.1700	790,850.00	

TOTAL OF BOQ PART : 00010 INR 10434693.30

Amount **10434693.30**
Other Charges 0.00

Net Amount on BOQ PART : 00010 INR 10434693.30

Net Total Amount INR 10,434,693.30
Less Rebate/Amount INR 0.00
Grand Total INR 10,434,693.30

INR ONE CRORE FOUR LAKH THIRTY-FOUR THOUSAND SIX HUNDRED NINETY-THREE AND THIRTY PAISA ONLY

[G. P. PATLEY]
MANAGER(CS)

NTPC Limited

(A Government of India Enterprise)

Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4000168564-037-1019 **Date :** 29.06.2016 **(version : 1 Date : 20.02.2018)**

To
MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Vendor Code : 1035822

Subject: : Plantation of trees in green belt area sipat

Version : 1 - Created for updation of NIL GST in India Tab as per request received from execution deptt. through IOM dated : 17.02.2018.

NIT NO. : Dated
Your Offer No. :
Your Reference : Your offer letter dated : 21.12.2015.
Our Reference : Sipat/CS/2016-17/16048/1667082

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Plantation of trees in green belt area sipat Version : 1 - Created for updation of NIL GST in India Tab as per request received from execution deptt. through IOM dated : 17.02.2018. of total value INR 22,314,000.00 (Rupee TWO CRORE TWENTY-THREE LAKH FOURTEEN THOUSAND ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 24.06.2016 to 23.06.2021. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. Sh. Pankaj Kumar Sharma DGM(EMG) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

Sh. Rajeev Verma
DGM(CS)

Enclosures :
Payment Details , Terms and Conditions and Drawing as per Annexure-A & B.

(Bill of Quantity)

Name of Work: Plantation of trees in green belt area sipat

Version : 1 - Created for updation of NIL GST in India Tab as per request received from execution deptt. through IOM dated : 17.02.2018.

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:

1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507
Invoicing to be done on
GST No. : 22AAACN0255D4Z5

10		Green Belt plantation	AU	1.000	22,314,000.00	22,314,000.00	

Tax: NIL **Extra**

10 .10		Green belt plantation& maintenan1st year	NO	60,000	127.0000	7,620,000.00	
10 .20		Maintenance for 2nd year	NO	60,000	70.0000	4,200,000.00	
10 .30		Maintenance for 3rd year	NO	60,000	70.0000	4,200,000.00	
10 .40		Maintenance for 4th year	NO	60,000	53.0000	3,180,000.00	
10 .50		Maintenance for 5th year	NO	60,000	30.0000	1,800,000.00	
10 .60		fencing barbed wire (3x3 mtr.interval)	RMT	3,000	292.0000	876,000.00	
10 .70		Maintenance of fencing 2nd year	RMT	300	321.2000	96,360.00	
10 .80		Maintenance of fencing 3rd year	RMT	300	350.4000	105,120.00	
10 .90		Maintenance of fencing 4th year	RMT	300	379.6000	113,880.00	
10 .100		Maintenance of fencing 5th year	RMT	300	408.8000	122,640.00	

TOTAL OF BOQ PART : 00010 INR 22314000.00

Amount **22314000.00**
Other Charges 0.00
Net Amount on BOQ PART : 00010 INR 22314000.00

Net Total Amount INR 22,314,000.00
Less Rebate/Amount INR 0.00
Grand Total INR 22,314,000.00
INR TWO CRORE TWENTY-THREE LAKH FOURTEEN THOUSAND ONLY

Sh. Rajeev Verma
DGM(CS)

NTPC Limited

(A Government of India Enterprise)

Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4000198487-037-1019 **Date :** 09.02.2018 **(version : 1 Date : 17.01.2019)**

To
MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Vendor Code : 1035822

Subject: : Plantation of trees in green belt area of Sipat.
[LOA Ref. No. SIPAT/CS/2017-18/17173/1737151 DATED:09.09.2017]

Note:- Version:1 PO created to incorporate a new line item 20 for watering of 15000 Plants (which is Off season plantation) in Green Belt area for the period from Dec.2018 to Feb.2019 as per approval of C/A in Pradeep at NP-22.

NIT NO. : Dated
Your Offer No. :
Your Reference : Your offer letter Ref. No. VVN/KP/vyay/2017/909 dated 22.05.2017
Our Reference : LOA Ref. No. SIPAT/CS/2017-18/17173/1737151 DATED:09.09.2017

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Plantation of trees in green belt area of Sipat. [LOA Ref. No. SIPAT/CS/2017-18/17173/1737151 DATED:09.09.2017] Note:- Version:1 PO created to incorporate a new line item 20 for watering of 15000 Plants (which is Off season plantation) in Green Belt area for the period from Dec.2018 to Feb.2019 as per approval of C/A in Pradeep at NP-22. of total value INR 25,043,350.00 (Rupee TWO CRORE FIFTY LAKH FORTY-THREE THOUSAND THREE HUNDRED FIFTY ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 01.02.2018 to 31.01.2023. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. Shri L.K. Kaushik, Sr. Manager (EMG) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

(R K Jain)
Sr.Manager(CS)

(Bill of Quantity)

Name of Work: Plantation of trees in green belt area of Sipat.
[LOA Ref. No. SIPAT/CS/2017-18/17173/1737151 DATED:09.09.2017]

Note:- Version:1 PO created to incorporate a new line item 20 for watering of 15000 Plants (which is Off season plantation) in Green Belt area for the period from Dec.2018 to Feb.2019 as per approval of C/A in Pradeep at NP-22.

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:
1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507
Invoicing to be done on
GST No. : 22AAACN0255D4Z5

10		Plantation in over burdan area	AU	1.000	24,293,350.00	24,293,350.00	

Tax: NIL **Extra**

10 .10		1st year plantation & maintenance	NO	42,500	199.9200	8,496,600.00	
10 .20		Second year Plantation maintenance	NO	42,500	108.6900	4,619,325.00	
10 .30		Third year Plantation maintenance	NO	42,500	97.5900	4,147,575.00	
10 .40		Fourth year PLANTATION maintenance	NO	42,500	93.6800	3,981,400.00	
10 .50		Fifth year plantation maintenance	NO	42,500	62.1000	2,639,250.00	
10 .60		1st yearFencing RCC barbed wire 3x3 mtr	RMT	880	310.0000	272,800.00	
10 .70		2nd year maintenance(10% of total lenth)	RMT	88	341.0000	30,008.00	
10 .80		3rd year maintenance(10% of total lenth)	RMT	88	372.0000	32,736.00	
10 .90		4th year maintenance(10% of total lenth)	RMT	88	403.0000	35,464.00	
10 .100		5th year maintenance(10% of total lenth)	RMT	88	434.0000	38,192.00	

TOTAL OF BOQ PART : 00010 INR 24293350.00

Amount **24293350.00**
Other Charges 0.00

Net Amount on BOQ PART : 00010 INR 24293350.00

20		Watering of 15000 Plants from Dec-18 to	AU	1.000	750,000.00	750,000.00	

Tax: NIL **Extra**

20 .10		Watering of 15000 Plants from Dec18 to F	EA	15,000	50.0000	750,000.00	

TOTAL OF BOQ PART : 00020 INR 750000.00

Amount **750000.00**
Other Charges 0.00

(R K Jain)
Sr.Manager(CS)

Net Amount on BOQ PART : 00020	INR 750000.00

Net Total Amount	INR 25,043,350.00
Less Rebate/Amount	INR 0.00
Grand Total	INR 25,043,350.00

INR TWO CRORE FIFTY LAKH FORTY-THREE THOUSAND THREE HUNDRED FIFTY ONLY

(R K Jain)
Sr.Manager(CS)

Netel (India) Limited

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उपमहाप्रबंधक (ई एम जी)
DGM (EMG)
एनटीपीसी लि. सीपत, बिलासपुर (छ.ग.)
NTPC Ltd. SIPAT, BILASPUR (C.G.)

D. Srinivasa Rao
Regional Manager - EMS
Netel (India) Limited

EIC
Sipat Super Thermal Power Project
NTPC Ltd., Sipat-Bilaspur

Ambient Air Quality Monitoring Data

Concentration of Pollutants							
Name of the Location			Lutra		Bitkula		Nirtu.	
Parameter			PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Unit of Measurement			$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
PERMISSIBLE LIMITS			100	60	100	60	100	60
Date of Monitoring	2nd Fort night	02-11-2020	58.0	28.2	37.8	24.0	42.9	19.8
		05-11-2020	47.9	22.3	42.4	28.1	39.2	18.3
		09-11-2020	51.3	23.3	49.5	22.5	47.2	28.2
		12-11-2020	41.7	28.2	48.9	20.0	52.1	23.0
		16-11-2020	31.6	20.0	26.1	16.1	33.1	19.1
		19-11-2020	51.7	26.5	37.2	13.5	43.1	16.2
		23-11-2020	33.4	16.0	51.1	28.2	46.7	23.1
		26-11-2020	47.0	20.8	43.0	18.2	40.5	14.2
		30-11-2020	38.9	12.5	34.7	11.2	33.3	16.2
Minimum concentration			31.6	12.5	26.1	11.2	33.1	14.2
Maximum concentration			58.0	28.2	51.1	28.2	52.1	28.2
Average			44.6	22.0	41.2	20.2	42.0	19.8

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NTPC Ltd., Sipat-Bilaspur

Concentration of Pollutants						
Name of the Location	Jhanj		Utarda		Nevsa	
Parameter	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Unit of Measurement	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
PERMISSIBLE LIMITS	100	60	100	60	100	60
Date of Monitoring 2nd Fort night						
02-11-2020	46.8	19.3	58.7	31.7	43.8	16.4
05-11-2020	52.6	31.7	49.2	24.3	42.2	20.1
09-11-2020	36.2	24.5	34.3	30.2	50.0	26.5
12-11-2020	58.9	31.5	61.4	26.3	51.0	31.1
16-11-2020	44.0	20.1	35.0	17.2	41.0	22.1
19-11-2020	33.6	20.1	44.9	19.1	43.4	20.1
23-11-2020	36.7	20.0	47.2	22.1	44.2	23.2
26-11-2020	34.7	12.2	53.2	21.3	49.0	20.8
30-11-2020	41.0	21.2	36.6	23.8	32.1	21.1
Minimum concentration	**33.6**	**12.2**	**34.3**	**17.2**	**32.1**	**16.4**
Maximum concentration	**58.9**	**31.7**	**61.4**	**31.7**	**51.0**	**31.1**
Average	**42.7**	**22.3**	**46.7**	**24.0**	**44.1**	**22.4**

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RESULTS & DISCUSSION

Respirable Particulate Matter (PM_{10})

PM_{10} concentrations at **Lutra** were observed
- Range 31.6 to 58.0 µg/m³, with the
- Mean value as 44.6 µg/m³ and the
- Limit: 100.0 µg/m³

PM_{10} concentrations at **Bitkula** were observed
- Range 26.1 to 51.1 µg/m³, with the
- Mean value as 41.2 µg/m³ and the
- Limit: 100.0 µg/m³

PM_{10} concentrations at **Nirtu** were observed
- Range 33.1 to 52.1 µg/m³, with the
- Mean value as 42.0 µg/m³ and the
- Limit: 100.0 µg/m³

PM_{10} concentrations at **Jhanj** were observed
- Range 33.6 to 58.9 µg/m³, with the
- Mean value as 42.7 µg/m³ and the
- Limit: 100.0 µg/m³

PM_{10} concentrations at **Utarda** were observed
- Range 34.3 to 61.4 µg/m³, with the
- Mean value as 46.7 µg/m³ and the
- Limit: 100.0 µg/m³

PM_{10} concentrations at **Nevsa** were observed
- Range 32.1 to 51.0 µg/m³, with the
- Mean value as 44.1 µg/m³ and the
- Limit: 100.0 µg/m³

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Respirable Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ concentrations at **Lutra** were observed
- Range 12.5 to 28.2 µg/m³, with the
- Mean value as 22.0 µg/m³ and the
- Limit: 60.0 µg/m³

$PM_{2.5}$ concentrations at **Bitkula** were observed
- Range 11.2 to 28.2 µg/m³, with the
- Mean value as 20.2 µg/m³ and the
- Limit: 60.0 µg/m³

$PM_{2.5}$ concentrations at **Nirtu** were observed
- Range 14.2 to 28.2 µg/m³, with the
- Mean value as 19.8 µg/m³ and the
- Limit: 60.0 µg/m³

$PM_{2.5}$ concentrations at **Jhanj** were observed
- Range 12.2 to 31.7 µg/m³, with the
- Mean value as 22.3 µg/m³ and the
- Limit: 60.0 µg/m³

$PM_{2.5}$ concentrations at **Utarda** were observed
- Range 17.2 to 31.7 µg/m³, with the
- Mean value as 24.0 µg/m³ and the
- Limit: 60.0 µg/m³

$PM_{2.5}$ concentrations at **Nevsa** were observed
- Range 16.4 to 31.1 µg/m³, with the
- Mean value as 22.4 µg/m³ and the
- Limit: 60.0 µg/m³

Conclusion:

The observed concentration of PM_{10} and $PM_{2.5}$ were found to be within prescribed standards of Central Pollution Control Board (CPCB) for Rural & Residential area.

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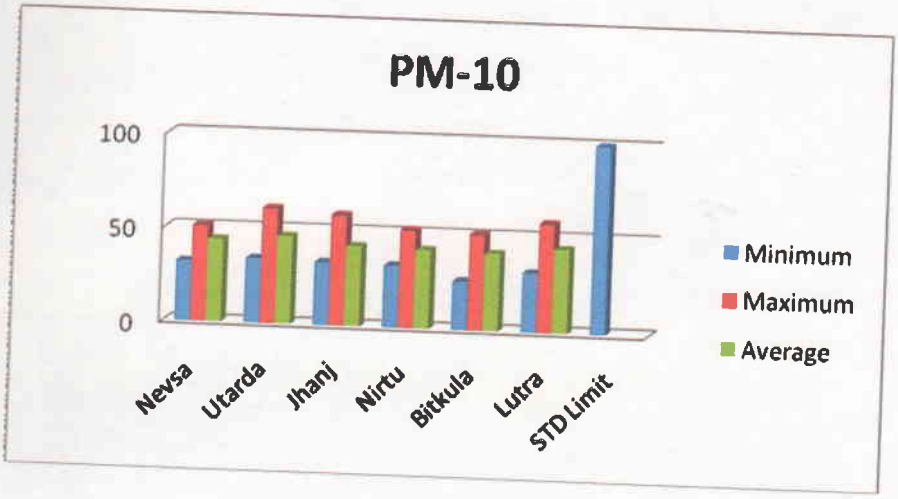
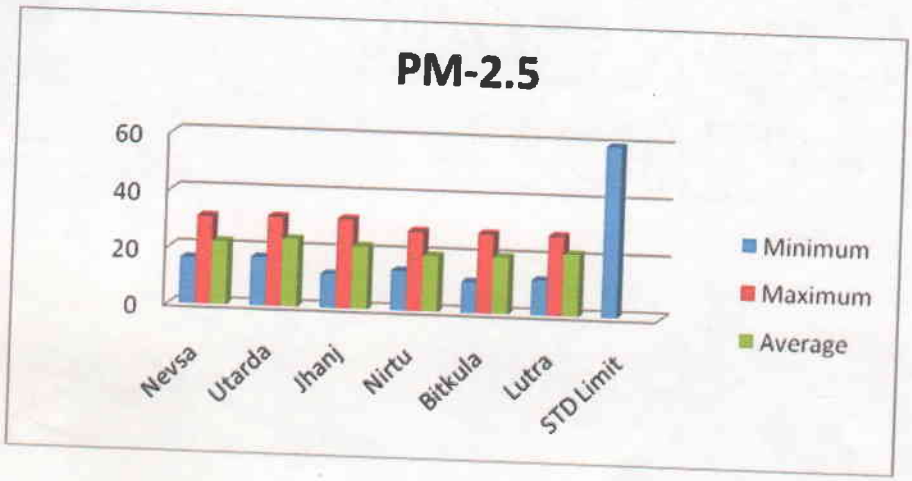
AMBIENT AIR QUALITY GRAPHS





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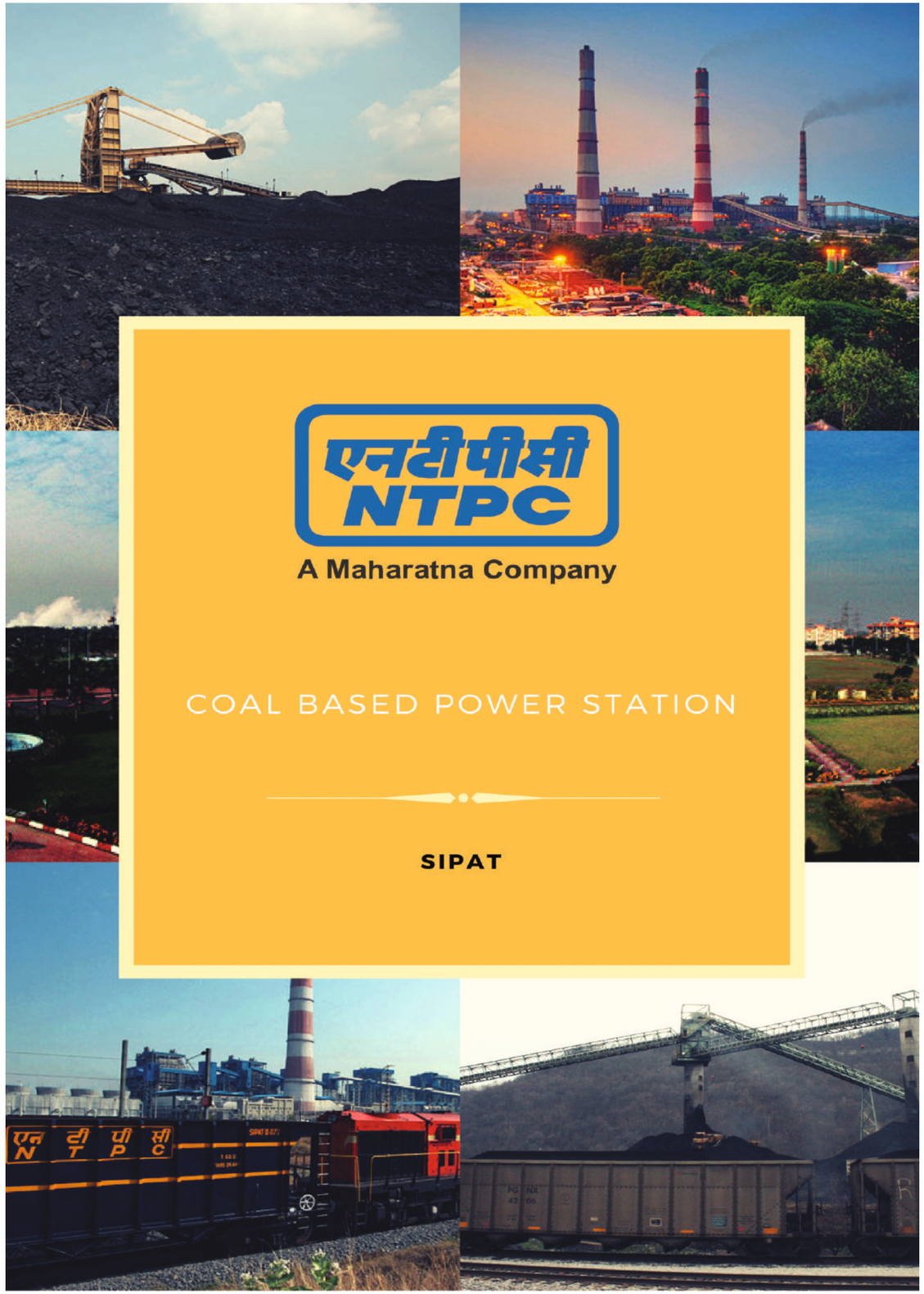
DEPARTMENT OF COMMUNITY MEDICINE, CIMS, BILASPUR CHHATTISGARH

A REPORT

To study the impact of coal transportation among villagers residing along the railway track from Dipka mines to NTPC Ltd. Sipat.

DEPARTMENT OF COMMUNITY MEDICINE, CIMS, BILASPUR CHHATTISGARH



Department of community medicine, CIMS, Bilapur.

HANDS IN ACTION

"The doctor should be opaque to his patients and, like a mirror, should show them nothing but what is shown to him."
Sigmund Freud

To study the impact of coal transportation among villagers residing along the railway track from Dipka mines to NTPC Ltd Sipat.

A Report

DEPARTMENT OF COMMUNITY MEDICINE, CIMS, BILASPUR CHHATTISGARH

Published on November 2017

Submitted by: Department of Community Medicine,Chhattisgarh Institute of Medical Science, Bilaspur, Chhattisgarh.
Phone: (O) – 07752-230030, Email id: commedcims@gmail.com

Principle investigator
Dr. Hemlata Thakur
Professor & HOD
MBBS, MD, FCGP

Co-Investigator
Dr. Vivek Sharma
Assistant Professor
MBBS, MD.

Co-Investigator
Dr. Shailesh Kawale
Assistant Professor
MBBS, MD, PGDMCH

PREFACE

The publication of this report is the end result of hardwork of the entire research team.Though the research report is written for NTPC SipatLtd. for their environmental issue but we hope recommendation of report will be sincerely implemented for the benefit of local community by the competent authority.

In this short research project an attempt is made to write the research project in simple and understandable way covering the major and minor health issue due to coal dust exposure and can be easily understood by the readers.In a sincere attempt to make this report a comprehensive one, there may be some gaps, imperfections and mistakes.

There are 7 chapters in this research report. They cover purpose of research work, research methodology, different research tools used, result and conclusion from research work and recommendation for implementation.We have attempted to provide enough information in the form of literature of review.

We would like to express my appreciation to the research participant for their co-operation, without them this research couldnot be possible.

Bilaspur
November 2017

Dr. Hemlata Thakur
Dr. Vivek Sharma
Dr. ShaileshKawale

CONTENT

ABBREVIATIONS

ABBREVATIONS

%	Percentage
&	And
>	More than
<	Less than
≥	More than or equal to
=	Is equal to
µm	Micro meter
µg/m^3	Micrograms per cubic meter
BOBRN	Bogie Open Bottom Rapid Discharge
BOXAN	Bogie Open High Sided Discharge
C.G.	Chhattisgarh
CIMS	Chhattisgarh Institute of Medical Science
CO_2	Carbon di-oxide
COPD	Chronic obstructive pulmonary disease
CVA	Cough variant asthma
CWP	Coal worker's pneumoconiosis
DALYs	Disability-adjusted life-years
ECG	Electrocardiograph
ETS	Environmental tobacco smoking
FEV	Forced expiratory volume
FEV_1	Forced expiratory volume in one second
FVC	Forced vital capacity
GI tract	Gastro intestinal tract

Govt.	Government
i.e.	That is
IEC	Information education communication
INSEARCH	Indian Study of Asthma, Respiratory Symptoms and Chronic Bronchitis
km	Kilometre
m^3	Cubic meter
MGR track	Merry-go-round track
mMRC grading	Modified medical research council grading.
MT	Metric ton
MW	Mega watt
NCDs	Non communicable diseases
No.	Number
NTPC	National Thermal Power Corporation
OADs	Obstructive airway diseases
PM	Particulate matter
SO_2	Sulphur di-oxide
SECL	South-eastern Coalfields Limited
SOB	Shortness of breath
vs	Verses
WHO	World health organisation
X-ray	X radiation

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Coal plays a key role in economic growth & development of India since last few decades. Coal is used in variety of sectors including power generation, cement manufacturing, iron and steel production. Coal currently fuels 66% of the India electricity and is forecast to continue to supply a strategic share for next three decades. There are still 1.2 billion people in the world live without adequate electricity which is vital for basic needs. It also causes adverse effect over health. On the other hand, concerns can also be seen that it is significantly deteriorating local environment, ecosystem, air quality and its impact on health.

Poor mitigation practices of coal handling causes health impact like asthma, cardiovascular diseases, COPD, cancer, mental stress, respiratory problem and these are scientifically evidence by various studies. Most of the research studies were carried out on occupation exposure of coal dust. However dose of coal dust exposure is leaser among general population than occupational cohort and that need to be further studied in long term follow-up studies. Very few studies carried out to know the impact of coal transportation on local population. So in this cross-sectional study we have evaluated number of health problem due to non-occupational coal dust exposure and we are also trying to evaluate health effect of coal in our study.

With this in view the department of Community Medicine, CIMS Bilaspur undertook a short study to ascertain the health impact on villagers due to coal transportation by railway wagon. The objectives of the study are to

1. To find out prevalence of Pneumoconiosis among study population.
2. To find out the distribution of morbidity pattern among the study population.
3. To find out the knowledge regarding health hazards from coal dust among study population.

The study was conducted among peoples living along the MGR track in two blocks of Bilaspur & Korba district covers 96,916 populations (49916 males and 47000 females) by adequate sample size of **900** selected by random sampling method. Data collection tool included three parts. First part contents interview of all the eligible candidates after taking proper consent. Second part is having anthropometric measurement and relevant investigation and clinical examination

and third part had complete clinical examination of screened out candidates by X-ray, spirometery, ECG examination by chest physician and cardiac examination by medical expert.

The major finding and conclusions are as follows –

1. Environmental observation of local study area by the investigators

- Around the NTPC Sipat industry – sufficient green belt was observed around the industrial and residential area.
- Around the MGR track – inadequate green belt was seen along the MGR track
- In the villages – in some of the villages, apart from MGR track coal is also transported by trucks and it was seen that roads are also covered with coal dust. This black dust was also observed in the residential area of villages.
- 29.9% study participant practice water spray around their houses to reduced dust.
- 28.1% respondents were not taking any kind of preventive measures.

2. Socio-Cultural and Demographic Profile of 900 Respondents

- Among the respondent females were 59.3% and 40.7% were male.
- Majority of peoples were illiterate (28.8%) and having low education level (up to primary school) 17%
- 18.9% respondents were unemployed.
- 68.8% were married and 25.5 % were unmarried.

3. Environmental profile of Respondent (status of Indore air pollution).

- 70.4% families prepare their food on smoky chulha.
- 49.9% respondents were facing indoor air pollution in their work place or house.
- 10% respondent were presently used to smoke tobacco and 14% of respondent gave the history of smoking by their family members

4. Knowledge & Practices regarding impact of coal dust on health

- 19.7% respondent were aware about the coal dust causing disease like breathing difficulty, asthma etc.
- For prevention from coal dust exposure 36.1% respondent cover mouth by clothes while going outside.

- 29.9% study participant practice water spray around their houses to reduced dust.
- 28.1% respondents were not taking any kind of preventive measures.

5. Various health problems among study participants –

- 21.4% respondents were facing difficulty in breathing.
- 17.2% were having cough with sputum.
- 12.3% of respondents were having chest pain during coughing.
- 10% were having early morning cough
- 8.7% felt that breathing difficulties disturb there daily routine activity.
- 8.2% were having other chronic disease like hypertension, diabetes mellitus etc.
- 7.8% were facing difficulty during sleep.
- 6.3% felt that due to breathing difficulty their social life get disturbed.

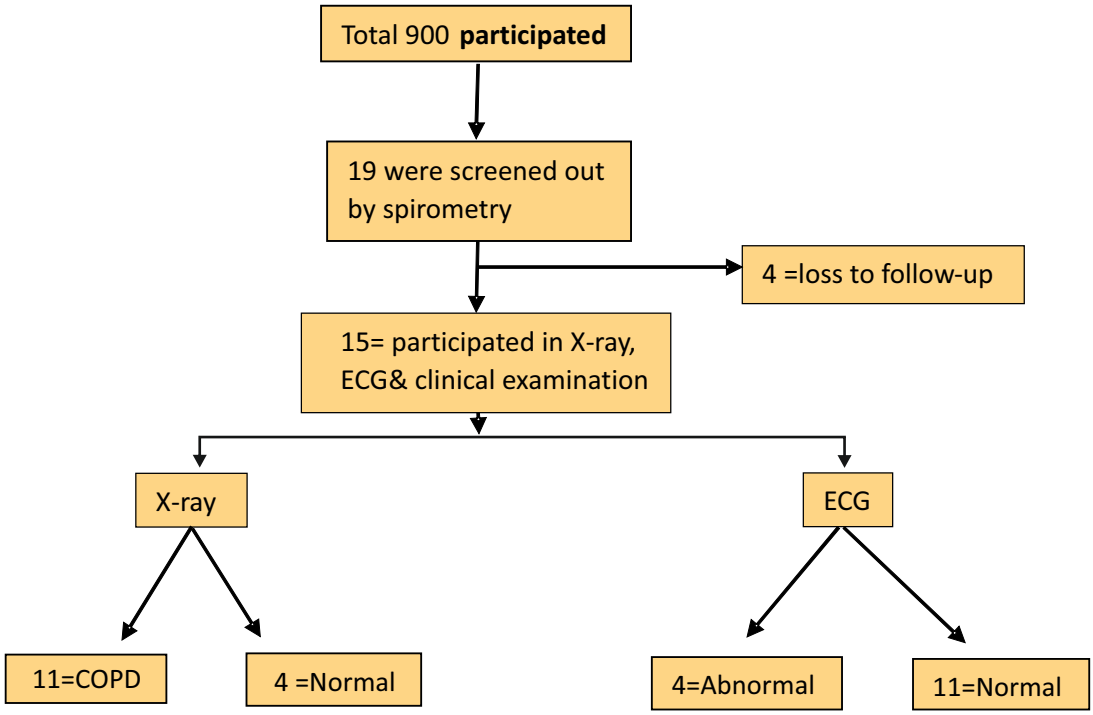
6. Age wise prevalence (per 1000 population) of various health problems –

- Prevalence of various health problem increases with age and less prevalent among age group less than 18 years and 18 to 35 years. (Table 11 – 14, page no 46 - 52)
- Health problem are more prevalent among age group 35 years and above.
- Prevalence of difficulty in breathing is 267 per 1000 population of age more than 35 years.
- 174 per 1000 population were having cough with sputum among age more than 35 years.
- Chest pain during coughing was found among 149 per 1000 population of age more than 35 years.
- 106 per 1000 peoples were having early morning cough.
- 118 per 1000 population felt that breathing difficulties disturbs their daily routine activity.
- Prevalence of difficulty in sleeping was 95 per 1000 population of age more than 35 years.
- 93 per 1000 population felt that due to breathing difficulty their social life get disturbed.
- Prevalence of COPD was 23 per 1000 population among the age above 35 years which is in a range of prevalence (i.e.12 to 43.6 per 1000 population) of various studies conducted in different part of country.

7. Final disease burden after detailed investigation

- 19 were screened out for COPD from 900 study participants by spirometry.
- 11 were diagnosed with COPD among 900 study participants after X-ray.
- 4 were diagnosed with cardiac disease among 900 study participants by ECG.
- 4 were loss to follow up.
- The cases of pneumoconiosis and cancer were not found in present study.

8. Diagnostic algorithm.



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1

INTRODUCTION

INTRODUCTION

Coal brings an industrial revolution since past few decades. Forty percent of the total electricity production in the world is generated from the combustion of coal. Though it is a naturally occurring substance, coal can be dangerous to human health especially in its particulate form. Coal based power generation plant consumes 80% of total coal extraction in the India[1]. All activity related to power generation from coal can be dangerous to human health, right from its extraction, transportation, combustion and even ash disposal, if mitigation measures are not properly planned. It is a big challenge to balance the potential benefits and harms of using coal as an energy source, according to Ministry of Coal, India is currently the third largest producer of coal in the world. Indian coal demand drives primarily by the coal power plants other key consumers are the steel and cement industries. A large fraction of Indian coal is transported using railways, all the coal transported through Indian railway by BOBRN/BOXN type of open wagon[2].

According to press relies from govt. of India ministry of railway dated 01/03/2016 ON 31 January 2016 around 1.07 lakh BOXN wagon and 0.134 lakh BOBR wagon were available in Indian railway for transportation of different ores including coal about 1million tons of total ores transported through these wagon per year and half of them were coal[3].

The first coal based power plant begins early in 1899 in Calcutta. Presently in year 2017 coal based power plant increased to 101. Installed capacity by source in India as on 31 May 2017 electricity production by various sources are as - Coal: (59.2%), Large Hydro: (13.5%), Small Hydro:(1.3%),Wind Power: (9.8%), Solar Power: (3.7%), Biomass: (2.5%), Nuclear: (2.1%), Gas: (7.6%) and Diesel: (0.3%)[4].

It was projected by ministry of coal and energy government of India coal base energy generation continue to fulfil the energy demand of our country for next few decades. Enforcement of environmental regulation is a serious challenge especially since power supply is constantly in demand.

As on 31 March 2015, India had estimated coal reserves of 306.6 billion metric tons (338.0 billion short tons) which is the fifth largest coal reserves in the world. India is the third largest producer of coal in the world, producing 536.5 million metric tons (591.4 million short tons) in 2014 are primarily found in eastern and south-central India. Jharkhand, Odisha, Chhattisgarh, West Bengal, Madhya Pradesh, Telangana and Maharashtra accounted for 98.58% of the total known coal reserves in India[5].

Coal use has severely degraded air quality and human health because of high particles and Sulphur-di-oxide (SO_2) emissions. Emission of CO_2 from coal combustion have been identifies as a primary culprit in increasing atmospheric CO_2concentration.

The fact that exposure to respirable coal dust causes emphysema and simple coal worker's pneumoconiosis (CWP) is well known. However, it is suspected that coal miners may be susceptible to a spectrum of dust related respiratory diseases, which may not necessarily be caused by the respirable fraction and this highlights the need to develop a method to assess coal dust exposures in the thoracic and inhalable particle size fractions supplement the current method for the repairable size fraction. It is hypothesised that larger particle size fraction may contribute to bronchitis, decreased FEV and possibly elevated cancers of the sinuses, buccal cavity, throat, and GI tract in occupational cohorts of coal miners[6].

This dust will deposit in the upper and lower airways of the respiratory tract and clearance mechanisms in the gastrointestinal tract. It can then be absorbed into the blood or lymphatic's. Inhalable dust is made up of all the dust sizes that can deposit throughout the respiratory tract. It can include the larger particles that deposit in the upper airways (nose and throat), the smaller particles that can penetrate the lower airways and deposit in the lungs. For example, only the fine particles (<10µm) are able to penetrate and deposit in the alveolar region[7].

Adverse effects of inhalable coal dust[6]

Possible adverse health effects associated with inhalable coal dust include:

Extra thoracic Region

- Nasal Cancer
- Sinusitis
- Buccal and lip cancer
- Pharyngeal and laryngeal cancer
- Gastric Cancer
- Throat and Eye Irritation

Tracheobronchial Region

- Chronic bronchitis
- Chronic obstructive airways disease and loss of FEV

Alveolar Region

- Coal Workers Pneumoconiosis (CWP)
- Silicosis
- Emphysema
- Tuberculosis
- Caplan's Syndrome

Air quality measurement[8]

Air quality measurements are typically reported in terms of daily or annual mean concentrations of PM_{10} particles per cubic meter of air volume (m^3). Routine air quality measurements typically describe such PM concentrations in terms of micrograms per cubic meter ($\mu g/m^3$). When sufficiently sensitive measurement tools are available, concentrations of the fine particles ($PM_{2.5}$ or smaller), are also reported. There is a close, quantitative relationship between exposure to high concentrations of small particulates ($PM_{10}$and $PM_{2.5}$) and increased mortality or morbidity, Conversely, when concentrations of small and fine particulates are reduced, related mortality will also go down – presuming other factors remain the same. This allows policymakers to project the population health improvements that could be expected if particulate air pollution is reduced.

Guideline values for particulate matter (WHO)[8]

$PM_{2.5}$

10µg /m^3 annual mean

25µg /m^3 24- hour mean

PM_{10}

20µg /m^3 annual mean

50µg /m^3 24- hour mean

Indian ambient air quality standards[9]

Particulate matter

<10 µm (PM_{10}) µg /m^3 annual mean-60

<10 µm (PM_{10}) µg /m^3 24 hour mean-100

<2.5µm ($PM_{2.5}$) µg /m^3 annual mean-40

<2.5µm ($PM_{2.5}$) µg /$m^3$24 hour mean-60

"WHO Air Quality Guidelines" estimate that reducing annual average particulate matter (PM_{10}) concentrations from levels of 70 $\mu g/m^3$, common in many developing cities, to the WHO guideline level of 20 $\mu g/m^3$, could reduce air

pollution-related deaths by around 15% . However, even in the European Union, where PM concentrations in many cities do comply with guideline levels, it is estimated that average life expectancy is 8.6 months lower than it would otherwise be, due to PM exposures from human sources.

Ozone is a major factor in asthma morbidity and mortality, while nitrogen dioxide and sulphur dioxide also can plan a role in asthma, bronchial symptoms, lung inflammation and reduced lung function. The evidence on airborne particulate matter (PM) and its public health impact is consistent in showing adverse health effects at exposures that are currently experienced by urban populations in both developed and developing countries. The ranges of health effects are broad, but are predominantly to the respiratory and cardiovascular systems. All population is affected, but susceptibility to the pollution may vary with other existing health problem or age. The risk of various outcomes has been shown to increase with exposure and there is little evidence to suggest a threshold below which no adverse health effect.

Factors associated with the extent of coal dust release wherever coal is mined, transported, stockpiled, handled or loaded include wind speed, moisture content (especially of the stockpile surface) and the extent of mechanical handling of the coal. The latter factor contributes to abrasion of the coal material and thus to the generation of dust.

Therefore the possible health effects of respirable coal dust in non-occupational context must be important to measure.

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2

BACKGROUND

BACKGROUND

NTPC Sipat is coal based Super Thermal Power project at District Bilaspur Chhattisgarh, with the capacity of 2980 MW. Approximately 40,000 MT to 45,000 MT of coal is burned per day for electricity generation.

The power station started generating of power from June 2008 and coal was imported form one of the SECL mines- Dipka coal mines by MGR track. Coal was transported from Dipka mine to Sipat plant about 42 Km distance by open wagon (BOBRN / BOXN).

To reduce the coal dust emission to the environment water spraying system at loading silo Central block station and track hopper at unloading area is only way to reduce the coal dust emission.

These open wagon carrier approximately 10 lakh MT of coal per month around 13 rakes per day and 1 rake in every two hours. Along the 42 km MGR track 34 villages with population of 95720 reside on 1 km either side of railway tracks.

Ministry of Environment, forest and climate change, Govt. of India has given a direction to NTPC Sipat Ltd so NTPC Sipat Ltd funded this research project to carry out a health survey of villages within one Km on either side of railway track from coal mine to power plant.

So the research project is design to study the health impact /effect of coal transportation among the peoples living in villages near to MGR track.

There is strong scientific evidence of adverse health effects from coal use in energy generation but access to electricity has a basic need for human development & socio-economic growth of any country, clean coal technology with proper mitigation techniques are only solution to make a balance between energy demand and lesser environmental impact due to coal.

Currently 66 % of Indian power generation is coal based. In 2011-12 particulate emission from coal fired power plants resulted is an estimated 80,000 to 115,000 premature death and more than 20 million asthma cases which cost the public and the government as estimated 16000 to 23000 crore Rupees. The largest impact of this emission is felt over the status of Delhi, Haryana, Maharashtra, Madhya Pradesh, Chhattisgarh and most of central east India[10]. There is evidence of coal impact on human health during every stage of its use for electricity generation right from mining to post combustion disposal. Coal combustion to generate energy has not only cause's widespread health effects on the population

but also contributes to climate change which can harm human health on a global scale. Number of studies and reviewed carried out around the world to study ill effect of coal fired power plant and related activity including coal transport, coal mining and there evidences but still the need for more research and data to provide local circumstantial evidences and their effects to make more sustainable choices for health care designs and recommendation according to local health care need. Health impact due to coal in particular region cannot be generalised around the world because number of social economic and cultural factors, mitigation practices, access to health care facility, health seeking behaviour of local population, level of literacy, Government commitment for enforcement of laws related to air quality standard and pollution control etc., all these factors varies from country to country and can change the outcome of health impact due to coal. Implementation of occupational safety measure and health monitoring at power generation plant and coal mines given certain degree of protection from occupation hazard, but for long term environment exposure to coal dust to general population without any safety measure can be causes significant impact on health of local community.

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3

REVIEW OF LITERATURE

REVIEW OF LITERATURE:

India is expanding industrially and economically and also their energy need. Around 66% of entire power generation in country is coal based. Coal India contributes 84% of the country's output of coal. This study aim to suggest energy security to country through best practice of mitigation in welfare of local community.

An attempt has been made to review literature and studies, which have focused on current mode of transportation of coal by Indian Railway. What are the various safer methods and technologies available for coal transportation by rail. What are other mitigation methods that can lesser harmful health impacts of coal dust during transportation of coal. Also reviewing the studies and literature related to various health impacts can occurs due to coal dust exposure. Number of field studies carried out in India and around the world to find out the COPD prevalence and other respiratory problems due to environmental exposure.

In present study we are reviewing the prevalence of respiratory problems and compare it with available data.

1. Ways of Coal transportation -

Number of ways coal can be transported to energy production site from coal mines site[11]. In India 250-260 tons of total coal transported by Indian railways and other methods of coal transportation are as-

a) Rail Road Trains
b) Coal Slurry Pipelines
c) Barge Transport
d) Highway Truck Movement
e) Conveyor Belt Transport

2. Transportation of coal by Indian Railway[12,13] -

All the coal transported by Indian railways is through Open wagon. According to coal India press release annually, Coal India transports 250-260 Million tons of coal through Indian Railways, roughly half of its production. In 2014-15, the Railways carried a total of 545 million tons of coal, accounting for almost 50 per cent of the 1,097 million tons of its freight carried during the year.

Transportation of coal is predominantly done in BOXN and BOBR type of open wagons. As on 31 January 2016, around 1.07 lakh BOXN wagons and 0.15 lakh BOBR wagons were available with Indian Railways. General purpose wagons like BOXN wagons are utilized for transportation of bulk commodities like minerals & ores, including coal. The prevalent arrangement in which general purpose wagons are not being reserved for transportation of any particular commodity has worked satisfactorily over the years. Given the critical importance of coal in the national economy, this traffic segment is normally accorded a relatively higher priority in supply of rakes over other bulk commodities. Further, BOBR wagons are generally dedicated for loading and transportation of coal traffic only.

Pic. 1 :
Bogie open bottom rapid discharge (BOBRN) Wagon

Pic. 2 :
Bogie open high sided discharge (BOXAN) Wagon

Coal India is in talks with the Indian Railways for an investment of 5,000 crore to procure wagons that carry coal. This could end up being the single largest investment by a railway customer for procuring wagons.

"Coal India had approved a plan to acquire 2,000 railway wagons in December, with a total plan to procure 9,500 wagons. While there is no specific design change that has been sought, the 2,000 wagons will be solely used for Coal India's transportation needs," Till the righting of report no reference are found related to close/covered wagon transportation of coal by Indian railways.

3. Covered wagon transportation[14] -

In some part of world coal are transported by covered railway wagon. These technologies definitely overcome with environmental pollution in certain extent. CLIVE Palmer's Waratah Coal will become the first mining company in Australia to transport coal in covered wagons. The company has proposed using wagons with fibreglass covers to transport loads from the China First Coal Mine in Central Queensland to the Abbot Point coal terminal in Bowen, north Queensland. The covers not only protect the environmental values to which the rail alignment abuts, but covering the wagons streamlines the train and makes it more fuel efficient and operationally superior to any other coal train system.

4. Surfactant technique[15] -

Number of trail and research are going on related to surfactant technology this can be used as a coal dust controlling agent and sprinkling over the coal during transportation. The principal uses of surfactants and related compounds in coal technology are the control of coal dust, the purification of coal from admixtures by flotation, the dispersion of coal in water for transportation through pipelines and as a fuel system, the dispersion of coal in fuel with subsequent burning of the coal/oil mixture, demineralization of coal, freeze-conditioning agents and side-car release agents for railroad transport of coal.

5. Water sprinkling[16] -

Continuous water sprinkling shall be carried out on the top of the heap at regular intervals to prevent dusting, fire & smoke. To prevent fugitive emission during loading/unloading, fixed pipe network with sufficient water storage and pump shall be installed. Water sprinkling shall be carried out at each and every stage of handling to avoid generation of coal dust or other dust within premises.

6. Green belt[17] -

Adequate thickness of green belt between railway track and residential area provide effective screening and capture the coal dust because fugitive dust escaping along coal transportation channels, from pit- heads to power plants and at the time of loading- unloading operations has also been observed. Once at power plants, every stage of coal utilization creates a different environmental hazard. Coal arriving in power plant premises is tipped from railway wagons or from conveyors. The tipping and storage areas are the ones where fungitive coal-dust escapes in the immediate neighbourhood, especially when these operations take place in the open, under dry weather conditions.

Heavier particles above 1 micron diameter size tend to settle while finger and lighter particles remain airborne for days together and travel for hundreds of kilometres over wind currents.

Particulates are deposited on plant surface by three processes- sedimentation by the gravity action, impaction under the influence of wind currents and deposition of the particles on the upper surfaces of the plant and is most important for large particles

Characters of plants including shapes of crown and other technical specification considered necessary for effecting absorption of pollutant gases and removal of dust particles are as follows.

For absorption of gases

1) Tolerance towards pollutants in question at concentrations that is not too high to be instantaneously lethal
2) Longer duration of foliage,
3) Freely exposed foliage through
   a. Adequate height of crown
   b. Openness of foliage in canopy
   c. Big leaves (long and broad laminar surfaces)
   d. Large number of stomatal apertures
   e. Stomata well-exposed (in level with the general epidermal surface)

Pic. 3 : Green belt around railway track.

For removal of suspended particulate matter

1. Height and spread of crown
2. Leaves supported on firm petioles
3. Abundance of surfaces on bark and foliage, through
   a. Roughness of bark,
   b. Epidermal outgrowths on petioles,
   c. Abundance of axillary hairs,
   d. Hairs or scales on laminar surfaces,
   e. Stomata protected (by wax, arches/ rings, hairs etc.)

7. Particulate Matter[8]-

Particulate matter is generated from the combustion of coal and is characterized by size like small particles less than 2.5 micrometres ($PM_{2.5}$) and larger particles up to 10 micrometres (PM_{10}). Smaller particles less than $PM_{2.5}$ travels deeper into the airways than $PM_{10}$and is therefore generally believed to cause a greater threat to human health

In a report evaluating over 40 studies on the health effects of exposure to small particulate matter ($PM_{2.5}$), the U.S. Environmental Protection Agency concluded that $PM_{2.5}$ likely causes respiratory symptoms, the development of asthma, and decrements in lung function in children. Findings from the review conclude that a 10 $\mu g/m^3$ increase in $PM_{2.5}$is associated with a 1% to 3.4% decrease in FEV1, a measure of lung function, in asthmatic children.

It also concluded that exposure to $PM_{2.5}$ increases emergency department visits and hospital admissions for respiratory related symptoms such as infections and chronic obstructive pulmonary disease. Epidemiological evidence from Australia and New Zealand[18], Mexico[19], Canada[20], and Europe[21] confirm that these health effects on the respiratory system are seen around the globe among communities exposed to $PM_{2.5}$. In addition to respiratory illnesses, low performance of work capacity, cancer and cardiovascular complication are common.

WHO air quality guideline for Particulate matter[22] -

WHOair quality guidelines and interim targets for particulate matter: annual mean concentrations[a]

	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	Basis for the selected level
Iinterim target-1 (IT-1)	70	35	These levels are associated with about a 15% higher long-term mortality risk relative to the AQG level.
Interim target-2 (IT-2)	50	25	In addition to other health benefits, these levels lower the risk of premature mortality by approximately 6% [2–11%] relative to theIT-1 level.
Interim target-3 (IT-3)	30	15	In addition to other health benefits, these levels reduce the mortality risk by approximately 6% [2-11%] relative to the -IT-2 level.
Air quality guideline (AQG)	**20**	**10**	These are the lowest levels at which total, cardiopul-monary and lung cancer mortality have been shown to increase with more than 95% confidence in response to long-term exposure to $PM_{2.5}$

Indian air quality guideline[23] -

[NAAQS Notification dated 18th November, 2009]

S. No.	Pollutants	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
			Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (notified by Central Government)	
1	Sulphur Dioxide (SO_2), $\mu g/m^3$	Annual*	50	20	1. Improved West and Gaeke 2. Ultraviolet Fluorescence
		24 Hours**	80	80	
2	Nitrogen Dioxide (NO_2), $\mu g/m^3$	Annual*	40	30	1. Modified Jacob & Hochheiser (Na-Arsenite) 2. Chemiluminescence
		24 Hours**	80	80	
3	Particulate Matter (Size <10μm) or PM_{10} $\mu g/m^3$	Annual*	60	60	1. Gravimetric 2. TEOM 3. Beta attenuation
		24 Hours**	100	100	
4	Particulate Matter (Size <2.5 μm) or $PM_{2.5}$ $\mu g/m^3$	Annual*	40	40	1. Gravimetric 2. TEOM 3. Beta attenuation
		24 Hours **	60	60	
5	Ozone (O_3), $\mu g/m^3$	8 hours**	100	100	1. UV photometric 2. Chemiluminescence 3. Chemical Method
		1 hours **	180	180	
6	Lead (Pb), $\mu g/m^3$	Annual *	0.50	0.50	1. AAS/ICP Method after sampling using EPM 2000 or equivalent filter paper 2. ED-XRF using Teflon filter
		24 Hour**	1.0	1.0	
7	Carbon Monoxide (CO), mg/m^3	8 Hours **	02	02	Non dispersive Infra Red (NDIR) Spectroscopy
		1 Hour**	04	04	
8	Ammonia (NH_3), $\mu g/m^3$	Annual*	100	100	1. Chemiluminescence 2. Indophernol blue method
		24 Hour**	400	400	
9	Benzene (C_6H_6), $\mu g/m^3$	Annual *	05	05	1. Gas chromatography based continuous analyzer 2. Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP)-particulate phase only, ng/m^3	Annual*	01	01	Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m^3	Annual*	06	06	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m^3	Annual*	20	20	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

** Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform interval.*

*** 24 hourly 08 hourly or 01 hourly monitored values, as applicable shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.*

8. Health effects of coal[6] -

Possible adverse health effects associated with inhalable coal dust include:

1. Respiratory Effect: -

Pollutants from burning coal that cause a negative health effect on the respiratory system include particulate matter (PM), sulphur dioxide (SO_2), and oxides of nitrogen such as NO_2. The mechanism injury to the airways and lungs via damage to cells caused by oxidizing molecules in pollutants. This leads to inflammation, cytotoxicity, and cell death.

Extra thoracic Region

- Nasal Cancer
- Sinusitis
- Buccal and lip cancer
- Pharyngeal and laryngeal cancer
- Gastric Cancer
- Throat and Eye Irritation

Tracheobronchial Region

- Chronic bronchitis
- Chronic obstructive airways disease and loss of FEV

Alveolar Region

- Coal Workers Pneumoconiosis (CWP)
- Silicosis
- Emphysema
- Tuberculosis
- Caplan's Syndrome

2. Cardiovascular Effect:[24]

The Coal-fired power plants contribute to the global burden of cardiovascular disease primarily through the emission of particulate matter. Particles less than 2.5 microns in diameter ($PM_{2.5}$) have been causally linked to cardiovascular disease and death. The mechanism of cardiovascular injury is the same as for the respiratory system: oxidative stress from oxidizing molecules in pollutants leads to inflammation and cytotoxicity.

3. Disturbance of sleep[25]

Respiratory disturbances during sleep are recognized as extremely common disorders with important clinical consequences. Breathing disorders during sleep can result in broad range of clinical manifestations, the most prevalent of which are un-refreshing sleep, daytime sleepiness, fatigue and cognitive impairment.

Poor sleep quality and daytime sleepiness have been shown to be prevalent issues in patients with COPD, with one case–control study showing a prevalence of 67.9% of COPD cases having poor sleep quality.

4. Other health effect[25] :-

- Cancer
- Growth and developmental problem
- Stress and mental health problem
- Injury
- Death

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4

METHODOLOGY WITH TOOLS

METHODOLOGY WITH TOOLS

The study was conducted in a area of district Bilaspur and Korba through which MGR track of NTPC Sipat was passed. This MGR track is from Dipka mines to NTPC sipat around 42 km long. The study was carried out among the villages which are situated within 1 km on both the side of railway track. There were 34 villages along the MGR track. The list of villages and their population was provided by NTPC Sipat. 30 cluster sampling method was used to select the villages and 24 villages were selected to identify 30 cluster for the survey. In each cluster 30 individuals were selected. These 900 individuals from the 30 clusters were selected randomly.

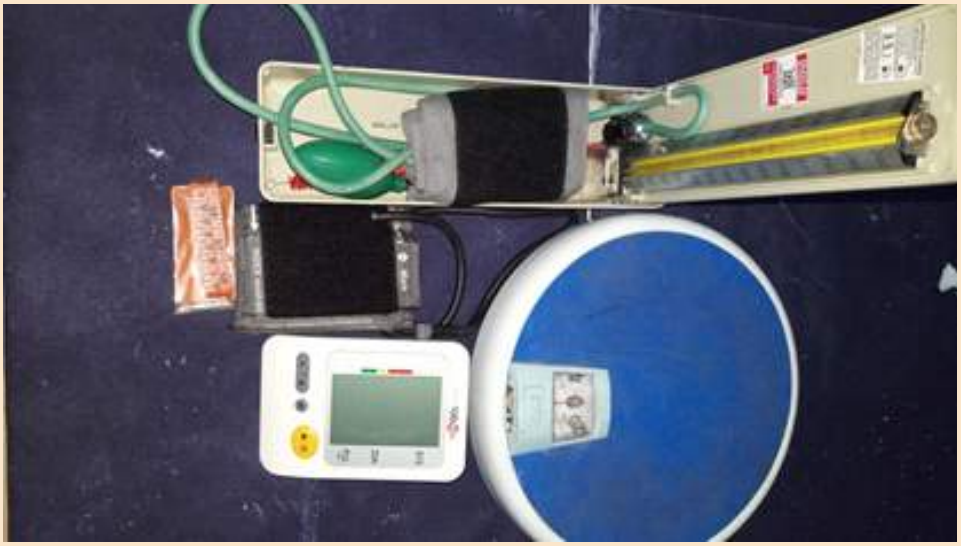
Sample selection

Inclusion criteria – History of minimum 8 years of residence

Exclusion criteria – Children age less than 8 years
Workers of coal mines
History of smoking for more than 8 years
Past medical history of serious respiratory illness before 8 years.

Tool for the study

Schedule No	Tool	Parameter
1	Interview schedule	**Socio-demographic information** - Educational qualification, marital status, occupation. **Economic status** - Family income, per capita income **Environmental condition** - Cooking place, use of smoky chulha **Personal habits** - Smoking **Health seeking behavior** - Health seeking behavior during medical illness.
2	Anthropometric measurements and investigation	**Anthropometry** - Weight, height **Vitals** - pulse, respiratory rate, blood pressure **Investigation** - haemoglobin estimation, spirometry (FEV1)
3	Perception and attitude towards coal dust	Disease caused by coal dust, preventive measures against coal dust
4	Evaluation of signs and symptoms	**Personal history** - Breathing difficulty, cough, expectoration, noisy breathing, work efficiency. **Family history** - Chronic diseases
5	Systemic examination	Respiratory and cardiovascular system was evaluate for any abnormal findings.



Pic. 4 : Manual & Electronic Sphygmomanometer, Weighing machine, Measuring Tape

Pic. 5 : Laptop based spirometry

Pic. 6 : Sahali's Hemoglobinometer

Pic. 7 : ECG Machine

Pic. 8 : Showing Interview of study participant.

Pic. 9 : Showing Examination of study participant.

Pic. 10 : Showing Laptop based Spirometry of study participant.

Pic. 11 : Showing Laptop based Spirometry of study participant.

Manpower planning

A research team was devloped for data collection from the identified villages. It comprise of faculty, technician and attendent from department of community medicine.

The data was collected after a brief training of investigator on interview schedule, anthropometric measurment, assesment of knowledge and practice of coal dust prevention, clinical examination of participants, blood investigation and operating of computer based spirometry.

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5

RESULT AND DISCUSSION

RESULTS AND DISCUSSION

The findings of the study have been discussed under the fallowing headings:

5.1 Population distribution of study area.
5.2 Profile of the respondents.
5.3 Indoor air pollution among houses in study area.
5.4 Awareness regarding presence of coal dust in surrounding environment.
5.5 Various health problems among respondents.
5.6 Diagnostic algorithm of survey.
5.7 Profile of suspected COPD cases.
5.8 Age wise prevalence of various health problems.

5.1 Population distribution of study area.

Table.1 Profile of district

Name of District	Total No. of Villages	Total population of the district	
		Male	Female
Bilaspur	1625	1349928	1312149
Korba	726	612158	594405
Total	2351	1962086	1906554

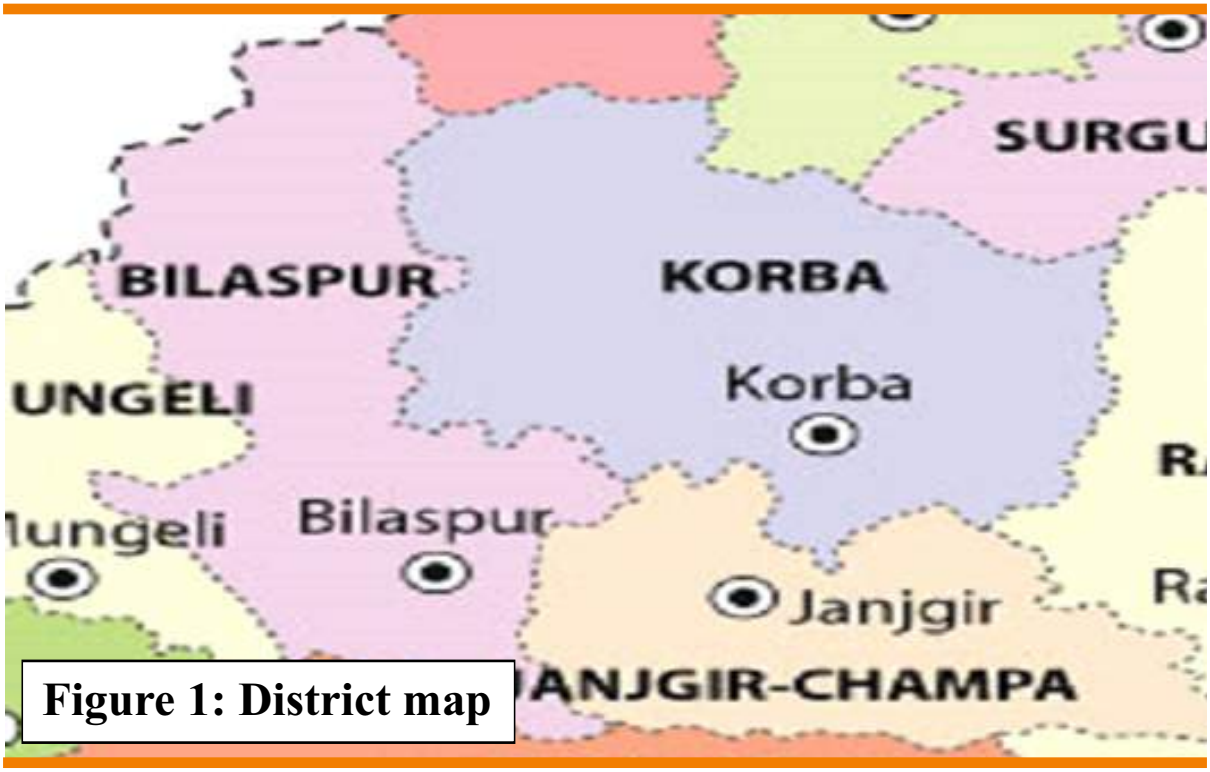


Figure 1: District map

Fig.1-We have covered two districts in the study (i.e. Bilaspur and Korba). Total villages in these district are 1625 and 726 respectively. Total males in these districts were 1349928 and 612158 respectively while total females in these districts were 1312149 and 594405 respectively. (Table1)

Table 2 Profile of study area (Along the MGR track)

Name of district	Total villages along the track	Total population along the track		Total peoples participated in study		
		Male	Female	Male	Female	Total (%)
Bilaspur	26	38481	36469	277	413	690 (76.7)
Korba	08	11435	10531	89	121	210 (23.3)
Total	34	49916	47000	366	534	900 (100)

Figure 2: MGR track with villages map

Fig 2-MGR track passes through 26 villages of Bilaspur and 08 villages of Korba district. In villages of these 2 districts, 49916 males and 47000 females reside along the MGR track. We have selected representative population (900 participants) by sampling method and covered 76.7% of participants from Bilaspur district and 23.3% participants covered from Korba district. (Table2)

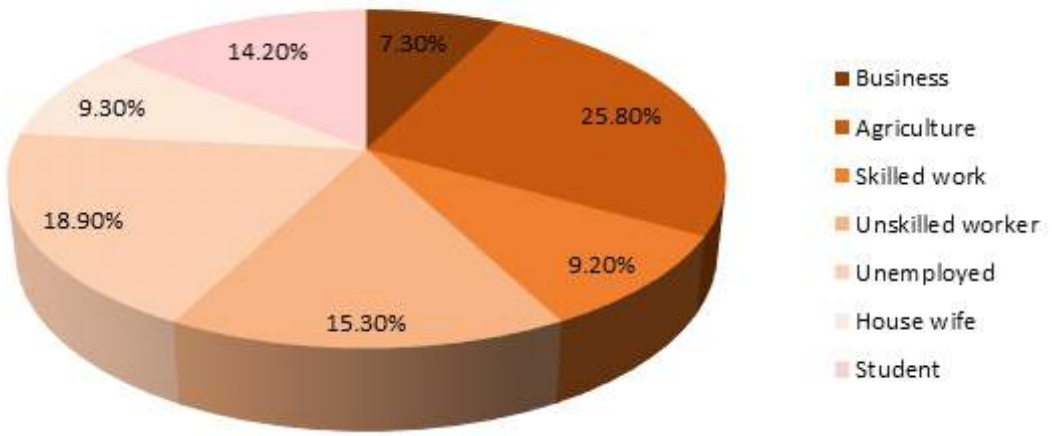
5.2 Profile of respondents

Table 3 Age and sex wise distribution of study participants

Age	Sex		Total (%)**
	Male (%)*	Female (%)*	
8-19	77 (43.8)	99 (56.2)	176 (19.5)
20-34	99 (41.2)	141 (58.8)	240 (26.6)
35-60	135 (35.8)	243 (64.2)	378 (42.0)
>60	55 (51.9)	51 (48.1)	106 (11.8)
Total	366 (40.7)	534 (59.3)	900 (100.0)
Educational qualification			
Illiterate	43 (16.7)	216 (83.3)	259 (28.8)
Primary	75 (49.0)	78 (51.0)	153 (17.0)
Middle	100 (46.5)	115 (53.5)	215 (23.9)
High School	106 (51.5)	100 (48.5)	206 (22.9)
Graduation / post graduation	42 (62.7)	25 (37.3)	67 (7.4)
Total	366 (40.7)	534 (59.3)	900 (100.0)

(* is row percentage, ** is column percentage)

Figure 3: Distribution of respondent by occupation



Among study participants evaluated for health problems 59.3% females and 40.7% male. Majority of respondent were in the age group 35 to 60 years. Literacy is somewhere related to acquire knowledge. Majority of respondents were illiterate i.e. 28.8% while others were having low level of education (i.e. 23.9% were up to middle school and 17% up to primary education). Very few (i.e. 7.4%) complete their graduation and post-graduation. (Table 3)

Out of all respondents 25.8% were involved in agriculture followed by 15.3% were unskilled workers, 7.3% were doing business work. Among the study participants 18.9% were unemployed, 14.2% were student and 9.3% were housewife constitute non-earning group. (Figure 3)

5.3 Indoor air pollution among houses in study area.

Table 4 Distribution of participants according to type of chulha used for cooking

Type of chulha	Yes	Percentage (%)
Smoky chulha	634	70.4
Non-smoky chulha	215	23.9
Both	51	5.7
Total	900	100

The study area belongs to rural area. 70.4% people use smoky chulha in houses for cooking food. (Table 4)

Table 5- Smoking status among family members

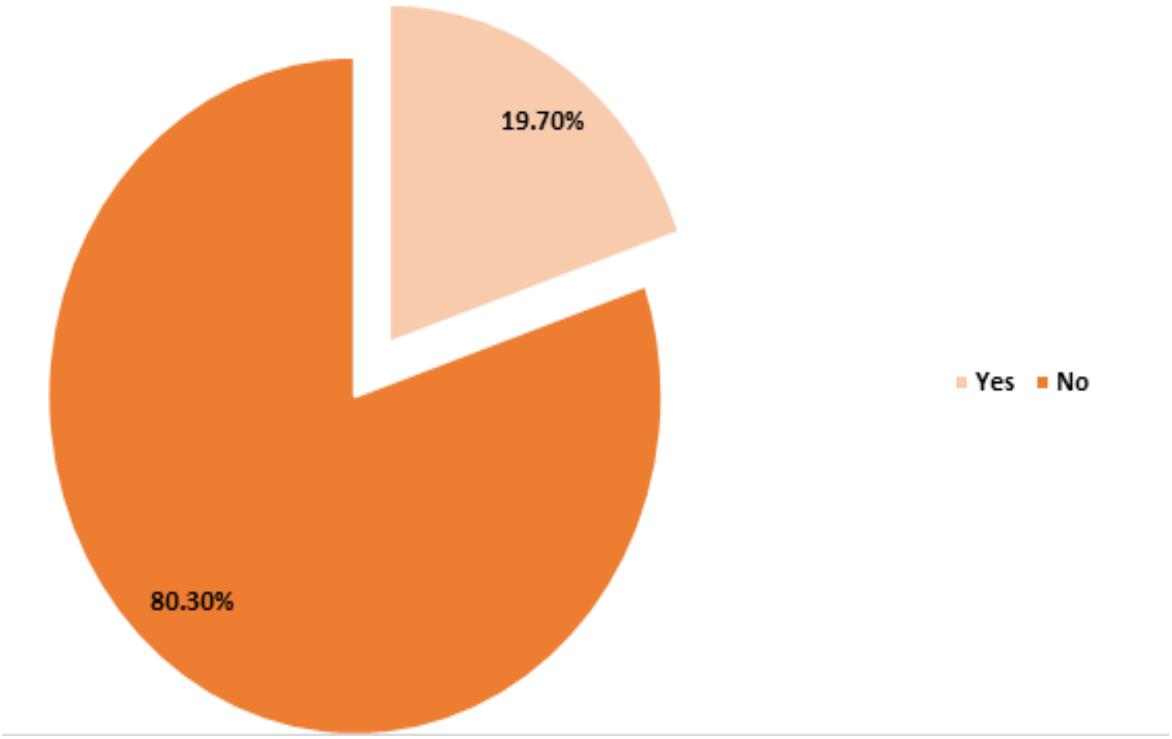
5.a Smoking by study participant	Frequency	Percentage (%)
Yes	90	10.00
No	810	90.0
Total	900	100

5.b Smoking by Family members	Frequency	Percentage (%)
Yes	126	14.0
No	774	86.0
Total	900	100

10% of study participants were having a habit of smoking while 14% study participants have smokers in their family. (Table 5.a & 5.b)

5.4 Awareness regarding presence of coal dust in surrounding environment.

Fig.4 Awareness about health effect from coal dust exposure.



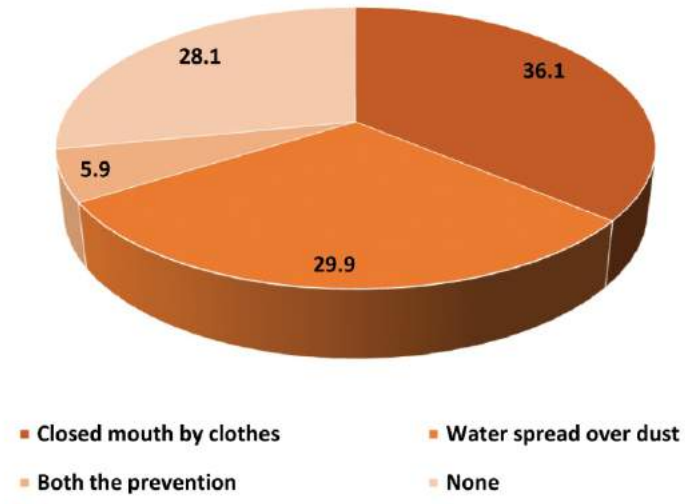
Only 19.7% respondents were aware about coal dust is responsible for causing disease. All of these respondents know that coal dust causes respiratory problems like breathing difficulty and asthma. (Figure 4)

Table 6- Preventive measures taken by respondents against coal dust

Prevention measures against coal dust	Yes	Percentage (%)
Closed mouth by clothes	325	36.1
Water spray over dust	269	29.9
Both the prevention	53	5.9
None	253	28.1
Total	900	100

Majority of respondents (36.1 %) prevent themself from dust by closing mouth by clothes. Nearly 1/3rd of participants i.e. 28.1% were not taking any precaution to protect from dust. (Table 6 & figure 5)

Fig 5:Preventive measures against coal dust



5.5 Various health problems among respondents.

Table 7 - various health problems among respondents

Various health problems	Male (%)*	Female (%)*	Health problem present (% out of 900)
Difficulty in breathing	76 (39.4)	117 (60.6)	193 (21.4)
Difficulty in sleeping	29 (41.4)	41 (58.6)	70 (7.8)
Early morning cough	39 (43.3)	51 (56.7)	90 (10.0)
Cough which create chest pain	45 (40.5)	66 (59.5)	111 (12.3)
Cough with sputum	74 (47.7)	81 (52.3)	155 (17.2)
Heaviness in chest	62 (56.8)	47 (43.2)	109 (12.1)
Abnormal sound during respiration	26 (36.1)	46 (63.9)	72 (8.0)
Breathing difficulty disturbs routine activity	31 (39.7)	47 (60.3)	78 (8.7)
Breathing difficulty disturbs social life	19 (33.3)	38 (66.7)	57 (6.3)
Chronic disease	36 (48.6)	38 (51.4)	74 (8.2)

(* is row percentage)

Peoples were having not only medical problems but also it affects their social life. 21.4% peoples were having breathing difficulty, 12.1% were felt heaviness in their chest and 8% had abnormal sound during respiration. 17.2% were having productive cough, 12.3% were having cough which create chest pain while 10% of these were having early morning cough. Breathing difficulty disturbs routine activity of 8.7% respondents, 7.8% felt difficulty in sleeping while it disturbs social life of 6.3% participants. (Table 7 & Figure 6)

Fig 6:Various health problems among respondents

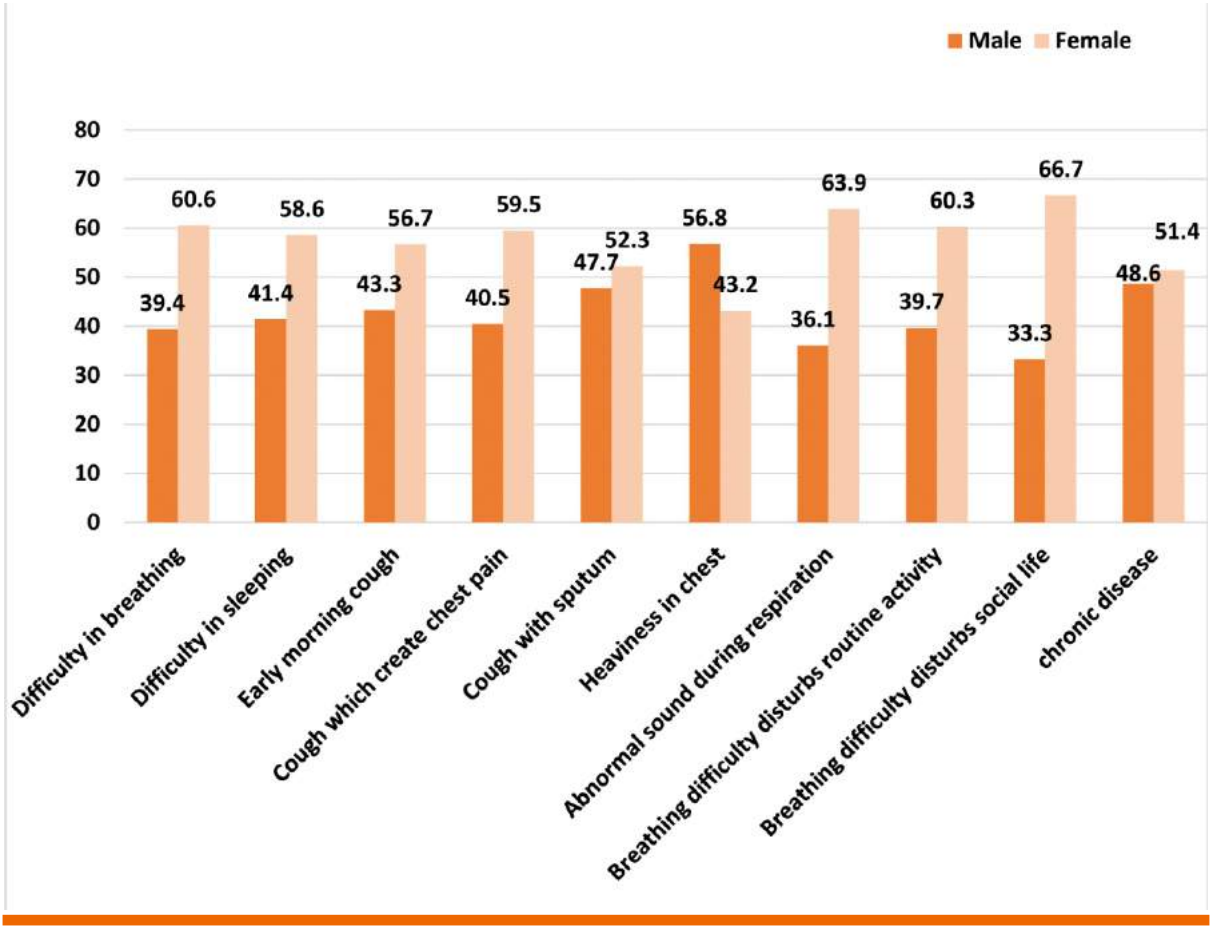
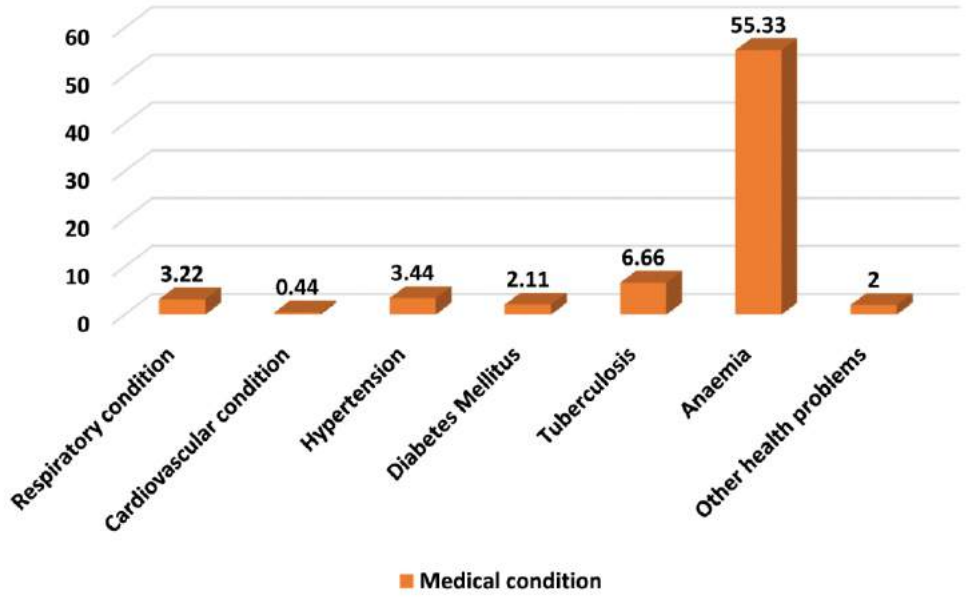


Table 8-Medical condition during clinical examination

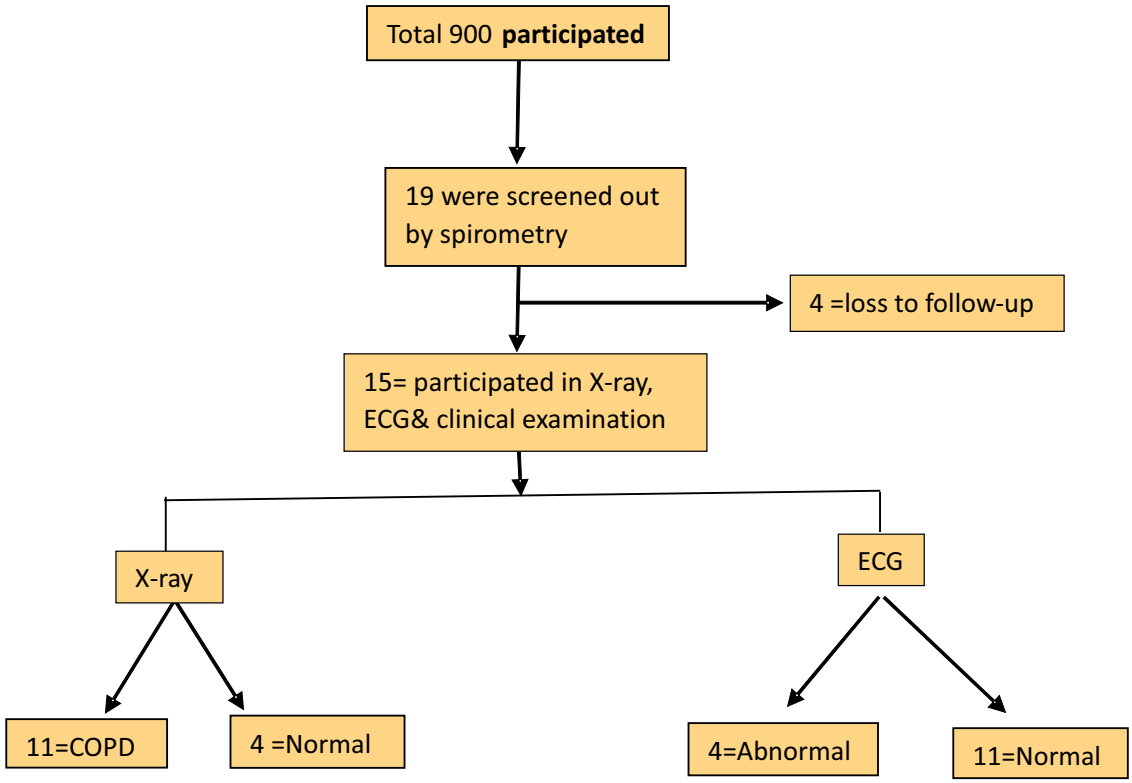
Medical condition	Abnormal	Percentage (%) (Out of 900)
Respiratory condition	29	3.22
Cardiovascular condition	04	0.44
Hypertension	31	3.44
Diabetes Mellitus	19	2.11
Tuberculosis	06	6.66
Anaemia	498	55.33
Other health problems	18	2.0

Majority of respondents were suffering from anaemia (55.33%), along with this hypertension & diabetes also find out among 3.44% & 2.11% respondents respectively during clinical examination (Table 8 & Fig 7)

Fig 7: Medical condition (n=900)



5.6 Diagnostic algorithm of survey



In the study total 900 participants were interviewed. They were screened and examine clinically to find any health problem. All were undergone computer based electronic spirometry and 19 were screened out who were having FEV1/FVC ratio <80%. Among these 4 were loss to follow up. So finally 15 were evaluated by doing X-ray, ECG and medical examination by physician. Among these 11 were having X-ray suggestive of COPD and 4 were having cardiac abnormality.

5.7 Profile of suspected COPD cases. (N = 15)

Table 9- Sex wise distribution of suspected COPD cases

Sex	Frequency	Percentage (%)
Male	4	26.7
Female	11	73.3
Total	15	100

Among suspected cases of COPD, 73.3% were females while 26.7% were male. (Table 9)

Table 10-Age wise distribution of suspected COPD cases

Age group	Frequency	Percentage (%)
< 35 years	2	13.3
≥ 35 years	13	86.7
Total	15	100

Majority of the suspected COPD cases were in the age group more than or equal to 35 years. (Table 10)

5.8 Prevalence of various health problems

Previous tables and figures are presented in terms of frequency and percentage. Here we are also calculating the prevalence of various health problems per 1000 population for the projection of this result to the population living in defined study area. While most of the data for comparison is also available in terms of prevalence. So the following tables (Table 11 to 14) described health problems in terms of prevalence.

Table 11: Age wise prevalence of various health problems.

Health problems	Age Category (in years)	Yes (%)	No (%)	Total (%)
difficulty in Breathing	<18	16 (9.5) (95)*	152 (90.5)	168 (100)
	18 - 35	59 (20.3) (203)*	231 (79.7)	290 (100)
	> 35	118 (26.7) (267)*	324 (73.3)	442 (100)
Difficulty in sleeping	< 18	8 (4.8) (48)*	160 (95.2)	168 (100)
	18 - 35	20 (6.9) (69)*	270 (93.1)	290 (100)
	> 35	42 (9.5) (95)*	400 (90.5)	442 (100)

(* Age wise prevalence of health problem per 1000 population)

Breathing difficulty is most common complaint among study participants and people were facing the sleep disturbance due to respiratory illness and these problems increases with the age advances. The maximum prevalence of sleeping disturbance is among peoples above 35 years of age (i.e. 9.5%). (Table 11)

Similar study conducted among patient of bronchial asthma by Cukic V[26] et al they found that sleep disturbance recognized as extremely common disorders with important clinical consequences. Breathing disorders during sleep can result in broad range of clinical manifestations, the most prevalent of which are unrefreshing sleep, daytime sleepiness and fatigue, and cognitive impairment. There is also evidence that respiratory-related sleep disturbances can contribute to several common cardiovascular and metabolic disorders, including systemic hypertension, cardiac dysfunction, and insulin-resistance. Correlations are found between asthma-related symptoms and sleep disturbances. Difficulties inducing sleep, sleep fragmentation on polysomnography, early morning awakenings and daytime sleepiness are more common in asthmatics compared with subjects without asthma

Article published by RohitBudhiraja[27] et al in J Clin Sleep Med and coated the reference of various study on sleep disturbance in COPD cases found that, the prevalence of insomnia is increased in patients with COPD. A higher proportion of persons with COPD had a low sleep efficiency (< 82%) than those without COPD (44% vs. 31%, p = 0.04). A recent study found a high prevalence of insomnia disorder (27.3%), defined as presence of insomnia symptoms along with daytime manifestations, in patients with COPD[28].

Whether COPD severity is related to worse sleep is unclear. Some studies suggest worse sleep in more severe COPD[29], while other studies have not shown an association between FEV1 and reported sleep quality[30]. Associated respiratory symptoms such as cough and sputum production appear to be better predictors of sleep disturbances[31-32].

Similar finding observed by NirupamaPutcha[33] et al on comorbidities of COPD found that poor sleep quality and daytime sleepiness have been shown to be prevalent issues in patients with COPD, with one case–control study showing a prevalence of 67.9% of COPD cases having poor sleep quality

Table 12: Age wise prevalence of various health problems.

Health problems	Age Category (in years)	Yes (%)	No (%)	Total (%)
Early morning cough	< 18	13 (7.7) (77)*	155 (92.3)	168 (100)
	18 - 35	30 (10.3) (103)*	260 (89.7)	290 (100)
	> 35	47 (10.6) (106)*	395 (89.4)	442 (100)
Cough which create chest pain	< 18	17 (10.1) (101)*	151 (89.9)	168 (100)
	18 - 35	28 (9.7) (97)*	262 (90.3)	290 (100)
	> 35	66 (14.9) (149)*	376 (85.1)	442 (100)
Cough with sputum	< 18	29 (17.3) (173)*	139 (82.7)	168 (100)
	18 - 35	49 (16.9) (169)*	241 (83.1)	290 (100)
	> 35	77 (17.4) (174)*	365 (82.6)	442 (100)

(* Age wise prevalence of health problem per 1000 population)

In this present study cough was also common complaint, coughing in early morning hours, also associated with sputum and chest pain. Its prevalence increases with age and was found to be maximum among age more than 35 years (10.6). (Table 12)

A study conducted by Akio Nijmi[34] published in current respiratory medicine Cough is the most common complaint for which patients seek medical attention. Cough variant asthma (CVA) is a form of asthma, which presents solely with cough. CVA is one of the most common causes of chronic cough. More importantly, 30 to 40% of adult patients with CVA, unless adequately treated, may progress to classic asthma.

In another study conducted by Jaclyn Smith and Ashley Woodcock[35] published in international journal of chronic obstructive pulmonary disease also coated cough is an important and frequent complaint of COPD cases. Patients with COPD most frequently complain of breathlessness and cough and these are both increased during exacerbations. Studies have generally focused on quality of life during end-stage disease, where breathlessness becomes dominant and cough less important. There are very little data on the frequency and severity of cough in COPD or its impact on quality of life at different stages of disease. Little is known about the factors that influence objective cough counts in COPD. Cough may be a marker for progressive disease in milder COPD patients

A hospital based study conducted by Tiku Sinha[36] et al on clinical profile of patients with chronic obstructive pulmonary disease with age range of 26-75 years and found that most common symptom in COPD patient was SOB followed by cough, expectoration, edema and chest pain. mMRC grading in COPD are higher than control group in our study. Smoking in pack year was significantly higher in COPD cases as 69.70± 36.164 and in control group it was 13.84±7.867, and they concluded that Cough was the most common presenting symptom.

Table13: Age wise prevalence of various health problems.

Health problems	Age Category (in years)	Yes (%)	No (%)	Total (%)
Breathing diffculty disturbs daily activity	< 18	4 (2.4) (24)*	164 (97.6)	168 (100)
	18 - 35	22 (7.6) (76)*	268 (92.4)	290 (100)
	> 35	52 (11.8) (118)*	390 (88.2)	442 (100)
Breathing difficulty disturbs social activity	< 18	2 (1.2) (12)*	166 (98.8)	168 (100)
	18 - 35	14 (4.8) (48)*	276 (95.2)	290 (100)
	> 35	41 (9.3) (93)*	401 (90.7)	442 (100)

(* Age wise prevalence of health problem per 1000 population)

In present study we observed that people were having disturbance in routine activity as well as unable to fulfil their social and family responsibilities, increase in absentees in their work place because of breathing difficulty and also disturbs social life of peoples. These problems were increases with age and maximum among the age above 35 years. (Table 13)

The editorial note published in chronic obstructive pulmonary disease in journal Lung India 2013 on under the titles chronic obstructive pulmonary disease: Indian guidelines and the road ahead[37] in India NCDs were estimated to have accounted for 53% of all deaths and 44% of disability-adjusted life-years (DALYs) lost in 2005. Of these chronic respiratory disease accounted for 7% deaths and 3% DALYs lost[38]. India also has had the ignominy of experiencing the "highest loss in potentially productive years of life" worldwide in 2005[39].

Crude estimates suggest there are 30 million COPD patients in India[40]. India contributes a significant and growing percentage of COPD mortality which is estimated to be amongst the highest in the world; i.e. more than 64.7 estimated age standardized death rate per 100,000 amongst both sexes. This would translate to about 556,000 in case of India (>20%) out of a world total of 2,748,000 annually[41]. Such mammoth volumes of disease have the potential to overwhelm health systems and state economies.

India contributes very significantly to mortality from COPD 102.3/100,000 and 6,740,000 DALYs out of world total of 27,756,000 DALYs; thus significantly affecting health related Quality of Life in the country.

Table14: Age wise prevalence of various health problems.

Health problems	Age Category (in years)	Yes (%)	No (%)	Total (%)
Heaviness in chest	< 18	7 (4.2) (42)*	161 (95.8)	168 (100)
	18 - 35	45 (15.5) (155)*	245 (84.5)	290 (100)
	> 35	57 (12.9) (129)*	385 (87.1)	442 (100)
Abnormal sound during respiration	< 18	7 (4.2) (42)*	161 (95.8)	168 (100)
	18	20 (6.9) (69)*	270 (93.1)	290 (100)
	> 35	45 (10.2) (102)*	397 (89.8)	442 (100)
Chronic obstructive pulmonary disease (COPD)	< 18	1 (0.6) (6)*	167 (99.4)	168 (100)
	18 - 35	0 (0.0) (0)*	290 (100)	290 (100)
	> 35	10 (2.3) (23)*	432 (97.7)	442 (100)

(* Age wise prevalence of health problem per 1000 population)

In this present study prevalence of COPD is 2.3% among the participants age above 35 years (i.e. 23 per 1000 population) while in various studies conducted in different part of country its ranges from 1.2% to 4.36% (i.e.12 to 43.6 per 1000 population) as references mentioned below. (Table 14)

A field survey conducted by of Kempegowda Institute of Medical Sciences, Bangalore, India in 2014 and cover population of 44387 in adult subjects of 35 years and above and to study association of tobacco smoking, environmental tobacco smoking (ETS) exposure and type of cooking fuel. The overall prevalence of COPD was 4.36%.The prevalence among males and females were 5.32% and 3.41% respectively. The prevalence was found to be increasing with an increase in age[42].

Several epidemiological studies have addressed the prevalence of COPD in India, the limiting issue in these being the methodology adopted and the definitions employed for diagnosis. Most of the studies have been invalidated questionnaire based, supplemented on occasion by measurement of peak flows. The reported prevalence estimates have ranged from 2 to 22% in men and from 1.2 to 19% in women[43].

The recent 'Indian Study of Asthma, Respiratory Symptoms and Chronic Bronchitis' (INSEARCH) study of 85,105 men and 84,470 women from 12 urban and 11 rural sites reported the prevalence of chronic bronchitis to be 3.49% (4.29% in males and 2.7% in females) in adults > 35 years.[37]

India is experiencing a continued increase in burden of chronic obstructive pulmonary disease (COPD). With an estimated prevalence of >57,000,000 people suffering from obstructive airway diseases (OADs), by the end of 2016[44], India is in second place for harbouring the most number of morbidity and mortality cases from OADs, after China. As per the countrywide estimates of the World Health Organization, the COPD morbidity assessed with disability adjusted life years was 690 per 100,000 population in 2004[45]. This is likely to be enormously high in a country with a population of 1.25 billion. The age standardised death rate of 64.7 per 100,000 population accounts for 20% of the annual worldwide COPD mortality (556,000 out of 2,748,000 cases)[46] In a recent single-day point prevalence study across India (POSEIDON) study, 14.5% of people had visited a physician for OADs[47].

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6

CONCLUSION

CONCLUSION

The major findings of the study are presented in the following section :

6.1 Observations of environment

- Around the NTPC Sipat industry – sufficient green belt was observed around the industrial and residential area.
- Around the MGR track – inadequate green belt was seen along the MGR track
- In the villages – in some of the villages, apart from MGR track coal is also transported by trucks and it was seen that roads are also covered with coal dust. This black dust was also observed in the residential area of villages.
- Health facilities – total 20 government health centres located in study area. These are 2 community health centres, 5 primary health centres and 13 sub-centres.
- Number of coal mine and NTPC hospitals are situated in study area but health facilities from these hospitals are available for their employees only.
- Stockpiling of coal – in few villages stockpiling was also observed.

6.2 Population distribution of study area

- MGR railway track passes through two district of state of Chhattisgarh, Bilaspur district and Korba district.
- Total 34 Villages are situated within one kilometre radius of railway track. All 34 villages are included in study out of all villages 26 from Bilaspur district and 8 from Korba district with total population of 96,916 and maximum number of study population (76.7%) covered from Bilaspur district.

6.3 Profile of the respondents

- Maximum numbers of study participant (59.3%) were female.
- Maximum number of study participant belongs to age group 35 to 60 years (42.0 %).
- Majority of participant were illiterate (28.8%) and (17%) were low educated only few of them complete their graduation and post-graduation (7.4%).
- About the occupation of study participant majority involves in agriculture (25.8%).

6.4 Indoor air pollution among houses in study area.

- Maximum number of study participants (70.4%) using the smoky-chulha for preparing their food are major source of indoor air pollution.
- Another important source of indoor air pollution is smoking; some of the (10%) study participant themselves having the history of smoking and (14%) study participant were passive smoker, having history of smoking in their family.

6.5 Awareness regarding presence of coal dust in surrounding environment.

- Only some of the study participant (19.7%) aware that coal dust is responsible for causing health problem e.g. breathing difficulty and asthma etc.
- Majority of them (36.1%) cover their mouth with clothes as a protective measure from dust.
- 29.9% study participant spray water around their houses for reduction of dust.

6.6 Various health problems among respondents.

- Breathing difficulty was most common health issue among study participant (21.4%).But prevalence of breathing difficulty increases with age as more than 35 and above.
- 17.2% study participant having a complain of cough with sputum,12.1% having heaviness in chest, 12.3% study participant heaving cough which creates chest pain and 8.0% participant having abnormal breathe sound during respiration .
- These respiratory problems also disturb their daily routine life (8.7%) while these breathing difficulty disturb social life of 6.3% study participant.
- 7.8% of study participant facing difficulty in sleeping during night because their breathing difficulties quantity as well as quality of sleep was lacking.

6. 7 Final disease burden after detailed investigation.

- 19 suspected COPD cases were screened out from 900 study participant by spirometry.
- 11 study participant were having X-ray suggestive of COPD and 4 were having cardiac abnormality.
- 4 study participant were loss to follow up.

6.8 Profile of suspected COPD cases. (N = 15)

- 73.3% of suspected COPD cases were female and 26.7% were male.
- 86.7% the suspected COPD cases were in the age group more than or equal to 35 years and 13.3% were less than 35 years.

6.9 Age wise prevalence of various health problems.

- Prevalence of difficulty in breathing is 267 per 1000 among peoples age more than 35 years.
- 174 per 1000 peoples were having cough with sputum among peoples age more than 35 years.
- Chest pain during coughing was found among 149 per 1000 people's age more than 35 years.
- 106 per 1000 peoples were having early morning cough.
- 118 per 1000 felts that breathing difficulties disturbs their daily routine activity.
- Prevalence of difficulty in sleeping was 95 per 1000 among peoples age more than 35 years.
- 93 per 1000 felts that due to breathing difficulty their social life disturbs.
- Prevalence of COPD was 2.3% among peoples age more than 35 years (i.e. 23 per 1000 population).
- The prevalence of COPD found in our study is similar with the prevalence of COPD among non coal dust exposure area is in the ranges from 1.2% to 4.36% (i.e.12 to 43.6 per 1000 population) of other study conducted in different part of country.

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7

RECOMMENDATIONS

RECOMMENDATIONS

1. Green belt to be built along the entire railway track.
2. System to be developed for health screening of villagers through regular periodic basis by health camp or health centre.
3. Developed wards with necessary essential equipment for screening and treatment related to respiratory diseases and cardiac diseases in nearby Government hospital e.g. spirometer, nebulizer, ECG machine, X-ray machine etc.
4. Regular IEC (Information education communication) activity to be organizes for local villagers.
5. Sentinels site to be established in some of the villages along the railway track for monitoring of air quality in regular interval to meet the set air quality standard.
6. Use safe and clean technology to transport the coal through railway wagons.

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REFERENCES

REFERENCES

(1) *Indian Chamber of Commerce, The Indian coal sector: Challenges and future outlook, introduction, page no.8 https://www.pwc.in/assets/pdfs/industries/power-mining/icc-coal-report.pdf ,exp on 30/10/2017.*

(2) *India's Energy Scenario &Coal, https://www.coalindia.in/enus/company/aboutus.aspx , exp on 30/10/2017*

(3) *Transportation of Coal by Indian Railways Press Information Bureau Government of India Ministry of Railways http://pib.nic.in/newsite/PrintRelease.aspx?relid=137100*

(4) *All India Installed Capacity (In Mw) Of Power Stations*

(5) *"Energy Statistics 2017" (PDF). http://mospi.nic.in. Retrieved 28 April 2017.*

(6) *Martin Jennings &MartynFlahive Martin Jennings & Associates, Review of Health Effects Associated with Exposure to Inhalable Coal Dust,introduction ,page 10 http://www.hstrust.com.au/MessageForceWebsite/Sites/326/Files/Jennings_ 20420_Inhlalable_Coal_Dust FinalReport.pdf retrieve on 30/10/2017*

(7) *Martin Jennings &Martyn Flahive Martin Jennings & Associates, Review of Health Effects Associated with Exposure to Inhalable Coal Dust, Inhalable Dust, Adverse Health Effects and SizeSelective Sampling ,page 1 2 http://www.hstrust.com.au/MessageForceWebsite/Sites/326/Files/Jennings_20420_Inhlalable_Coal_DustFinalReport.pdf retrieve on 30/10/2017*

(8) *Ambient (outdoor) air quality and health ,Factsheet,Updated September 2016 http://www.who.int/mediacentre/factsheets/fs313/en , retrive on 30/10/2017.*

(9) *National Ambient Air Quality Standards,Central Pollution Control Board.http://www.arthapedia.in/index.php?title=Ambient_Air_Quality_Standards_in_India*

(10) *National institute of occupational health. Pneumoconiosis and Other Respiratory Morbidities Among Coal Miners In India*

(11) *Coal Transportation – McKetta Department of Chemical Engineering https://che.utexas.edu/course/che359&384/lecture_notes/topic_3/Chapter 4.pdf*

(12) *www.thehindubusinessline.com/companies/coal-india...wagons/article 7126820.ece*

(13) *Press Information Bureau Government of India Ministry of Railways, pib.nic.in/newsite/PrintRelease.aspx?relid=137100*

(14) *www.theherald.com.au/story/1558060/covered-wagons-en-route-for-coal*

(15) *Surfactants in coal technology Journal of the American Oil Chemists' SocietyJuly 1983, Volume 60, Issue 7, pp 1349–1359| Cite aslink. springer.com/article/10.1007/BF02702116*

(16) *GUIDE LINES FOR COAL HANDLING UNITS, gpcb.gov.in/pdf/coal-handling-guidelines.pdf*

(17) *GUIDELINES FOR DEVELOPMENTOF GREENBELTS, CENTRAL POLLUTION CONTROL BOARD (Ministry of Environment & Forests, Govt. of India) Parivesh Bhawan, East Arjun Nagar Delhi -110 032*

(18) *Barnett AG, Williams GM, Schwartz J, Neller AH, Best TL, Petroeschevsky AL, etal. Air pollution and child respiratory health: A case-crossover study in Australia and New Zealand. Am J of RespCritCare Med 2005;171(11):1272-1278.*

(19) *Barraza-Villarreal A, Sunyer J, Hernandez-Cadena L ,Escamilla-Nuñez MC, Sienra-Monge JJ, Ramírez- Aguilar M, etal. Air pollution, airway inflammation, and lung function in a cohort study of Mexico City school children. Environ Health Perspect 2008; 116(6):832. ng-term exposure to $PM_{2.5}$is causally linked to the development of lung-cancer.*

(20) *Chen Y, Yang Q, Krewski D, Shi Y, Burnett RT, McGrail K. Influence of relatively low level of particulate air pollution on hospitalization for COPD in elderly people. InhalToxicol. 2004;16(1):21-25*

(21) *De Hartog J, Hoek G, Peters A, Timonen K, Ibald- Mulli A, Brunekreef B, etal. Effects of fine and ultrafine particles on cardiorespiratory symptoms in elderly subjects with coronary heart disease The ULTRA Study. Am J Epidemiol 2003;157(7):613-623*

(22) *WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide Global update 2005, whqlibdoc.who.int/hq/2006/ WHO_SDE_PHE_OEH_06.02_eng.pdf*

(23) *NATIONAL AMBIENT AIR QUALITY STATUS & TRENDS IN INDIA-2011, cpcb.nic.in/divisionsofheadoffice/pams/NAAQStatus_ Trend_Report_2011 .pdf*

(24) *U.S. Environmental Protection Agency. Integrated Science Assessment for Particulate Matter.2009 December 2009; EPA/600/R-08/139F.*

(25) *Multnomah County Health Department, The Human Health Effects of Rail Transport of Coal, February 2013.*

(26) *Cukic V[1], Lovre V, Dragisic D. Mater Sociomed. Sleep disorders in patients with bronchial asthma.2011;23(4):235-7. doi: 10.5455/msm.2011.23. 235-237.*

(27) *Budhiraja R, Siddiqi TA, Quan SF. Sleep disorders in chronic obstructive pulmonary disease: etiology, impact, and management.J Clin Sleep Med. 2015 Mar 15;11(3):259-70. doi: 10.5664/jcsm.4540.*

(28) *Budhiraja R, Parthasarathy S, Budhiraja P, Habib MP, Wendel C, Quan SF. Insomnia in patients with COPD. Sleep. 2012;35:369–75.*

(29) *Fleetham J, West P, Mezon B, Conway W, Roth T, Kryger M. Sleep, arousals, and oxygen desaturation in chronic obstructive pulmonary disease. The effect of oxygen therapy. Am Rev Respir Dis. 1982;126:429–33.*

(30) *Omachi TA, Blanc PD, Claman DM, et al. Disturbed sleep among COPD patients is longitudinally associated with mortality and adverse COPD outcomes. Sleep Med. 2012;13:476–83.*

(31) *Klink M, Quan SF. Prevalence of reported sleep disturbances in a general adult population and their relationship to obstructive airways diseases. Chest. 1987;91:540–6*

(32) *Klink ME, Dodge R, Quan SF. The relation of sleep complaints to respiratory symptoms in a general population. Chest. 1994;105:151–4.*

(33) *Nirupama Putcha, MD, MHS, M. Bradley Drummond, MD, MHS, Robert A. Wise, MD, and Nadia N. Hansel, MD, MPH Comorbidities and Chronic Obstructive Pulmonary Disease: Prevalence, Influence on Outcomes, and ManagementSemin Respir Crit Carioe Med. 2015 Aug; 36(4): 575–591. Published online 2015 Aug 3. doi: 10.1055/s-0035-1556063*

(34) *Akio Niimi Cough and Asthma Curr Respir Med Rev. 2011 Feb; 7(1): 47–54*

(35) *Jaclyn Smith and Ashley Woodcock Cough and its importance in COPDInt J Chron Obstruct Pulmon Dis. 2006 Sep; 1(3): 305–314*

(36) *Teeku Sinha, Susheel Kumar Nalli, Amardeepak Toppo A study of clinical profile of patients with chronic obstructive pulmonary disease DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20171314*

(37) *Parvaiz A. Koul Chronic obstructive pulmonary disease: Indian guidelines and the road ahead Lung India. 2013 Jul-Sep; 30(3): 175–177. doi: 10.4103/0970-2113.116233*

(38) *ICMR-MRC Workshop. Building Indo-UK Collaboration in chronic diseases; 2009. p. 16*

(39) *Reddy KS, Shah B, Varghese C, Ramadoss A. Responding to the threat of chronic diseases in India. Lancet 2005;366:1746-51.*

(40) *Salvi S, Agarwal A. India needs a national COPD prevention and Control program. J Assoc Physicians India 2012;60 Suppl: 5-7.*

(41) *Lopez AD, Shibuya K, Rao C, Mathers CD, Hansell AL, Held LS, et al. Chronic obstructive airway disease: Current burden and future projections. Eur Resp J 2006;27:397-412*

(42) *Parasuramalu BG, Huliraj N, Prashanth Kumar SP; Gangaboraiah, Ramesh Masthi NR, Srinivasa Babu CR. Prevalence of chronic obstructive pulmonary disease and its association with tobacco smoking and environmental tobacco smoke exposure among rural population.Indian J Public Health. 2014 Jan-Mar;58(1):45-9. doi: 10.4103/0019-557X.128166.*

(43) *Jindal SK, Aggarwal AN, Gupta D. A review of the population studies from India to estimate national burden of chronic obstructive pulmonary disease and its association with smoking. Indian J Chest Dis Allied Sci 2001;43:139-47.*

(44) *Murthy KJR, Sastry JG. Economic burden of chronic obstructive pulmonary disease. In: Background Papers: Burden of Disease in India. National Commission on Macroeconomics and Health Ministry of Health and Family Welfare Government of India, New Delhi. 2005; pp. 265–274.*

(45) *World Health Organization. Health Topics: Global Burden of Disease. http://www.who.int/topics/global_burden_of_disease/en/. Date last accessed: March 28, 2016*

(46) *Lopez AD, Shibuya K, Rao C, et al. Chronic obstructive pulmonary disease: current burden and future projections. Eur Respir J 2006; 27: 397–412.*

(47) *Salvi S, Apte K, Madas S, et al. Symptoms and medical conditions in 204912 patients visiting primary health-care practitioners in India: a 1-day point prevalence study (the POSEIDON study). Lancet Glob Health 2015; 3: e776–e784*

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ANNEXURES

Annexure - a

List of villages with population

Sr. No.	Name of village	Male population	Female population	Total population
1	Baniyadih	552	558	1110
2	Bitkula	1924	1755	3679
3	Darrabhatha	2010	1672	3682
4	Davandih	281	258	539
5	Deori	1623	1412	3035
6	Dhayaniya	1041	940	1981
7	Gatoura	4966	4616	9582
8	Gudi	2059	1853	3912
9	Janji	1840	1726	3566
10	Karra	560	511	1071
11	Kaudiya	2007	1920	3927
12	Khamhriya	1035	998	2033
13	Khanda	534	552	1086
14	Kukda	492	1857	2349
15	Lutra	1380	1261	2641
16	Madai	1288	1197	2485
17	Nirtu	1050	1180	2230
18	Pandhi	2350	2227	4577
19	Parsahi	518	465	983
20	Pipranar	377	348	725
21	Raliya	1080	918	1998
22	Rank	1658	1484	3142
23	Sipat+Navadih	3667	4439	8106
24	Udangi	1181	1122	2303
25	Uslapur	188	155	343
26	Khaira	1355	1314	2669
27	Jhanjh	515	499	1014
28	Newsa	1480	1319	2799
29	Ratija	1183	1079	2262
30	Renki	1902	1754	3656
31	Sirkikhurd	884	961	1845
32	Sirli	1253	1146	2399
33	Utrada	3213	2947	6160
34	Hardivishal	1005	826	1831
	Total	48,451	47,269	95,720

Annexure - b

Research team

- Dr. Hemlata Thakur
  (Principle Investigator)
  Professor & HOD
  MBBS MDFCGP
- Dr. Vivek Sharma
  (Co-Investigator)
  Assistant Professor
  MBBS MD
- Dr. Shailesh Kawale
  (Co-Investigator)
  Assistant Professor
  MBBS MD PGDMCH
- Dr. Vijay Kumar Manwani
  Associate Professor
  MBBS MD
- Dr. Sachin Pandey
  Assistant Professor (Biostatistician)
  MSc PhD
- Dr. Ashish Bahgel
  Assistant Professor
  MBBS MD
- Dr. Suchita Singh
  Assistant Professor
  MBBS MD
- Dr. Smita Verma
  Assistant Professor
  MBBS MD
- Dr. Anmol Minz
  Demonstrator
  MBBS MD
- Dr. K. C. Nathani
  Demonstrator (MBBS)
- Dr. Madhu Saxena
  Demonstrator (MBBS)
- Dr. Neelu Kashyap
  LMO-RHTC (MBBS)
- Dr. Bhavna Pandey
  PG Student (MBBS)
- Dr. Vineeta Rawate
  PG Student (MBBS)

- Abida Begam
  Lab technician (B Sc. DAP)
- Suman Gupta
  Lab technician (12th pass. DMLT)
- Vishwmitra Kashyap
  Lab technician (M Sc. DAP. PGDCA)
- Pravin Kumar Ekka
  Attendant (MA.)
- Prabha Singh
  Attendant (B Sc)

Interns

- Rajrishi Yadav
- Tripti Singh
- Balram Rohidas
- Dilip Ghodki
- Shailendra Sahu
- Subham Mishra
- Gaurav Singh
- Nameesh Banjare
- Trijeshwar Debbarma
- Vivek Mittal
- Smita Khushwaha
- Astha Chandravanshi
- Shrijan Adil
- Sandeep Dangi
- Rahul Hirdhar
- Ajit Lakra
- Nandkishor Tandon

Annexure - c

Consent Form

सहमति पत्र

मैं स्वयं / पालक.....उम्र.....लिंग.....पता.....

.....मकान.नं.....गांव.....ब्लॉक.....जिला.....

सहमति देती / देता हूँ कि मैं अपनी पूरी इच्छा के साथ अनुसंधान कार्य में भाग लेने के लिए सहमत हूँ। इससे होने वाले लाभ या नुकसान की पूर्ण जानकारी दी गई हैं। मेरी व्यक्तिगत परिचय को पूर्णतः गोपनीय रखी जायेगी और अन्य जानकारी को केवल अनुसंधान के लिए ही उपयोग में लाई जायेगी।

हस्ताक्षर

स्वयं / पालक

For official use only

FINAL REPORT OF NTPC FUNDED PROJECT (2018-19)

on

"Preliminary Studies on Impact of Coal Dust on Soil, Crop and Tree Species due to Open Wagon Coal Transportation"

By

Dr. J. R. Patel, Dr. A.K. Awasthi, Ajeet Williams, Dr. Geet Sharma, P. K. Keshry, Dr. (Smt.) Yushma Sao and Dr. N.K. Chaure

INDIRA GANDHI KRISHI VISHWAVIDYALAYA

BTC COLLEGE OF AGRICULTURE AND RESEARCH STATION

SARKANDA, BILASPUR – 495001

(CHHATTISGARH)

Final Report of NTPC Funded Project

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"Preliminary Studies on Impact of Coal Dust on Soil, Crop and Tree Species due to Open Wagon Coal Transportation"

INDIRA GANDHI KRISHI VISHWAVIDYALAYA

BTC COLLEGE OF AGRICULTURE AND RESEARCH STATION

BILASPUR -495001 (CHHATTISGARH)

FOREWARD

Agricultural crops, soil, water, air, different herbs, shrubs, trees and forest vegetations are affecting due to various pollutants present in environment. Out of different pollutants, coal dust is one of them, which may be beneficial / harmful to agriculture sector. Information pertaining to the impact of coal dust on soil, crop and tree species due to open wagon coal transportation is not available at this juncture. Further, in view of the increasing dependence on coal fired power plants as energy source during coming decades, and the environmental problems related to this developmental activity, the present work was planned in Sipat industrial area situated in Bilaspur district of Chhattisgarh, which is transported coal by railway wagon from Dipika mines of South Eastern Coalfields to NTPC, Sipat, Bilaspur (C.G.).

The report presented in this publication is a result of hard work of the research team of the BTC CARS, Bilaspur. In this project report, a sincere attempt is made to cover the different issues related to coal transportation by Sipat plant through Merry Go Round rail track. However, there may be some imperfections and mistakes.

To better understanding and simplification of the results, project report is presented in 11 chapters' viz., abstract, introduction, basic information of coal transportation work, objectives of the study, selection of experimental area, methodology, results and discussion, summary, conclusions and suggestions for future.

I would like to express my appreciation to the scientists of the IGKV, BTCCARS, Bilaspur and Department of Soil Science & Agriculture Chemistry, COA; Raipur who actively participated in the project to complete the job, withought their help this research work could not be possible. I wish to record my grateful thanks to Dr R. K. Bajpai, (Director of Research, IGKV, Raipur) and Dr. R.K.S. Tiwari (Dean, CARS, Bilaspur) for technical supports, timely guidance and suggestions in the investigation. I also thankful to Department of Environment Management of Super Thermal Power Station (NTPC Limited) Sipat (Bilaspur) for their cooperation throughout the project period.

Place --- **Bilaspur**
Dated ---

(JAGAT RAM PATEL)
PRINCIPAL INVESTIGATOR

CONTENT

####

ABSTRACT

The study entitled **"Preliminary studies on impact of coal dust on soil, crop and tree species due to open wagon coal transportation"** were undertaken by the Indira Gandhi Agriculture University, Barrister Thakur Chhedilal College of Agriculture and Research Station , Sarkanda, Bilaspur (Chhattisgarh) during 2018-19 crop season.

Rice crop cultivated under the study area indicated that the plant height, number of panicles, number of filled grains as well as grain and straw yields showed significant variation under distances from 10 to 1500 m of Merry Go Round (MGR) rail line. The grain yield obtained in 10 m distance was significantly lower than the yield obtained under 500, 1000 and 1500 m which were at par with each other. Straw yield of rice was also followed similar trends of the grain yield. Distribution of light textured soil nearby railway track and moderate to heavy textured soil at 1000 m and 1500 m away from railway track might be reason of variation in the crop yield. However, results are based on preliminary study and only one season data. To draw any conclusion, research work needs further confirmation through multi-season experimentation.

The silt and sand content of the soil were more near Merry Go Round (MGR) railway line *i.e.*, at 10 m distance than far distance i.e., control site (1500 m). Soil bulk density was observed more at closer site of the MGR line (10 m) while porosity percentage was low at that point. The available Nitrogen, phosphorus, potassium, sulphur, boron, iron, magnesium, copper and zinc contents were higher at closer site (10 m distance) as compare to the control site (1500 m distance). Similarly, the soil microbial biomass carbon and colony farming unit of bacteria, fungus and actinomycetes were higher at 10 m distance. The very labile and labile fractions of the carbon were also higher at 10 m site. The forest zone had more microbial population along with the organic carbon percentage, soil microbial biomass carbon, fractions of carbon (very labile, labile and less labile carbon) and available nitrogen than the other zones

while cropped zone had more micronutrients than the other zones of the Merry Go Round railway line. However, heavy metals contents (cadmium, chromium, cobalt, nickel, lead and arsenic) did not showed regular trend under the first year study. The soil parameter pH found under neutral condition. The content of organic matter, available potassium and available sulfur were recorded medium in category. But available N status was under low category. The available P content was low to medium status. Further, the available Iron and Manganese observed towards higher value.

A reconnaissance survey of the vegetation was carried out around the MGR Railway track and inventory with floristic composition of plants was prepared. The vegetation analysis was done at 16 sites located at varying distances from the point source of pollution in the prevailing wind direction with the help of quadrates. During the course of study period, there was no well marked change in the species composition. The atmospheric pollutants can affect both the stability and the productivity of plant ecosystem. The estimates clearly indicated that the resistant species have occupied more space at the polluted sites, whereas the relatively sensitive plants are more at the sites far away from the source of pollution. Such changes have influenced the stability of sensitive plant species in the herbaceous community. Although the present study is preliminary in nature and need more detailed and exhaustive studies are called for.

INTRODUCTION

Sipat Super Thermal Power Station (Rajiv Gandhi Super Thermal Power Station) is located about 20 km away from Bilaspur head quarter on Bilaspur to Balouda road at Sipat village in Bilaspur district of Chhattisgarh State. The power plant is one of the coal based power plant of National Thermal Power Corporation (NTPC) Limited (A Government of India Enterprises). The coal for the power plant is sourced from Dipika mines of South Eastern Coalfields Limited. Coal transportation through Merry Go Round (MGR) rail line of Sipat to Dipika was started on 31st January, 2009. The project has an installed capacity of 2980 Mega watt (MW) consisting of two stages, stage one which got commissioned later was of 3 units of 660 MW each involving super-critical boilers technology and stage two consisted of 2 units of 500 MW.

National Thermal Power Corporation (NTPC) Sipat

BASIC INFORMATION OF COAL TRANSPORTATION WORK

Some basic information relating to coal transportation through MGR rail line as obtained from NTPC staff is given in Table -3. 1 below:-

Table – 3.1: Details of train and wagon used for coal transportation from Dipika to Sipat.

S. No.	Parameter	Details
1	Train speed (range)	20 – 40 km hr^{-1}
2	Train speed (average)	25 km hr^{-1}
3	Train trips (day)	15 – 16
4	Train trips (average/day)	14 – 15
5	Total cars in train	58 wagons
6	Wagon capacity /car	60-70 MT
7	Actual loading (weight) in car	62- 63 MT
8	Train timing	24 hrs
9	Wagon type Sipat/Rail	BOBR/BOXN
10	Coal size in wagon	200 mm

OBJECTIVES OF THE STUDY

The present work was planned in Sipat industrial area around the Merry Go round rail line situated in Bilaspur district of Chhattisgarh, India, as per following specific objectives:

1 Enumeration of crop and cropping pattern, soil properties, forest vegetation and tree species present in the study area.

2. Evaluation of the quantity of coal deposition in soil and plants due to transportation of coal on quarterly basis after monsoon rain

3 Determination of the effects of pollutants on different tree species present at study area

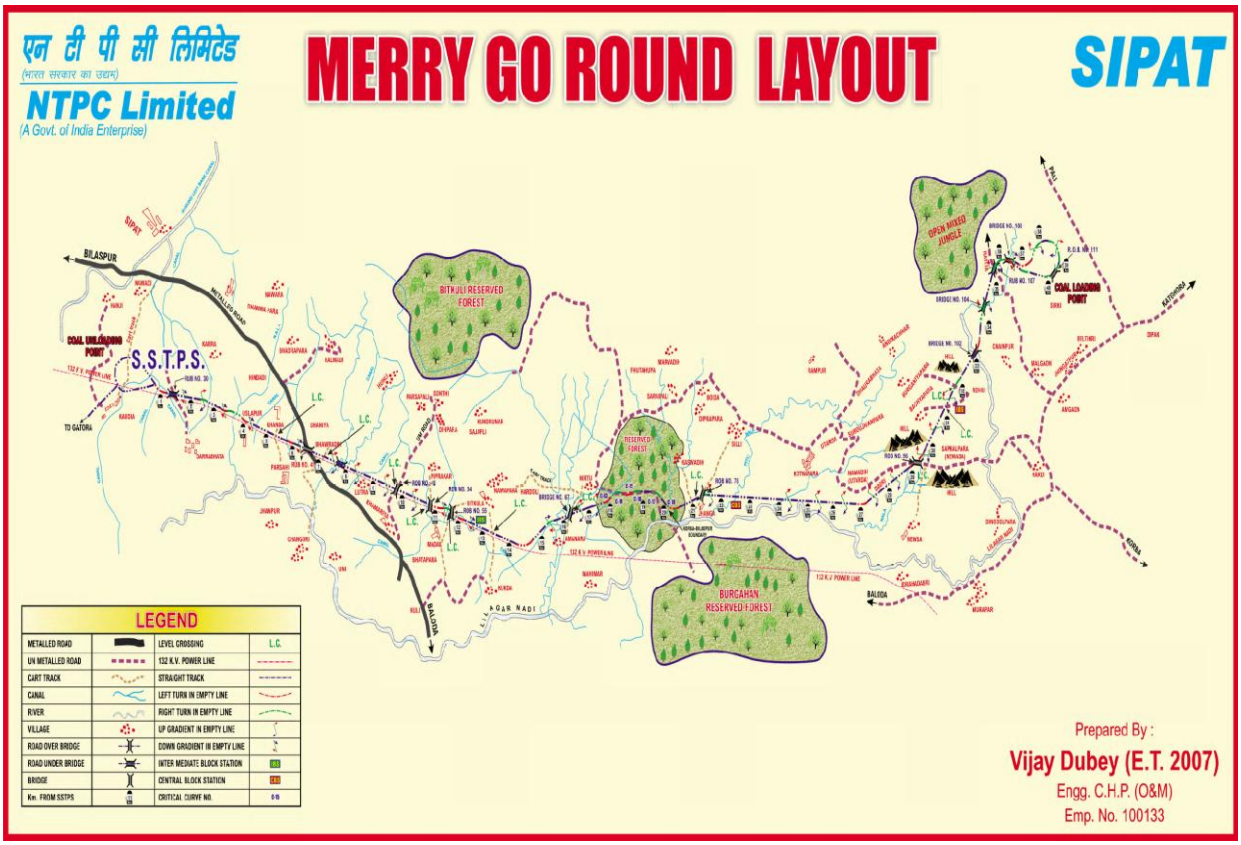
4 Physico-chemical analysis of soil and major plants grown/available in the study area

5. To create awareness among the farming community about the effect of coal dust in agriculture and forest trees species by the brochure/ pamphlet/ Kisan Goshthi/Farmer's Scientist interaction and/or Kisan Mela.

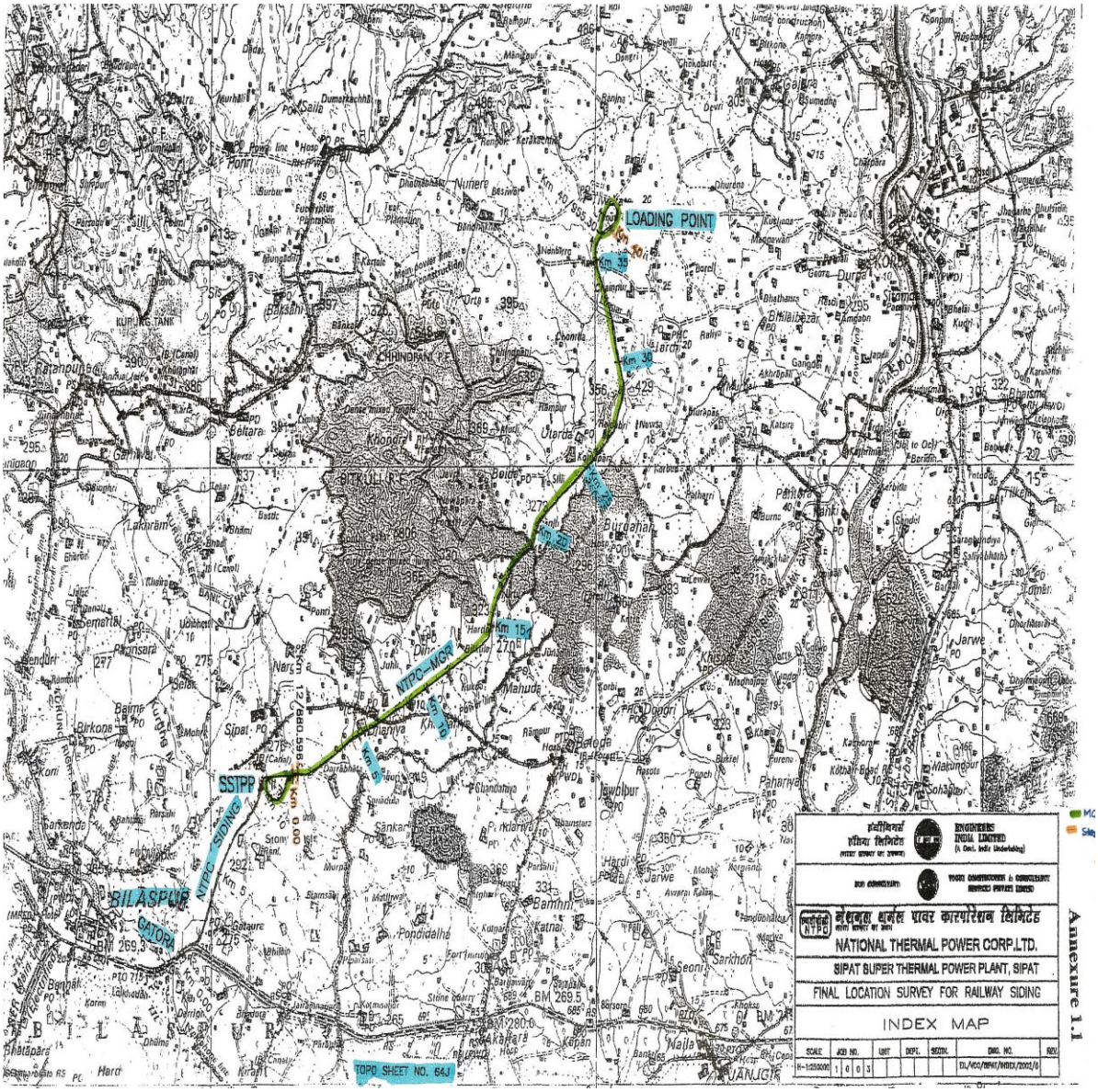
SELECTION OF EXPERIMENTAL AREA

On the basis of visual observation of 40 km long Merry Go Round (MGR) rail line from coal unloading point, Sipat to coal loading point, Dipika, three sites were selected for the purpose of study. The first point is named as crop area / zone which are situated in between 5 to 6 km away from SSPT, Sipat on MGR line. Area is only rice zone and covered Khanda & Parsahi villeges in right side while, villages Baniyadih & Juhali are situated in left side of MGR rail line. Second site is a reserved forest area / zone of village Nirtu spread over the both side of rail line in between Amanara (16 km) and Jhanga (21 km) villages. Newsa area (29 to 30 km) near village Renki (32 km) is the third spot, termed as mixed area / zone having fallow area & bushy plants in left side and fallow land as well as rice fields in right side of the MGR line.

Photograph of Study Site



MGR Rail Line SSPT, Sipat to Coal Loading Point Dipika



Sipat Topo - Sheet Map

COAL COMPOSITION

The coal sample analysis report obtained from CIMFR, Dhanbad provided by NTPC, Sipat indicated that coal ash contains 65.00, 26.80, 3.29, 1.90, 0.60, 0.63, 0.38, 0.31, 0.04 and 1.04 per cent oxide of silica, aluminum, ferrous, titanium, calcium, magnesium, phosphorus, sulphur, sodium and potassium, respectively. Report is given below:-

CENTRAL INSTITUTE OF MINING AND FUEL RESEARCH, BILASPUR UNIT
27 Kholi Chowk, Mungeli Road. P.Box-41. Bilaspur (C.G.) 495001
दूरभाष : 07752-271450, 271581-87, 411328, फैक्स : 07752-271450

परीक्षण प्रतिवेदन

Report No.15/P/78(A)

Method used :Proximate(ASTM-D7582),GCV(ASTM-D5865),HGI(ASTM-4433),TS(ASTM-D4239-05)&AFT(ASTM-D5373-02),Rigaku ZSX Primus XRF

Date of performance of the test : 01.10.2015 to 14.10.2015

Measurment Uncertainty on 95% Confidence Level

Sampling procedure : Sampling not done by CIMFR Staff.

Vm=± 1.27%, Ash= ± 0.92%, CV=±66Kcal/Kg, S=±0.13%

Statement of analysis in respect of 01 coal sample received on 19.08.2015 from

ST=±36°C HT=±37°C FT=±45°C

The AGM(Chemistry), NTPC/Sipat, Dist: Bilaspur(C.G)

(for dry basis)

Vide letter no. O&M/Chem./2015-16/NIL Dated. 19.08.15

Sl. no.	CIMFR N CIMFRB/ 15-16/P/	Party Sample No.	Wt. In gms	Size Passing	On 60 % RH & 40oC Moist. %	Ash %	VM %	FC %	GCV kcal/kg	HGI
1	502	STAGE#1 FEEDER COAL-30.07.2015	4650	6mm	6.48	30.48	27.56	35.48	4786	69

Ash Fusion Temperature

DT(°C)	ST(°C)	HT(°C)	FT(°C)
1426	>1450	>1450	>1450

Ash Analysis

SiO_2 %	Al_2O_3 %	Fe_2O_3 %	TiO_2 %	CaO %	MgO %	P_2O_5 %	SO_3 %	Na_2O %	K_2O %
65.00	26.80	3.29	1.90	0.60	0.63	0.38	0.31	0.04	1.04

Note: Results of Ultimate Analysis will be communicated as soon as possible.

F.N : 1) This is only a test report and results relate only to the items tested.

2) The report shall not be reproduced except in full without the approval of the lab.

Officer-In-Charge
CIMFR Bilaspur Unit.

METHODOLOGY

(A) Experimental Crop Cultivation:

Study was conducted at crop area / zone during kharif season of 2018 under Randomized Block Design with five replications nearby Merry Go Round railway line of 40.00 km length from Sipat to Dipika. Both sides of rail line, 03 sub stations were marked at 0 m (near rail line, 10 m away), 500 m and 1000 m distance as treatment area and beyond 1000 m area was treated as control zone (1500 m) for crop cultivation.

Rice variety Indira Rajeshwari (IGKVR-1) a medium duration (125 days) was taken as test crop in the crop zone/ area of Merry go round rail line of Sipat to Dipika. Variety is a high yielder (46.96 – 51.88 q ha^{-1}), which is suitable for irrigated as well as rainfed areas of medium to heavy soils (Dorsa and Kanhar) of Chhattisgarh. Crop was fertilized @ 80:50:30 kg ha^{-1} nitrogen: phosphorus pentaoxide: potassium oxide, respectively. A seed rate of 70 kg ha^{-1} was used. The details of kharif rice cultivation are given in table -7.1 and 7.2 as below:

Table – 7.1: Details of farmers under NTPC Sipat project in Bilaspur district (Kharif-2018).

SN	Farmers Name (Mr / Smt)	Father / Husband Name (Mr / Smt)	Village	Post	District	Aadhar No	Mobile No
Right hand side of MGR rail line - Sipat to Dipika (0, 500,1000 and 1500 meter distance ,respectively)							
1	Shyamlata	Arjun Lal Patanwar	Usalapur	Dhania	Bilaspur	716357075995	8889850738
2	Sant Ram	Kaleshwar	Parsahi	Dhania	Bilaspur	759000291807	7610685671
3	Nageshwari Patel (Ashok Patanwar)	Dampat Lal Patel	Raj Kishore Nagar	Lingiyadih	Bilaspur	323953995526	9926159487
4	Bihanu Singh (Ram lal)	Jhanglu Singh	Parsahi	Dhania	Bilaspur	720925224683	9753817678
Left hand side of MGR rail line - Sipat to Dipika (0, 500,1000 and 1500 meter distance respectively)							
1	Raghwendra Kashyap	Gangaram Kashyap	Baniyadih	Dhania	Bilaspur	531453200448	9753360564
2	Manohar Singh (Rameshwar)	Tijram	Baniyadih	Dhania	Bilaspur	560907145443	8223853518
3	Ramadhar Vishwakarma	Meluram Vishwakarma	Baniyadih	Dhania	Bilaspur	841739986553	9685886911
4	Daduram Neti (Hejpal / Gajpal)	Ghansay Neti	Juhli	Sonthi	Bilaspur	917157702697	9753408616

Table – 7.2: Details of farmers fields under NTPC Sipat project in Bilaspur district (Kharif-2018).

S. N.	Name (Mr / Smt)	Name Father/ Husband (Mr / Smt)	Village/Pat H No/ Revenue area	Field - Khasara No.	Field area (Decimal)	Date of Nursery	Date of transplanting
Right hand side of MGR rail line - Sipat to Dipika (0, 500,1000 and 1500 meter distance respectively)							
1	Shyamlata	Arjun Lal Patanwar	Khanda / 06/ Sipat	286/2	50.0	16.06.2018	10.08.2018
2	Sant Ram	Kaleshwar	Parsahi/ Sipat	69	90.0	03.07.2018	07.08.2018
3	Nageshwari Patel (Ashok Patanwar)	Dampat Lal Patel	Parsahi/ 00014 / Sipat	75/2	50.0	04.07.2018	09.08.2018
4	Bihanu Singh (Ram lal)	Jhanglu Singh	Parsahi/ 36 / Sipat	282/21	15.0	30.06.2018	10.08.2018
Left hand side of MGR rail line - Sipat to Dipika (0, 500,1000 and 1500 meter distance respectively)							
1	Raghwendra Kashyap	Gangaram Kashyap	Baniyadih	588/2	40.0	02.07.2018	29.07.2018
2	Manohar Singh (Rameshwar)	Tijram	Baniyadih/14 / Sipat	101 & 102	40.0	24.06.2018	25.07.2018
3	Ramadhar Vishwakarma	Meluram Vishwakarma	Baniyadih/14 / Sipat	416	15.0	01.07.2018	04.08.2018
4	Daduram Neti (Hejpal/Gajpal)	Ghansay Neti	Juhli/ 21 / Sipat	1151/2	50.0	26.06.2018	03.08.2018
Total					350.0 Decimals (3.50 Acres) or 1.40 Hectares		

(B) Soil Properties in Study Area

Soil samples were collected from the study area (crop zone / area, forest zone / area and mixed fallow land / zone on transportation MGR rail line) and analysis were undertaken for its physicochemical (soil texture, bulk density, particle density, porosity percentage, soil pH, electrical conductivity, organic carbon percentage, available nutrients viz., N, P, K, S, Fe, Mn, Cu, Zn, B as well as heavy metals *viz*., Cd, Cr, Co, Ni, Pb and As as well as biological population of bacteria, actinomycetes and fungi; soil microbial biomass carbon and carbon fractions *i.e*., very labile, labile, less labile and non-labile properties at Soil Science laboratory, BTCCARS, Bilaspur (CG) and Department of Soil Science & Agriculture Chemistry, IGKV, College of Agriculture, Raipur (CG). Data were statistically analyzed under three factors

Factorial Randomized Block Design with three replications. Twenty four combinations of treatments were considered under study as 03 locations (crop zone / area, forest zone / area and mixed fallow land / zone), 02 directions (left and right side of MGR line) and 04 distances (0, 500, 1000 and 1500 m) in width from 10 m away of rail line for soil analysis. Soil samples were taken around the studied area (railway line) before sowing of rice crop at crop zone, forest zone and mixed zone, termed as initial soil sample and after the harvest of crop in respective areas, termed as final soil sample for study purposes. Some laboratory equipments used during the course of investigation are given below:-

pH meter for soil analysis

EC meter for analysis of electrical conductivity in soil

Digestion of soil for heavy metal analysis by microwave digestion system

Analysis of heavy metal in soil by inductively coupled plasma optical emission spectroscopy

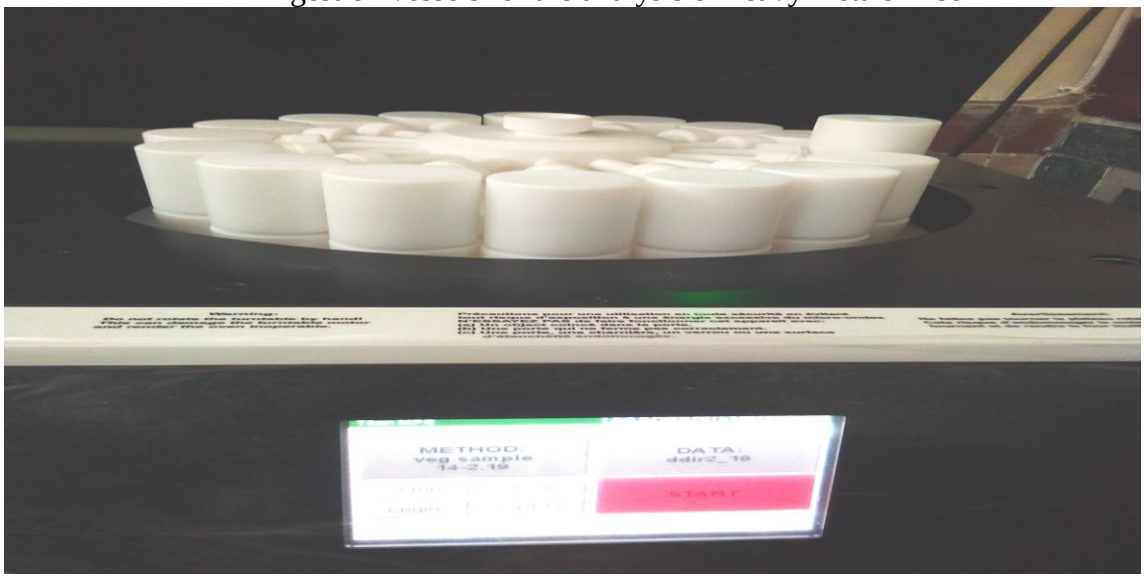
Inductively coupled plasma mass spectroscopy for heavy metal analysis

Soil available phosphorus determination by spectrophotometer

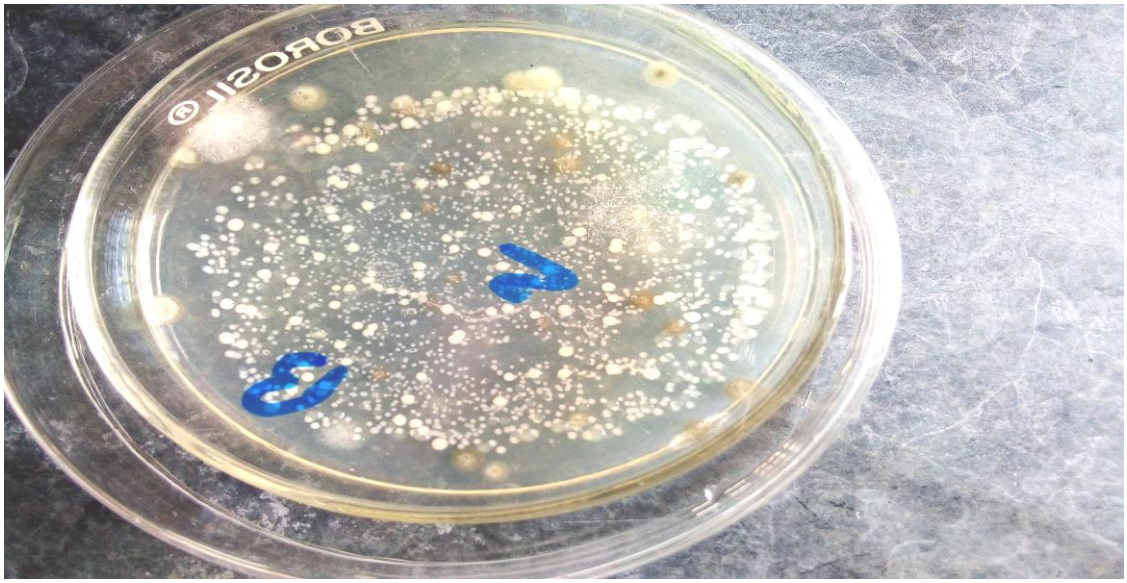
Soil available Nitrogen determination in Nitrogen Distillation Unit

Soil available potassium determination by flame photometer

Digestion vessels for the analysis of heavy metals in soil



Microwave digestion system



Bacterial colonies in plate

Serial dilution and inoculation of the soil sample for microbial growth

Analysis of micronutrient by Atomic absorption spectroscopy

(c) Forest Vegetation and Tree Species:

A reconnaissance survey of the vegetation was carried out around the MGR and inventory with floristic composition of plants present was prepared. The vegetation analysis was done at twenty four sites located at varying distances from the point source of pollution in the prevailing wind direction with the help of quadrates. At each site, the quadrates were laid out randomly and the presence and absence of species in each quadrate were noted. In view of determination of the effects of pollutants on different tree species present at study area, sampling stations were established in three locations in both the side of MGR at four distances. Thus, there were twenty four grid points at a distance of 0, 500, 1000 and 1500 m from the centre in each direction. Except at the centre, in each grid point vegetation survey was conducted by quadrate method. At the centre, survey was conducted in the area between 0 to 25 m in each direction. Morphology of leaves was studied to assess the foliar damage due to pollution.

RESULTS AND DISCUSSION

The results obtained on various parameters of crop, soil and forest vegetation during the course of investigation entitled "**Preliminary studies on impact of coal dust on soil, crop and tree species due to open wagon coal transportation"** are presented objective wise in this chapter :-

Objective 1. Enumeration of Crop and Cropping Pattern, Soil Properties, Forest Vegetation and Tree Species Present in the Study Area

(A) Crop and Cropping Pattern:

Chhattisgarh state is known as rice bowl where paddy, maize, pigeonpea, blackgram, greengram, soybean, til, ramtil, groundnut, sunflower, kodon, kutki, ragi etc. crops are grown during monsoon season depending on soil type, soil situation, climatic zone and irrigation facility. Similarly, availability of irrigation water, condition of soil moisture, suitability of crop & variety, facility of animal protection etc., in some part of state winter cropping (rice, wheat, gram, lentil, linseed, pea, lakhdi safflower, sunflower etc.) are also practiced.

Site selected for study areas *i.e.*, in crop zone and mixed area, only rice is grown during kharif season under mono cropping system due to rain fed area and cultivation of long duration paddy varieties (more than 130 days). Lack of sufficient canal irrigation water and problems of stray animals in the selected area, in general rabi cropping is not practiced and economical.

Table – 8.1: Preliminary study on rice crop in farmer's field under NTPC project study, Sipat (Kharif-2018).

Tr No	Treatment detail	Number of Hills (m^{-2})	Plant height (cm)	Number of total tillers (m^{-2})	Number of panicles (m^{-2})	Length of panicle (cm)	Number of total grains ($panicle^{-1}$)	Number of filled grains ($panicle^{-1}$)	Test weight (g)	Grain yield (q ha^{-1})	Straw yield (q ha^{-1})
A	**Side from railway track**										
1	Right Side	34.0	118.30	137.30	124.25	22.99	170.65	136.20	28.18	40.015	43.335
2	Left Side	32.6	116.95	138.75	125.75	23.64	172.50	135.25	28.11	41.185	44.270
	CD (5 %)	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
B	**Distance from railway track**										
1	0 m	32.5	**108.50**	131.60	111.70	22.53	162.50	120.60	27.99	36.860	38.630
2	500 m	32.8	**115.80**	136.70	**126.90**	23.24	168.50	**137.90**	28.09	**40.960**	**44.600**
3	1000 m	33.7	120.40	139.70	**128.80**	23.49	174.70	**140.40**	28.26	**41.960**	**45.710**
4	1500 m	34.2	125.80	144.10	**132.60**	24.00	180.60	**144.00**	28.26	**42.620**	**46.270**
C D (5 %)		**NS**	**8.99**	**NS**	**10.93**	**NS**	**NS**	**11.30**	**NS**	**3.65**	**3.74**
C V (%)		12.77	8.35	9.88	9.55	10.19	9.62	9.10	1.40	9.82	9.34

Results:

Study on rice crop under the study area indicated that all the rice parameters (number of hills, plant height, number of total tillers, number of panicles, length of panicle, number of total grains, number of filled grains, test weight, grain yield and straw yield) did not reached to the level of significance under left and right sides /directions of Merry Go Round rail line (Table – 8.1).

The plant height, number of panicles, number of filled grains as well as grain and straw yields showed significant variation under distances from 0 m to 1500 m of Merry Go Round rail line (Table – 8.1). Plant height observed value at 0 m distance was significantly lower as compared to 1000 and 1500 m distance, however, with no significant difference with 500 m distance. Recorded values of panicles and filled grains under 500, 1000 and 1500 m distances are statistically at par but higher than 0 m distance. The grain yield obtained in 0 m distance was significantly lower than the yield obtained under 500, 1000 and 1500 m which were at par with each other. Straw yield of rice was also followed similar trends of grain yield. Rest of the rice characters *i.e.* number of hills, number of total tillers, length of panicle, number of grains and test weight did not show any significant differences.

Distribution of light textured soil nearby railway track and moderate to heavy textured soil at 1000 m and 1500 m away from railway track (table – 8.2) might be reason of variation in the crop yield. In general yield of a crop is depends on number of factors in production system. Out of them, sowing method, time of sowing, variety, plant population, plant protection, plant physiological activities, soil type and its fertility, water and fertilizer management, deposition of pollutants *i. e.*, coal on plant surface etc are main factors. These factors may be also attributed in the present study. However, results are based on preliminary study and only one season data. To draw any conclusion, research work needs further confirmation through multi-season experimentation.

Survey on Insect-Pest and Disease:

The survey on insect pests and diseases in the farmers' rice crop as a major kharif crop in the selected study area, denoted their population / incidence below economic injury level (stem borer < 5 %, leaf folder < 1 - 2 freshly damaged leaf / plant, white backed plant hopper <10 - 20 insects / plant etc and bacterial leaf blast < 5 % disease severity) . Hence, indicated no significant effect on the rice yield.

Photographs of Experimental Rice field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Barrister Thakur Chhedilal College of Agriculture and
Research Station, Bilaspur -495001(C G)
A Project
on
"Preliminary Studies on Impact of
Coal Dust on Soil, Crop and Tree Species du
Open Wagon Coal Transportation"
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(B) Soil type of the area

Texture of the soil

Soil textural classifications of different locations are given in table - 8.2. In crop zone of location - 1, the silty clay and clay soil were found in right side and left side of the railway track, respectively. In forest zone (location - 2), sandy clay loam to silty clay soil was observed in right side and sandy clay loam to clay soil in left side. However, mixed zone (location – 3) had sandy clay, sandy loam and sandy clay loam in right side and sandy clay, sandy clay loam and sandy loam soil were found in left side of the MGR rail track.

Table – 8.2: The textural classification of soil of the study sites of MGR rail track.

Treatments	Direction	Distance	Relative percentage of soil particles			Textural class
			Sand	Silt	Clay	
Location- 1 (cultivated / crop land)	Right side from railway track (Khanda and Parsahi)	0 m	33.44	20.8	45.76	Silty Clay soil
		500 m	26.4	13.8	59.8	
		1000 m	24.52	31.08	44.4	
		1500 m	39.24	21.7	39.06	
	Left side from railway track (Baniyadih and Juhali)	0 m	47.68	17.44	34.88	Clay Soil
		500 m	31.20	30.10	38.70	
		1000 m	23.84	31.36	44.80	
		1500 m	35.04	18.56	46.40	
Location -2 (forest land)	Right side Nirtu forest	0 m	62.92	12.36	24.72	Sandy Clay Loam
		500 m	57.32	12.80	29.87	
		1000 m	33.40	26.64	39.96	Silty Clay Soil
		1500 m	52.61	17.23	30.15	Sandy Clay Soil
	Left side Nirtu forest	0 m	65.85	08.53	25.60	Sandy Clay loam
		500 m	32.16	29.68	38.16	Clay Soil
		1000 m	47.92	17.36	34.72	
		1500 m	53.44	16.92	29.62	Sandy clay loam

Location -3 (mixed land)	**Right side Newasa area**	**0 m**	57.00	12.90	30.10	Sandy clay Soil
		500 m	66.08	8.48	25.44	
		1000 m	68.16	11.94	19.90	Sandy loam Soil
		1500 m	57.20	17.12	25.68	Sandy Clay Loam
	Left side Newasa area	**0 m**	71.16	8.24	20.60	Sandy Clay Soil
		500 m	59.00	16.40	24.60	Sandy Clay Loam
		1000 m	58.52	12.44	29.03	
		1500 m	71.24	12.31	16.43	Sandy Loam Soil

(c) Forest Vegetation and Tree Species:

There was no well marked change in the species composition. In general, the number of individuals and species increased with increasing distance from source. Table – 8.3 to 8.6 show the plant species at different study sites during rainy and winter seasons, respectively. The plant species like, *Cassia tora*, *Cynodon dactylon* and *Dichanthium annulatum* were more dominant in the close of the source. On the other hand dominant plant species e.g. *Achyranthes aspera*, *Convolvulus pluricaulis*, *Desmodium triflorum* etc. were more or less uniformly distributed. However, *Paspalidum flavidum*, *Phyllanthus simplex*, *Rungia repens* etc, were more dominant at distant places.

Diversity of the each species was more in rainy season which is quite natural. It is observed that the resistant species have occupied more space, whereas the relatively sensitive plants are more at the sites far away from the source. The successful survival of a species in the areas may be due to adequate biomass formation and their suitable structure, ability to survive and reproduce under the stress condition. The sensitive plants have been show impaired growth under polluted environment, leading to injury and death of the tissues. The absence of sensitive species in the area, results in decreased diversity and richness of species.

Table – 8.3: Trees at different sites of MGR track [Presence (+) and absence (-)]

Plant Species	Location – 1								Location - 2								Location – 3							
	Right Side				Left Side				Right Side				Left Side				Right Side				Left Side			
	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 M	1500 m
Acacia nilotica	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Aegle marmelos	+	+	+	+	-	-	+	+	+	-	+	+	-	-	+	+	-	+	+	+	-	-	+	+
Ailanthus excels	+	+	-	+	-	-	+	+	+	-	-	+	+	+	+	+	+	+	-	+	-	-	+	+
Artocarpus heterophyllus	-	-	+	+	-	-	+	+	+	-	+	+	+	-	+	+	-	-	+	+	-	-	+	+
Azadirachta indica	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+
Boswellia serrata	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	+	-	-	-	+	-	-	-	+
Butea monosperma	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Diospyros malnoxylon	-	-	-	+	-	-	-	+	-	-	+	+	-	-	+	+	-	-	-	+	-	-	-	+
Emblica officinalis	-	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Ficus bengalensis	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Ficus religiosa	-	+	-	+	-	+	+	+	-	-	+	+	-	+	+	+	-	+	-	+	-	+	+	+
Hardwickia binata	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	+	-	-	-	+	-	-	-	+
Lagerstroemia parviflora	-	-	-	-	-	-	+	+	-	+	+	+	-	+	+	+	-	-	-	+	-	-	+	+
Madhuca indica	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mangifera indica	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pongamia pinnata	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Syzygium cuminii	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Shorea robusta	-	-	-	-	-	-	-	-	-	+	+	+	-	+	+	+	-	-	+	+	-	-	+	+
Tamarindus indica	+	-	-	+	+	-	+	+	-	-	-	+	+	-	+	+	+	-	-	+	+	-	+	+
Terminalia arjuna	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
T. tomentosa	-	-	-	+	-	-	+	+	-	+	+	+	-	+	+	+	-	-	+	+	-	-	+	+

Table – 8.4: Shrubs at different sites of MGR track [Presence (+) and absence (-)]

Plant Species	Location – 1								Location - 2								Location – 3							
	Right Side				Left Side				Right Side				Left Side				Right Side				Left Side			
	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m
Abutilon indicum	-	-	-	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+
Argemone maxicana	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cassia occidentalis	+	+	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+
Croton bonplandianum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Crotalaria sericea	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
C. retusa	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-
Calotropis procera	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
C. gigantia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Clitoria annuna	-	+	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+
Datura metal	+	+	+	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+
Euphorbia nerifolia	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Ipomoea carnea	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Lantana camara	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Nyctanthes arbortristis	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Sida rhombifolia	+	+	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Solanum xanthocarpum	+	-	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+
Smilex macrophylla	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Tabernamontina coronaria	-	+	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+
Tephrosia purpurea	+	-	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+
Xanthium strumarium	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xanthium spinubesia	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+

Table – 8.5: Herbs at different sites of MGR track [Presence (+) and absence (-)]

Plant Species	Location – 1								Location – 2								Location – 3							
	Right Side				Left Side				Right Side				Left Side				Right Side				Left Side			
	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 M	1500 m
Achyranthes aspera	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ageratum conyzoides	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Amaranthus spinosus	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Alternanthera sessilis	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+
Atylosia scarabaeioides	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+
Boerhaavia diffusa	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Blumea mollis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cassia tora	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Celosia argentea	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Convolulus pluricaulis	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Commelina benghalensis	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Cleome viscose	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Crotolaria linifolia	+	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-
Cyperus rotundus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Desmodium triflorum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Eclipta alba	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Euphorbia hirta	+	-	-	+	+	-	+	+	+	-	+	+	+	-	-	+	+	-	-	+	+	-	-	+
Evolvulus alsinoides	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
E. nummularis	-	+	+	+	-	+	-	+	-	+	-	+	-	+	+	+	-	+	+	+	-	+	+	+
Echinops echinatus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fimbristylis cypera	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Indigofera linifolia	+	-	+	+	+	-	-	+	+	-	-	+	+	-	+	+	+	-	+	+	+	-	+	+
Phyllanthus simplex	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Polygonum glabrum	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Phaseolus spp.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rungia elegans	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Rungia repens	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Scoparia dulcis	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+

Setaria glauca	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Sida cordata	-	+	+	+	-	+	-	+	-	+	-	+	-	+	+	+	-	+	+	+	-	+	+	+
Sida cordifolia	-	+	-	-	-	+	+	-	-	+	+	-	-	+	-	-	-	+	-	-	-	+	-	-
Typha angustata	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Tridex procumbens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichodesma spp.	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-

Table – 8.6: Grasses at different sites of MGR track [Presence (+) and absence (-)]

Plant Species	Location – 1								Location – 2								Location – 3							
	Right Side				Left Side				Right Side				Left Side				Right Side				Left Side			
	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 m	1500 m	0 m	500 m	1000 M	1500 m
Apluda mutica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+
Anthranxon ciliaris	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bothriochloea pertusa	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+
Chrysopogon fulvus	-	-	+	+	-	-	+	+	-	-	-	+	-	-	-	+	-	-	+	-	-	-	+	+
Cynodon dactylon	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+
Dactyloctenium aegyptiacum	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Desmostachya bipinnatum	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+
Digitaria sanguilnalis	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+
Dicanthum annulatum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Eragrostis unioloides	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Echinochloea colonum	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Eragrostis tenella	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	+	-	+	-	+	+
E. viscose	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
E. ciliaris	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+
Heteropogon anthephorides	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Paspalidium flavidum	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
Saccharum munja	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	+	-	+	-	+	+
Saccharum spontaneum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Setaria tometosa	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+
S. glauca	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	+	-	-	+	-	-	-	+	+

Objective 2. Evaluation of the Quantity of Coal Deposition in Soil and Plants due to Transportation of Coal on Quarterly Basis after Monsoon Rain

The studies pertaining to objective 2 will be conducted in the forthcoming year.

Objective 3. Determination of the Effects of Pollutants on Different Tree Species Present at Study Area

From the survey carried out, it has been observed that under pollution, defoliation takes place, which is reflected from the physiological observations on plants. Plants in the north and south direction of MGR are affected. There is a reduction in number of species at the nearest point of the railway tract. A reduction is observed in the south and north direction. With the increase of the distance from the central point there is an increase in the number of species. The ground vegetation which are growing outside of the zone are *Achyranthes aspera, Cassia tora, Croton bonplandianum, Echinops echinatus, Indigofera linifolia, Parthenium hysterophorus, Scoparia dulcis, Solanum surattense, Cynodon dactylon, Dactyloctenium aegyptiacum, Eragrostis tenella, Saccharum munja, Dicanthium annulatum, Setaria glauca,* etc. However, these species are rarely found at the nearest point of the railway tract particularly in the north and south directions. Ground vegetation (herbs and grasses) and shrubs seem to be sensitive to pollution as compared to trees, the herbs and grasses being more affected. The leaves with different injury symptoms (Table – 8.9) indicate that pollutants are present in the area throughout the year although in the rainy season their concentrations are comparatively lower.

Herbal species are the susceptible while already established woody species are able to cope up with the pollution although they show some visible injury under stress. It has been observed that *Acacia nilotica, Aegle marmelos, Alianthus excelsa, Azadirachta indica, Butea monosperma, Ficus bengalensis, Ficus religiosa, Pongamia pinnata, Syzygium cuminii* are more resistant to dust as compared to others. These trees may provide a natural sink for air and dust pollution and may be planted on large scale.

Although the present study is preliminary in nature, and need more detailed and exhaustive studies are called for.

Table – 8.7: Observation data of plants in study area (H = High, M = Moderate, IR = Inconsistent Response).

S. No.	Plant Species	Location – 1						Location - 2						Location – 3					
		Right Side			Left Side			Right Side			Left Side			Right Side			Left Side		
		0 m	500 m	1000 m	0 m	500 m	1000 m	0 m	500 m	1000 m	0 m	500 m	1000 m	0 m	500 m	1000 m	0 m	500 m	1000 M
1.	*Acacia nilotica*	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
2.	*Aegle marmelos*	M	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
3.	*Alianthus excelsa*	M	M	IR	M	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
4.	*Artocarpus heterophyllus*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
5.	*Azadirachta indica*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
6.	*Butea monosperma*	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
7.	*Diospyros melanoxylon*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
8.	*Emblica officinalis*	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
9.	*Ficus bengalensis*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
10.	*Ficus religiosa*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
11.	*Hardwickia binata*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
12.	*Lagerstroemia parviflora*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
13.	*Madhuca indica*	M	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
14.	*Mangifera indica*	M	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
15.	*Pongmia pinnata*	M	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
16.	*Syzygium cuminiiIR*	M	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
17.	*Shorea robusta*	M	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR	H	M	IR
18.	*Tamarindus indica*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
19.	*Tectona grandis*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
20.	*Terminalia arjuna*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR
21.	*Terminalia tomentosa*	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR	M	M	IR

Table – 8.8: Number of species at various distances from the MGR track.

Direction	Distance	Tree	Shrubs	Herbs	Grasses	Total
Location – 1 Right Side	0 m	11	12	12	11	46
	500 m	13	18	25	10	66
	1000 m	11	18	29	16	74
	1500 m	17	19	28	18	82
Location – 1 Left Side	0 m	9	12	13	11	45
	500 m	11	15	26	10	62
	1000 m	17	18	28	16	79
	1500 m	18	19	28	19	84
Location – 2 Right Side	0 m	11	12	12	11	46
	500 m	13	15	25	10	63
	1000 m	18	18	29	15	70
	1500 m	21	19	28	19	77
Location – 2 Left Side	0 m	11	12	12	11	46
	500 m	16	15	26	10	67
	1000 m	21	18	29	15	83
	1500 m	21	19	28	20	88
Location – 3 Right Side	0 m	10	12	12	11	45
	500 m	13	15	26	10	64
	1000 m	14	18	29	19	80
	1500 m	21	19	28	15	83
Location – 3 Left Side	0 m	9	12	12	11	44
	500 m	11	15	26	10	62
	1000 m	18	18	29	19	84
	1500 m	21	19	28	20	88

Table – 8.9: Leaf injury symptoms of different tree species.

S. No.	Botanical Name	Tree Form	Injury Symptoms	Colour of injured tissue
1.	*Acacia nilotica*	T	MN	Light yellow
2.	*Aegle marmelos*	T	F	Brown to tan
3.	*Alianthus excels*	T	MC & IC	Yellow
4.	*Artocarpus heterophyllus*	T	TB	Brown to tan
5.	*Azadirachta indica*	T	MC	Light yellow
6.	*Butea monosperma*	ST/T	MN & MC	Brown to tan
7.	*Diospyros melanoxylon*	ST/T	MN, MC & IC	Brown to tan
8.	*Emblica officinalis*	T	MC & IC	Yellow
9.	*Ficus bengalensis*	T	MC	Light yellow
10.	*Ficus religiosa*	T	MC	Light yellow
11.	*Hardwickia binata*	T	MC	Light yellow
12.	*Lagerstroemia parviflora*	ST/T	F	Brown
13.	*Madhuca indica*	T	MN, MC & IC	Brown to tan
14.	*Mangifera indica*	T	MN, TB & IN	Dark brown
15.	*Pongmia pinnata*	T	MN	Light yellow
16.	*Syzygium cuminii*	ST/T	N & TB	Brown to tan
17.	*Shorea robusta*	T	MN & TB	Brown to tan
18.	*Tamarindus indica*	T	MN	Light yellow
19.	*Tectona grandis*	T	MN	Yellow
20.	*Terminalia arjuna*	T	F	Brown to tan
21.	*Terminalia tomentosa*	T	MC & IC	Yellow

T = Tree ST = Small Tree MN = Marginal necrosis MC = Marginal chlorosis
TB = Tip burn IC = Interveinal chlorosis F = Flecking IN = Interveinal necrosis

Objective 4. Physico-Chemical Analysis of Soil and Major Plants Grown/ Available in the Study Area

The changes in important soil physical, chemical and biological properties around merry Go Round railway line are summarized as bellow;-

1. Bulk density (ρ_b) of the soil

The bulk density of soil in respect of three locations and both directions did not show any significant differences under study. Table 8.10 showed that he maximum bulk density was recorded at 10 m site (1.40 Mg/m^3) of the MGR railway track and lowest at 1500 m site (1.28 Mg/m^3). The bulk density of the closer site (10 m) was higher as compare to 500 m (1.37 Mg/m^3), 1000 m (1.32 Mg/m^3) and 1500 m site (1.28 Mg/m^3). The bulk density of the soil was more at closer site and it gradually decreases with increase in distance. The sand and silt contents were higher at 10 m site which might increase bulk density of soil. This may be due to the more minute dust particles as well as the numbers of pores which were higher (table 8.10) in control site (1500 m) of the study area and it might increase the volume of the soil as well as surface area of the soil too.

2. Particle density (ρ_s) of the soil

Soil parameter, the particle density did not show any significant differences in respect of locations and directions in study area (table – 8.10). The maximum particle density was recorded at 10 m site from the railway track and minimum at 1500 m distance (table 8.10). The particle density of the closer site (10 m) was higher (2.60 Mg/m^3) as compare to 500 m (2.51 Mg/m^3), 1000 m (2.42 Mg/m^3) and 1500 m site (2.34 Mg/m^3). The particle density of the soil was lowest at control site (1500 m) and it gradually increases towards the closer site (10 m).

3. Porosity (f) percentage of the soil

The Porosity percentage of the soil did not reach to the level of significance under locations and directions of MGR track. The maximum porosity percentage (49.68 %) was recorded at 1500 m site which was higher than the 10 m (40.09 %), 500 m (44.90 %) and 1000 m distance (47.16 %). The result (table – 8.10) showed that the nearby (10 m) soil of the MGR railway line had minimum porosity percentage and it gradually increases with the distance increases from the railway track. These gradual increases in soil porosity percentage towards control site may be due to the more minute pollutants in soil which increases the volume of the soil and thus the pores content of the soil due to their minute size as well as the clay content of the soil which were higher at 1000 m and 1500 m site.

Table - 8.10: Bulk density, particle density and porosity percentage of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	Bulk density (Mg/m^3)	Particle density (Mg/m^3)	Porosity Percentage
A. Location at railway track				
1	Crop zone	1.35	2.49	46.13
2	Forest zone	1.31	2.46	46.60
3	Mixed zone	1.36	2.44	43.64
	CD (5 %)	NS	NS	NS
B. Side from railway track				
1	Right Side	1.33	2.44	46.21
2	Left side	1.35	2.49	44.71
	CD (5 %)	NS	NS	NS
C. Distance from railway track				
1	10 m	1.40	2.60	40.09
2	500 m	1.37	2.51	44.90
3	1000 m	1.32	2.42	47.16
4	1500 m	1.28	2.34	49.68
	CD (5 %)	0.082	0.12	3.9

4. Soil pH

The soil pH did not reach to the level of significance under locations and directions of MGR track in both initial and final soil samples. In initial soil sample, the soil pH at 1500 m site (6.73) was significantly higher than the 10 m (6.63), 1000 m (6.56) and 500 m site (6.28) and while in case of the final soil sample, maximum soil pH was recorded at 1500 m site (6.63) which was significantly higher than the 1000 m (6.55), 500 m (6.42) and 10 m site (6.38). The soil pH of the control site (1500 m) was slightly higher as compare to the other distances from the track. The decrease in soil pH towards MGR line of the study area might be due to organic matter which was higher at 10 m distance and thus the soil pH was lower than the other distance of the research area. However, the pH of the soil of study area is neutral in condition (Ranges from 6.5-7.0).

5. Electrical conductivity (EC) of soil

The EC of the soil did not show any significant differences in respect of locations (both soil samples) and directions (initial soil sample). Results shown in table 8.11 revealed that the electrical conductivity of the closer site (10 m) soils was higher compare to control site (1500 m). The four distances (10 , 500 , 1000 and 1500 m) shows non-significant results in initial soil sample while in case of the final soil sample the EC of the 10 m site (0.22 dS/m) was significantly higher than the 500 m (0.19 dS/m), 1000 m (0.18 dS/m) and 1500 m site (0.17dS/m). The gradual increase in the EC of the soil towards the railway line may be due to the increase in the many heavy metals (table 8.15 & 16) and micronutrient (table 8.13 & 14) content of soil which may associate with the particles of the pollutant.

6. Soil organic carbon (OC)

The percentage of the organic carbon was more at forest zone (0.72% in initial and 0.74 % in final soil sample) and minimum at mixed zone (0.61 % in initial soil) and in crop zone (0.64 % in final soil). The left side has more organic carbon (0.65% in initial and 0.70% in final soil sample) than right side (0.69 % in initial and 0.69 % in final soil).The organic carbon percentage (table 8.11) of the closer site (10 m and 500 m) soils was higher than the control site (1500 m). The very labile and labile carbon fraction of the soil was reduced at far site (table 8.18) which might be reason for decrease in organic carbon percentage with distance in study area. However the O C value of soil is under medium category.

Table - 8.11: Soil pH, electrical conductivity and organic carbon percentage of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	pH		Electrical conductivity (dS/m)		Organic carbon (%)	
		Initial	Final	Initial	Final	Initial	Final
A. Location at railway track							
1	Crop zone	6.76	6.44	0.118	0.18	0.68	0.64
2	Forest zone	6.40	6.56	0.112	0.20	0.72	0.74
3	Mixed zone	6.50	6.49	0.115	0.19	0.61	0.71
	CD (5 %)	NS	NS	NS	NS	0.017	0.023

B. Side from railway track							
1	Right Side	6.56	6.48	0.128	0.20	0.656	0.7
2	Left side	6.54	6.51	0.102	0.18	0.692	0.69
	CD (5 %)	NS	NS	NS	0.01	0.014	NS
C. Distance from railway track							
1	10 m	6.63	6.38	0.126	0.22	0.73	0.76
2	500 m	6.28	6.42	0.101	0.19	0.68	0.71
3	1000 m	6.56	6.55	0.106	0.18	0.66	0.67
4	1500 m	6.73	6.63	0.127	0.17	0.60	0.63
	CD (5 %)	0.055	0.114	NS	0.014	0.02	0.027

7. Available soil nitrogen (N)

The maximum available nitrogen content was recorded in forest zone (158.4 kg ha^{-1} in initial and 152.61 kg ha^{-1} in final soil sample) which were significantly higher than the crop zone (132.9 kg ha^{-1} in initial and 130.35 kg ha^{-1} in final soil sample) and mixed zone (120.5 kg ha^{-1} in initial and 119.65 kg ha^{-1} in final soil sample). The left side (139.7 kg ha^{-1} in initial soil and 133.19 kg ha^{-1} in final soil sample) had more available nitrogen than the right side (134.8 kg ha^{-1} in initial soil and 135.21 kg ha^{-1} in final soil sample).

The available nitrogen content in the closer site (10 m and 500 m) was higher as shown in table 8.12. Initial soil sample had 165.6 kg ha^{-1} available nitrogen at 10 meter site which was significantly higher than the other sites 500 m (150.7 kg ha^{-1}), 1000 m (124.4 kg ha^{-1}) and control *i.e.*, 1500 m (108.4 kg ha^{-1}) while in case of the final soil sample, maximum available nitrogen (167.92 kg ha^{-1}) was recorded at closer site (10 m) which was significantly higher than the 500 m (140.96 kg ha^{-1}), 1000 m (122.78 kg ha^{-1}) and 1500 m site (105.16 kg ha^{-1}). The increase in available nitrogen status of the soil towards the MGR railway line may be due to increase in organic carbon content (table 8.11) as well as the labile carbon fraction (table 8.18) of the soil. Available N status of soil is low in category.

8. Available soil phosphorus (P)

The high available phosphorus was recorded at mixed zone (14.1 kg ha^{-1} in initial soil) which was higher than the cropped zone (12.6 kg ha^{-1} in initial soil) and minimum at forest zone (10.4 kg ha^{-1} in initial soil). The available P content in soil was found no significant in different zones in final soil sample. In respect of sides, left side (12.2 kg ha^{-1} in initial soil and 13.55 kg

ha^{-1} in final soil sample) of the studied area had more available phosphorus than the right side (12.6 kg ha^{-1} in initial soil and 13.34 kg ha^{-1} in final soil sample).

Data shown in table 8.12 revealed that the closure site to railway track (10 m) has higher (14.1 kg ha^{-1}) available phosphorus content than the far sites 500 m (11.4 kg ha^{-1}), 1000 m (11.5 kg ha^{-1}) and 1500 m (12.6 kg ha^{-1}) in initial soil sample. Similarly, in final soil sample, the available phosphorus recorded was significantly higher at 10 m (15.33 kg ha^{-1}) as compared to 500 m site (13.66 kg ha^{-1}), 1000 m (12.48 kg ha^{-1}) and 1500 m (12.31 kg ha^{-1}).

The phosphorus status of the final soil sample was more than the initial sample; it may be due to the transformation of the fixed phosphorus into available phosphorus by the soil microbes. However the available P content in soil is found low to medium in range.

9. Available soil potassium (K)

Cropped zone had high available potassium status (262.5 kg ha^{-1} in initial soil and 264.92 kg ha^{-1} in final soil sample) which was significantly higher than forest zone (204.2 kg ha^{-1} in initial soil and 206.91 kg ha^{-1} in final soil sample) and mixed zone (218.5 kg ha^{-1} in initial soil and 218.19 kg ha^{-1} in final soil sample). Significantly lower available potassium was recorded at left side (226.4 kg ha^{-1} in initial soil and 223.32 kg ha^{-1} in final soil sample) than the right side (230.3 kg ha^{-1} in initial soil sample and 236.70 kg ha^{-1} in final soil sample).

Table 8.12 depicts that the available potassium content of the experimental site decreased with increase in distance from the railway line and increase from initial to final soil sample. The maximum available potassium (249.8 kg ha^{-1}) was recorded in closer site (10 m) which was significantly higher than the 500 m (234 kg ha^{-1}), 1000 m (222.8 kg ha^{-1}) and 1500 m site (207 kg ha^{-1}) in initial soil sample while in case of the final soil sample, maximum available potassium (257.55 kg ha^{-1}) was found at 10 m which was significantly higher than the 500 m (239.45 kg ha^{-1}), 1000 m (223.90 kg ha^{-1}) and control *i. e.*, 1500 m site (199.12 kg ha^{-1}).

The available potassium content was increased from initial to final soil sample might be due to the transformation of fixed potassium into available form by microbial activity. The available K content in soil was found under medium category.

Table - 8.12: Available nitrogen, phosphorus and potassium contents of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	Nitrogen (kg ha^{-1})		Phosphorus (kg ha^{-1})		Potassium (kg ha^{-1})	
		Initial	Final	Initial	Final	Initial	Final
A. Location at railway track							
1	Crop zone	132.9	130.35	12.6	13.42	262.5	264.92
2	Forest zone	158.4	152.61	10.4	13.10	204.2	206.91
3	Mixed zone	120.5	119.65	14.1	13.82	218.5	218.19
	CD (5 %)	7.5	10.52	0.72	NS	0.95	11.65
B. Side from railway track							
1	Right Side	134.8	135.21	12.6	13.34	230.3	236.70
2	Left side	139.7	133.19	12.2	13.55	226.4	223.32
	CD (5 %)	6.12	NS	0.59	NS	0.78	9.51
C. Distance from railway track							
1	10 m	165.6	167.92	14.1	15.33	249.8	257.55
2	500 m	150.7	140.96	11.4	13.66	234.0	239.45
3	1000 m	124.4	122.78	11.5	12.48	222.8	223.90
4	1500 m	108.4	105.16	12.6	12.31	207	199.12
	CD (5 %)	8.66	12.14	0.83	0.8	1.1	13.45

10. Available soil sulphur (S)

The available sulphur content in different zones as well as both directions *i.e.*, left and right side of the studied area shows non-significant result. However, data recorded in final sample from various zones had significant effect. Crop (26.29 kg ha^{-1}) and forest (26.04 kg ha^{-1}) zone are statistically at par and crop zone is significantly better than the mixed zone (24.69 kg ha^{-1}).

The available sulphur content in soil presented in table 8.13 showed decreasing orders *i.e.*, maximum sulphur was recorded at closer site to railway track (10 m) while minimum at control site (1500 m). Initial soil sample reveals that the maximum available sulphur (28.6 kg ha^{-1}) was recorded at 10 m of the MGR railway track which was significantly higher than the 500 m (25.41 kg ha^{-1}), 1000 m (23.21 kg ha^{-1}) and 1500 m site (21.74 kg ha^{-1}) while in case of the final

soil sample, the maximum available sulphur (29.75 kg ha^{-1}) was recorded at 10 m site which was significantly higher than the 500 m (26.81 kg ha^{-1}), 1000 m (23.69 kg ha^{-1}) and 1500 m site (22.44 kg/ha). The available S recorded under medium category.

11. Available soil boron (B)

The boron content in soil was found non-significant in different locations in both initial and final soil sample. However, the significant result was found in boron content in respect of directions (initial and final soil sample). The more available boron content was analyzed at right side (0.65 ppm in initial soil and 0.55 ppm in final soil sample) than the left side (0.53 ppm in initial soil and 0.52 ppm in final soil sample). Table 8.13 depicts that the maximum boron content (0.72 ppm) was recorded in 10 m site which was significantly higher than the 500 m (0.63 ppm), 1000 m (0.54 ppm) and 1500 m site (0.47 ppm) in initial soil sample. Similar trend was recorded for final soil sample.

12. Available soil iron (Fe)

The cropped zone (24.39 ppm in initial soil and 24.25 ppm in final soil sample) had more available iron content which was higher than the mixed zone (23.10 ppm in initial soil and 23 ppm in final soil sample) and minimum iron status was recorded in forest zone (21.71 ppm in initial soil and 23.65 ppm in final soil sample). The iron content of the left side (23.7 ppm in initial soil sample and 23.08 ppm in final soil sample) was more than the right side (22.5 ppm in initial soil sample and 24.18 ppm in final sample) of the studied area. As depicted in table 8.13 that the maximum iron content (23.7 ppm) in initial soil was obtained at 1000 m site which was found at par with 10 m (23.6) while in case of the final soil sample, the maximum iron concentration (28.37 ppm) was recorded at 10 m site which was significantly higher than the 500 m site (24.68 ppm), 1000 m (21.20 ppm) and control site *i. e.*, 1500 m (20.27 ppm). The observe value of DTPA extractable Fe is towards higher value (more than 4.5 ppm).

Table - 8.13: Available S, B and Fe content of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	Available sulphur (kg ha^{-1})		Available boron (ppm)		Available iron (ppm)	
		Initial	Final	Initial	Final	Initial	Final
A. Location at railway track							
1	Crop zone	25.20	26.29	0.60	0.55	24.39	24.25
2	Forest zone	25.1	26.04	0.59	0.52	21.71	23.65
3	Mixed zone	23.92	24.69	0.58	0.54	23.10	22.99
	CD (5 %)	NS	1.40	NS	NS	0.29	0.87
B. Side from railway track							
1	Right Side	24.99	26.07	0.65	0.55	22.5	24.18
2	Left side	24.49	25.27	0.53	0.52	23.7	23.08
	CD (5 %)	NS	NS	0.033	0.028	0.24	0.71
C. Distance from railway track							
1	10 m	28.6	29.75	0.72	0.69	23.6	28.37
2	500 m	25.41	26.81	0.63	0.57	23.3	24.68
3	1000 m	23.21	23.69	0.54	0.49	23.7	21.20
4	1500 m	21.74	22.44	0.47	0.40	21.7	20.27
	CD (5 %)	1.53	1.62	0.047	0.04	0.33	1.01

13. Available soil manganese (Mn)

The maximum available manganese status was recorded at cropped zone (18.1 ppm in initial soil and 18.60 ppm in final soil sample) which was significantly higher than the forest zone (16.3 ppm in initial soil and 17.03 ppm in final soil sample) and mixed zone (17.2 ppm in initial soil sample and 16.41 ppm in final soil sample). The left side (17.8 ppm in initial soil and 17.80 ppm in final soil sample) of the studied area had significantly more manganese content than the right side (16.60 ppm in initial soil and 16.90 ppm in final soil sample). The higher manganese concentration (table - 8.14) was recorded in 10 m and 1000 m sites of railway line which were significantly higher than the 500 m (17.4 ppm) and 1500 m site (16.1 ppm) in initial soil sample while in case of the final soil sample, high manganese concentration (20.29 ppm) was recorded at 10 m site followed by 500 m (17.78 ppm), 1000 m (17.11 ppm) and least at 1500 m site (14.22 ppm). The observe value of DTPA extractable Mn is towards higher value (more than 3.5 ppm).

14. Available soil copper (Cu)

The non-significant results were recorded with reference to available copper between the directions and different locations. Result (table 8.14) revealed that the available copper status was more at closer site (10 m) of the railway track. The maximum concentration (3.13 ppm) was recorded at 10 m site followed by 500 m (2.97 ppm), 1000 m (2.99 ppm) and control site (2.96 ppm) in initial soil sample while in case of final soil sample, maximum available Cu was recorded at 10 m site (3.16 ppm) which was significantly higher than the 500 m (3.01), 1000 m (2.88 ppm) and 1500 m (2.79 ppm).

15. Available soil zinc (Zn)

The maximum available zinc was recorded at cropped zone (0.77 ppm in initial soil and 0.62 ppm in final soil sample) which was significantly higher than the forest zone (0.53 ppm in initial soil and 0.66 ppm in final soil sample) and mixed zone (0.48 ppm in initial soil sample and 0.58 ppm in final soil sample). Further, significantly more available zinc was recorded at left side (0.65 ppm in initial soil sample and 0.64 ppm in final soil sample) than the right side (0.53 ppm in initial soil sample and 0.64 ppm in final soil sample) of the studied area. Table 8.14 depicts that the high concentration of available zinc (0.78 ppm) was recorded at closer point (10 m) which was significantly higher than the 500 m (0.49), 1000 m (0.56 ppm) and 1500 m site (0.54 ppm) in initial soil sample while in case of the final soil sample, the maximum zinc concentration (0.75 ppm) was recorded at 10 m site which was significantly higher than the 500 m (0.69 ppm), 1000 m (0.62 ppm) and 1500 m site (0.42 ppm). The suitable range of Zn; if less than 0.6 ppm indicates insufficient and more than 0.6 ppm refers sufficient available content in soil.

The available micronutrient concentration (B, Fe, Mn, Cu and Zn) of the soil increases towards the railway track might be due to the more microbial population (table 8.17).

Table - 8.14: Available Mn, Cu and Zn content of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	Available manganese (ppm)		Available copper (ppm)		Available zinc (ppm)	
		Initial	Final	Initial	Final	Initial	Final
A. Location at railway track							
1	Crop zone	18.1	18.60	3.18	3.00	0.77	0.62
2	Forest zone	16.3	17.03	3.20	2.96	0.53	0.66
3	Mixed zone	17.2	16.41	2.68	2.93	0.48	0.58
	CD (5 %)	0.17	0.789	NS	NS	0.013	0.047
B. Side from railway track							
1	Right Side	16.6	16.90	3.09	2.96	0.53	0.60
2	Left side	17.8	17.80	2.94	2.96	0.65	0.64
	CD (5 %)	0.14	0.644	NS	NS	0.011	0.038
C. Distance from railway track							
1	10 m	17.6	20.29	3.13	3.16	0.78	0.75
2	500 m	17.4	17.78	2.97	3.01	0.49	0.69
3	1000 m	17.6	17.11	2.99	2.88	0.56	0.62
4	1500 m	16.1	14.22	2.96	2.79	0.54	0.42
	CD (5 %)	0.20	0.911	0.011	0.13	0.015	0.054

16. Heavy metals Cadmium (Cd), Cobalt (Co) and Chromium (Cr) content

The heavy metal Cd, Co and Cr contents are given in table 8.15. In initial soil sample, the maximum cadmium concentration (2.04 ppm) was recorded at forest zone followed by mixed zone (1.54 ppm) and minimum at crop zone (1.44 ppm). However, directions did not reach to the level of significance. Results revealed that in initial soil sample, site 10 m (1.82 ppm) and 1000 m (1.82 ppm) recorded maximum cadmium content and are significantly higher than the 500 m (1.37 ppm) and 1500 m (1.68 ppm) sites while in case of the final soil sample, it was found non-significant.

The cobalt content in soil did not show any significant results with any factor. However, the forest zone had maximum cobalt (37.32 ppm) followed by mixed zone (35.50 ppm) and crop zone (34.60 ppm) in final soil sample.

The maximum chromium concentration was recorded at forest zone (36.72 ppm in initial soil and 38.67ppm in final soil sample) and minimum at crop zone (30.67 ppm in initial soil and 34.58 ppm in final soil sample). The mixed zone recorded 33.76 ppm in initial soil and 36.73 ppm in final soil sample. Further, concentration of left side (35.08 ppm in initial soil sample and 35.73 ppm in final soil sample) was significantly higher than the right side (32.36 ppm in initial soil and 37.59 ppm in final soil sample).In final soil sample, the maximum chromium concentration (38.31 ppm) was recorded at closer site (10 m) of the MGR railway line which was significantly higher than the 500 m (34.93 ppm) and 1500 m (35.80 ppm) but at par with 1000 m site (37.60 ppm).

Table - 8.15: Cadmium, Cobalt and Chromium content of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	Cadmium (ppm)		Cobalt (ppm)		Chromium (ppm)	
		Initial	Final	Initial	Final	Initial	Final
A. Location at railway track							
1	Crop zone	1.44	1.80	32.12	34.60	30.67	34.58
2	Forest zone	2.04	1.95	34.41	37.32	36.72	38.67
3	Mixed zone	1.54	1.87	32.34	35.50	33.76	36.73
	CD (5 %)	0.176	NS	NS	2.16	2.35	2.25
B. Side from railway track							
1	Right Side	1.61	1.82	32.13	35.65	32.36	37.59
2	Left side	1.74	1.92	33.78	35.96	35.08	35.73
	CD (5 %)	NS	NS	NS	NS	1.92	1.84
C. Distance from railway track							
1	10 m	1.82	1.96	33.08	37.00	34.54	38.31
2	500 m	1.37	1.85	33.58	35.69	32.78	34.93
3	1000 m	1.82	1.87	31.38	35.60	34.11	37.60
4	1500 m	1.68	1.80	33.79	34.94	33.44	35.80
	CD (5 %)	0.203	NS	NS	NS	NS	2.60

17. Heavy metals Lead (Pb), Nickel (Ni) and Arsenic (As)

In initial soil sample, maximum lead content (7.35 ppm) was recorded under forest zone and minimum at crop zone (5.86 ppm). However, mixed zone (6.16 ppm) and crop zone are statistically at par. The left side (6.73 ppm) had higher lead content compared to right side (6.18 ppm) in initial soil sample of the studied area. Further, the lead content in soil showed no significant results in respect of distances in initial soil under study. However, in case of final soil sample, all three factors were showed non-significant results.

Nickel content at different locations and sides were found non-significant. Content of this metal in soil showed erratic pattern in respect of different distances *i.e.,* maximum was found at 1000 m (35.08 ppm) followed by 1500 m (34.43 ppm) and lowest at 500 m distance (31.51 ppm) in initial soil and in final soil, maximum was at 1500 m distance (36.27 ppm) and minimum at 500 m distance (32.01 ppm).

The arsenic content in initial as well as final soil samples were found non-significant for all three factors under study.

In general, the heavy metal contents were increased from initial to final soil sample.

Table - 8.16: Heavy metals (Pb, Ni and As) content of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	Lead (ppm)		Nickel (ppm)		Arsenic (ppm)	
		Initial	Final	Initial	Final	Initial	Final
A. Location at railway track							
1	Crop zone	5.86	6.83	33.20	34.29	1.87	1.92
2	Forest zone	7.35	7.40	33.22	34.58	1.90	1.94
3	Mixed zone	6.16	7.37	33.38	35.27	1.88	1.93
	CD (5 %)	0.57	NS	NS	NS	NS	NS
B. Side from railway track							
1	Right Side	6.18	7.14	31.90	34.51	1.94	1.97
2	Left side	6.73	7.26	34.63	34.92	1.83	1.89
	CD (5 %)	0.47	NS	1.88	NS	NS	NS
C. Distance from railway track							
1	10 m	6.87	7.68	32.06	35.05	1.95	2.02
2	500 m	6.57	6.67	31.51	32.01	1.81	1.82
3	1000 m	6.02	7.33	35.08	35.53	1.86	1.89
4	1500 m	6.36	7.11	34.43	36.27	1.91	1.98
	CD (5 %)	NS	NS	2.66	2.68	NS	NS

18. Soil microbial population (colony forming unit/ CFU) of Bacteria, Actinomycetes and Fungus

The highest CFU of bacteria per gram of soil was recorded at forest zone (156.5×10^6 cfu/g in initial soil and 160.5×10^6 cfu/g in final soil sample) which was significantly higher than the mixed zone (66.5×10^6 cfu/g in initial soil and 160.5×10^6 cfu/g in final soil sample) and cropped zone (137.1×10^6 cfu/g in initial soil and 135.37×10^6 cfu/g in final soil sample). Colony farming unit of right side (128.66×10^6 cfu/g in initial soil sample and 128.83×10^6 cfu/g in final soil sample) was higher than the left side (111.7×10^6 cfu/g in initial soil and 116.11×10^6 cfu/g in final soil sample). The maximum colony farming unit of bacteria (144.9×10^6) was found at closer site (10 m) which was significantly higher than the other sites *viz.*, 500 m (127.6×10^6), 1000 m (113×10^6) and 1500 m (93×10^6) sites in initial sample while in final soil sample, maximum bacterial CFU (135.55×10^6) was recorded at closer site (10 m) which was significantly higher than 500 m (124×10^6), 1000 m (121×10^6 cfu/g of soil) and 1500 m site (107.77×10^6) as shown in table 8.17.

The highest CFU of actinomycetes were recorded at forest zone (36.29×10^4 cfu/g in initial soil and 40.25×10^4 cfu/g in final soil sample) which was significantly higher than the crop zone (32.63×10^4 cfu/g in initial soil and 35.41×10^4 cfu/g in final soil sample) and mixed zone (15.58×10^4 cfu/g in initial soil and 15.87×10^4 cfu/g in final soil sample). Further, colony farming unit of right side (29.83×10^4 cfu/g in initial soil sample and 32.52×10^4 cfu/g in final soil sample) was significantly higher than the left side (26.50×10^4 cfu/g in initial soil and 28.5×10^4 cfu/g in final soil sample). Table 8.17 depicted highest CFU of actinomycetes (40.11×10^4) at closer site (10 m) which was significantly higher than 500 m (34×10^4), 1000 m (23.22×10^4) and control site i.e., 1500 m (14.94×10^4) in initial soil sample while in case of final soil sample, the highest CFU of actinomycetes per gram of soil (36.55×10^4) were recorded at 10 m distance from MGR railway track which was significantly higher than the 500 m (32.22×10^4), 1000 m (30.38×10^4) and control site (22.88×10^4).

The highest CFU of fungus were recorded at forest zone (10.4×10^2 cfu/g in initial soil and 12.08×10^2 cfu/g in final soil sample) which was significantly higher than the crop zone (10×10^2 cfu/g in initial soil and 10.92×10^2 cfu/g in final soil sample) and mixed zone (9×10^2 cfu/g in initial soil and 9.5×10^2 cfu/g in final soil sample). The colony farming unit of right side (10.3×10^2 cfu/g in initial soil sample and 11.64×10^2 cfu/g in final soil sample) was higher than the left side (9.3×10^2 cfu/g in initial soil and 10×10^2 cfu/g in final soil sample).As shown in table 8.17, the maximum fungal CFU (11.5×10^2) was recorded at closer site which was

significantly higher than the 500 m (11.1×10^2), 1000 m (9.2×10^2) and control site (7.3×10^2) in initial soil sample while in case of the final soil sample, the highest fungal colony forming unit was 14.25×10^2 at 10 m site and it was significantly higher than the 500 m (12.14×10^2), 1000 m (9.86×10^2) and control site (7.08×10^2).

The CFU of the microbes were increases towards the railway line may be due to the more organic carbon percentage (table-8.11) as well as the very labile and labile fraction of the carbon (table-8.18) and metal contents (table-15 & 16).

Table - 8.17: Microbial population of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	Bacteria (CFU×10^6 per g soil)		Actinomycetes (CFU×10^4 per g soil)		Fungi (CFU×10^2 per g soil)	
		Initial	Final	Initial	Final	Initial	Final
A. Location at railway track							
1	Crop zone	137.1	135.37	32.63	35.41	10	10.92
2	Forest zone	156.5	160.5	36.29	40.25	10.4	12.08
3	Mixed zone	66.5	71.29	15.58	15.87	9	9.50
	CD (5 %)	5.6	7.71	2.17	3.16	0.66	0.80
B. Side from railway track							
1	Right Side	128.4	128.66	29.83	32.52	10.3	11.64
2	Left side	111.7	116.11	26.50	28.5	9.3	10.03
	CD (5 %)	4.5	6.3	1.77	2.58	0.54	0.65
C. Distance from railway track							
1	10 m	144.9	135.55	40.11	36.55	11.5	14.25
2	500 m	127.6	124.44	34.28	32.22	11.1	12.14
3	1000 m	113.8	121.77	23.33	30.38	9.2	9.86
4	1500 m	93.8	107.77	14.94	22.88	7.3	7.08
	CD (5 %)	6.4	8.9	2.51	3.65	0.76	0.92

19. Soil microbial biomass carbon (SMBC)

The soil microbial biomass carbon acts as the transformation agent of the organic matter in the soil. As such, the biomass is a both source and sink of the carbon, nitrogen and phosphorus contained in the organic matter. The maximum soil microbial biomass carbon was recorded at

forest zone (171.62 µg g^{-1} in initial soil and 186.13 µg g^{-1} in final soil sample) and minimum at mixed zone (148.93 µg g^{-1} in initial soil sample and 159.77µg g^{-1} in final soil sample). The right side (164.53 µg g^{-1} in initial soil sample and 171.73µg g^{-1} in final soil sample) area of the MGR railway had more SMBC than left side (160.38 µg g^{-1} in initial soil sample and 169.87µg g^{-1} in final soil sample). Table 8.18 depicts that the initial soil sample had maximum SMBC (184.49µg g^{-1}) at 10 m site which was significantly higher than 500 m (167.84µg g^{-1}), 1000 m (153.05µg g^{-1}) and 1500 m site (144.45µg g^{-1}) while in case of final soil sample, highest SMBC (193.47µg g^{-1}) was recorded at closer site (10 m) from railway track which was significantly higher than the all other sites of the experimental area i.e. 176.42µg g^{-1} at 500 m, 163.85µg g^{-1} at 1000 m and 149µg g^{-1} at control site (1500 m).

The soil organic carbon has positively correlation with the soil microbial biomass carbon. The microbial biomass carbon of the study area gradual decreases towards the control site (1500 m) might be due to the decrease in the organic carbon percentage (table – 8.11) as well as the decrease in labile fraction of the carbon (table – 8.18).

20. Very Labile and Labile carbon fractions

The maximum very labile fraction of carbon was recorded at forest zone (6.60g kg^{-1} in initial soil sample and 6.84g kg^{-1} in final soil sample) and minimum at mixed zone (6.16g kg^{-1} in initial soil sample and 6.49g kg^{-1} in final soil sample). In respect of directions, left side (6.35g kg^{-1} in initial soil sample and 6.83g kg^{-1} in final soil sample) had more very labile carbon fraction than the right side (6.53g kg^{-1} in initial soil sample and 6.53g kg^{-1} in final soil sample). Table 8.18 depicts that the very labile fraction of the carbon recorded maximum (6.86 g Kg^{-1}) at closer site followed by 500 m (6.70 g kg^{-1}), 1000 m (6.30 g kg^{-1}) and control site (5.92 g kg^{-1}) in initial soil sample while in case of the final soil sample, maximum very labile carbon fraction (7.25 g kg^{-1}) was found at 10 m site followed by 500 m (6.76 g kg^{-1}), 1000 m (6.41 g kg^{-1}) and control site (5.92 g kg^{-1}).

The maximum labile fraction of carbon was recorded at forest zone (0.0.53g kg^{-1} in initial soil sample and 0.61g kg^{-1} in final soil sample) which was significantly higher than the crop zone (0.46 g kg^{-1} in initial soil and 0.0.40g kg^{-1} in final soil sample) and mixed zone (0.51 g kg^{-1} in initial soil sample and 0.61g kg^{-1} in final soil sample). Left side (0.50g kg^{-1} in initial soil sample and 0.55g kg^{-1} in final soil sample) had more labile carbon fraction than the right side (0.50g kg^{-1} in initial soil sample and 0.52g kg^{-1} in final soil sample). In initial soil sample, highest (0.58 g kg^{-1}) labile fraction of carbon was recorded at nearby site (10 m) of the experimental area which was significantly higher than the 500 m site (0.51 g kg^{-1}), 1000 m site

(0.47 g kg^{-1}) and control site (0.43 g kg^{-1}) while in case of final soil sample, highest labile fraction of carbon (0.66 g kg^{-1}) was recorded at 10 m site followed by 500 m site (0.56g kg^{-1}), 1000 m site (0.49 g kg^{-1}) and control site (0.44 g kg^{-1}).

Table - 8.18: Soil microbial biomass carbon (SMBC) and very labile as well as labile carbon status of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	Soil microbial biomass carbon (µg/g)		Very labile C (g kg^{-1})		Labile C (g kg^{-1})	
		Initial	Final	Initial	Final	Initial	Final
A. Location at railway track							
1	Crop zone	166.82	166.50	6.57	6.55	0.46	0.40
2	Forest zone	171.62	186.13	6.60	6.84	0.53	0.61
3	Mixed zone	148.93	159.77	6.16	6.49	0.51	0.61
	CD (5 %)	7.742	8.342	0.251	NS	0.027	0.038
B. Side from railway track							
1	Right Side	164.53	171.73	6.53	6.53	0.50	0.52
2	Left side	160.38	169.87	6.35	6.83	0.50	0.55
	CD (5 %)	NS	NS	NS	NS	NS	0.031
C. Distance from railway track							
1	10 m	184.49	193.47	6.86	7.25	0.58	0.66
2	500 m	167.84	176.42	6.70	6.76	0.51	0.56
3	1000 m	153.05	163.85	6.30	6.41	0.47	0.49
4	1500 m	144.45	149.47	5.92	6.09	0.43	0.44
	CD (5 %)	8.940	9.632	0.289	0.43	0.031	0.044

21. Less Labile and non labile carbon fractions

The maximum less labile fraction of carbon was recorded at forest zone (0.43g kg^{-1} in initial soil sample and 0.45g kg^{-1} in final soil sample) which was statistically at par with crop zone (0.0.42g kg^{-1} in initial soil and 0.40g kg^{-1} in final soil sample) and mixed zone (0.44g kg^{-1} in initial soil sample and 0.45g kg^{-1} in final soil sample). The right side (0.43g kg^{-1} in initial soil sample and 0.44g kg^{-1} in final soil sample) had less labile carbon fraction than the left side (0.43g kg^{-1} in initial soil sample and 0.43g kg^{-1} in final soil sample).The highest less labile carbon fraction (0.46 g kg^{-1}) was recorded at 500 m site which was significantly higher than the 1000 m (0.42 g kg^{-1}) and control site (0.38 g kg^{-1}) but at par with 10 m site in initial soil sample

while in final soil, maximum less labile fraction (0.49 g kg^{-1}) was recorded at 10 m site followed by 500 m (0.46 g kg^{-1}), 1000 m (0.42 g kg^{-1}) and control site *i. e.*, 1500 m (0.36 g kg^{-1}).

The higher non labile fraction of carbon was recorded at forest zone (2.29g kg^{-1} in initial soil sample and 2.18g kg^{-1} in final soil sample) which was higher than the cropped zone (2.22g kg^{-1} in initial soil and 2.17g kg^{-1} in final soil sample) and mixed zone (2.06g kg^{-1} in initial soil sample and 2.05 g kg^{-1} in final soil sample). In respect to directions, right side (2.18g kg^{-1} in initial soil sample and 2.15g kg^{-1} in final soil sample) had more non labile carbon fraction than the left side (2.20g kg^{-1} in initial soil sample and 2.11g kg^{-1} in final soil sample). Table 8.19 depicts that maximum non labile carbon fraction (2.32 g kg^{-1}) was recorded at 1500 m site and was significantly higher than the 10 m (2.03 g kg^{-1}) , 500 m (2.16 g kg^{-1}) and 1000 m site (2.26 g kg^{-1}) in initial soil sample while in final soil sample, maximum non labile fraction (2.27 g kg^{-1}) was recorded at 1500 m site followed by 1000 m (2.20 g kg^{-1}), 500 m (2.09 g kg^{-1}) and 10 m site (1.97 g kg^{-1}).

The different fractions of carbon were increased from initial soil sample to final soil sample. This may be due to increase in organic carbon percentage (table – 8.11).

Table - 8.19: Less labile and non labile carbon status of the soil under different zones, sides and distances of studied area

Tr. No.	Treatment detail	Less labile Carbon (g kg^{-1})		Non-labile Carbon (g kg^{-1})	
		Initial	Final	Initial	Final
A. Location at railway track					
1	Crop zone	0.42	0.40	**2.22**	**2.17**
2	Forest zone	0.43	0.45	**2.29**	**2.18**
3	Mixed zone	0.44	0.45	**2.06**	**2.05**
	CD (5 %)	NS	0.027	**0.12**	**NS**
B. Side from railway track					
1	Right Side	0.43	0.44	**2.18**	**2.15**
2	Left side	0.43	0.43	**2.20**	**2.11**
	CD (5 %)	NS	NS	**NS**	**NS**
C. Distance from railway track					
1	10 m	0.45	0.49	**2.03**	**1.97**
2	500 m	0.46	0.46	**2.16**	**2.09**
3	1000 m	0.42	0.42	**2.26**	**2.20**
4	1500 m	0.38	0.36	**2.32**	**2.27**
	CD (5 %)	0.030	0.032	**0.138**	**0.158**

The chemical analysis of major plants grown/available in the study area will be under taken.

Objective 5. The Work under Objective IV Regarding Creation of Awareness Among the Farming Community about the Effect of Coal Dust in Agriculture and Forest Trees Species by the Brochure/ Pamphlet/ Conduction of Kisan Goshthi/Farmer's Scientist Interaction and or Kisan Mela .

The proposed work under above objective will be started before the end of the project.

SUMMARY

The investigation entitled **"Preliminary studies on impact of coal dust on soil, crop and tree species due to open wagon coal transportation"** was carried out in 2018-19 season.

Rice cultivation study was conducted at crop area / zone during kharif season of 2018 under Randomized Block Design with five replications nearby Merry Go Round railway line of 40.00 km length from Sipat to Dipika. Both sides of rail line, 03 sub stations were marked at 0 m (near rail line, 10 m away), 500 m and 1000 m distance as treatment area and beyond 1000 m area was treated as control zone (1500 m) for crop cultivation. Crop variety Indira Rajeshwari was taken as test crop as per the packages of practices.

The soil samples were taken before sowing and after harvest of the rice crop. There was three locations of the experiment where the soil samples were collected *i.e.*, cropped land, forest land and mixed land (cultivated and uncultivated land) along their left and right directions with four different distances (10 m, 500 m, 1000 m and 1500 m) from the Merry Go Round railway line. The experiment was laid out in a factorial randomized block design with three factors and three replications. The initial (before sowing) and final (after harvesting) soil samples were analyzed for its textural classes, bulk density, particle density, porosity percentage, available nutrients (N, P, K, S, Fe, Mn, Cu, Zn and B), heavy metal status (Cd, Cr, Co, Ni, Pb and As), microbial population (CFU of bacteria, fungus and actinomycetes), soil microbial biomass carbon and different fractions of the carbon (very labile, labile, less labile and non-labile carbon) under different locations, directions and distances of the studied area.

The salient findings of the present investigation are summarized under the following heads:-

(1) Rice crop yield at crop zone in relation to directions and distances from MGR railway line

The grain (42.62 q ha^{-1}) and straw (46.27 q ha^{-1}) yields of rice was highest at 1500 m site which was significantly higher than the 10 m site (36.86 and 38.63 q ha^{-1}, respectively) of the studied area.

(2) Physical, chemical and biological properties of soil in relation to locations, directions and distances from the MGR railway line

The bulk density of the control site (1500 m) was significantly lower than the closer site (10 m) site. The maximum particle density was recorded at closer site which was significantly higher than control site. The maximum porosity percentage was recorded at control site which was significantly higher than the nearby site of the studied area.

The pH of the control site was significantly higher than the 10 m site. The EC of the studied area was found non linear pattern. Organic carbon percentage was significantly high in forest zone than other zones. Significantly maximum organic carbon was recorded at 10 m site and minimum at control site.

Significantly higher available nitrogen was recorded in forest zone and minimum in mixed zone. The significantly maximum available N was recorded at 10 m site and minimum at control site. Available phosphorus was higher in mixed zone in initial soil and lower in forest zone while left side had more available P than the right side. Significant maximum available P was recorded at 10 m site and minimum at control site. The maximum available potassium was recorded in cropped zone and minimum in forest zone. Right side had significantly more available K than left side. The maximum available K was found at 10 m site and minimum at control site of the studied area with significant difference.

Maximum available sulphur was recorded at crop zone and minimum in mixed area at final sample. The available S was maximum in 10 m site of the studied area with significant variations. The right side has significantly more available boron content than the left side. The available boron was maximum at 10 m site of the studied area and minimum at control site with significant differences. The available iron (Fe) status was significantly higher in cropped zone and minimum in forest zone in initial soil sample while the left side had more available Fe than the right side. The available manganese status in soil was found maximum in crop zone and minimum in mixed land with significant result while left side had more available Mn content than the right side with significant variations. The maximum available Mn was recorded at 10 m site and minimum at control site of the studied area with significant result. The maximum available zinc was found higher in cropped zone and lower in mixed zone in initial soil sample with significant differences while the left side had higher nutrient status than the right side with significant result. The Zn and Cu content in soil is gradually decreasing with increase in distance.

The cadmium content was higher in forest zone and lower in cropped zone in initial soil sample. The erratic pattern was recorded with distance. The cobalt content of the forest zone was found more and cropped zone has less. The chromium content was maximum in forest zone and minimum in cropped zone with significant result. Maximum Cr was recorded in 10 m site and minimum at 500 m site. The maximum lead content was recorded in forest zone and minimum in cropped area while left side had more Pb content than the right side in initial soil sample. The maximum Ni concentration was recorded at 1000 m site and minimum at 500 m site of the studied area.

The maximum colony farming unit of bacteria, fungi and actinomycetes were recorded at closer site (10 m) while minimum at 1500 m site with significant variations. The colony farming unit of the bacteria, fungi and actinomycetes were significantly higher in forest zone than the mixed zone. Right side area recorded more microbial population than the left side. Soil microbial biomass carbon at 10 m site was significantly higher than the control site (1500 m). Further, right side had more SMBC than the left side. The significantly higher soil microbial biomass carbon was recorded at forest zone than the mixed zone of the studied area.

The soil parameter pH found under neutral condition. The content of organic matter, available potassium and available sulfur were recorded medium in category. But available N status was under low category. The available P content was low to medium status. Further, the available Iron and Manganese observed towards higher value.

(3) Carbon fractions of soil in relation to locations, directions and distances from the MGR railway line

Very labile, labile, less labile and non-labile carbon fraction was recorded maximum at forest zone and minimum at mixed zone except less labile carbon which has minimum concentration in cropped zone. All the fractions of the carbon (very labile, labile and less labile except non labile) were maximum at 10 m site and they were significantly higher than control site (1500 m) while non-labile carbon was maximum in control site and minimum in 10 m site of the studied area. Very labile, labile and non-labile carbon was higher at left side area and minimum at right side while less labile was higher at right side and low at left side.

(4) Changes in vegetation

The fallout of SPM from railway wagons in the area has caused changes in the stability of the sensitive community of the vegetation present in the area. The diversity of plant community depends on both the number of species present in a population and on their evenness. The numbers of individuals were not evenly distributed at all the study sites. The resistant species were present in higher number at the sites receiving pollution load. The inverse of evenness is the concentration of individuals. At the distant places, most of the constituent species shared the numbers more or less equally, resulting in low dominance value.

CHAPTER - 10

CONCLUSIONS

On the basis of one year study of the project, the following conclusions could be drawn:-

- Grain and straw yield of rice was more at far distance (1500 m) from Marry Go Round railway line.
- Cropped zone of the studied area contains more particle density, soil pH, available potassium, available boron, available micronutrients viz., iron, manganese, copper, zinc and less electrical conductivity, organic carbon percentage, available sulphur, heavy metals (cadmium, cobalt, chromium, lead, nickel and arsenic) and less labile carbon.
- Forest zone had more porosity percentage, electrical conductivity, organic carbon, available nitrogen, available sulphur, microbial population (bacteria, actinomycetes and fungi), heavy metals (cadmium, cobalt, chromium, lead, arsenic, soil microbial biomass carbon, carbon fractions (very labile, labile, less labile and non-labile) and less bulk density, soil pH, available phosphorus, available potassium, available boron, available iron and available manganese.
- Mixed zone had more bulk density, available phosphorus , nickel and contains less porosity percentage, particle density, available nitrogen, available copper, available zinc and microbial population (bacteria, actinomycetes, fungi), soil microbial biomass carbon, very labile carbon, labile carbon and non-labile carbon fraction.
- Left side of the studied area contains more bulk density, particle density, organic carbon, available nitrogen, phosphorus, potassium, iron, manganese, zinc, heavy metals viz., cadmium, cobalt, chromium, lead and nickel, very labile, labile and non-labile carbon. However, right side contains more electrical conductivity, available sulphur, available

boron, available copper, microbial population (bacteria, actinomycetes and fungi), arsenic, soil microbial biomass carbon and less labile carbon.

- The closer site of the studied area (10 m site) had more bulk density, particle density, electrical conductivity, organic carbon percentage, available nitrogen, phosphorus, potassium, sulphur, available micronutrients (iron, manganese, copper, zinc, boron), microbial population (bacteria, actinomycetes and fungi), heavy metals (cadmium, cobalt, chromium, lead, arsenic), soil microbial biomass carbon, very labile carbon, labile carbon and less labile carbon while less porosity percentage and non-labile carbon. Control site (1500 m site) had more porosity percentage, soil pH and non-labile carbon.
- The atmospheric pollutants can affect both the stability and the productivity of plant ecosystem. The study indicated that the resistant species have occupied more space at the polluted sites, whereas the relatively sensitive plants are more at the sites far away from the emission source.
- The absence of few species from certain sites indicated existence of pollution.
- The fallout SPM in the area has caused changes which influenced the stability of sensitive plant species in the herbaceous community.

SUGGESTIONS FOR FUTURE STUDIES

The following thrust areas of research work could be made on the basis of present study for planning and appropriate formulation of technology by the students, scientists and decision as well as policy makers:-

- The effects of pollutants on crop and plant physiological aspects may be studied
- Coal dust deposition by the transportation line of the coal from loading to unloading point needs to be evaluated around the Merry Go Round railway track
- Long term effect of coal dust on different crops, physicochemical and biological properties as well as carbon fractions and nutrient dynamics of soils and local vegetation in relation to local climatic features need to be studied
- Effects of wind direction and their velocity in relation to coal dust transportation need to be studied.
- Suitable and efficient plantation work (green belt) to be undertaken both sides of Merry Go Round rail line to minimize the pollution.
- Proper covering and water sprinkling over coal transporting cars can minimize the blowing of dust in the transporting areas.

Annexure-I

PROJECT SANCTION LETTER

एनटीपीसी NTPC
A Maharatna Company

NTPC Limited
(A Government of India Enterprise)
Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966
GST No. : 22AAACN0255D4Z5

Purchase Order No. : 8200223754-037-1019 **Date :** 07.03.2018 **(version : 0)**

To
Comptroller, Indira Gandhi Krishi Vishwavidyalaya
Krishak Nagar
Raipur
Chhattisgarh
India - 492006

Vendor Code : 1081799

Subject: : Preliminary studies on Impact of coal dust on soil, crop and tree species due to Open Wagon Coal Transportation.
NIT NO. : Dated
Your Offer No. :
Your Reference :

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Preliminary studies on Impact of coal dust on soil, crop and tree species due to Open Wagon Coal Transportation. of total value INR 935,000.00 (Rupee NINE LAKH THIRTY-FIVE THOUSAND ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 10.03.2018 to 30.06.2019. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

7/3/2018

Enclosures :

एस.डी.गरवार
S D GARWAR
अपर महाप्रबंधक (पर्यावरण प्रबंधन)
AGM (Environment Management)
एनटीपीसी लिमिटेड सीपत, बिलासपुर (छ.ग.)
NTPC Limited. SIPAT, BILASPUR (C.G.)

INDIRA GANDHI KRISHI VISHWAVIDYALAYA, KRISHAK NAGAR, RAIPUR (CG) **UC/AUC**
UTILIZATION/AUDIT UTILIZATION CERTIFICATE FOR THE YEAR 2018-19

NAME OF THE SCHEME: NTPC

Preliminary studies on impact of coal dust on soil crop and tree species due to open wagon coal transportation

	Opening balance for the year brought over from the previous year 2017-18	Remittances by the council during the year 2018-19 (allocation in Rs)	Councils share of receipt realized from the scheme during the year 2018-19	Actual expenditure for year 2018-19	Councils share of sanctioned grant for the year 2018-19	Councils share of expenditure incurred and entitled during for the year 2018-19 (in Rs)	Closing balance at the end of year 2018-19
Rec.Cont.	-	7,85,000	-	7,80,845	-	7,80,845	4,155
Non Rec.	-	1,50,000	-	1,49,965	-	1,49,965	35
Total		**9,35,000**	-	**9,30,810**	-	**9,30,810**	**4,190**
Expenditure incurred by- **BTCCARS Bilaspur (C.G.)**							

Grant released vide No1..Endt. No./Compt/Bud/.NTPC/47/2018-19/699 Raipur Dated-31/05/2018

CERTIFIEDTHAT

The grant has been utilized for the purpose for which it was made by the council. The excess expenditure incurred over and above the sanctioned ceiling of one more sanctioned heads of expenditure has been met by re-appropriation of saving under remaining heads. The explanation for the expenditure not covered by re-appropriation has been furnished in the attached pro-forma for the issue of covering sanction by council.

Comptroller
I.G.K.V., Raipur (C.G.)

DEAN
RTC College of Agriculture & Research
Station (I.G.K.V.) Sarkanda, Bilaspur (C.G.)

Annexure-III

UNIVERSITY ALLOTMENT ORDER

Dr. J.R. Patel / Dr. A.K. Awasthi – By hand. Acct (Main)

INDIRA GANDHI KRISHI VISHWAVIDYALAYA
KRISHAK NAGAR, RAIPUR - 492012 (C.G.)

No./Compt/Bud/NTPC/47/2018-19/699 Dated : 31/05/2018

05/6/18

DEAN 05/6/18

**\\ ALLOTMENT ORDER **

Financial Year	2018-19		
System Gen. Allotment No.	CARS-BSP/GOI/NTPC/2018-19/271	Allotment Date	01/06/2018
Authority	BCO, Raipur	Allotment Type	Allotment 100%
DDO(to which budget Allotted)	Dean, TCB CARS, Bilaspur		
Funding Source	GOI		
Funding Agency	NTPC		
Type of Funding	Research		
Scheme	Preliminary stuidies on impact of coal dust on soil, crop and tree species due to open wagon coal transportation		
Installment No.	1		

On approval of HVC, allotment for the financial year 2018-19 under budget head NTPC Trials is being issued as per details given below:

Sr.No.	Object Head	Description of Allotted Budget Detail Head	Installments	Allotted Amt
1	Recurring	Recurring	1	785000.00
2	Non-Recurring	Non-Recurring	1	150000.00
		Total		935000.00

Approved by the Hon'ble Vice-Chancellor, IGKV, Raipur

BCO, Raipur

No./Compt/Bud/NTPC/47/2018-19/699 Dated : 31/05/2018

Copy to:

1 P.A. to Hon'ble Vice-Chancellor, IGKV, Raipur

2 Thakur Chhedilal Barrister College of Agriculture & Research Station, Bilaspur

BCO, Raipur

C.A.R.S., I.G.K.V. 1067 Date 05/06/18 Sarkande, Bilaspur (C.G.)

Received on 06.06.2018

Annexure – IV

LIST OF INVESTIGATORS, THEIR POSITION AND ADDRESSES RELATED

TO PROJECT ENTITLED

"PRELIMINARY STUDIES ON IMPACT OF COAL DUST ON SOIL, CROP AND TREE SPECIES DUE TO OPEN WAGON COAL TRANSPORTATION"

S.N.	Name	Post	Position in the project	Address	Contact	E Mail Id
1	Dr. Jagat Ram Patel	Principal Scientist (Agronomy)	Principal Investigator	BTCCARS Bilaspur	9425555387	jrpatel_fodder@rediffmail.com
2	Dr. A. K. Awasthi	Professor (Entomology)	Co-Principal Investigator	BTCCARS Bilaspur	8770161473	alok8011@rediffmail.com
3	Dr. (Smt.) Y. Sao	Assistant Professor (Soil Science)	Co-Principal Investigator	BTCCARS Bilaspur	9907448440	yush27ag_guj@yahoo.co.in
4	Sh. A. Williams	Scientist (Forestry)	Co-Principal Investigator	BTCCARS Bilaspur	9827189258	ajeetwilliams@yahoo.com
5	Dr. Geet Sharma	Scientist (Agronomy)	Co-Principal Investigator	BTCCARS Bilaspur	8319986364	geetsharma@hotmail.co.in
6	Sh. P. K. Keshry	Scientist (Soil Science)	Co-Principal Investigator	BTCCARS Bilaspur	7587230211	pk_keshry@rediffmail.com
7	Dr. N.K. Chaure	Principal Scientist (Agricultural Statistics)	Co-Principal Investigator	BTCCARS, Bilaspur	8770749079	nkchaure@ gmail.com

Annexure – V

Overview of MGR

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High Court of Chhattisgarh

Daily Status
Principal Bench Chhattisgarh
In The Court Of :
Case Number :CRMP/0001681/2017
Sipat Super Thermal Power Plant **Versus** Chhattisgarh State Environment Conservation Board Bilaspur
Date : 28-11-2017

Short Order	: 1-ADJOURNED WITH PRIORITY OF LISTING
Next Purpose	: MOTION HEARING MATTERS
Next Hearing Date	: 09-01-2018

High Court of Chhattisgarh

Daily Status
Principal Bench Chhattisgarh
In The Court Of :
Case Number :CRMP/0001681/2017
Sipat Super Thermal Power Plant **Versus** Chhattisgarh State Environment Conservation Board Bilaspur
Date : 12-01-2018

Short Order	: 1-ADJOURNED
Next Purpose	: MOTION HEARING MATTERS
Next Hearing Date	: 17-01-2018

High Court of Chhattisgarh

Daily Status
Principal Bench Chhattisgarh
In The Court Of :Justice
Case Number :CRMP/0001681/2017
Sipat Super Thermal Power Plant **Versus** Chhattisgarh State Environment Conservation Board Bilaspur
Date : 17-01-2018

Presentee	: Shaleen Singh Baghel
Short Order	: 1-RETURN NOT FILED
Next Purpose	: MOTION HEARING MATTERS
Next Hearing Date	: 14-03-2018

Justice

High Court of Chhattisgarh

Daily Status
Principal Bench Chhattisgarh
In The Court Of :Justice
Case Number :CRMP/0001681/2017
Sipat Super Thermal Power Plant **Versus** Chhattisgarh State Environment Conservation Board Bilaspur
Date : 21-03-2018

Short Order	: 1-ADJOURNED WITH PRIORITY OF LISTING
Next Purpose	: MOTION HEARING MATTERS
Next Hearing Date	: 09-05-2018

Justice

High Court of Chhattisgarh

Daily Status
Principal Bench Chhattisgarh
In The Court Of :Justice
Case Number :CRMP/0001681/2017
Sipat Super Thermal Power Plant **Versus** Chhattisgarh State Environment Conservation Board Bilaspur
Date : 09-05-2018

Short Order : 1-ADJOURNED WITH PRIORITY OF LISTING
Next Purpose : MOTION HEARING MATTERS
Next Hearing Date : 05-07-2018

Justice

E-COURTS
HIGH COURTS OF INDIA

High Court of Chhattisgarh

Back

Principal Bench Chhattisgarh

Case Details

Case Type	: CRMP	
Filing Number	: 31105/2017	Filing Date: 17-11-2017
Registration Number	: 1681/2017	Registration Date: 24-11-2017
CNR Number	**: CGHC01-032411-2017**	

Case Status

First Hearing Date	: 09th January 2018
Next Hearing Date	: 05th July 2018
Stage of Case	: MOTION HEARING MATTERS
Coram	: 13459Hon'ble Shri Justice Goutam Bhaduri
Bench	: Single Bench
Judicial	: Criminal Section
Causelist Name	: LIST-1 MOTION HEARING
Short Order	: ADJOURNED WITH PRIORITY OF LISTING

Petitioner and Advocate

1) Sipat Super Thermal Power Plant

Advocate- B.D.GURU,RAJENDRA TRIPATHIRAJENDRA TRIPATHI ,Shaleen Singh Baghel,ADITYA BHARDWAJ,RAJENDRA TRIPATHI

2) V. B. Fadnavish

3) R. B. Purvar

4) Dr. Sudhir Dahiya

Respondent and Advocate

1) Chhattisgarh State Environment Conservation Board Bilaspur

Advocate - BHASKAR PAYASHI ,ROHITASHVA SINGH

Acts

Under Act(s)	Under Section(s)
Other	U/S 482 OF CRPC

IA Details

IA Number	Party	Date of Filing	Next Date	IA Status
IA/1/2017	Sipat Super Thermal Power Plant Chhattisgarh State Environment Conservation Board Bilaspur	17-11-2017	--	Pending

History of Case Hearing

Cause List Type	Judge	Business On Date	Hearing Date	Purpose of hearing
	Hon'ble Shri Justice Goutam Bhaduri	28-11-2017	09-01-2018	MOTION HEARING MATTERS
	Hon'ble Shri Justice P. Sam Koshy	12-01-2018	17-01-2018	MOTION HEARING MATTERS
	Hon'ble Shri Justice Goutam Bhaduri	17-01-2018	14-03-2018	MOTION HEARING MATTERS
	Hon'ble Shri Justice Goutam Bhaduri	21-03-2018	09-05-2018	MOTION HEARING MATTERS
	Hon'ble Shri Justice Goutam Bhaduri	09-05-2018	05-07-2018	MOTION HEARING MATTERS

Orders

Order Number	Judge	Order Date	Order Details
1		28-11-2017	View
2		12-01-2018	View

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH
NEW DELHI
****

ORIGINAL APPLICATION NO. 458 OF 2018
Earlier O.A. No. 195 of 2014 (CZ)

IN THE MATTER OF:

1. **Sanjeev Dutta**
   R/o Senior MIG-11,
   Nehru Nagar, Bilaspur,
   District Bilaspur (Chattisgarh)

2. **Syed Zafar Ali**
   R/o Priyadarshini Nagar,
   District Bilaspur (Chattisgarh) **.....Applicants**

Versus

1. **National Thermal Power Corporation (NTPC)**
   Through its Chairman-cum-Managing Director,
   NTPC Bhawan, Scope Complex,
   Institutional Area, Lodhi Road,
   New Delhi -110003

2. **General Manager**
   Sipat National Thermal Power Project,
   Shed No. 9, S.E.C.L. Complex, Sipat Road
   Bilaspur (Chattisgarh)

3. **State of Chattisgarh**
   Through the Secretary,
   Govt. of Chattisgarh,
   Dept. of Forest, D.K.S. Bhawan,
   Raipur, Chattisgarh

4. **Chief Conservator of Forests**
   Chattisgarh, Office of C.C.F.,
   Jail Road, Raipur, (Chattisgarh)

5. **Union of India**
   Through the Secretary
   Ministry of Environment and Forests,
   Paryavaran Bhawan, CGO Complex,
   Ladhi Road, New Delhi- 110003

6. **Inspector General of Forests**
   Dept. of Environment and Forests,
   Forest Conservation Division,
   Paryavaran Bhawan, CGO Complex,
   New Delhi

7. **Conservator of Forests**
   Circle – Blaspur, District Bilaspur
   Chattisgarh

8. **D.F.O. Bilaspur**
   District Bilaspur (Chattisgarh)

9. **D.F.O (Social Forestry Division)**
   Bilaspur (Chattisgarh)

10. **The District Collector**
    Bilaspur (Chattisgarh) **.....Respondents**

COUNSEL FOR APPLICANT:

Mr. Saurabh Sharma with Mr. Dharamvir Sharma, Advs.

COUNSEL FOR RESPONDENTS:

Mr. Sachin Kr. Verma with Mr. Pankaj Sharma Advs. for NTPC/CEA/Ministry of Power

Mr. Om Shankar Shrivastava, Adv. for MoEF&CC

Mr. Rohit Sharma with Mr. Siddharth S. Chauhan, Advs. for State of Chattisgarh

JUDGEMENT

PRESENT:
Hon'bleMr. Justice Raghuvendra S. Rathore(Judicial Member)
Hon'ble Dr.Satyawan Singh Garbyal (Expert Member)

Reserved on: 14th February, 2019
Pronounced on: 19th February, 2019

1. Whether the judgment is allowed to be published on the net?
2. Whether the judgment is allowed to be published in the NGT Reporter?

Dr. S.S. GARBYAL, (EXPERT MEMBER)

1. In this Application, the Applicant has raised the issue of violation of the provisions of Forest (Conservation) Act, 1980 and use of forest land for non- forest purpose by Respondent No. 1. It has been submitted that the Applicant initially filed writ petition No. 105 of 2001 before the Hon'ble High Court, Chattisgarh at Bilaspur with the prayer for quashing the transfer of lands to NTPC Respondent No. 1 for non-observance of the provisions of the Forest (Conservation) Act, 1980 and the Madhya Pradesh Panchayati Rajya Adhiniyam, 1993. This writ Petition was subsequently transferred to this Tribunal and was registered as O.A. No. 4 of 2014 and was decided on 23rd April, 2014 with the following directions:-

..

..

3. It has also been pointed out by the Learned Counsel for the parties that the Hon'ble High Court of Chattisgarh at Bilaspur vide it's order dated 27.02.2001 had initially directed while granting permission for felling of the trees for the purpose of construction of the plant on the condition of depositing an amount of Rs. 65,00,000/- with the State Government for the development of forest and green belt which was said to be in progress as given out by the Learned Advocate General. It was further submitted that subsequently vide order dated 31.10.2001 of Hon'ble High Court of Chattisgarh an additional amount of Rs. 65,00,000/- was deposited. As it was given out that the project of the Respondent No. 1 at Sipat has already been constructed with an investment of Rs. 600 crores. The Learned Counsel for the Applicants in view of the subsequent development, submitted that as regards the initial prayer of allotment of the land and restraining the Respondent No. 1 from utilising the same for the purpose of construction of the plant, the same has already become infructuous in view of the fact that the plant has already come up on the disputed site with a huge

investment as mentioned above. With regard to the issue of diversion of the forest land and the utilisation of the total amount of Rs. 1.30 Crores (Rs 65 lakhs + Rs. 65 lakhs) deposited as per the orders of the Hon'ble High Court of Chattisgarh at Bilaspur, he may be directed to file a fresh Original Application. The aforesaid issue itself would require determination as it is contested by the Respondent whether the area in dispute was a forest land as averred by the Applicant who contended that even though the plantation was raised under social forestry the site would be covered under the forest laws as applicable in the State of Chattisgarh, more particularly under the Forest (Conservation) Act, 1980 in terms of the order of the Hon'ble Supreme Court in the case of T.N. Godavarman vs. Union of India (1997) 2 SCC 267 order dated 12.12.1996. Be that as it may. Since these were not the issues as originally raised it may not be possible to decide the same on the basis of the original pleadings as they have been raised by way of subsequent events.

4. In view of the above, we dispose of the Original Application No. 04/2014 arising out of Writ Petition No. 105/2001 filed before the Hon'ble High Court of Chattisgarh as having become infructuous in the light of the facts stated above. However liberty is granted to the Applicant to raise the issue with regard to the diversion of forest land and the alleged violation of Forest (Conservation) Act, 1980 and the question with regard to utilisation of the amount deposited as directed by the Hon'ble High Court of Chattisgarh by the Order dated 27.02.2001 and dated 31.10.2001 by means of a fresh petition.

..

..

2. Thereafter the Applicants filed this O.A. No. 195 of 2014 on 14th July, 2014 with the following prayers:-

i. Direct the Respondent No. 1 to immediately stop use of forest land for non forest purposes without obtaining the forest clearance.

ii. Direct the Respondent No. 1 for restoration of the forest lands to its original state.

iii. Direct the respondents to recover NPV and penalty for using the forest lands for non forest purposes.

iv. Direct the respondents to initiate inquiry for illegal tree felling.

v. Pass any other orders as this Hon'ble Tribunal may deem fit in the circumstances of the case.

3. The Applicants have submitted that in the year 1996, the National Thermal Power Corporation (NTPC) Respondent No. 1 initiated to set up a 2000 Mgh Coal-based thermal power project in and around Sipat, District Bilaspur, State of Chattisgarh and accordingly undertook survey in eight villages in the Bilaspur District. Subsequently the NTPC obtained Environmental Clearance on 22nd Feb, 1999 and Forest Clearance for diversion of 204.991 ha of revenue forest (Chote Bade Jhad ke Jungle) on 05.05.1999. The Applicants have submitted that NTPC did not disclose that more than 200 ha of land shown as public utility land/ grass land is actually the land on which Social Forestry Division of Chattisgarh, Forest Department had done massive afforestation and after its successful tree growth, such land has been transferred to respective Gram Panchayats as village forest land. It has further been alleged that Ministry of Environment and Forest (MoEF) while granting FC for 204.991 ha did not consider social forestry plantation land as forest land and therefore have erred. The Applicants have relied upon the letter issued by the DFO Social Forestry Division dated 14.06.1999 in which DFO had informed the Chief Executive Officer of Zila Panchayat, Bilaspur regarding the plantation work done by the Social Forestry Division, wherein it has been stated that 3.61 lacs trees were planted on 224.500 ha lands, thus having an average of around 1600 trees per ha.

4. The Applicants have also referred to the Hon'ble Supreme Court order dated 12.12.1996 passed in Writ Petition No. 202

of 1995, wherein the Hon'ble Supreme Court had ordered that the term "Forest land" occurring in Section 2 of the Forest (Conservation) Act, 1980 will not only include "forest" as understood in the dictionary sense but also any area recorded as forest in the Government record irrespective of ownership.

5. It is also stated that the then State of Madhya Pradesh had issued circular in pursuance of the order of the Hon'ble Supreme Court and in the circular dated 13th January, 1997 issued by the Revenue Department of the Government of Madhya Pradesh that all lands recorded as *"forest"* in Government records would have to be treated as "forest", irrespective of the ownership and all such lands which are not recorded as *"forest"* and contain 200 trees per ha, would also have to be treated as *"forest"*.

6. Under these circumstances, the Applicants have submitted that the land over which Social Forestry Division had raised plantations and which have subsequently been transferred to the NTPC should have also been treated as forest land and prior approval of the MoEF should have been obtained, in accordance with Forest (Conservation) Act, 1980.

7. In the reply filed on behalf of the State of Chattisgarh, it has been stated that the total land transferred to NTPC was 1601.867 ha which included 853.755 ha of private land and 748.112 ha of Government land. And out of 748.112 ha of Government land 543.121 hectares were Government Revenue land and 204.991 ha were Government Revenue Forest land. It has further been stated that during 1986-87 the Social Forestry Division had raised plantation on 143.391 ha of Government Revenue land and 81.109 hectares of Government Revenue Forest land which together constituted 224.500 ha. Out of which 205.715 ha was transferred to the NTPC which included 143.391 ha of Government Revenue land and 62.324 ha Government Revenue Forest land. In short, the details

about the status of the 205.715 ha of land transferred to NTPC are as given below:-

a. ***Total area planted by Social Forestry Division – 224.500 ha.***
b. ***Total land transferred to NTPC out (a) above - 205.096 ha.***
c. -

- ***Out of (b) above area transferred to the NTPC which did not attract the provisions of Forest (Conservation) Act, 1980 - 143.391 ha.***
- ***An area which was transferred to NTPC where the provision of Forest (Conservation) Act, 1980 were followed - 62.324 ha.***
- ***An area which was not transferred to NTPC - 18.785 ha.***

8. The State Government Chattisgarh had stated that at the time of sending proposal for transfer of land to NTPC in the year 1998-99 there were only 29 trees per ha over the land where the Social Forestry Division had raised plantations. It has further been stated by the Government of Chattisgarh that the status of this land in a Government record was *"Government Revenue land",* therefore, this land could not have been treated as *"forest"* in terms of the criteria fixed by the State Government.

9. The MoEF have submitted that no notified forest land is involved in the project of the NTPC other than an area of 204.991 ha of revenue forest land (Chote Bade Jhad ke Jungle).

10. They have submitted that the NTPC has already obtained the approval of the Central Government for diversion of 204.991 ha of revenue forest land on 05.05.1999. They have further submitted that in addition to this area of 60.00 ha has also been diverted in favour of the NTPC on 30.06.2004 for

construction of MGR Railway line from Thermal Power Plant to Gatora Railway Station. Based on the site inspection done by the Regional Office of the MoEF on 21.01.2017, the status of compliance of conditions stipulated in the approval accorded under Forest (Conservation) Act, 1980 has been given as below:-

....

....

i. ***Approval dated 05.05.1999 appears to be Stage I approval. No details pertaining to the Stage-II approval, if any, obtained by the User Agency has been made available. No detail pertaining to payments of NPV, if any, made by the User Agency in the instant case. Further, applicability of payment of NPV could not be ascertained as the User Agency did not make available the Stage-II approval. A view may be taken at appropriate level, if the approval dated 05.05.1999 is to be treated as final approval or Stage-I approval.***

ii. ***Further, out of the total 410.0 ha of degraded forest land identified for raising compensatory afforestation, 190 ha is orange forest land comprised of 140.0 ha in Bilaspur Forest Division and 50 ha in Janjgir Champa Forest Division, however, no detail pertaining to the declaration of the land identified for rising CA as reserved Forests under the Indian Forest Act, 1927 has not been made available by the User Agency/ State Forest Department.***

2. ***Status of compliance of conditions stipulated in the forest clearance accorded vide letter No. 8-115/2003-FC dated 30.06.2004 for diversion of 60.0 ha of forest land for construction of MGR railway line from Thermal Power Plant to Gatora Railway Station -***

i. ***Compensatory afforestation has been raised in Khamhriya village over an area of 76.990 ha of revenue land allotted by the District Collector. However, present status of plantation viz. year of plantation, survival percentage, etc was not made available by the user Agency.***

ii. Supporting document pertaining to the mutation and transfer of forest land in favour of the State Forest Department were not made available by the PP. Further, no detail pertaining to the declaration of Revenue Forest land identified for raising CA as Reserved Forest land under the Indian Forest Act, 1927 was made available by the State Forest Department/user Agency.

iii. Detail of progress made so far and area covered under plantation strip plantation along the railway line was not made available by the User Agency.

iv. Exact detail of measures taken by the PP in compliance No. (vi) of the FC approval has not been made available during the inspection.

11. It has been submitted by the Learned Counsel for MoEF that the FC granted on 05.05.1999 was the final Forest Clearance under Section 2 of Forest (Conservation) Act, 1980 as there were no two stage clearance for diversion of forest land during 1999.

12. In view of the facts and circumstances stated above, we are of the considered opinion that 143.391 ha. of Govt. Revenue land on which Social Forestry Division had raised plantation during 1986-87 cannot be treated as *'Forest Land'* because of two reasons, namely :-

i. Status of land in Govt. Revenue Records, was and continues to be 'revenue land'. The status of the land did not change to forest land even after it was transferred to Panchayat, after raising plantation during 1986-87 by the Social Forestry Division.

ii. Total number of trees on this 143.391 ha. Revenue land at the time of the proposal received from the NTPC was 29 per ha. Therefore, in terms of the criteria fixed by the then State Govt. i.e. Madhya Pradesh for treating any area outside forest land as 'forest' was 200 trees per hectare, therefore,

this land **could not have been treated as forest land,** thereby attracting provisions of Forest (Conservation) Act, 1980.

13. In view of the facts and circumstances narrated above, we are satisfied that for diversion of 143.391 ha of Revenue land to NTPC the approval of MoEF was not required as it did not attract the provisions of the Forest (Conservation) Act, 1980. Accordingly, this OA is dismissed, with no orders as to cost.

.....
Justice Raghuvendra S. Rathore
(Judicial Member)

.....
Satyawan Singh Garbyal
(Expert Member)

Dated: 19th February, 2019
New Delhi

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कार्यालय सहायक मिट्टी परीक्षण अधिकारी, तिलक नगर बिलासपुर (छ.ग.) (संशोधित)

क्रंमाक/तकनीकी/2020–21/83 बिलासपुर, दिंनाक 09/07/2020

प्रति,

क्षेत्रीय अधिकारी,
पर्यावरण संरक्षण मंडल
व्यापार विहार बिलासपुर (छ.ग.)

विषयः – मेसर्स एन.टी.पी.सी. सीपत के आसपास के सात गॉवों के मृदा नमूनो में उर्वरता परीक्षण के के संबध में।

संदर्भः– श्री आर.पी. मिश्रा, वरिष्ठ वैज्ञानिक, केन्द्रीय प्रदुषण नियत्रंण बोर्ड भोपाल (म.प्र) से दुरभाष में हुई चर्चा अनुसार दिनांक 07/07/2020।

विषांयतर्गत श्री आर. पी. मिश्रा, वरिष्ठ वैज्ञानिक, केन्द्रीय प्रदुषण नियत्रंण बोर्ड भोपाल (म.प्र) द्वारा दुरभाष में चाही गई जानकारी के संबध में एन.टी.पी.सी.सीपत के आसपास के गॉवों के मिट्टी नमूनो के विश्लेषण रिर्पाट के औसत के आधार पर विवरण निम्नानुसार है।

1. ग्राम रलिया – ग्राम रलिया में नाइट्रोजन (N) की उपलब्धता समान्य से लगभग 30 प्रतिशत कम है, जबकि स्फूर (P) की उपलब्धता मध्यम तथा पोटाश (K) की अधिक है। अन्य पोषक तत्वो में सल्फर, बोरान, आयरन, मैग्नीज, कॉपर, की उपलब्धता पर्याप्त है जबकि जिंक में आंशिक कमी परिलक्षित है।

2. ग्राम – हरदाडीह – ग्राम हरदाडीह में नाइट्रोजन की उपलब्धता समान्य से लगभग 21 प्रतिशत कम है, जबकि स्फूर की उपलब्धता मध्यम तथा पोटाश की अधिक है। अन्य पोषक तत्व सल्फर, बोरान, आयरन, मैग्नीज, कॉपर, जिंक की उपलब्धता पर्याप्त है।

3. ग्राम –रांक – ग्राम रांक में नाईटोजन समान्य से लगभग 38 प्रतिशत कम है जबकि स्फूर एवं पोटाश की उपलब्धता मध्यम है । अन्य सूक्ष्म पोषक तत्वो में मैग्नीज की उपलब्धता का समान्य से लगभग 42 प्रतिशत कम है तथा शेष पोषक तत्व पर्याप्त है।

4. ग्राम – भिलाई – इस ग्राम में नाईट्रोजन की उपलब्धता समान्य से लगभग 5 प्रतिशत कम है जबकि स्फूर की उपलब्धता मध्यम तथा पोटाश की अधिक है। इसी प्रकार सॅल्फर, बोरान, कॉपर, मैग्नीज, आयरन की उपलब्धता पर्याप्त है जबकि जिंक की आंशिक कमी है।

5. ग्राम – कोडिया – इस ग्राम में नाईट्रोजन की उपलब्धता समान्य से लगभग 30 प्रतिशत कम है जबकि स्फूर की उपलब्धता मध्यम तथा पोटाश की उपलब्धता अधिक है।अन्य सूक्ष्म तत्वो मे जिंक की उपलब्धता समान्य से लगभग 20 प्रतिशत कम है, जबकि शेष पोषक तत्व सॅल्फर, बोरान, कॉपर, मैग्नीज, आयरन की उपलब्धता पर्याप्त है।

6. ग्राम –गतौरा – इस ग्राम में नाईट्रोजन की उपलब्धता समान्य से लगभग 23 प्रतिशत कम है, जबकि स्फूर की उपलब्धता कुछ क्षेत्रो मे समान्य से लगभग 5 प्रतिशत कम है। पोटाश की उपलब्धता अधिक है। अन्य सूक्ष्म तत्वो में जिंक की उपलब्धता समान्य से लगभग 3 प्रतिशत कम है तथा शेष पोषक तत्व सॅल्फर, बोरान, कॉपर, मैग्नीज, आयरन की उपलब्धता पर्याप्त है।

उक्त सभी ग्रामों की मृदा लगभग अम्लीय है। तथा उक्त ग्रामो से लिये गये कुल 34 मिट्टी नमूनो के विश्लेषण में से 16 नमूनो में आर्गेनिक कार्बन की उपलब्धता कम एंव 18 में मध्यम है।

टीपः– इस कार्यालय में मृदा विश्लेषण द्वारा मृदा में उपलब्ध पोषक तत्वो का परीक्षण किया जाता है। विस्तृत जानकारी के लिये कृषि विज्ञान केन्द्र के वैज्ञानिको से संपर्क कर जानकारी प्राप्त करने की कृपा करेगे।

सहायक मिट्टी परीक्षण अधिकारी,

तिलक नगर बिलासपुर (छ.ग.)

क्रंमाक/तकनीकी/2020–21 / 84

बिलासपुर दिंनाक 09/07/2020

प्रतिलिपि–

1. कार्यालय कलेक्टर, जिला बिलासपुर की ओर सादर सूचनार्थ प्रेषित।
2. श्री आर. पी. मिश्रा, वरिष्ठ वैज्ञानिक, केन्दीय प्रदुषण नियत्रंण बोर्ड, परिवेश भवन पर्यावरण कम्पलेक्स E-5 अरेरा कालोनी, भोपाल (म.प्र) की ओर दुरभाष में हुई चर्चानुसार जानकारी प्रेषित।
3. उप संचालक कृषि बिलासपुर की ओर सादर सूचनार्थ प्रेषित।

सहायक मिट्टी परीक्षण अधिकारी

तिलक नगर बिलासपुर (छ.ग.)

कार्यालय कलेक्टर, जिला–बिलासपुर (छ.ग.)

कमांक 1437 /स.व.लि. / 2020 बिलासपुर, दिनांक : 29/6/20

प्रति,

डॉ. आर. पी. मिश्रा,
साईंटिस्ट 'डी', लेबोरेटरी हेड,
केन्द्रीय प्रदूषण नियंत्रण बोर्ड,
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय)
रिजनल डायरेक्टोरेट (सेन्ट्रल),
शंकर भवन तृतीय तल, नार्थ टी.टी. नगर,
भोपाल 462003

विषय :– मेसर्स एन.टी.पी.सी. सीपत के आसपास के 07 गांवो के मृदा नमूनों में उर्वरता परीक्षण के संबंध में।

संदर्भः–
1. माननीय नेशनल ग्रीन ट्रिब्युनल, प्रिंसीपल बेंच, नई दिल्ली का प्रकरण क्रमांक 459/2018 रश्मि सिंह विरूद्ध मेंसर्स एन.टी.पी.सी. सीपत के संबंध में पारित आदेश दिनांक 27.02.2020
2. इस कार्यालय का सहायक मिट्टी परीक्षण अधिकारी, तिलक नगर बिलासपुर को प्रेषित पत्र क्रमांक 2258 दिनांक 15.06.2020
3. कार्यालय, सहायक मिट्टी परीक्षण अधिकारी, तिलक नगर बिलासपुर (छ.ग.) का पत्र क्रमांक 58 दिनांक 22.06.2020

उपरोक्त विषयातंर्गत संदर्भ क्रमांक 01 में उल्लेखित प्रकरण क्रमांक 459/2018 रश्मि सिंह विरूद्ध मेंसर्स एन.टी.पी.सी. सीपत के संबंध में पारित आदेश दिनांक 27.02.2020 के परिप्रेक्ष्य में मेंसर्स एन.टी.पी.सी. सीपत के आसपास के 07 गांवों (रलिया, हरदाडीह, रांक, भिलाई, कौड़िया, गतौरा, सुरखीपाली) के मृदा नमूनों का संग्रहण एवं परीक्षण कर जांच रिपोर्ट प्रस्तुत करने के संबंध में सहायक मिट्टी परीक्षण अधिकारी, तिलक नगर बिलासपुर को संदर्भित पत्र क्रमांक 02 प्रेषित किया गया। उक्त जानकारी संदर्भित पत्र क्रमांक 03 के माध्यम से इस कार्यालय को प्राप्त हुई है। ग्राम सुरखीपाली में खेती करने योग्य भूमि का अभाव होने के कारणवश उक्त ग्राम से मृदा नमूना एकत्र नहीं किये जाने की जानकारी संदर्भित पत्र क्रमांक 03 में उल्लेखित की गई है। उक्त जानकारी की जांच करने पश्चात् ग्राम सुरखीपाली को छोड़कर शेष 06 ग्रामों के मृदा नमूना विश्लेषण परिणाम की जानकारी आपकी ओर सादर सम्प्रेषित है।

संलग्नः– उपरोक्तानुसार। (कुल पेज 1–36)

कलेक्टर
जिला–बिलासपुर (छ.ग.)

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कृषि, सहकारिता एवं किसान कल्याण विभाग
भारत सरकार
कृषि विभाग, छ.ग. शासन

स्वस्थ धरा, खेत हरा

CT/2020-21/32330549/1
DASHRATH KOSHLE

किसान का विवरण

नाम	DASHRATH KOSHLE
पता	
गाँव	रतिया
उप-जिला तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx7096
मोबाइल संख्या	
लिंग:Male,श्रेणी:SC	

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330549/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या ईंग संख्या	211/1
खेत आकार	0.56 हेक्टेयर
सिंचित	सिंचित(Canal)
भू स्थिति (जीपीएस) अक्षांश 22.065600°N देशान्तर 82.300900°E	

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

सॉयल परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आंकलन
1	पीएच	7.20		अल्कलाइन
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.75	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	200.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	12.54	किग्रा./हे.	मध्यम
6	उपलब्ध पोटेशियम (K)	492.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	10.00	पीपीएम	अपर्याप्त
8	उपलब्ध जिंक (Zn)	0.73	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	6.15	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	1.12	पीपीएम	अपर्याप्त
12	उपलब्ध कॉपर (Cu)	0.39	पीपीएम	पर्याप्त

जैविक एवं सूक्ष्म पोषक तत्वों संबंधी सिफारिशें

		एन.पी.के. के साथ
1 जिंक (Zn)	एक @ 20-40 किलोग्राम/हे. (जिसमें 140-280 किलोग्राम/हे.	-
2 मैंगनीज (Mn)	मैंगनीज सल्फेट 10 -25 किलोग्राम / हेक्टेयर)	1 % मैंगनीज सल्फेट + 0.25% चूना या 0.5% मैंगनीज सल्फेट (तीन बार छिड़काव)

व्यक्तिगत अनुशंसाएं

1	लाभ / लिफ्सम

कृषि विभाग, छ.ग. शासन

फसल के लिए उर्वरक सिफारिशें (जैविक स्पष्ट से तक)

क्र.स	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और साझा	जैव उर्वरक और साझा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन (किग्रा / हे.)
1	धान (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	28	डी ए पी(18-46-0)
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश

मृदा मिट्टी परीक्षण प्रयोगशाला
बिलासपुर (छत्तीसगढ़)

कृषि, सहकारिता एवं किसान कल्याण विभाग
कृषि और किसान कल्याण मंत्रालय
भारत सरकार

कृषि विभाग, छ.ग. शासन

स्वस्थ धरा, खेत हरा

CT/2020-21/32330576/1
MAG RAM YADAV

किसान का विवरण

नाम	DAG RAM YADAV
पता	
गाँव	धनिया
उप-जिला /तहसील	मस्तूरी
बस्ती का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx0324
मोबाइल संख्या	6260020885
लिंग: Male,श्रेणी:OBC	

मिट्टी नमूना विवरण

परीक्षण नमूना संख्या	CT/2020-21/32330576/1
नमूना एकत्र करने की तिथि	18-06-2020
खसरा संख्या	
खसरा संख्या/ प्लॉट संख्या	5/6
खेत आकार	0.23 हेक्टेयर
सिंचित	सिंचित(Canal)
भू स्थिति (जीपीएस) अक्षांश 22.071300°N देशान्तर 82.296200°E	

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परिणाम मान	इकाई	आंकलन
1	पीएच	7.00		न्यूट्रल
2	ईसी	0.40	डी एस / एम	
3	जैविक कार्बन (OC)	0.75	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	10.75	किग्रा./हे.	मध्यम
6	उपलब्ध पोटेशियम (K)	481.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	21.25	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.37	पीपीएम	अपर्याप्त
9	उपलब्ध बोरॉन (B)	6.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	4.31	पीपीएम	अपर्याप्त
11	उपलब्ध मैंगनीज (Mn)	3.76	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.23	पीपीएम	पर्याप्त

विशेषज्ञ एवं सूक्ष्म पोषक [illegible]

	[illegible]	[illegible]
1 जिंक (Zn)	जिंक सल्फेट (33 -25 किग्रा/हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना
2 आयरन (Fe)	फेरस सल्फेट (25-50 किग्रा/हे.) (मिट्टी में डालना उचित है)	1% फेरस सल्फेट (तीन बार छिड़काव)+ 0.5 % चूना

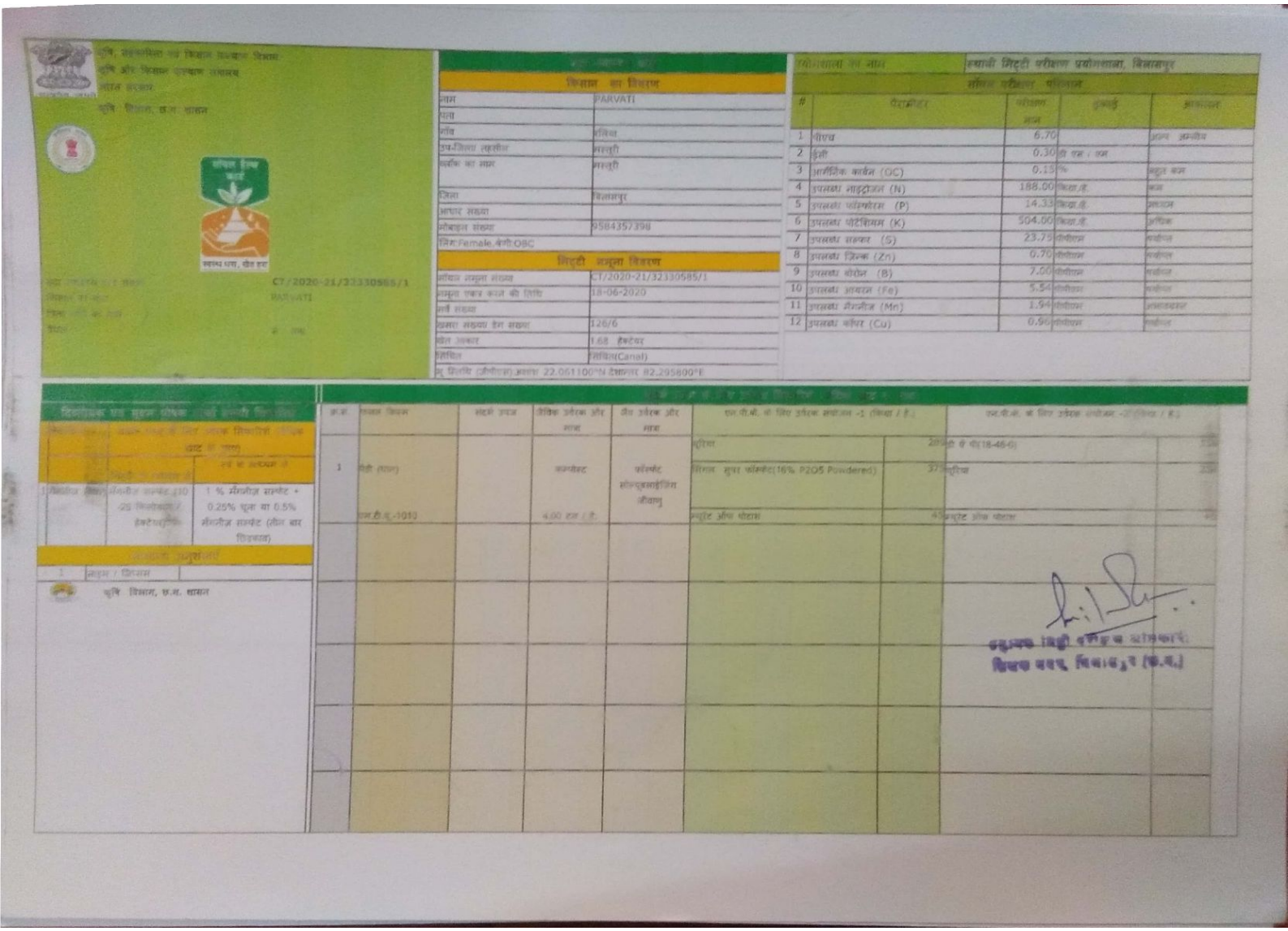
सामान्य अनुशंसाएँ

1	खाद / टिप्पण	

कृषि विभाग, छ.ग. शासन

क्र.सं.	फसल विवरण	सहयोगी उपाय	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	मिट्टी (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	28	डी ऐ पी(18-46-0)	3.50
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	3.00
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	0.50

सहायक मिट्टी परीक्षण अधिकारी
जिला बस्तर जिला(छ.ग.)



किसान का विवरण

नाम	PARVATI
पति	
गाँव	बस्तर
उप-जिला /तहसील	बस्तर
ब्लॉक का नाम	बस्तर
जिला	जगदलपुर
आधार संख्या	
मोबाइल संख्या	9584357398
जेंडर:Female,श्रेणी:OBC	

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330585/1
नमूना एकत्र करने की तिथि	18-06-2020
भूमि संख्या	
खसरा संख्या/ ईग संख्या	126/6
खेत आकार	1.68 हेक्टेयर
सुविधा	सिंचित(Canal)

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	6.70		अम्ल उदासीन
2	ईसी	0.30	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.15	%	बहुत कम
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा/हे.	कम
5	उपलब्ध फॉस्फोरस (P)	14.33	किग्रा/हे.	पर्याप्त
6	उपलब्ध पोटेशियम (K)	504.00	किग्रा/हे.	अधिक
7	उपलब्ध सल्फर (S)	23.75	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.70	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	7.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	5.54	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	1.94	पीपीएम	अपर्याप्त
12	उपलब्ध कॉपर (Cu)	0.96	पीपीएम	पर्याप्त

सिफारिश अनुसार

क्र.सं.	मात्रा / विवरण	
1	जिंक	जिंक सल्फेट 310 GR मिलीग्राम / हेक्टेयर मृदा
2	बोरोन	1 % मैंगनीज सल्फेट + 0.25% चूना या 0.5% मैंगनीज सल्फेट (तीन बार छिड़काव)

कृषि विभाग, छ.ग. शासन

क्र.सं.	फसल विवरण	संतुलित उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. की लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान) एम.टी.यू.-1010		वर्मीकम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	209	डी पी एस(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	250
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

सहायक स्थायी मृदा परीक्षण प्रयोगशाला, बिलासपुर (छ.ग.)

कृषि, सहकारिता एवं किसान कल्याण विभाग
कृषि और किसान कल्याण मंत्रालय
भारत सरकार

कृषि विभाग, छ.ग. शासन

स्वस्थ धरा, खेत हरा

मृदा स्वास्थ्य कार्ड संख्या: CT/2020-21/32330578/1
किसान का नाम: SANTOSH YADAV
पिता का नाम:
पता:

वर्ष: से तक

किसान का विवरण

नाम	SANTOSH YADAV
पता	
गांव	रतिया
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx5626
मोबाइल संख्या	9754432627

लिंग:Male,श्रेणी:OBC

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330578/1
नमूना एकत्र करने की तिथि	18-06-2020
सर्वे संख्या	
खसरा संख्या/ प्लॉट संख्या	4/4
खेत आकार	0.16 हेक्टेयर
सिंचित	सिंचित(Canal)

भू स्थिति (जीपीएस):अक्षांश 22.070000°N देशान्तर 82.290000°E

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

जांच परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	5.90		अम्लीय
2	ईसी	0.50	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.75	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	112.00	किग्रा/है	बहुत कम
5	उपलब्ध फॉस्फोरस (P)	13.44	किग्रा/है	मध्यम
6	उपलब्ध पोटेशियम (K)	448.00	किग्रा/है	अधिक
7	उपलब्ध सल्फर (S)	23.75	पीपीएम	पर्याप्त
8	उपलब्ध जिन्क (Zn)	0.57	पीपीएम	अपर्याप्त
9	उपलब्ध बोरोन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	5.23	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	1.94	पीपीएम	अपर्याप्त
12	उपलब्ध कॉपर (Cu)	1.01	पीपीएम	पर्याप्त

जिंक एवं सूक्ष्म पोषक तत्वों की सिफारिश

	मिट्टी के माध्यम से	एवं के माध्यम से
1 जिंक (Zn)	जिंक सल्फेट (10 -25 किलोग्राम/ हेक्टेयर) +	0.5% जिंक सल्फेट +0.25% चूना
2 मैंगनीज (Mn)	मैंगनीज सल्फेट (10 -25 किलोग्राम/ हेक्टेयर)	1 % मैंगनीज सल्फेट + 0.25% चूना या 0.5% मैंगनीज सल्फेट (तीन बार छिड़काव)

सामान्य अनुशंसाएं

1	ब्लॉक / जिलाम

कृषि विभाग, छ.ग. शासन

फसल के लिए उर्वरक सिफारिश

क्र.सं.	फसल किस्म	सदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / है.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / है.)
1	धान (धान) एम.टी.यू.-1010		कम्पोस्ट 5.00 टन / है.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	363	डी ए पी(18-46-0)
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश

सहायक मिट्टी परीक्षण अधिकारी
जिला बलरामपुर (छ.ग.)

मृदा, सस्यशास्त्र एवं विकास संस्थान केन्द्र
राष्ट्रीय कृषि विकास योजना अन्तर्गत
भारत सरकार
कृषि विभाग, म.प्र. शासन

C:/2020-21/3213093/7/1
BHAVANI LAL SAHU

किसान का विवरण

नाम	BHAVANI LAL SAHU
पता	
ग्राम	
उप-जिला तहसील	
मोबाईल नं.	
जिला	
आधार संख्या	XXXXXXXX2126
मोबाईल संख्या	9977647096
जिस Male,फेमेले OBC	

मिट्टी नमूना विवरण

मोबाइल नमूना संख्या	ST/2020-21/3213093/7/1
नमूना एकत्र करने की तिथि	17-06-2020
खेती संख्या	9373
खसरा संख्या/ प्लॉट संख्या	0.66 हेक्टेयर
खेत आकार	
सिंचित	सिंचित(Canal)

भू. सेंटरॉयड (जीपीएस) अक्षांश 22.075700°N देशान्तर 82.202400°E

प्रयोगशाला की राय

मृदा परीक्षण परिणाम प्रयोगशाला, सिवनी

#	पैरामीटर	मान	इकाई	आकलन
1	पीएच	6.20		प्रतिक्रिया हल्की अम्लीय
2	ईसी	0.40 डेसी एस / एम		
3	जार्विक कार्बन (OC)	0.15%		बहुत कम
4	उपलब्ध नाइट्रोजन (N)	313.00 किग्रा/हे		अपर्याप्त
5	उपलब्ध फॉस्फोरस (P)	14.33 किग्रा/हे		अपर्याप्त
6	उपलब्ध पोटेशियम (K)	448.00 किग्रा/हे		अधिक
7	उपलब्ध सल्फर (S)	15.00 मिलीग्राम		मध्यम
8	उपलब्ध जिंक (Zn)	1.26 मिलीग्राम		मध्यम
9	उपलब्ध बोरोन (B)	5.00 मिलीग्राम		मध्यम
10	उपलब्ध आयरन (Fe)	15.08 मिलीग्राम		मध्यम
11	उपलब्ध मैंगनीज (Mn)	23.58 मिलीग्राम		मध्यम
12	उपलब्ध कॉपर (Cu)	0.98 मिलीग्राम		मध्यम

सिफारिश

कृषि विभाग, म.प्र. शासन

क्र.	फसल किस्म	मात्रा/हे	जैविक उर्वरक और मात्रा	रोग प्रतिरोध और मात्रा	एन.पी.के. के लिए प्रतिरोध सर्वेक्षण -1 (किग्रा / हे.)			एन.पी.के. के लिए प्रतिरोध सर्वेक्षण -2 (किग्रा / हे.)		
					यूरिया	डीएपी	पोटाश	यूरिया	डीएपी	पोटाश
1	मेंथे (खेत)				सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)					
					375 कि.ग्रा					
					यूरिया और पोटाश					
					21 कि.ग्रा + 0 कि.ग्रा(18-46-0)					
2					यूरिया और पोटाश					
					65 कि.ग्रा + 0 कि.ग्रा(18-46-0)					

कृषि, सहकारिता एवं किसान कल्याण विभाग
कृषि और किसान कल्याण मंत्रालय
भारत सरकार

कृषि विभाग, छ.ग. शासन

मोबाइल हेल्थ कार्ड
स्वस्थ धरा, खेत हरा

CT/2020-21/32330936/1
ITWAR SINGH

किसान का विवरण

नाम	ITWAR SINGH
पता	
गांव	हर्दीपाट
उप-जिला तहसील	मस्तूरी
स्वीकृत का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx3251
मोबाइल संख्या	9977647096
लिंग:Male, श्रेणी:ST	

मिट्टी नमूना विवरण

परीक्षण नमूना संख्या	CT/2020-21/32330936/1
नमूना एकत्र करने की तिथि	17-06-2020
खसरा संख्या	
खसरा संख्या/ प्लॉट संख्या	91/7
खेत आकार	0.81 हेक्टेयर
सिंचित	सिंचित(Tube well)

भू स्थिति (जीपीएस) अक्षांश 22.007600°N देशान्तर 82.292400°E

प्रयोगशाला का नाम: स्थानी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परिणाम मान	इकाई	मंतव्य
1	पीएच	5.60		अम्लीय अनुकूल
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.75	%	उच्चतम
4	उपलब्ध नाइट्रोजन (N)	175.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	10.75	किग्रा./हे.	उच्चतम
6	उपलब्ध पोटेशियम (K)	448.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	15.00	पीपीएम	पर्याप्त
8	उपलब्ध जिन्क (Zn)	0.74	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	7.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	23.08	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	40.12	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	1.03	पीपीएम	पर्याप्त

फसल हेतु सुझाव

क्र. 1 खाद / जिलेवार

कृषि विभाग, छ.ग. शासन

क्र.स.	फसल किस्म	खेत में उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान)		कम्पोस्ट	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	130
	धान.टी.यू.-1010		4.00 टन / हे.		सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	230
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45
2	धान		कम्पोस्ट	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	130
	पिपरमेन्ट-273		4.00 टन / हे.		सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	230
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

सहायक [illegible]
बिलासपुर, बिलासपुर (छ.ग.)

कृषि, सहकारिता एवं किसान कल्याण विभाग
कृषि और किसान कल्याण मंत्रालय
भारत सरकार
कृषि विभाग, छ.ग. शासन

स्वस्थ धरा, खेत हरा

C*/2020-21/32330935/1
MAHESH RAM

किसान का विवरण

नाम	MAHESH RAM
पता	
गाँव	हर्दीडीह
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx9434
मोबाइल संख्या	9131058482

लिंग:Male,श्रेणी:OBC

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330935/1
नमूना एकत्र करने की तिथि	17-06-2020
सर्वे संख्या	
खसरा संख्या/ प्लॉट संख्या	37/4
खेत आकार	0.80 हेक्टेयर
सिंचित	सिंचित(Others)
भू स्थिति (जीपीएस):अक्षांश 22.075600°N देशान्तर 82.229200°E	

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

सॉयल परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	7.00		न्यूट्रल
2	ईसी	0.30	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.60	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	13.44	किग्रा./हे.	मध्यम
6	उपलब्ध पोटैशियम (K)	459.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	16.25	पीपीएम	पर्याप्त
8	उपलब्ध ज़िन्क (Zn)	1.12	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	8.31	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	4.85	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.86	पीपीएम	पर्याप्त

रासायनिक अनुशंसा

क्र.1	ब्लॉक / जिलेवार
	कृषि विभाग, छ.ग. शासन

क्र.स.	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धैंची (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	238
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

जिला मिट्टी सर्वेक्षण अधिकारी
जिला बिलासपुर (छ.ग.)

कृषि, सहकारिता एवं किसान कल्याण [illegible]
मृदा और किसान कल्याण [illegible]
भारत सरकार
मृदा विज्ञान [illegible]

स्वस्थ धरा, खेत हरा

मृदा स्वास्थ्य कार्ड संख्या: CT/2020-21/32330934/1
किसान का नाम: PUSAU RAM
पिता/पति का नाम:
पता:

से तक:

किसान का विवरण

नाम	PUSAU RAM
पता	
गाँव	हर्दीडीह
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx1234
मोबाइल संख्या	9131058482

लिंग:Male,श्रेणी:SC

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330934/1
नमूना एकत्र करने की तिथि	17-06-2020
सर्वे संख्या	
खसरा संख्या/ ब्लॉक संख्या	36/92
खेत आकार	1.36 हेक्टेयर
सिंचित	सिंचित(Tube well)

भू स्थिति (जीपीएस):अक्षांश 22.076100°N देशान्तर 82.292400°E

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

सॉयल परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	5.40		उपयुक्त
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.60	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	200.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	10.75	किग्रा./हे.	मध्यम
6	उपलब्ध पोटेशियम (K)	233.00	किग्रा./हे.	मध्यम
7	उपलब्ध सल्फर (S)	11.25	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	1.28	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	6.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	17.23	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	34.48	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	1.13	पीपीएम	पर्याप्त

सिफारिशें

[illegible]	[illegible] / जिप्सम	application of Lime @ 3-4q/ha in furrow for each crop is recommended except for low land rice

कृषि विभाग, छ.ग. शासन

फसल उपयुक्त के लिए उर्वरक सिफारिश (किग्रा / हे.)

क्र.स.	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	238
					म्यूरेट ऑफ पोटाश	67	म्यूरेट ऑफ पोटाश	67
2	गेहूँ जी.डब्लू.-273		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	238
					म्यूरेट ऑफ पोटाश	67	म्यूरेट ऑफ पोटाश	67

[illegible]
सहायक मिट्टी सर्वेक्षण अधिकारी
जिला मुख्यालय, बिलासपुर (छ.ग.)

मृदा परीक्षण एवं विश्लेषण प्रयोगशाला, बिलासपुर

स्वस्थ धरा, खेत हरा

CT/2020-21/32130932/1

VINOD KUMAR

किसान का विवरण	
नाम	VINOD KUMAR
पिता	
गाँव	हरदीकल
उप-जिला/तहसील	मस्तूरी
बैंक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx0616
मोबाइल संख्या	9131058482
लिंग:Male,श्रेणी:OBC	

मिट्टी नमूना विवरण	
सोयल नमूना संख्या	CT/2020-21/32130932/1
नमूना एकत्र करने की तिथि	17-06-2020
खेत संख्या	
खसरा संख्या/ इन्द्र संख्या	91/9
खेत आकार	0.80 हेक्टेयर
सिंचित	सिंचित(Tube well)
भू. स्थिति (जीपीएस) अक्षांश 22.075800°N देशान्तर 82.292400°E	

स्वायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परिणाम	इकाई	श्रेणी
1	पीएच	7.30		क्षारीय सहनीय
2	ईसी	0.50 डी एस / एम		अत्यधिक सहनीय
3	आर्गेनिक कार्बन (OC)	0.75%		मध्यम
4	उपलब्ध नाइट्रोजन (N)	213.00 किग्रा./है		कम
5	उपलब्ध फॉस्फोरस (P)	8.96 किग्रा./है		कम
6	उपलब्ध पोटेशियम (K)	448.00 किग्रा./है		अधिक
7	उपलब्ध सल्फर (S)	17.50 पीपीएम		पर्याप्त
8	उपलब्ध जिंक (Zn)	1.09 पीपीएम		पर्याप्त
9	उपलब्ध बोरोन (B)	5.00 पीपीएम		पर्याप्त
10	उपलब्ध आयरन (Fe)	3.00 पीपीएम		अपर्याप्त
11	उपलब्ध मैंगनीज (Mn)	15.94 पीपीएम		पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.98 पीपीएम		पर्याप्त

उर्वरक एवं सूक्ष्म पोषक [मृदा की स्थिति के अनुसार]

क्र.सं.	फसल विवरण	रकबा इकाई	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संस्तुति -1 (किग्रा / है.)	एन.पी.के. के लिए उर्वरक संस्तुति -2 (किग्रा / है.)
1	धान (धान)	4.00 एकड़ / है.	कम्पोस्ट गोबर्धन	पर्सपेट सोल्यूबलाईजिंग बैक्टीरिया	यूरिया 285कि ग्रा(18-46-0) मिश्रण सुपर फॉस्फेट(16% P2O5 Powdered) 500कि.ग्रा	285कि ग्रा(18-46-0) 500कि.ग्रा
2	गेहूँ (गेहूँ)	4.00 एकड़ / है.	कम्पोस्ट सोल्यूबलाईजिंग जीवाणु	पर्सपेट सोल्यूबलाईजिंग जीवाणु	यूरिया 285कि ग्रा(18-46-0) मिश्रण सुपर फॉस्फेट(16% P2O5 Powdered) 500कि.ग्रा	285कि ग्रा(18-46-0) 500कि.ग्रा

संस्तुत उर्वरक अनुसूची

क्र.	जिला / किसान	
1	कृषि विभाग, छ.ग. शासन	

CT/2020-21/3233054S/1
SULOCHANA PATEL

किसान का विवरण

नाम	SULOCHANA PATEL
पता	
जिला	बेमेतरा
उप-जिला तहसील	बेमेतरा
बैंक का नाम	स्टेट बैंक ऑफ इंडिया
खाता संख्या	XXXXXXX0800
ऑनबोर्डिंग संख्या	
लिंग/Female श्रेणी/OBC	

मिट्टी नमूना विवरण

सैंपल नम्बर संख्या	CT/2020-21/3233054S/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ प्लॉट संख्या	1756/1
खेत आकार	0.13 हेक्टेयर
सिंचित	सिंचित(Canal)
भू. स्थिति (जीपीएस) अक्षांश 22.093300°N देशान्तर 82.293400°E	

स्थानीय मिट्टी परीक्षण प्रयोगशाला, बेमेतरा

मिट्टी परीक्षण परिणाम

#	पैरामीटर	मात्रा	श्रेणी	आकलन
1	पीएच	6.20		अम्लीय क्रमशीय
2	ईसी	0.50 डी एस / एम		
3	आर्गेनिक कार्बन (OC)	0.13%		बहुत कम
4	उपलब्ध नाइट्रोजन (N)	150.00किग्रा./हे.		कम
5	उपलब्ध फास्फोरस (P)	14.33किग्रा./हे.		
6	उपलब्ध पोटेशियम (K)	235.00किग्रा./हे.		
7	उपलब्ध सल्फर (S)	21.50पीपीएम		
8	उपलब्ध जिंक (Zn)	0.62पीपीएम		
9	उपलब्ध बोरोन (B)	5.00पीपीएम		
10	उपलब्ध आयरन (Fe)	5.85पीपीएम		
11	उपलब्ध मैंगनीज (Mn)	10.81पीपीएम		
12	उपलब्ध कॉपर (Cu)	0.51पीपीएम		

क्र.सं.	फसल किस्म	सदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)	एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)
1	धान (धान)		कम्पोस्ट	पोस्फेट सल्यूबिलाईजिंग ऑरगेनु	यूरिया 289किग्रा से की(19-46-0)	
	एम.टी.यू.-1010		4.00 टन / हे.		सिंगल सुपर फॉस्फेट(16% P2O5 Powdered) 375किग्रा/हेक्टेयर	
					म्यूरेट ऑफ पोटाश 67किग्रा/हेक्टेयर	
2	धान		कम्पोस्ट	पोस्फेट सल्यूबिलाईजिंग ऑरगेनु	यूरिया 289किग्रा से की(19-46-0)	
	आईआर-64		4.00 टन / हे.		सिंगल सुपर फॉस्फेट(16% P2O5 Powdered) 375किग्रा/हेक्टेयर	
					म्यूरेट ऑफ पोटाश 67किग्रा/हेक्टेयर	

स्वायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	मान	इकाई	आकलन
1	पीएच	6.20		हल्का अम्लीय
2	ईसी	0.40	डेसी एस / एम	सामान्य
3	आर्गेनिक कार्बन (OC)	0.15	%	बहुत कम
4	उपलब्ध नाइट्रोजन (N)	213.00	किग्रा/है.	कम
5	उपलब्ध फॉस्फोरस (P)	22.40	किग्रा/है.	प्रचुर
6	उपलब्ध पोटेशियम (K)	235.00	किग्रा/है.	प्रचुर
7	उपलब्ध सल्फर (S)	21.25	पीपीएम	संतोषी
8	उपलब्ध जिंक (Zn)	0.57	पीपीएम	अपर्याप्त
9	उपलब्ध बोरोन (B)	7.00	पीपीएम	संतोषी
10	उपलब्ध आयरन (Fe)	12.31	पीपीएम	संतोषी
11	उपलब्ध मैंगनीज (Mn)	1.39	पीपीएम	अपर्याप्त
12	उपलब्ध कॉपर (Cu)	0.66	पीपीएम	संतोषी

किसान का विवरण

नाम	TIRITH KUWAR PATEL
पिता	
गाँव	रक
ग्राम-जिला/तहसील	मस्तूरी
सर्वेक्षण का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	
मोबाइल संख्या	
लिंग/Male श्रेणी/OBC	

मिट्टी नमूना विवरण

मोबाइल नमूना संख्या	CT/2020-21/323305#0/1
नमूना एकत्र करने की तिथि	10-06-2020
खेत संख्या	1-40/1
जिस सतह से नमूना	0.20 हेक्टेयर
खेत आकार	
स्थिति	मस्तूरी

भू. निर्देशांक (जियोटैग) अक्षांश 22.093300°N देशान्तर 82.293400°E

CT/2020-21/323305#0/1
TIRITH KUWAR PATEL

मिट्टी परीक्षण के बाद खेत में उर्वरक प्रबंधन हेतु सुझाव

क्र.सं.	उर्वरक का नाम	खेत में प्रयोग की मात्रा	कौन से पौधे के लिए उपयोगी	खेत में प्रयोग का समय	खेत में प्रयोग का तरीका
1	यूरिया (N)	3.00 ट्रक / है.	सभी पौधे	बुवाई के 30 दिन बाद	पौधे के पास डालें
2	डीएपी (DAP)	2.50 ट्रक / है.	सभी पौधे	बुवाई के समय	पौधे के पास डालें
3	म्यूरेट ऑफ पोटाश (MOP)	1.00 ट्रक / है.	सभी पौधे	बुवाई के समय	पौधे के पास डालें
4	जिंक सल्फेट	25 किग्रा / है.	सभी पौधे	बुवाई के समय	मिट्टी में मिलाएं
5	बोरेक्स	10 किग्रा / है.	सभी पौधे	बुवाई के समय	मिट्टी में मिलाएं

सामान्य सुझाव

1	0.5% जिंक सल्फेट +0.25% चूना का छिड़काव (पत्तियों पर)
2	1 % फेरिक सल्फेट + 0.25% चूना का 0.5% मोलेक्स सल्फेट (पौधा बाद छिड़काव)

CT/2020-21/13330537/1

NAR SINGH PATEL

किसान का विवरण

नाम	NAR SINGH PATEL
पता	
गाँव	रेत
उप-जिला/तहसील	मरवाही
ब्लॉक का नाम	मरवाही
जिला	बिलासपुर
आधार संख्या	XXXXXXXX9695
मोबाइल संख्या	
लिंग:Male, श्रेणी:OBC	

मिट्टी नमूना विवरण

परीक्षण नमूना संख्या	CT/2020-21/32330537/1
नमूना एकत्र करने की तिथि	16-06-2020
खसरा संख्या	
खसरा संख्या/उप संख्या	1761/2
खेत आकार	0.40 हेक्टेयर
सिंचित	सिंचित(Canal)
भू स्थिति (जीपीएस):अक्षांश 22.093300°N देशान्तर 82.293400°E	

स्थानीय मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

क्र	पैरामीटर	परिणाम मान	इकाई	मानसंकेत
1	पीएच	6.70		उदासीन
2	ईसी	0.50	डी एस / एम	
3	जार्बनिक कार्बन (OC)	0.80	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	100.00	किग्रा./हे.	अधिक कम
5	उपलब्ध फॉस्फोरस (P)	11.64	किग्रा./हे.	मध्यम
6	उपलब्ध पोटेशियम (K)	313.00	किग्रा./हे.	मध्यम
7	उपलब्ध सल्फर (S)	23.75	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.76	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	5.54	पीपीएम	पर्याप्त
11	उपलब्ध मैगनीज (Mn)	1.05	पीपीएम	अपर्याप्तमध्य
12	उपलब्ध कॉपर (Cu)	0.51	पीपीएम	पर्याप्त

किसान हेतु सुझाव संकेत

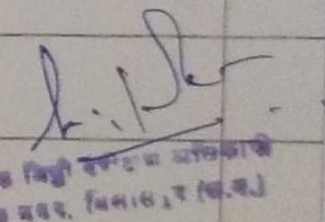
क्र.	सूक्ष्म पोषक	मात्रा (किग्रा / हे.)	सुझाव
1	मैगनीज (Mn)	मैंगनीज सल्फेट (10 -25 किलोग्राम / हेक्टेयर)	1 % मैंगनीज सल्फेट + 0.25% चूना या 0.5% मैंगनीज सल्फेट (तीन बार छिड़काव)

संस्तुतियाँ

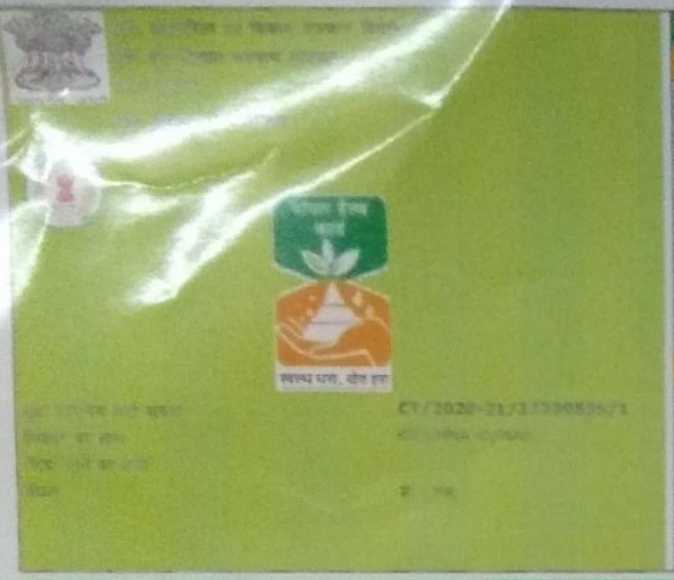
क्र.	नाम / जिलाम
1	कृषि विभाग, छ.ग. शासन

मृदा के लिए उर्वरक संस्तुति

क्र.क्र.	फसल विवरण	खरीफ उपज	डीएपी उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान) एम.टी.यू.-1010		कम्पोस्ट 5.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	36.5	डी ऐ पी(18-46-0)	87
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	42
					म्यूरेट ऑफ पोटाश	67	म्यूरेट ऑफ पोटाश	67



सहायक मिट्टी परीक्षण अधिकारी
जिला बिलासपुर (छ.ग.)



स्वस्थ धरा, खेत हरा

CT/2020-21/32330535/1

किसान का विवरण

नाम	KRISHNA KUMAR
पिता	
पति	ना
ग्राम/जिला/तहसील	मरवही
सर्वेक्षण का स्थान	मरवही
जिला	बिलासपुर
आधार संख्या	xxxxxxxx0582
मोबाइल संख्या	

लिंग:Male, श्रेणी:OBC

मिट्टी नमूना विवरण

अद्वितीय नमूना संख्या	CT/2020-21/32330535/1
नमूना एकत्र करने की तिथि	16-06-2020
फसली मौसम	
फसल लगाया गया संख्या	135
खेत आकार	0.18 हेक्टेयर
सिंचित	नहीं
भू स्थिति (जीपीएस) अक्षांश 22.095400°N देशांतर 82.266900°E	

स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

प्रयोगशाला परीक्षण परिणाम

क्र.	पैरामीटर	परिणाम मान	इकाई	श्रेणी
1	पीएच	6.50		उदासीन क्षारीय
2	ईसी	0.50	डी एस / एम	
3	जैविक कार्बन (OC)	0.75	%	अधिक
4	उपलब्ध नाइट्रोजन (N)	225.00	किग्रा/हे.	मध्य
5	उपलब्ध फॉस्फोरस (P)	16.12	किग्रा/हे.	अधिक
6	उपलब्ध पोटेशियम (K)	268.00	किग्रा/हे.	अधिक
7	उपलब्ध सल्फर (S)	25.00	मिलीग्राम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.63	मिलीग्राम	पर्याप्त
9	उपलब्ध बोरोन (B)	5.00	मिलीग्राम	पर्याप्त
10	उपलब्ध आयरन (Fe)	8.01	मिलीग्राम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	1.03	मिलीग्राम	उपलब्धतायुक्त
12	उपलब्ध कॉपर (Cu)	0.35	मिलीग्राम	पर्याप्त

जैविक एवं पुनर्चक्रण पोषक तत्वों की सिफारिश

		प्रति हे. प्रयोग
1	जिंक सल्फेट (10 किग्रा/हेक्टेयर)	1 % जिंक्सल्फेट + 0.25% चूना या 0.5% जिंक्सल्फेट (तीन बार छिड़काव)

अनुशंसा/सुझाव

1	नमूना / विवरण	

कृषि विज्ञान, छ.ग. शासन

उर्वरक एवं पोषक तत्व प्रबंधन सिफारिश

क्र.सं.	फसल विवरण	खरीफ उपज	रासायनिक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक सिफारिश -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक सिफारिश -2 (किग्रा / हे.)	
1	धान (धान) उन्नत हे.यू.-1010		यूरिया 3.00 टन / हे.	फॉस्फेट होलुबलाईजिंग जीवाणु	यूरिया	220	डी ए पी(18-46-0)	200
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	313	यूरिया	130
					म्यूरेट ऑफ पोटाश	50	म्यूरेट ऑफ पोटाश	50

अधिकृत हस्ताक्षर

CT/2020-21/32330[illegible]/1
HIDAY

सॉयल हेल्थ कार्ड
स्वस्थ धरा, खेत हरा

किसान का विवरण

नाम	HIDAY
पता	
गाँव	भेलई
उप-जिला तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx7650
मोबाइल संख्या	
लिंग:Male,श्रेणी:OBC	

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330582/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ डैग संख्या	197/2
खेत आकार	2.14 हेक्टेयर
सिंचित	सिंचित(Tube well)
भू स्थिति (जीपीएस) अक्षांश 22.048000°N देशान्तर 82.294700°E	

प्रयोगशाला का नाम	स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर			
सॉयल परीक्षण परिणाम				
#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	6.90		अल्प अम्लीय
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.15	%	बहुत कम
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	23.29	किग्रा./हे.	मध्यम
6	उपलब्ध पोटैशियम (K)	448.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	21.25	पीपीएम	पर्याप्त
8	उपलब्ध जिन्क (Zn)	1.03	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	6.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	4.92	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	1.94	पीपीएम	अपर्याप्त
12	उपलब्ध कॉपर (Cu)	0.42	पीपीएम	पर्याप्त

द्वितीयक एवं सूक्ष्म पोषक तत्वों संबंधी सिफारिशें

[illegible] फसल के लिए उर्वरक सिफारिशें (जैविक खाद के साथ)

	मिट्टी + [illegible] से	स्प्रे के माध्यम से
1 मैंगनीज (Mn)	मैंगनीज सल्फेट (10-25 किलोग्राम/ हेक्टेयर)	1 % मैंगनीज सल्फेट + 0.25% चूना या 0.5% मैंगनीज सल्फेट (तीन बार छिड़काव)

सामान्य अनुशंसाएँ

1	लाइम / जिप्सम	

कृषि विभाग, छ.ग. शासन

[illegible] उर्वरक सिफारिशें (जैविक खाद के साथ)

क्र.स	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	पैडी (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	28	डी ए पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	238
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45
2	गेहूं जीडब्लयू-273		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	238
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

प्रभारी मिट्टी परीक्षण अधिकारी
विकास खण्ड, बिलासपुर (छ.ग.)

नाम	RAM LAL
पता	
गाव	भोर्डे
उप-जिला/ तहसील	उत्तरी
जिले का नाम	उत्तरी
जिला	बिलासपुर
आधार संख्या	
मोबाइल संख्या	
जिंक Male/फीमेल SC	

मिट्टी नमूना विवरण

सर्वेक्षण नमूना संख्या	CT/2020-21/32310583/2
नमूना एकत्र करने की तिथि	16-06-2020
खेत संख्या	
खसरा संख्या/ प्लॉट संख्या	10/5
खेत आकार	0.24 हैक्टेयर
सिंचित	सिंचित(Tube well)
भू. स्थिति (जीपीएस) अक्षांश 22.054700°N देशान्तर 82.279600°E	

प्रयोगशाला का नाम इंदानी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परिणाम	मूल्यांकन	आकलन
1	पीएच	6.50		अम्लीय अम्लीय
2	ईसी	0.60 डी एस / एम		
3	जैविक कार्बन (OC)	0.60 %		साधारण
4	उपलब्ध नाइट्रोजन (N)	263.00 किग्रा./है.		कम
5	उपलब्ध फॉस्फोरस (P)	9.85 किग्रा./है.		कम
6	उपलब्ध पोटैशियम (K)	431.00 किग्रा./है.		अधिक
7	उपलब्ध सल्फर (S)	27.50 पीपीएम		पर्याप्त
8	उपलब्ध जिंक (Zn)	0.60 पीपीएम		अपर्याप्त
9	उपलब्ध बोरोन (B)	7.00 पीपीएम		पर्याप्त
10	उपलब्ध आयरन (Fe)	6.46 पीपीएम		पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	7.21 पीपीएम		पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.91 पीपीएम		पर्याप्त

विशेषज्ञ एवं वैज्ञानिक सलाह (मृदा परीक्षण के लिए संपर्क किसान सेवा केंद्र / वैज्ञानिक)

मृदा के लिए	मृदा के लक्षण के अनुसार
फसल / किस्म	जिंक सल्फेट (ZnSO4 21% जिंक सल्फेट)
1 धान	0.5% जिंक सल्फेट +0.25% चूना

फसल एवं उर्वरक संस्तुति

क्र.सं.	फसल किस्म	संभावित उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संस्तुति -1 (किग्रा / है.)	एन.पी.के. के लिए उर्वरक संस्तुति -2 (किग्रा / है.)
1	धान (धान) एच.टी.वी.-101)	4.00 टन / है.	कम्पोस्ट 4.00 टन / है.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया 289कि ग्रे की(18-46-0)	
2	मिलेट्स	4.00 टन / है.	कम्पोस्ट	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	सिंगल सुपर फॉस्फेट(16% P2O5 Powdered) 500यूरिया	

कृषि, सहकारिता [illegible] कल्याण विभाग

कृषि [illegible] कल्याण [illegible]

कृषि विभाग [illegible] शासन

सॉयल हेल्थ कार्ड

स्वस्थ धरा, खेत हरा

मृदा स्वास्थ्य कार्ड संख्या	CT/2020-21/32330583/1
किसान का नाम	SHYAM LAL
पिता/ पति का नाम	
वैधता	से तक

मृदा स्वास्थ्य कार्ड

किसान का विवरण

नाम	SHYAM LAL
पता	
गाँव	भेलई
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx1664
मोबाइल संख्या	
लिंग:Male,श्रेणी:OBC	

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330583/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ हैग संख्या	10/10
खेत आकार	0.20 हेक्टेयर
सिंचित	सिंचित(Tube well)
भू स्थिति (जीपीएस) अक्षांश 22.054700°N देशान्तर 82.279600°E	

प्रयोगशाला का नाम	स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर			

सॉयल परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	6.50		आंशिक अम्लीय
2	ईसी	0.60	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.60	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	263.00	किग्रा./है.	कम
5	उपलब्ध फॉस्फोरस (P)	9.85	किग्रा./है.	कम
6	उपलब्ध पोटेशियम (K)	481.00	किग्रा./है.	अधिक
7	उपलब्ध सल्फर (S)	27.50	पीपीएम	पर्याप्त
8	उपलब्ध ज़िन्क (Zn)	0.60	पीपीएम	अपर्याप्त
9	उपलब्ध बोरोन (B)	7.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	6.46	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	7.21	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.91	पीपीएम	पर्याप्त

द्वितीयक एवं सूक्ष्म पोषक तत्वों संबंधी सिफारिशें

पैरामीटर	खरीफ अवधि के लिए उर्वरक सिफारिशें (जैविक खाद के साथ)	
	मिट्टी के माध्यम से	स्प्रे के माध्यम से
1 जिंक (Zn)	जिंक सल्फेट (15-25 किलोग्राम / हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना

सामान्य अनुशंसाएँ

1	लाइम / जिप्सम	

कृषि विभाग, छ.ग. शासन

[illegible]

क्र.स.	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / है.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / है.)	
1	पैडी (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / है.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	174
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	500	यूरिया	221
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45
2	भिन्डी		कम्पोस्ट 4.00 टन / है.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	230	डी ए पी(18-46-0)	174
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	500	यूरिया	162
					म्यूरेट ऑफ पोटाश	67	म्यूरेट ऑफ पोटाश	67

स्वस्थ धरा, खेत हरा

CT/2020-21/3333057?/1

SATYA NARYAN

किसान का विवरण	
नाम	SATYA NARYAN
पता	
गाँव	भेलई
उप-जिला तहसील	नवरत्री
बस्ती का नाम	नवरत्री
जिला	बिलासपुर
आधार संख्या	xxxxxxxx5508
मोबाइल संख्या	8839076676
लिंग:Male, श्रेणी:OBC	

मिट्टी नमूना विवरण	
सॉयल नमूना संख्या	CT/2020-21/32330577/1
नमूना एकत्र करने की तिथि	18-06-2020
खसरा संख्या	
खसरा संख्या हेग संख्या	7/2
खेत आकार	0.28 हेक्टेयर
सिंचित	सिंचित(Tube well)
भू स्थिति (जीपीएस):अक्षांश 22.054500°N देशान्तर 82.286600°E	

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

#	पैरामीटर	परिणाम मान	इकाई	आकलन
1	पीएच	6.10		अम्लीय अम्लीय
2	ईसी	0.50	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.75	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	313.00	किग्रा.हे.	मध्यम
5	उपलब्ध फॉस्फोरस (P)	13.44	किग्रा.हे.	मध्यम
6	उपलब्ध पोटेशियम (K)	504.00	किग्रा.हे.	अधिक
7	उपलब्ध सल्फर (S)	25.00	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.74	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	7.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	11.38	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	9.03	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.66	पीपीएम	पर्याप्त

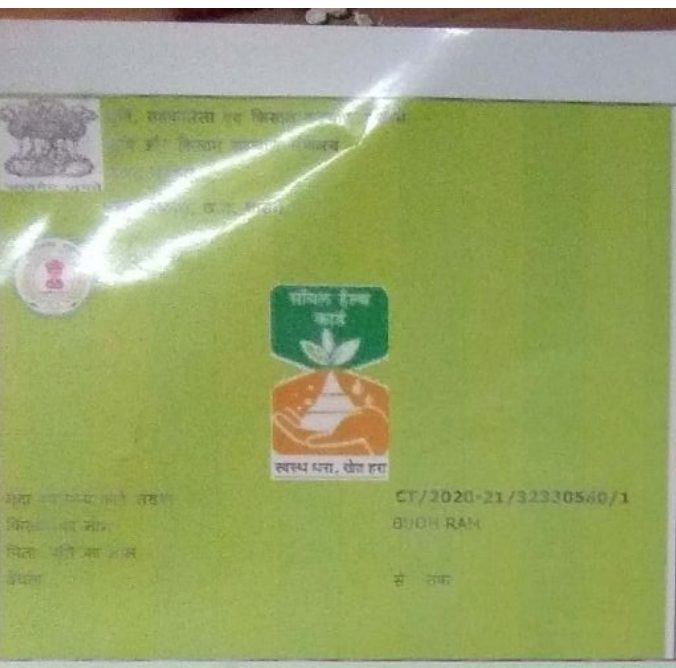
राजस्व अधिकारी

1 स्थान / विभाग

कृषि विभाग, छ.ग. शासन

क्र.स.	फसल विवरण	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान)		कम्पोस्ट	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	217	डी ए पी(18-46-0)	130
	धान.टी.यू.-1010		3.00 टन / हे.		सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	260
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	43

सहायक मिट्टी एवं कृषि रसायनज्ञ
जिला सर्वेक्षण, बिलासपुर (छ.ग.)



स्वस्थ धरा, खेत हरा

CT/2020-21/32330580/1

BUDH RAM

किसान का विवरण

नाम	BUDH RAM
पता	
गाँव	भेलई
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार सख्या	
मोबाइल संख्या	

लिंग:Male,श्रेणी:OBC

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330580/1
नमूना एकत्र करने की तिथि	18-06-2020
सर्वे सख्या	
खसरा सख्या/ ईग सख्या	208/25
खेत आकार	0.04 हेक्टेयर
सिंचित	सिंचित(Canal)

भू स्थिति (जीपीएस):अक्षांश 22.056100°N देशान्तर 82.294900°E

प्रयोगशाला का नाम: एथावी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

सॉयल परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	6.30		आंशिक अम्लीय
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.60	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	238.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	14.33	किग्रा./हे.	मध्यम
6	उपलब्ध पोटैशियम (K)	504.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	21.25	पीपीएम	पर्याप्त
8	उपलब्ध ज़िन्क (Zn)	0.69	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	4.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	7.08	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	10.81	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.41	पीपीएम	पर्याप्त

सामान्य सिफारिशें

1	कृषि विभाग, छ.ग. शासन

क्र.स.	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान) एन.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	170
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	238
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

सहायक मिट्टी परीक्षण अधिकारी
जिला प्रयोगशाला, बिलासपुर (छ.ग.)

मृदा स्वास्थ्य कार्ड	
किसान का विवरण	
नाम	DARASH
पता	
तहसील	सिरसा
ग्राम-पंचायत/शहर/वार्ड	सरसौदी
कार्डधारक का नाम	सरसौदी
मोबाइल	सिरसापुर
आधार संख्या	
फोन/दूरभाष संख्या	
लिंग:Male, श्रेणी:OBC	

मिट्टी नमूना विवरण	
प्रयोगशाला नमूना संख्या	CT/2020-21/32330552/1
नमूना संग्रह करने की तिथि	16-06-2020
फसली वर्ष	
खसरा/प्लॉट/हदबस्त संख्या	112/29
खेत आकार	0.13 हेक्टेयर
सिंचित	सिंचित(Canal)
भू स्थिति (जियोग्राफिक अक्षांश 22.063500°N देशांतर 82.203700°E	

प्रयोगशाला — क्षेत्रीय मिट्टी परीक्षण प्रयोगशाला, सिरसापुर

#	पैरामीटर	मान	इकाई	मूल्यांकन
1	पीएच	6.96		अम्ल उदासीन
2	ईसी	0.60	डी एस / एम	
3	जैविक कार्बन (OC)	0.3	%	कम
4	उपलब्ध नाइट्रोजन (N)	288.0	किग्रा/हे	उपयुक्त
5	उपलब्ध फॉस्फोरस (P)	9.8	किग्रा/हे	कम
6	उपलब्ध पोटेशियम (K)	492.00	किग्रा/हे	प्रचुर
7	उपलब्ध सल्फर (S)	18.75	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.62	पीपीएम	पर्याप्त
9	उपलब्ध बोरॉन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	8.04	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	8.4	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.91	पीपीएम	पर्याप्त

फसल उपज के लिए उर्वरक सिफारिशें (जैविक खाद के साथ)						
क्र.सं.	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. की लिए उर्वरक सयोजन -1 (किग्रा / हे.)	एन.पी.के. की लिए उर्वरक सयोजन -2 (किग्रा / हे.)
1	मिट्टी (खाद)		कम्पोस्ट	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	217.39 से पे(18-46-0)
	एम.टी.यू.-1010		3.00 टन / हे.		सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	250
					म्यूरेट ऑफ पोटाश	83 म्यूरेट ऑफ पोटाश

सहायक मिट्टी परीक्षण अधिकारी,
विकास खण्ड, सिरसापुर (म.प्र.)

CT/2020-21/32330579/1

LAKHAN

किसान का विवरण

नाम	LAKHAN
पता	
गांव	भेलई
उप-जिला/तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx7385
मोबाइल संख्या	

लिंग:Male, श्रेणी:OBC

मिट्टी नमूना विवरण

प्रयोगशाला नमूना संख्या	CT/2020-21/32330579/1
नमूना एकत्र करने की तिथि	18-06-2020
खेत संख्या	
खसरा संख्या/ ईग संख्या	13/26
खेत आकार	0.20 हेक्टेयर
सिंचित	सिंचित(Canal)

भू स्थिति (जीपीएस) अक्षांश 22.056600°N देशान्तर 82.277900°E

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

प्रयोगशाला परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	5.40		उदासीन
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.45	%	कम
4	उपलब्ध नाइट्रोजन (N)	326.00	किग्रा./हे.	मध्यम
5	उपलब्ध फॉस्फोरस (P)	14.33	किग्रा./हे.	मध्यम
6	उपलब्ध पोटेशियम (K)	425.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	10.00	पीपीएम	अपर्याप्त
8	उपलब्ध जिंक (Zn)	0.60	पीपीएम	अपर्याप्त
9	उपलब्ध बोरोन (B)	6.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	16.92	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	8.48	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.46	पीपीएम	पर्याप्त

सिफारिश पत्र सूचना पोषक [illegible]

	अपने उपयोग के लिए संस्तुति (किग्रा/हे)	
	मिट्टी में आवश्यक है	खेत में आवश्यक है
[illegible]	एस @ 20-40 किलोग्राम/हे (जिप्सम 140-280 किलोग्राम/हे)	-
जिंक (Zn)	जिंक सल्फेट (15-25 किलोग्राम / हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना

अन्य अनुशंसाएं

1	लाइम / जिप्सम	application of Lime @ 3-4q/ha in furrow for each crop is recommended except for low land rice

कृषि विभाग, छ.ग. शासन

[illegible]

क्र.सं.	फसल विवरण	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान) एम.टी.यू.-1010		कम्पोस्ट 3.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	217	डी ऐ पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	166
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

[illegible]
[illegible]

किसान का विवरण

नाम	KHELAN PATEL
पता	
गाँव	बाँदिया
उप-जिला तहसील	मस्तुरी
ब्लॉक का नाम	मस्तुरी
जिला	बिलासपुर
आधार संख्या	XXXXXXXX0671
मोबाइल संख्या	

लिंग:Male, श्रेणी:OBC

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330542/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ ब्लॉक संख्या	947/3
खेत आकार	0.20 हेक्टेयर
सिंचित	बारानी
भू स्थिति (जीपीएस) अक्षांश 22.092500°N देशान्तर 82.300900°E	

प्रयोगशाला का नाम: स्थानीय मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	6.10		अम्लीय
2	ईसी	0.60	डेसी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.15	%	बहुत कम
4	उपलब्ध नाइट्रोजन (N)	137.00	किग्रा./हे.	बहुत कम
5	उपलब्ध फॉस्फोरस (P)	10.75	किग्रा./हे.	मध्यम
6	उपलब्ध पोटेशियम (K)	492.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	15.00	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.64	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	4.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	8.62	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	3.21	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.33	पीपीएम	पर्याप्त

सामान्य अनुशंसाएं

1 ग्राम / जिलाम

कृषि विभाग, छ.ग. शासन

फसल उपज के लिए उर्वरक अनुशंसा (किग्रा / हे.)

क्र.स.	फसल किस्म	लक्ष्य उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	पैरी (धान) एम.टी.यू.-1010		कम्पोस्ट 3.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	291	डी ए पी(18-46-0)	109
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	313	यूरिया	249
					म्यूरेट ऑफ पोटाश	33	म्यूरेट ऑफ पोटाश	33

मृदा एवं मिट्टी परीक्षण प्रयोगशाला
जिला पंचायत बिलासपुर (छ.ग.)

स्वस्थ धरा, खेत हरा

CT/2020-21/32330532/1

SHIV KUMARI

किसान का विवरण

नाम	SHIV KUMARI
पता	
गाँव	बोड़वा
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx1533
मोबाइल संख्या	
लिंग:Female,श्रेणी:OBC	

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330532/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ प्लॉट संख्या	407/2
खेत आकार	0.21 हेक्टेयर
सिंचित	सिंचित(Canal)
भू स्थिति (जीपीएस):अक्षांश 22.111300°N देशान्तर 82.290600°E	

परीक्षणशाला का नाम: मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	6.50		आदिक अम्लीय
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.60	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	137.00	किग्रा./है.	बहुत कम
5	उपलब्ध फॉस्फोरस (P)	5.37	किग्रा./है.	कम
6	उपलब्ध पोटैशियम (K)	336.00	किग्रा./है.	मध्यम
7	उपलब्ध सल्फर (S)	20.00	पीपीएम	पर्याप्त
8	उपलब्ध जिन्क (Zn)	0.25	पीपीएम	अभावग्रस्त
9	उपलब्ध बोरोन (B)	6.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	5.85	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	1.03	पीपीएम	अभावग्रस्त
12	उपलब्ध कॉपर (Cu)	0.25	पीपीएम	पर्याप्त

मिट्टी परीक्षण एवं सुधार परीक्षण की सिफारिशें

	मिट्टी परीक्षण के लिए आवश्यक सिफारिशें (जैविक खाद के साथ)	
	मिट्टी में सुधार के	रोग के प्रबन्धन के
1 जिंक (Zn)	जिंक सल्फेट (15 -25 किलोग्राम / हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना
2 मैंगनीज (Mn)	मैंगनीज सल्फेट (10 -25 किलोग्राम/ हेक्टेयर)	1 % मैंगनीज सल्फेट + 0.25% चूना या 0.5% मैंगनीज़ सल्फेट (तीन बार छिड़काव)

सामान्य अनुशंसाएं

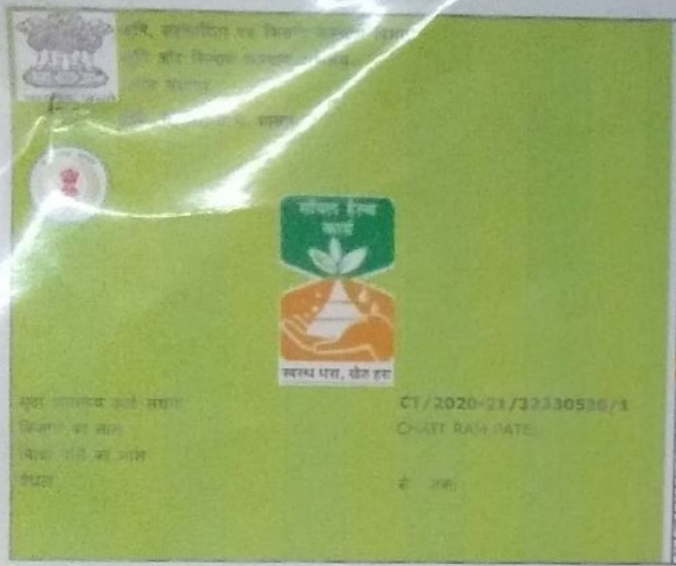
1	लाइम / जिप्सम	

कृषि विभाग, छ.ग. शासन

फसलों के लिए उर्वरक की सिफारिश

क्र.स.	फसल किस्म	सहजे उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक सयोजन -1 (किग्रा / है.)		एन.पी.के. के लिए उर्वरक सयोजन -2 (किग्रा / है.)	
1	पैडी (धान) एम.टी.यू.-1010		कम्पोस्ट 5.00 टन / है.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	363	डी ऐ पी(18-46-0)	109
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	500	यूरिया	295
					म्यूरेट ऑफ पोटाश	67	म्यूरेट ऑफ पोटाश	67

सहायक मिट्टी परीक्षण अधिकारी
जिला प्रयोगशाला, बिलासपुर (छ.ग.)



CT/2020-21/32330530/1
CHAIT RAM PATEL

किसान का विवरण

नाम	CHAIT RAM PATEL
पता	
गाँव	भाँडिया
उप-जिला/तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	
मोबाइल संख्या	
लिंग:Male,श्रेणी:OBC	

मिट्टी नमूना विवरण

सैंपल नमूना संख्या	CT/2020-21/32330530/1
नमूना एकत्र करने की तिथि	16-06-2020
खसरा संख्या	
खसरा संख्या/ईडी संख्या	465/3
खेत आकार	0.18 हेक्टेयर
सिंचित	सिंचित(Others)
भू स्थिति (जीपीएस) अक्षांश 22.122200°N देशान्तर 82.285900°E	

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परिणाम मान	इकाई	आकलन
1	पीएच	6.90		प्रायः उदासीन
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.75	%	पर्याप्त
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा./है.	कम
5	उपलब्ध फॉस्फोरस (P)	15.23	किग्रा./है.	पर्याप्त
6	उपलब्ध पोटेशियम (K)	481.00	किग्रा./है.	अधिक
7	उपलब्ध सल्फर (S)	26.25	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.23	पीपीएम	अपेक्षाकृत कम
9	उपलब्ध बोरोन (B)	0.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	5.54	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	10.12	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.21	पीपीएम	पर्याप्त

मृदा परीक्षण पश्चात फसलों के लिए सिफारिश जैविक खाद के साथ

	मृदा परीक्षण के लिए संयंत्र सिफारिश जैविक खाद के साथ	
	मिट्टी के सल्फर के	एस के उपचार के
1 जिंक(Zn)	जिंक सल्फेट (15 -25 किलोग्राम / हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना

अनुशंसाएँ

	नाम / जिलाम
1	

कृषि विभाग, छ.ग. शासन

क्र.स	पोषक तत्व	सहने उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / है.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / है.)	
1	मिट्टी (पोषक)		कम्पोस्ट	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	109
	एम.टी.यू.-1010		4.00 टन / है.		सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	256
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	46

महाप्रबंधक मिट्टी परीक्षण प्रयोगशाला
बिलासपुर (छ.ग.)

स्वस्थ धरा, खेत हरा

C1/2020-21/32330527/1

DILIP

किसान का विवरण

नाम	DILIP
पता	
गाँव	कोटेया
उप-जिला तहसील	मरवाही
बसोंक का नाम	मरवाही
जिला	बिलासपुर
आधार संख्या	xxxxxxxx7438
मोबाइल संख्या	

लिंग:Male, श्रेणी:SC

मिट्टी नमूना विवरण

नमूना नमूना संख्या	C1/2020-21/32330527/1
नमूना एकत्र करने की तिथि	16-06-2020
खसरा संख्या	
खसरा संख्या हेक्टर संख्या	721/1
खेत आकार	0.45 हेक्टेयर
सिंचाई	बारानी

भू स्थिति (जीपीएस) अक्षांश 22.156944°N देशान्तर 82.157222°E

प्रयोगशाला का नाम: छत्तीसगढ़ मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परिणाम मान	इकाई	आकलन
1	पीएच	6.10		अम्लीय अम्लीय
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.75	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	17.92	किग्रा./हे.	मध्यम
6	उपलब्ध पोटैशियम (K)	470.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	27.50	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.54	पीपीएम	अपेक्षाकृत
9	उपलब्ध बोरोन (B)	6.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	12.12	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	8.85	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.76	पीपीएम	पर्याप्त

टिप्पणी एवं सुझाव

	जिंक सल्फेट (ZnSO4 .2H2O) / (ZnSO4)
	0.5% जिंक सल्फेट +0.25% चूना

सामान्य अनुशंसाएँ

1	खाद / उर्वरक

कृषि विभाग, छ.ग. शासन

फसल के लिए उर्वरक अनुशंसा

क्र.सं	फसल विवरण	बहुवर्षीय उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / है.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / है.)	
1	मेंथी (बीज) एम.टी.यू.-1010		कम्पोस्ट 3.00 टन / है.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	230	डी ए पी(18-46-0)	109
					सिंगल सुपर फॉस्फेट(18% P2O5 Powdered)	313	यूरिया	196
					म्यूरेट ऑफ पोटाश	33	म्यूरेट ऑफ पोटाश	33

(Two hundred thirty kg)

किसान का विवरण

नाम	KISANI BAI
पता	
गांव	
उप-जिला तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	XXXXXXXX3135
मोबाइल संख्या	
लिंग:Female, श्रेणी:OBC	

मिट्टी नमूना विवरण

यूनिक नमूना संख्या	CT/2020-21/32330568/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ ईग संख्या	3503/1
खेत आकार	2.86 हेक्टेयर
इरीगेशन	कैनाल(Canal)
भू स्थिति (जीपीएस) अक्षांश 22.073700°N देशान्तर 82.271100°E	

प्रयोगशाला का नाम: स्थानीय मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	श्रेणी
1	पीएच	6.20		अम्लीय अम्लीय
2	ईसी	0.60	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.15	%	बहुत कम
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	22.40	किग्रा./हे.	पर्याप्त
6	उपलब्ध पोटेशियम (K)	504.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	13.75	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.73	पीपीएम	पर्याप्त
9	उपलब्ध बोरॉन (B)	6.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	7.69	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	4.67	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.63	पीपीएम	पर्याप्त

संस्तुति/सलाह

1. खेत / किसान: कृषि विभाग, छ.ग. शासन

क्र.सं.	फसल किस्म	संस्तुत उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सॉल्यूबलाईजिंग जीवाणु	यूरिया	285	डी ए पी(18-46-0)	130
					रॉक फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	220
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	42

स्वस्थ धरा, खेत हरा

CT/2020-21/32330564/1

CHANDRSHEKHAR

किसान का विवरण

नाम	CHANDRSHEKHAR
पता	
गाँव	सहोरा
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx3424
मोबाइल संख्या	
जेंडर:Male,श्रेणी:	

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330564/1
नमूना एकत्र करने की तिथि	16-06-2020
खतौनी संख्या	
खसरा संख्या/ प्लॉट संख्या	2891/1
खेत आकार	1.33 हेक्टेयर
प्रतिनिधि	बाजारी
भू स्थिति (जीपीएस) अक्षांश 22.083900°N देशान्तर 82.262700°E	

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

सॉयल परीक्षण परिणाम

#	पेरामीटर	परिणाम मान	इकाई	आकलन
1	पीएच	6.10		आंशिक अम्लीय
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.15	%	बहुत कम
4	उपलब्ध नाइट्रोजन (N)	250.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	8.96	किग्रा./हे.	कम
6	उपलब्ध पोटैशियम (K)	504.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	16.25	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.56	पीपीएम	अल्पतत्वता
9	उपलब्ध बोरॉन (B)	6.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	8.01	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	10.85	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.61	पीपीएम	पर्याप्त

जैविक पूर्ण घुलन पोषक तत्वों संबंधी सिफारिशें

	[illegible] सिफारिशें (जैविक खेती के लिए)	
[illegible]	[illegible]	अन्य का उपयोग 2
[illegible]	जिंक सल्फेट (10 कि.ग्रा. प्रति हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना

जैविक अनुशंसाएँ

1	मक्का / हिरवा	

कृषि विभाग, छ.ग. शासन

क्र.स.	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	पैरी (धान) एम.टी.यू.-1010		कम्पोस्ट 3.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	230	डी ऐ पी(18-46-0)	144
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	419	यूरिया	173
					म्यूरेट ऑफ पोटाश	33	म्यूरेट ऑफ पोटाश	33

[illegible] मिट्टी [illegible]
[illegible] बिलासपुर (छ.ग.)

कृषि विभाग, छ.ग. शासन

स्वस्थ धरा, खेत हरा

मृदा परीक्षण फार्म

किसान का विवरण	
नाम	MOHAR SAY
पता	
गाँव	सरौंदा
उप-जिला तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx2081
मोबाईल संख्या	7879993975
लिंग:Male,श्रेणी:SC	

मिट्टी नमूना विवरण	
सैंपल नमूना संख्या	CT/2020-21/32330581/1
नमूना एकत्र करने की तिथि	18-06-2020
सर्वे संख्या	
खसरा संख्या/ईवा संख्या	3646/1
खेत आकार	0.24 हेक्टेयर
सिंचित	सिंचित(Canal)
भू स्थिति (जीपीएस):अक्षांश 22.061200°N देशान्तर 82.275700°E	

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

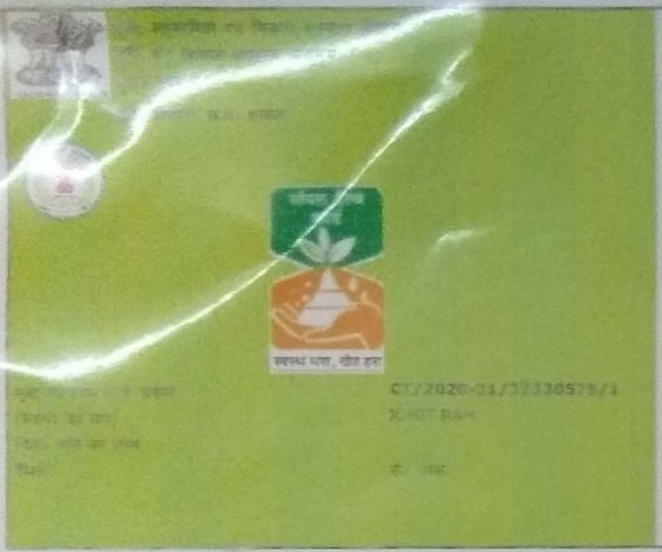
खनिज परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	6.50		आदिक क्षारीय
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.75	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा/हे.	कम
5	उपलब्ध फॉस्फोरस (P)	14.33	किग्रा/हे.	मध्यम
6	उपलब्ध पोटेशियम (K)	504.00	किग्रा/हे.	अधिक
7	उपलब्ध सल्फर (S)	13.75	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.75	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	7.69	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	49.40	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	1.46	पीपीएम	पर्याप्त

सर्वेक्षण अनुशंसाएँ

क्र.	फसल किस्म	सदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	238
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	42

स्थायी मिट्टी परीक्षण प्रयोगशाला
बिलासपुर, बिलासपुर (छ.ग.)



स्वस्थ धरा, खेत हरा

CT/2020-21/32330575/1

JOHIT RAM

मृदा स्वास्थ्य कार्ड

किसान का विवरण

नाम	JOHIT RAM
पता	
गाँव	गतौरा
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx8694
मोबाइल संख्या	
लिंग:Male,श्रेणी:OBC	

मिट्टी नमूना विवरण

मृदा नमूना संख्या	CT/2020-21/32330575/1
नमूना एकत्र करने की तिथि	18-06-2020
सर्वे संख्या	
खसरा संख्या/ डेग संख्या	106
खेत आकार	0.30 हेक्टेयर
सिंचित	सिंचित(Tube well)
भू स्थिति (जीपीएस):अक्षांश 22.073800°N देशान्तर 82.284800°E	

प्रयोगशाला का नाम	स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर			

मृदा परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	5.40		प्रबल अम्लीय
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.75	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	288.00	किग्रा.हे.	मध्यम
5	उपलब्ध फॉस्फोरस (P)	13.44	किग्रा.हे.	मध्यम
6	उपलब्ध पोटेशियम (K)	504.00	किग्रा.हे.	अधिक
7	उपलब्ध सल्फर (S)	13.75	पीपीएम	पर्याप्त
8	उपलब्ध जिन्क (Zn)	0.50	पीपीएम	अपर्याप्त
9	उपलब्ध बोरोन (B)	7.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	7.08	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	5.58	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.36	पीपीएम	पर्याप्त

द्वितीयक एवं सूक्ष्म पोषक तत्व संबंधी सिफारिशें

पोषक तत्व	फसल प्रकार के लिए उर्वरक सिफारिशें (जैविक खाद के साथ)	
	मिट्टी में प्रयोग के	पत्ते पर छिड़काव के
जिन्क (Zn)	जिंक सल्फेट (15 -25 किलोग्राम / हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना

सामान्य अनुशंसाएँ

1	लाइम / जिप्सम	application of Lime @ 3-4q/ha in furrow for each crop is recommended except for low land rice

कृषि विभाग, छ.ग. शासन

क्र.स	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	पैडी (धान) एम.टी.यू.-1010		कम्पोस्ट 3.00 टन / हे.	फॉस्फेट सॉल्यूबलाईजिंग जीवाणु	यूरिया	217	डी ए पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	166
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45
2	गेहूं जीडब्ल्यू-273		कम्पोस्ट 3.00 टन / हे.	फॉस्फेट सॉल्यूबलाईजिंग जीवाणु	यूरिया	217	डी ए पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	166
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

सहायक मिट्टी परीक्षण अधिकारी
विकास खण्ड [illegible] (छ.ग.)

कृषि विभाग, छ.ग. शासन

स्वस्थ धरा, खेत हरा

CT/2020-21/32330574/1
YAR MOHAMAD

किसान का विवरण

नाम	YAR MOHAMAD
पता	
गाँव	गटोरा
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx6352
मोबाइल संख्या	

लिंग:Male,श्रेणी:OBC

मिट्टी नमूना वितरण

सॉयल नमूना संख्या	CT/2020-21/32330574/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ डेग संख्या	2916/5
खेत आकार	1.18 हेक्टेयर
सिंचित	सिंचित(Canal)

भू स्थिति (जीपीएस):अक्षांश 22.083300°N देशान्तर 82.265300°E

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

सॉयल परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आंकलन
1	पीएच	5.70		आंशिक अम्लीय
2	ईसी	0.50	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.30	%	कम
4	उपलब्ध नाइट्रोजन (N)	213.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	9.85	किग्रा./हे.	कम
6	उपलब्ध पोटेशियम (K)	504.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	16.25	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.49	पीपीएम	अंशावस्त
9	उपलब्ध बोरॉन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	18.01	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	5.03	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	1.33	पीपीएम	पर्याप्त

जिंक एवं सूक्ष्म पोषक [illegible]

	मिट्टी में मात्रा से	रेत के माध्यम से
1 जिंक (Zn)	जिंक सल्फेट (15 -25 किलोग्राम / हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना

सामान्य अनुशंसाएँ

1	लाइम / जिप्सम	

कृषि विभाग, छ.ग. शासन

[illegible] के लिए उर्वरक सिफारिशें (जैविक खाद की मात्रा)

क्र.सं.	फसल किस्म	संदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	पैडी (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	269	डी ऐ पी(18-46-0)	174
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	500	यूरिया	221
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

उपसंचालक मिट्टी सर्वेक्षण अधिकारी
जिला सर्वेक्षण बिलासपुर (छ.ग.)

कृषि विभाग, छ.ग. शासन

स्वस्थ धरा, खेत हरा

CT/2020-21/32330572/2/2

PURUSHTTOM SAHU

किसान का विवरण

नाम	PURUSHTTOM SAHU
पता	
गाँव	मटौरा
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx2056
मोबाइल संख्या	

लिंग:Male,श्रेणी:OBC

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330572/2
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ ईग संख्या	3554/6
खेत आकार	0.27 हैक्टेयर
सिंचित	सिंचित(Canal)

भू स्थिति (जीपीएस):अक्षांश 22.073300°N देशान्तर 82.271900°E

प्रयोगशाला का नाम: मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मिट्टी परीक्षण परिणाम

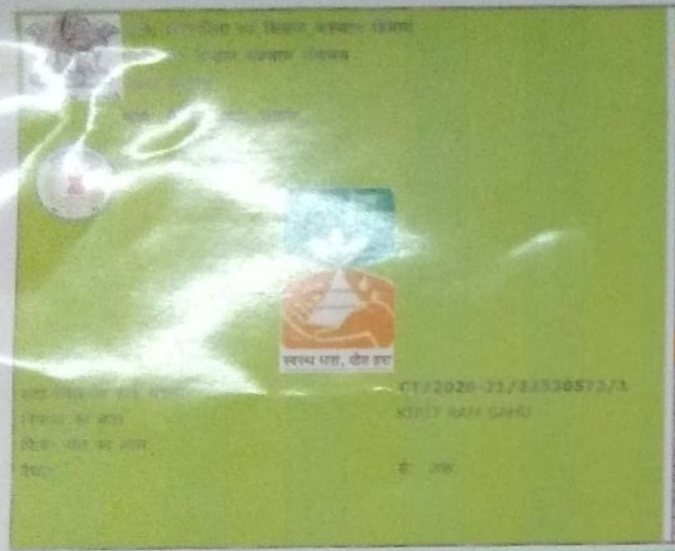
#	पैरामीटर	परीक्षण मान	इकाई	श्रेणीकरण
1	पीएच	6.10		अम्लीय अम्लीय
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.30	%	कम
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	9.85	किग्रा./हे.	कम
6	उपलब्ध पोटैशियम (K)	448.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	20.00	पीपीएम	पर्याप्त
8	उपलब्ध जिन्क (Zn)	0.65	पीपीएम	पर्याप्त
9	उपलब्ध बोरॉन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	6.15	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	8.46	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.50	पीपीएम	पर्याप्त

सामान्य अनुशंसाएँ

क्र.	अवलोकन / जिन्क	
1		

कृषि विभाग, छ.ग. शासन

क्र.स.	फसल किस्म	खेत में उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धान (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सॉल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	174
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	500	यूरिया	221
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45



CT/2020-21/32330572/1

KIRIT RAM SAHU

किसान का विवरण

नाम	KIRIT RAM SAHU
पिता	
गाँव	भाटीत
उप-जिला तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	XXXXXXXX4880
मोबाइल संख्या	

लिंग:Male,श्रेणी:OBC

मिट्टी नमूना विवरण

सोयल नमूना संख्या	CT/2020-21/32330572/1
नमूना एकत्र करने की तिथि	16-06-2020
फार्म संख्या	
खसरा संख्या/प्लॉट संख्या	3529/3
खेत आकार	0.20 हेक्टेयर
सिंचित	सिंचित(Canal)
भू स्थिति (जीपीएस):अक्षांश 22.073300°N देशान्तर 82.271900°E	

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परिणाम मान	इकाई	आकलन
1	पीएच	6.10		अम्लीय अम्लीय
2	ईसी	0.40	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.30	%	कम
4	उपलब्ध नाइट्रोजन (N)	188.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	9.85	किग्रा./हे.	कम
6	उपलब्ध पोटेशियम (K)	448.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	20.00	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.65	पीपीएम	पर्याप्त
9	उपलब्ध बोरोन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	6.15	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	8.48	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.50	पीपीएम	पर्याप्त

संस्तुति अनुसार

1	ब्लॉक / जिलाम

कृषि विभाग, छ.ग. शासन

क्र.सं.	उत्पाद विवरण	संदर्भ उत्पाद	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	डीएपी (फास्फेट) एन.टी.पी.सी.-1310		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	174
					जिंक्सल सुपर सल्फेट(16% P2O5 Powdered)	500	यूरिया	223
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

किसान का विवरण

नाम	CHANDRAKANT
पता	
गाँव	गटौरा
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx5798
मोबाइल संख्या	7828269346

लिंग:Male,श्रेणी:OBC

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330571/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ ढेग संख्या	2868/1
खेत आकार	0.17 हेक्टेयर
सिंचित	बारानी

भू स्थिति (जीपीएस) अक्षांश 22.080200°N देशान्तर 82.265400°E

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

लैब परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	5.50		उदय अम्लीय
2	ईसी	0.60	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.60	%	मध्यम
4	उपलब्ध नाइट्रोजन (N)	238.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	23.29	किग्रा./हे.	मध्यम
6	उपलब्ध पोटैशियम (K)	123.00	किग्रा./हे.	कम
7	उपलब्ध सल्फर (S)	11.25	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.53	पीपीएम	अल्पमात्रक
9	उपलब्ध बोरॉन (B)	5.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	16.31	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	28.12	पीपीएम	पर्याप्त
12	उपलब्ध कॉपर (Cu)	0.68	पीपीएम	पर्याप्त

सिफारिश पर आधारित पोषक तत्व प्रबंधन हेतु सिफारिशें

पैरामीटर	उद्देश्य फसल की लिए उर्वरक सिफारिशें (जैविक खाद के साथ)	
	मिट्टी में व्यवहार से	इन्हें को व्यवहार में
1 जिंक (Zn)	जिंक सल्फेट (15 -25 किलोग्राम/ हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना

सामान्य अनुशंसाएँ

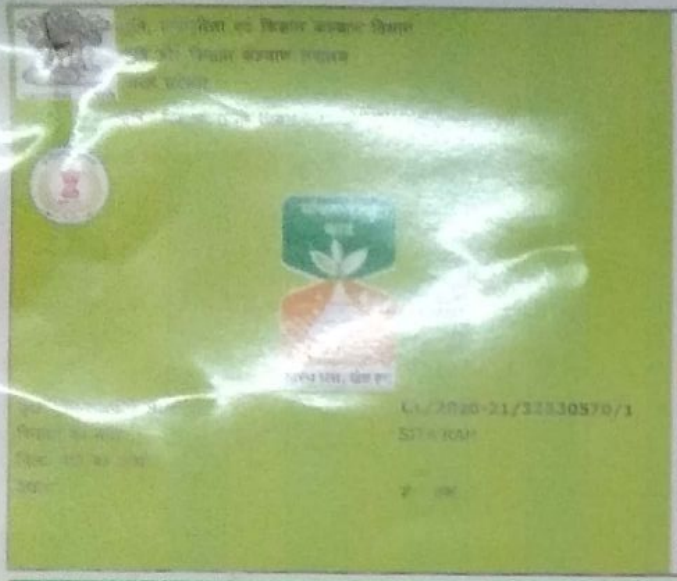
1	लाइम / जिप्सम

कृषि विभाग, छ.ग. शासन

फिर उपयोग के लिए उर्वरक सिफारिशें (किग्रा / हे.)

क्र.स	फसल किस्म	खेत में उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धैंचा (धान) एम.टी.यू.-1010		कम्पोस्ट 3.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	230	डी ए पी(18-46-0)	109
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	313	यूरिया	188
					म्यूरेट ऑफ पोटाश	67	म्यूरेट ऑफ पोटाश	67

सहायक विकास अधिकारी
विकास खण्ड, मस्तूरी (छ.ग.)



किसान का विवरण

नाम	SITA RAM
पता	
गाँव	गतौरा
उप-जिला तहसील	नवागढ़ी
ब्लॉक का नाम	नवागढ़ी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx1644
मोबाइल संख्या	

लिंग:Male, श्रेणी:ST

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330570/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ ईग संख्या	3420/1
खेत आकार	0.18 हेक्टेयर
सिंचित	सिंचित(Tube well)

भू स्थिति (जीपीएस) अक्षांश 22.072800°N देशान्तर 82.268900°E

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

मृदा परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	6.50		अधिक अम्लीय
2	ईसी	0.70	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.45	%	कम
4	उपलब्ध नाइट्रोजन (N)	200.00	किग्रा./है.	कम
5	उपलब्ध फॉस्फोरस (P)	9.85	किग्रा./है.	कम
6	उपलब्ध पोटैशियम (K)	304.00	किग्रा./है.	अधिक
7	उपलब्ध सल्फर (S)	12.50	पीपीएम	पर्याप्त
8	उपलब्ध जिंक (Zn)	0.46	पीपीएम	अपर्याप्त
9	उपलब्ध बोरोन (B)	7.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	5.85	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	1.58	पीपीएम	अपर्याप्त
12	उपलब्ध कॉपर (Cu)	0.46	पीपीएम	पर्याप्त

विशेषज्ञ द्वारा सहायक आंकड़े कार्यालय हेतु टिप्पणी

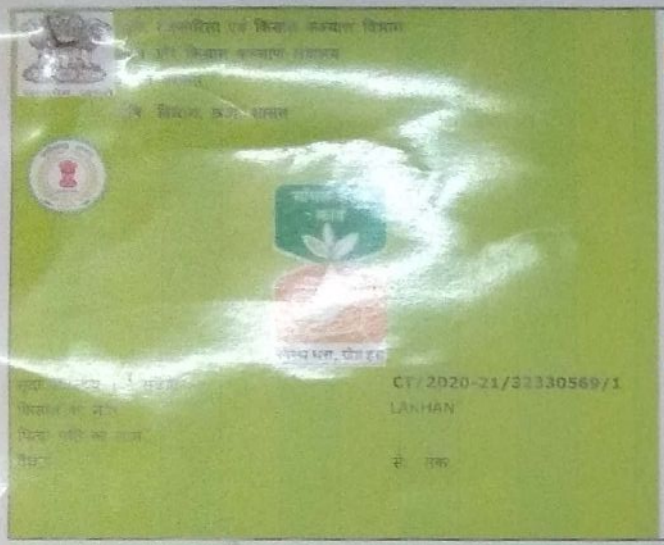
परिणाम	मृदा परीक्षण के लिए उर्वरक सिफारिशें (किग्रा. प्रति हे.)	
	कमी के स्तरों के	कमी के अनुपात में
1 जिंक (Zn)	जिंक सल्फेट (15 -25 किलोग्राम / हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना
2 मैंगनीज (Mn)	मैंगनीज सल्फेट (10 -25 किलोग्राम / हेक्टेयर)	1 % मैंगनीज सल्फेट + 0.25% चूना या 0.5% मैंगनीज सल्फेट (तीन बार छिड़काव)

सामान्य अनुशंसाएँ

1	लाइम / जिप्सम

कृषि विभाग, छ.ग. शासन

क्र.सं.	फसल किस्म	पहले उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संस्तुति -1 (किग्रा / है.)		एन.पी.के. के लिए उर्वरक संस्तुति -2 (किग्रा / है.)	
1	धान (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / है.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	174
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	500	यूरिया	221
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45
2	गेहूँ जीडब्लयू-273		कम्पोस्ट 4.00 टन / है.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	289	डी ए पी(18-46-0)	174
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	500	यूरिया	221
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45
3	सोयाबीन जेएस-9218		कम्पोस्ट 4.00 टन / है.	राईजोबियम	यूरिया	87	डी ए पी(18-46-0)	115
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	331	यूरिया	42
					म्यूरेट ऑफ पोटाश	22	म्यूरेट ऑफ पोटाश	22



CT/2020-21/32330569/1

LAKHAN

से एक

किसान का विवरण

नाम	LAKHAN
पता	
गाँव	गढौरा
उप-जिला/ तहसील	मस्तूरी
ब्लॉक का नाम	मस्तूरी
जिला	बिलासपुर
आधार संख्या	xxxxxxxx4337
मोबाइल संख्या	

लिंग:Male,श्रेणी:OBC

मिट्टी नमूना विवरण

सॉयल नमूना संख्या	CT/2020-21/32330569/1
नमूना एकत्र करने की तिथि	16-06-2020
सर्वे संख्या	
खसरा संख्या/ ईग संख्या	2604/2
खेत आकार	0.74 हेक्टेयर
सिंचित	सिंचित(Tube well)

भू स्थिति (जीपीएस) अक्षांश 22.073600°N देशान्तर 82.265500°E

प्रयोगशाला का नाम: स्थायी मिट्टी परीक्षण प्रयोगशाला, बिलासपुर

सॉयल परीक्षण परिणाम

#	पैरामीटर	परीक्षण मान	इकाई	आकलन
1	पीएच	7.10		आंशिक क्षारीय
2	ईसी	0.60	डी एस / एम	
3	आर्गेनिक कार्बन (OC)	0.15	%	बहुत कम
4	उपलब्ध नाइट्रोजन (N)	175.00	किग्रा./हे.	कम
5	उपलब्ध फॉस्फोरस (P)	15.23	किग्रा./हे.	मध्यम
6	उपलब्ध पोटैशियम (K)	459.00	किग्रा./हे.	अधिक
7	उपलब्ध सल्फर (S)	18.75	पीपीएम	पर्याप्त
8	उपलब्ध जिन्क (Zn)	0.48	पीपीएम	अभावग्रस्त
9	उपलब्ध बोरोन (B)	7.00	पीपीएम	पर्याप्त
10	उपलब्ध आयरन (Fe)	5.23	पीपीएम	पर्याप्त
11	उपलब्ध मैंगनीज (Mn)	1.21	पीपीएम	अभावग्रस्त
12	उपलब्ध कॉपर (Cu)	0.42	पीपीएम	पर्याप्त

सिन्थेटिक एवं मुख्य पोषक तत्वों की पि रिक्ति

पोषकतत्व	संदर्भ उपज के लिए अंकरक सिफारिशें (रासायनिक खाद के रूप)	
	मिट्टी / साफ्यता से	मृदा की आवश्यकता से
1 जिंक (Zn)	जिंक सल्फेट (15 -25 किलोग्राम / हेक्टेयर)	0.5% जिंक सल्फेट +0.25% चूना
2 मैंगनीज (Mn)	मैंगनीज सल्फेट (10 -25 किलोग्राम / हेक्टेयर)	1 % मैंगनीज सल्फेट + 0.25% चूना या 0.5% मैंगनीज सल्फेट (तीन बार छिड़काव)

सामान्य अनुशंसाएँ

1	साइम / जिप्सम

कृषि विभाग, छ.ग. शासन

क्र.स.	फसल किस्म	सदर्भ उपज	जैविक उर्वरक और मात्रा	जैव उर्वरक और मात्रा	एन.पी.के. के लिए उर्वरक संयोजन -1 (किग्रा / हे.)		एन.पी.के. के लिए उर्वरक संयोजन -2 (किग्रा / हे.)	
1	धैंचा (धान) एम.टी.यू.-1010		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	269	डी ऐ पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	238
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45
2	गेहूँ जोडबलए-273		कम्पोस्ट 4.00 टन / हे.	फॉस्फेट सोल्यूबलाईजिंग जीवाणु	यूरिया	269	डी ऐ पी(18-46-0)	130
					सिंगल सुपर फॉस्फेट(16% P2O5 Powdered)	375	यूरिया	238
					म्यूरेट ऑफ पोटाश	45	म्यूरेट ऑफ पोटाश	45

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

Ref. No.: CS-9518-109(2)-9-FC-NOA-6815 **Date: 24.05.2019**

M/s GE Power India Limited
Plot No.7, IHDP Building,
Sector-127, Noida-201301

Kind Attn.: Mr. Lalit Sankarni, Executive-Business Operations

Sub.: Notification of Award (NOA) for Ex-works Supply (India) for Flue Gas Desulphurisation (FGD) System Package for Sipat Super Thermal Power Station Stage-I (3 x 660 MW) as per Common Bidding Document No. CS-0011-109(2)-9.

Dear Sir,

1.0 This has reference to the following:

i) Our Invitation for Bids (IFB) No. 40087737 dated 31.08.2018 inviting Envelope-I (Techno-Commercial) Bids and IFB no. 40087818 for Envelope-II (Price) Bids.

ii) Bidding Documents for the subject package downloaded by you from SRM portal comprising the following:

S. No.	Description of Bidding Documents
1	Section-I : Invitation for Bids (IFB)
2	Section-II : Instructions to Bidders (ITB)
3	Section-III : Bid Data Sheets (BDS)
4	Section-IV : General Conditions of Contract (GCC)
5	Section- V : Special Conditions of Contract (SCC)
6	Section-VI : Technical Specifications including Tender Drawings and Technical Data Sheets
7	Section-VII : Forms & Procedures (FP) consisting of Part-1 of 3, Part-2 of 3 and Part-3 of 3

iii) Various Amendments/Clarifications/Errata issued to the Bidding Documents for the subject package as per details given below:

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
Dy. General Manager (Contract Services)
एनटीपीसी लिमिटेड / NTPC Limited
EOC, A-8A, Sector-24, NOIDA-201301 (U.P.)

अभियांत्रिकी कार्यालय परिसर, प्लाट न. ए - ८ ए, सेक्टर २४, पोस्ट बॉक्स नं. १३, नोएडा (उ.प्र.), पिन: २०१३०१
ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No. 13, NOIDA (U.P.), Pin: 201301
कॉरपोरेट पहचान नंबर: एल. ४०१०१ डी. एल. १९७५ जी. ओ. आई. ००७९६६, वेबसाइट: www.ntpc.co.in
Corporate Identification Number : L40101DL1975GOI007966, Website: www.ntpc.co.in
टेलीफोन नं.: ०१२०-२४१०३३३ (१० लाईनें), ०१२०-२४१०११६ (५ लाईनें), फैक्स: ०१२०-२४१०१३६, ०१२०-२४१०१३७
Telephone No.:0120-2410333 (10 Lines), 0120-2410116 (5-Lines), Fax: 0120-2410136, 0120-2410137
पंजीकृत कार्यालय : एन.टी.पी.सी. भवन, स्कोप काम्प्लेक्स, ७ इन्स्टीट्यूशनल एरिया, लोदी रोड, नई दिल्ली - ११०००३
. Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

List of Clarifications			
Commercial Clarifications			
S. No.	**Description**	**Ref. no.**	**Issuance/ Uploading Date**
1	Clarification no. 1 (Commercial) to Bidding Documents	CS-0011-109(2)-9-CLRF.01 (Comm)	03.10.2018
2	Clarification no. 2 (Commercial) to Bidding Documents	CS-0011-109(2)-9-CLRF.02 (Comm.)	24.10.2018
Technical Clarifications			
S. No.	**Description**	**Ref. no.**	**Issuance Date**
1	Clarification no. 1 (Technical)	CS-0011-109(2)-9-CLRF-01(TECH)	26.10.2018
2	Clarification no. 2 (Technical)	CS-0011-109(2)-9-CLRF-02(TECH)	19.11.2018
3	Clarification no. 3 (Technical)	CS-0011-109(2)-9-CLRF-03(TECH)	28.11.2018
List of Amendments			
S. No.	**Description**	**Ref. no.**	**Issuance Date**
1	Amendment no. 1 to Bidding Documents consisting of : (i) Amendment No. 01 to Section VII	CS-0011-109(2)-9-AMDT.01	19.09.2018
2	Amendment no. 2 to Bidding Documents consisting of : (i) Amendment No. 01 to BDS (Section-III) (ii) Amendment No. 01 to SCC (Section-V) (iii) Amendment No. 02 to Section VII	CS-0011-109(2)-9-AMDT-02	03.10.2018
3	Amendment no. 3 to Bidding Documents consisting of : (i) Amendment No. 01 to Technical Specification (Section-VI)	CS-0011-109(2)-9-AMDT-03	26.10.2018
4	Amendment no. 4 to Bidding Documents consisting of :	CS-0011-109(2)-9-AMDT-04	27.10.2018

अभियांत्रिकी कार्यालय परिसर, प्लाट न. ए - ८ ए, सेक्टर २४, पोस्ट बॉक्स नं. १३, नोएडा (उ.प्र.), पिन: २०१३०१
ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No. 13, NOIDA (U.P.), Pin: 201301
कॉरपोरेट पहचान नंबर: एल. ४०१०१ डी. एल. १९७५ जी. ओ. आई. ००७९६६, वेबसाइट: www.ntpc.co.in
Corporate Identification Number : L40101DL1975GOI007966, Website: www.ntpc.co.in
टेलीफोन नं.: ०१२०-२४१०३३३ (१० लाईनें), ०१२०-२४१०११६ (५ लाईनें), फैक्स: ०१२०-२४१०१३६, ०१२०-२४१०१३७
Telephone No.:0120-2410333 (10 Lines), 0120-2410116 (5-Lines), Fax: 0120-2410136, 0120-2410137
पंजीकृत कार्यालय : एन.टी.पी.सी. भवन, स्कोप कॉम्प्लेक्स, ७ इन्स्टीट्यूशनल एरिया, लोदी रोड, नई दिल्ली - ११०००३
Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
Dy. General Manager (Contract Services)
एनटीपीसी लिमिटेड / NTPC Limited
EOC, A-8A, Sector-24, NOIDA-201301 (U.P.)

	(i) Amendment No. 3 to Section VII		
5	Amendment no. 5 to Bidding Documents consisting of : (i) Amendment No. 02 to Technical Specification (Section-VI)	CS-0011-109(2)-9-AMDT-05	19.11.2018

List of Errata

S. No.	Description	Ref. no.	Issuance Date
1	Errata No.1 to Bidding Documents	CS-0011-109(2)-9-ERRATA.01	05.10.2018
2.	Errata No.2 to Bidding Documents	CS-0011-109(2)-9-ERRATA.02	03.12.2018

iv) Your Envelope-I (Techno-commercial) Bid dated 03.12.2018 opened on 04.12.2018.

v) Post Bid Discussions we had with you on 19.12.2018, 26.12.2018, 03.01.2019 and 06.02.2019 resulting into the following Minutes of Meeting enclosed herein with this Notification of Award:

a) Minutes of Meeting (MOM) on Commercial issues-Appendix-A
b) Minutes of Meeting (MOM) on Technical issues -Appendix-B
c) Minutes of Meeting(MOM) on QA&I issues - Appendix-C
d) Minutes of Meeting (MOM) on Safety issues – Appendix-D

vi) Your Envelope-II (Price) Bid dated 03.12.2018 opened on 08.04.2019 and Reverse Auction held for subject Package on 08.04.2019.

vii) Our email dated 13.04.2019 inviting you for Post Bid Discussions on Price Bid.

viii) Minutes of Discussion (commercial) held on 15.04.2019 with regards to issues related to Price Bid. Enclosed at Appendix-E.

2.0 We confirm having accepted your Envelope-I (Techno-commercial) Proposal opened on 04.12.2018 and Envelope-II (Price) Proposal opened on 08.04.2019, read in conjunction with all the Specifications, Terms and Conditions of the Bidding Documents & its Amendments/ Clarifications/ Errata, agreed Minutes of Meeting as referred to in para 1.0 above and award on you the contract for work of Design, Engineering, Manufacturing, Shop fabrication, Assembly, Inspection and Testing at Supplier's work(s), Type Testing, Packing, Forwarding to site of all Ex-Manufacturing Works/Place of Dispatch (both in India) Equipments/ Materials/

अभियांत्रिकी कार्यालय परिसर, प्लाट न. ए - ८ ए, सेक्टर २४, पोस्ट बॉक्स नं. १३, नॉएडा (उ.प्र.), पिन: २०१३०१
ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No. 13, NOIDA (U.P.), Pin: 201301
कॉर्पोरेट पहचान नंबर: एल. ५०१०१ डी. एल. १९७५ जी. ओ. आई. ००७९६६, वेबसाइट: www.ntpc.co.in
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टेलीफोन नं.: ०१२०-२४१०३३३ (१० लाईनें), ०१२०-२४१०११६ (५ लाईनें), फैक्स: ०१२०-२४१०१३६, ०१२०-२४१०१३७
Telephone No.:0120-2410333 (10 Lines), 0120-2410116 (5-Lines), Fax: 0120-2410136, 0120-2410137
पंजीकृत कार्यालय : एन.टी.पी.सी. भवन, स्कोप कॉम्प्लेक्स, ७ इन्स्टीट्यूशनल एरिया, लोदी रोड, नई दिल्ली - ११०००३
Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
Dy. General Manager (Contract Services)
एनटीपीसी लिमिटेड / NTPC Limited
EOC, A-8A, Sector-24, NOIDA-201301 (U.P.)

Special tools & tackles and Mandatory Spares, etc. covered under Flue Gas Desulphurisation (FGD) System Package for Sipat Super Thermal Power Station Stage-I (3 x 660 MW), as per Bidding Document and its Amendments/ Clarifications/ Errata read in conjunction with agreed Minutes of Meeting, as referred to in para 1.0 above (hereinafter referred to as the 'First Contract').

3.0 We have also issued Notification of Award to you vide our NOA no. **CS-9518-109(2)-9-SC-NOA-6816 dated 24.05.2019** for the work of providing all services i.e. Transportation from manufacturer's works/ place of dispatch to site (both in India), transit insurance, delivery at site, receipt, unloading, handling, storage, in-plant transportation, taking delivery of employer supplied equipment from site stores, comprehensive all risk insurance, installation, supervision, pre-commissioning, testing, commissioning and performance testing of all Equipment/systems and materials, and all other services leading to successful "completion of facilities" and handing over to Employer of the Equipment/ Materials including Mandatory Spares etc. (hereinafter referred to as the 'Second Contract') covered under Flue Gas Desulphurization (FGD) System Package for Sipat Super Thermal Power Station Stage-I (3 x 660 MW), as per Bidding Document and its Amendments/ Clarifications/ Errata read in conjunction with agreed Minutes of Meeting, as referred to in para 1.0 above.

3.1 You shall also be fully responsible for the works to be executed under the ' Second Contract' and it is expressly understood and agreed by you that any breach under the 'Second Contract' shall automatically be deemed as a breach of this 'First Contract' and vice- versa and any such breach or occurrence or default giving us a right to terminate the 'Second Contract' and/or recover damages there under, shall give us an absolute right to terminate this Contract and/or recover damages under this 'First Contract' as well and vice- versa. However, such breach or default or occurrence in the 'Second Contract' shall not automatically relieve you of any of your responsibilities/obligations under this 'First Contract'. It is also expressly understood and agreed by you that the equipment/ materials to be supplied by you under 'First Contract' when installed and commissioned under the 'Second Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

4.0 CONTRACT PRICE

4.1 The total Contract Price for the entire scope of work covered under this NOA shall be ₹ **426,13,20,859/- (INR Four Hundred and Twenty Six Crore, Thirteen Lakh, Twenty Thousand, Eight Hundred and Fifty Nine only)** as per the following break up:

अभियांत्रिकी कार्यालय परिसर, प्लाट न. ए -८ ए, सेक्टर २४, पोस्ट बॉक्स नं. १३, नोएडा (उ.प्र.), पिन: २०१३०१
ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No. 13, NOIDA (U.P.), Pin: 201301
कॉरपोरेट पहचान नंबर: एल ४०१०१ डी. एल. १९७५ जी. ओ. आई. ००७९६६, वेबसाइट: www.ntpc.co.in
Corporate Identification Number : L40101DL1975GOI007966, Website: www.ntpc.co.in
टेलीफोन नं.: ०१२०-२४१०३३३ (१० लाईनें), ०१२०-२४१०११६ (५ लाईनें), फैक्स: ०१२०-२४१०१३६, ०१२०-२४१०१३७
Telephone No.:0120-2410333 (10 Lines), 0120-2410116 (5-Lines), Fax: 0120-2410136, 0120-2410137
पंजीकृत कार्यालय : एन.टी.पी.सी. भवन, स्कोप कॉम्प्लेक्स, ७ इन्स्टीट्यूशनल एरिया, लोदी रोड, नई दिल्ली - ११०००३
Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
Dy. General Manager (Contract Services)
एनटीपीसी लिमिटेड / NTPC Limited
EOC, A-8A, Sector-24, NOIDA-201301 (U.P.)

S. No.	Particulars	Contract Price
1.	Ex-Manufacturing Works/Place of Dispatch Price (both in India) for Plant & Equipment	₹ 399,48,84,379/-
2.	Ex-Manufacturing Works/Place of Dispatch Price (both in India) for Mandatory spares	₹ 26,60,63,239/-
3	Type Test Charges	₹ 3,73,241/-
4	**Total (A) [1+2+3]**	**₹ 426,13,20,859/-**

5.0 You shall prepare and finalize the Contract Documents for signing of the formal Contract Agreement and shall enter into the Contract Agreement with us, as per Performa enclosed with the Bidding Documents, on non-judicial stamp paper of appropriate value within 28 days from the date of this Notification of Award.

6.0 This NOA is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including all the enclosed Appendices, by the authorized signatory of your Company as a proof of your acknowledgement and confirmation.

Please take necessary action to commence the work and confirm action.

Thanking You,

Yours faithfully,
For and on behalf of NTPC Ltd.

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
Dy. General Manager (Contract Services)
एनटीपीसी लिमिटेड / NTPC Limited
EOC, A-8A, Sector-24, NOIDA-201301 (U.P.)

24/05/19

Shrish Kumar Singh
DGM (CS)
Tel no.: 0120-4948668
email: shrishksingh@ntpc.co.in
Fax no.-0120-2410011

Encl:

i. **Minutes of Meeting(MOM) on Commercial issues-Appendix-A (02 Pages)**
ii. **Minutes of Meeting (MOM) on Technical issues -Appendix-B (03 Pages)**
iii. **Minutes of Meeting(MOM) on QA&I issues - Appendix-C (30 Pages)**
iv. **Minutes of Meeting (MOM) on Safety issues – Appendix-D (04 Pages)**
v. **Minutes of Discussions (Commercial) -Appendix-E (21 Pages)**

अभियांत्रिकी कार्यालय परिसर, प्लाट न. ए - ८ ए, सेक्टर २४, पोस्ट बॉक्स नं. १३, नोएडा (उ.प्र.), पिन: २०१३०१
ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No. 13, NOIDA (U.P.), Pin: 201301
कॉरपोरेट पहचान नंबर: एल. ४०१०१ डी. एल. १९७५ जी. ओ. आई. ००७९६६, वैबसाइट: www.ntpc.co.in
Corporate Identification Number : L40101DL1975GOI007966, Website: www.ntpc.co.in
टेलीफोन नं.: ०१२०-२४१०३३३ (१० लाईनें), ०१२०-२४१०११६ (५ लाईनें), फैक्स: ०१२०-२४१०१३६, ०१२०-२४१०१३७
Telephone No.:0120-2410333 (10 Lines), 0120-2410116 (5-Lines), Fax: 0120-2410136, 0120-2410137
पंजीकृत कार्यालय : एन.टी.पी.सी. भवन, स्कोप काम्प्लेक्स, ७ इन्स्टीट्यूशनल एरिया, लोदी रोड, नई दिल्ली - ११०००३
Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

Appendix-A
Page 1 of 2

MINUTES OF POST BID DISCUSSIONS (COMMERCIAL) HELD BETWEEN NTPC LIMITED (NTPC) AND GE POWER INDIA LIMITED (GEPIL) ON 26.12.2018 FOR FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE UNDER LOT-2 (AS PER COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9.

PRESENT

NTPC	**GEPIL**
Mr. Naveen Jain, GM (CS-I& P&S) Mr. V. N. Jain, GM (Fin.) Mr. P K Singh, AGM (CS-I) Mr. Binay Mallik, AGM (CS-I) Mrs Priyanka Kumari, Sr. Manager (CS-I)	Mr. Lalit Sankarni, Executive (Business Operations) Mr. Roshan Singh, Lead Manager (Sales)

With reference to GEPIL Envelope-I (Techno-Commercial) Bid Ref No. **QFECS1326662 dated 3rd December 2018** submitted online for Flue Gas Desulphurization (FGD) System Package for Lot-2 Projects, discussions were held between GEPIL and NTPC at NTPC EOC, NOIDA, wherein the following have been agreed to with respect to Projects under FGD Lot-2:

1.0 GEPIL confirmed that all Deviations/ Exceptions/Variations, if any, explicit or implicit contained in their proposal with respect to NTPC's bidding documents including its Amendments/Clarifications/Errata shall stand withdrawn. Further, GEPIL confirmed that they would execute the work strictly as per the provisions of the Bidding Documents including its Amendments/ Clarifications/Errata in case of award.

2.0 GEPIL in **Attachment 4** has stated that the facilities viz. all plant and equipment to be supplied and installed and services to be carried out under the flue gas desulphurisation package for TALCHER, SIMHADRI, SIMHADRI Projects. However, during the discussion GEPIL confirmed that the facilities offered are eligible facilities and conform to the Bidding Documents for TALCHER, SIMHADRI, SIPAT Projects.

3.0 GEPIL confirmed that any additional **Special Maintenance Tools & Tackles**, other than those indicated by them at **Attachment-4A**, required for the equipment supplied under this package shall be furnished by them at no extra cost to NTPC, in case of award.

4.0 GEPIL submitted details with regard **to Erection Tools & Plant and Safety Equipments & Safety Personnel Protective Equipments (as required in Attachment-10)**. Further, GEPIL confirmed that they will deploy the quantity and type of tools and equipment as per the requirement of NTPC and agreed to bring more equipment, if so warranted, in the opinion of the Project Manager. Further, with regards to Safety issues including bringing the minimum suggestive Safety Equipments & Safety Personal Protective Equipments to site, separate Minutes of meeting are being finalized by GEPIL with Safety department of NTPC.

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5.0 GEPIL submitted **a list of Commissioning/Start-up Spares (Attachment-11)** and further confirmed that they shall ensure the availability of the required quantity of Commissioning spares, in line with the Bidding Documents, without any additional cost before start-up/initial operation.

6.0 With reference to **Attachment-16**, GEIPL has confirmed that they will submit the value of all indices for Price Adjustment as per Appendix-2 Section VII book 3 of 3 of bidding document during the signing of Contract agreement.

MINUTES OF POST BID DISCUSSIONS (COMMERCIAL) HELD BETWEEN NTPC LIMITED (NTPC) AND GE POWER INDIA LIMITED (GEPIL) ON 26.12.2018 FOR FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE UNDER LOT-2 (AS PER COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9.

7.0 With regards to the Work Schedule, GEPIL confirmed that they shall strictly adhere to the Work Schedule specified in the BDS and comply to the requirements stipulated in the Bidding Documents in this regard.

8.0 GEPIL has confirmed that they have carried out a comprehensive assessment of the capacity and capability of **M/s General Electric Company, USA** Associate/Collaborator/QFGDM for packages under FGD LOT-2 and confirmed that **M/s General Electric Company, USA** have sufficient capacity and capability to execute the scope of work as per the provisions of the Bidding Documents.

9.0 It was agreed by GEPIL that these discussions with them on their Techno-Commercial offer shall not be construed by GEPIL that they have been considered qualified and eligible for calling/opening of their price bid and award.

(NTPC) **(GEPIL)**

ANNEXURE- I

MINUTES OF POST BID TECHNICAL DISCUSSIONS BETWEEN NTPC LIMITED & GE POWER INDIA LTD. IN RESPECT OF TECHNO COMMERCIAL BID PROPOSAL FOR FLUE GAS DESULPHURIZATION SYSTEM PACKAGE FOR LOT-2 PROJECTS AT ENGG. OFFICE COMPLEX, NTPC, NOIDA ON 19.12.2018

Participants:

NTPC LIMITED	GE POWER INDIA LTD.
Udayan Kumar GM (PE-Mech/SG)	Lalit Sankrani Executive Business Operations
Deepak AGM (PE-Mech/SG)	Naresh Sharma Manager (Commercial Proposal)
P.K.Gupta AGM(PE-Mech/SG)	Prashant Sapkal Lead Project Engineer
P. K. Behera DGM (PE-Mech/WS)	Sunil Sahu Manager (Commercial Proposal)
Pramod Chandra Nath DGM (PE-Mech/Piping)	Hiren Nariyelwala Manager (Sales)
Prabhat Ranjan Deen Sr. Manager (PE-Mech/Layout)	Roshan Singh Manager (Sales)
Md Suhel Khan Sr. Manager (PE-Mech/SG)	
Sujeet Kumar Sr. Manager (PE-Mech/MH)	
Anuj Kumar Shahi Sr. Manager (PE-Mech/PU)	
Raj Seth Sr. Manager (PE-C&I)	
Kuntal Bhuiyan Manager (PE-Electrical)	
Abuzar Ahmed Manager (PE-Civil)	
Adarsh Agarwal Manager (PE-Mech/SG)	

FGD System Package for Lot-2 Projects covers seven (7) projects and GE have furnished bids for three (3) projects namely Sipat STPS Stage-I (3x660 MW), Talcher Stage-I&II (2X500 MW+4X500 MW) and Simhadri Stage-I & II (2X500MW+2X500 MW). Further, GE has declared to be interested in taking award of only two (2) projects as per Attachment-1A. Based on the discussion between NTPC and GE on submitted bids for three (3) nos. of projects, following agreements were reached.

1. **Compliance to Tender Documents:**
GE confirmed that all deviations, variations, exceptions and clarifications with respect to the NTPC specification contained in their bid proposal, implicit or explicit, except those specifically agreed herein, stand unconditionally withdrawn without any cost implications to NTPC. GE further confirmed that all work shall be performed by them in total conformity with the Technical Specification, Bid Document No. CS-0011-109(2)-9 including its amendments/clarifications issued by NTPC from time to time for FGD System Package for Lot-2 Projects.

2. **FGD System Layout:**
With regard to Project wise Layouts for FGD system, NTPC pointed out that, some of the equipment/facilities indicated in bidder's layout are outside the specified area for FGD in GLP included in tender document. GE stated that the layouts submitted in the bid are indicative and final layout showing arrangement of equipment shall be finalised during detailed engineering. Further, GE confirmed that final layout shall be such that all equipment for FGD system shall be located within the identified space in GLP as included in technical specification.
Further, the layout shall be prepared such that the noise levels of equipment covered under this contract shall not exceed the ambient noise standards specified by CPCB (i.e. 55 dBA in day time and 45 dBA in night time) in nearby residential areas such as Township etc.

3. **Provenness Criteria:**
GE has indicated name of the sub-vendors in the bid. GE confirmed that complete provenness data along with end user certificates as per Sub-section I-A, Part-A, Section-VI of the bidding documents to establish the provenness of the systems, equipment, auxiliaries and bought out items shall be submitted to NTPC for review and approval, in case of award, within time schedule as indicated in biding documents along with Deed of Joint Undertaking (DJU), if required, before placement of order on the sub-vendor.

4. **Technical Data Sheet**
NTPC stated that GE has not furnished most of the data in the Bid Data Sheet and has indicated 'During Detailed Engineering' at many places.GE has also indicated "Refer attached Curves" in the bid data sheet which are not attached. GE agreed to furnish the complete data sheet including missing data, which could not be finalised and given at the bidding stage, within four weeks after award of contract in case of award.

5. **Special Maintenance Tools & Tackles:**
GE has furnished the list of special maintenance tools and tackles in Attachment-4A. NTPC asked GE to furnish the justification for the completeness of the list. GE stated that the items covered under the list are exhaustive and are as per their practice adopted in earlier projects. However, in case any additional maintenance tools and tackles are required at a later stage, same shall be supplied to NTPC without any additional cost implication.

6. **Performance Guarantee & Demonstration Parameters:**
GE has indicated demonstration parameters in Attachment-9B for various guaranteed parameters. GE stated that the guaranteed figures for Booster fan head, Wet Ball Mill capacity and Vacuum Belt filter capacity are indicative value. GE agreed that in case any chage during detailed engineering (w.r.t. the guaranteed figures) in line with technical specification requirement, the same will be considered for guarantee purp...

GE has informed that vacuum belt filter capacity indicated in attachment-9B for Sipat project is 69.5 T/hr which is on dry basis and confirmed that the corresponding value with 10% moisture (wet basis) shall be 77.2 T/hr. Accordingly vacuum belt filter capacity will be demonstrated.

7. **Specific Confirmations:**

GE made following specific confirmations with regard to their proposal to emphasize their commitment/focus on issues.

i. GE confirmed that mandatory spares shall be included and supplied in line with the specification requirements.

ii. GE confirmed that number of flue in the stack, Stack height and its location shall be in line with the specification requirements.

iii. GE confirmed that terminal points shall be in line with the specification requirements.

iv. GE confirmed that erection strategy for FGD System of the awarded project shall be furnished by them after award.

v. GE confirmed that the duct lining from absorber outlet to chimney shall be in line with specification and not flake glass lining which was inadvertently declared in data sheet.

vi. GE confirmed that the max purge flow rate to waste water treatment system shall not be more than 12 m^3/hr for 660 MW Unit and 10 m3/hr for 500 MW unit averaged over a 24 hour period.

19/12/2018

Md Suhel Khan (NTPC)

(GE)

Sunil Kumar Sahu

Chiren J. Narlyelu

MINUTES OF MEETING OF POST BID DISCUSSIONS HELD AT NTPC EOC OFFICE, ON 19/12/2018 BETWEEN NTPC LTD AND M/s GE POWER INDIA LTD. REGARDING QA&I ISSUES FOR FGD SYSTEM PKG. FOR LOT-2 PROJECTS (7 PROJECTS)

BID DOCUMENT NO. CS-0011-109 (2)-9

Present:

M/s NTPC Ltd.		M/s GE POWER
K K Chattopadhyay, (GM/QA)	S K. Lal, AGM(QA)	Suryya Nath Choudhury, HOD/Quality ECS
Sankar Bajal, AGM(QA)	Mukesh Kashyap –DGM(QA)	Abhimanyu Sharma, Manager-Tendering
B C Roy, AGM(QA)	S. N. Tripathy –DGM(QA)	Roshan Singh, Manager- Sales
K J Rao, AGM(QA)	M Khaliquzzama, DGM (QA)	
Alok Srivastav, AGM(QA)	Manan Sharma, Sr Manager (QA)	
Nishith Agarwal, AGM(QA)	Ankush Birla, Manager (QA)	

Following was discussed and agreed:

1.0 Deviation in Bid:

M/s GE POWER confirmed that there are no deviations in the bid w.r.t. QA&I requirements of the tender. M/s GE POWER shall comply with the QA&I requirements, as contained in the bid documents.

2.0 Sub-Contractors/ Sub-Vendors/ Sub-Suppliers:

In exercise of provisions of Cl. 19.1 of GCC (General Conditions of Contract), NTPC-QA will control the items/Systems as listed below, for the purpose of acceptance of their suppliers:

SN.	Item/system	SN.	Item/system
1	Booster Fans	15	FGD Tie Transformer(100 MVA 220/34.5kV)
2	Slurry Recirculation Pumps	16	Auxiliary Oil Filled Transformers
3	Oxidation Blowers	17	Switchyard 220KV Equipment(220kV Circuit Breakers, 220 kV Instrument Transformers, 220kV Disconnectors, 220kV Surge Arrestors)
4	Wet Limestone Grinding Mills	18	Control & Protection (for Switchyard)
5	Slurry Pumps	19	Control & Instrumentation(C&I) Equipments / Systems
6	Agitators	20	RO based Desalination Plant Equipment/Systems for FGD
7	Vacuum Belt Filters	21	Water Pre-treatment Equipment/Systems for FGD
8	Limestone Sampling System	22	Oil Free compressor(HVAC)
9	Agency for civil works	23	Gear Box for Limestone/Gypsum handling system
10	Design agency for civil & steel structural works	24	Fluid Coupling for Limestone/Gypsum handling system
11	HT motor- booster fan motor	25	Crusher for Limestone/Gypsum handling system
12	LT Switchgear	26	Conveyor belt for Limestone/Gypsum handling system
13	33KV/11KV/6.6KV/3.3KV Switchgears	27	Analyzers for FGD
14	Numerical relays & Net working	28	Control Systems for FGD

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The process of vendor approval of the above items shall be as under:

i) In case the item is also covered under Sub QR list, the proposed vendors for the same shall be accepted by QA after acceptance of the vendor by NTPC Engg. For these items, M/s GE POWER will submit the relevant vendor details of the proposed vendors for sub QR clearance to NTPC PE.

ii) For the item not covered under Sub QR but has been listed in above table, NTPC approved vendors shall only be employed by the main contractor. A list of proposed vendors for such items have been placed at **Annex-I** to this MOM. List of NTPC approved vendors against similar package/item has shared with the main contractor to enable him to consider the same, if he so wishes. However, the main contractor has specifically advised to carry out his own due diligence before consider the sub vendor previously known to NTPC. List of sub vendors placed at Annex I has been drawn with 'A' identified against such vendors previously known to NTPC. M/s GE POWER agreed to comply with the NTPC approval conditions, if any, for vendors identified with "A" in this list. For vendor proposals where status of proposal is in "DR" category (details required, as NTPC does not have any past experience with them) in the above mentioned list, M/s GE POWER agreed to furnish the following details of such proposals, in NTPC Formats (copies handed over), **in time bound manner, so as not to impede the progress of the Project/ Works -**

i. Duly Filled Main supplier Evaluation Report.
ii. Duly Filled Sub-Supplier Questionnaire.
iii. Factory Registration Certificate.
iv. Overall Organization Chart with Manpower details (Design, Manufacturing, Quality etc.)
v. Supply reference list of the Sub-Supplier indicating similar product supply order reference no., customer name, rating of product, date /year of supply, date / year of commissioning.
vi. List of Manufacturing Equipment available with sub vendor.
vii. List of Testing Equipment available with sub vendor.
viii. Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any.
ix. Details of Outsourced Manufacturing Processes, if any.
x. Quality control exercised during receipt, in-process & final inspection.

M/s GE POWER will furnish the required details, as detailed out above, of the proposed Manufacturer/ Sub-Vendor, along with their own detailed recommendations, in the NTPC-formats (copies handed over). NTPC informed that proposals/ details shall be received only up to **3 months prior to ordering date of the concerned item (L-2 Network/ BOI Schedule),** for NTPC review and assessment. M/s GE POWER will accordingly plan the submissions.

It is understood that in terms of provisions of Cl. 19.1 of GCC (General Conditions of Contract), in case M/s GE POWER opts for additional Vendor proposals, over & above the agreed list herein, may be given by M/s GE POWER, in sufficient time, so as not to impede the progress of the work. Accordingly, all such proposals along with required details (as given above), shall be received only up to **3 months prior to ordering date of the concerned item/ Scheduled start of the Manufacture of Self Manufactured Item,** for NTPC review and assessment.

iii) In case the item is not covered under Sub. QR and list of items at sl. No. 2.0 above, the vendors proposed for the same shall be accepted based on Main Contractor's certification regarding past experience with the vendor for supply of similar items. The certification to be submitted to NTPC, before placing the order on the vendor. In case, proposed vendors for such items are not having past experience with Main Contractor, these vendors shall be assessed by the Main Contractor for their capability, and the assessment report shall be submitted to NTPC for reference & record, before placing order on the vendor.

iv) During detailed engineering, NTPC QA will review list of all items to be used for completion of FGD system pkg. Based on its review, NTPC will decide the inspection categorization of all items. There will be 3 inspection categories of items –

a) CAT-I: For these items the Quality Plans are approved by NTPC and the final acceptance will be after physical inspection witness by NTPC.

b) CAT-II: For these items the Quality Plans approved by NTPC. However no physical inspection shall be done by NTPC. The final acceptance by NTPC shall be on the basis review of documents as per approved QP.
c) CAT-III: For these items Main Contrator approves the Quality Plans. The final acceptance by NTPC shall be on the basis certificate of conformance by the main contractor.

It is clearly understood that NTPC reserves the right to conduct Surveillance Inspection/ Audit of the material, which are identified in Cat-II/ Cat-III, to verify the effectiveness of Quality System of M/s GE POWER and conformance of the offered lot, to the applicable Standards/ requirements. It is agreed that M/s GE POWER will submit the copies of unpriced Purchase Order (as provided in GTR) of the orders placed on vendors for the items other than those listed in table at Sl. No. 2.0 above, to NTPC for the purpose of surveillance audit, if desired by NTPC, **prior to issue of Despatch Clearance of the concerned item.**

3.0 The schedule of submission and approval of QP shall be finalized within three weeks of effective date as per LOI/NOA of the contract. The schedule shall be dovetailed with L2 network in such a manner the QP is approved at least 6 weeks prior to scheduled start of manufacturing of the respective item and FQP is approved at least three months before scheduled start of field activity.

4.0 M/s GE POWER confirmed that they shall deploy appropriate Batching Plant for producing Concrete, which will be having digitized recording system. This plant shall be calibrated with NPL traceable weights. The plant shall have the facility of delivering the output on recorder, giving separate details of the various constituents (cement, aggregate, water, admixtures, fly ash etc.) in each batch of concrete being produced.

5.0 M/s GE POWER confirmed that for Schedule-I/ Schedule-II supplies, orders shall be placed suitably on approved Sub-Vendors' manufacturing location (Foreign/ Indigenous), keeping the Contractual requirements in view.

6.0 M/s GE POWER confirmed that the QA Documentation Package shall include copy of approved Data Sheets/ Drawings & QP, along with all Material Test Certificate (MTCs), CHPs, Material Dispatch Clearance Certificate (MDCCs) for all items. The same shall be reviewed by M/s GE POWER for its completeness and only thereafter it shall be submitted to NTPC.

7.0 M/s GE POWER confirmed that requisite storage facilities for the equipment/materials shall be established by M/s GE POWER at site prior to receipt of equipment/material at site, after allotment of land by NTPC. For this purpose, requisite storage plan and schedule for the same shall be agreed between M/s GE POWER and NTPC site within 3 months of effective date as per LOI/NOA.

8.0 M/s GE POWER confirmed that similar to supply portion of the work, the non-conformities observed during field erection activities shall also be dispositioned according to NTPC's NCR dispositioning system in the prescribed format of NTPC.

9.0 A QA&I coordination procedure has been mutually agreed upon and has been placed as annexure to this MOM.

(NTPC)

(GE POWER)
(SURYYAN CHOWDHURY)
GE - POWER

QA CO-ORDINATION PROCEDURE for FGD SYSTEM PKG. OF LOT -2 PROJECTS (7 PROJECTS)

1. **PURPOSE:**

This document specifies procedure to be adopted for the coordination of QA&I activities relating to FGD System pkg. of Lot-2 projects (7 projects) to satisfy the QA&I requirements laid down in contract.

2. **SCOPE:**

This document specifies procedure of:

- Vendor Approval
- Quality Plan - Bought-out items/Manufacturing items approval/finalization.
- Field Quality Plan approval/finalization.
- Inspection/Testing of equipments/items.
- Dispositioning of Non-conformities.
- Dispatch clearance of equipments/items.
- QA documentation Package
- Quality audit & surveillance.

3. **DEFINATIONS:**

3.1 **NTPC Inspector:** Means NTPC's Own Inspector/duly authorized third party inspection agency.

3.2 **Resident Inspector:** Means NTPC's own inspector posted in the country of origin of the equipment or manufacturing works. NTPC Inspectors at Regional Inspection Offices near the works of GE POWER and at other Regional Inspection Offices are considered as resident inspectors.

4. **PROCEDURE:**

4.1 **CO ORDINATORS AND CORRESPONDANCE**

4.1.1 Overall QA coordinator of GE POWER for this contract shall be informed within four week's of LOI / effective date of contract.

4.2 **VENDOR APPROVAL**

4.2.1 List of items requiring vendor approval is identified and enclosed with LOA. The List contains, the vendors as proposed by GE POWER, and acceptable vendors to NTPC are marked with "A" as APPROVED. Vendors not known to NTPC for which details are required to be submitted by GE POWER as per agreement are marked 'DR'. Other information regarding vendor approval is as per agreed MOM.

4.2.2 GE POWER shall submit the complete vendor details for "DR" Category vendors (in NTPC prescribed format) as per MOM.

4.2.3 Upon receipt of complete vendor details, NTPC shall review and respond expeditiously.

4.2.4 Monthly progress report of vendor approval for vendors identified in 'DR' category shall be furnished by GE POWER overall coordinator.

Jagannohan

4.2.5 Within three weeks of release of purchase order for bought out items/ components, GE POWEI shall furnish to NTPC a copy of the purchase order without price details but together with detailed purchase specification, QP and delivery conditions.

4.3 QUALITY PLANS

4.3.1 List of items requiring approval of quality plans shall be finalized by NTPC during detailed engineering.

4.3.2 GE POWER shall finalize a realistic schedule of submission of QPs based on project requirements prior to LOA which shall be incorporated on L-2 network.

4.3.3 GE POWER shall submit to NTPC, the Quality Plans with reference documents as per schedule of submission. The final submission of Quality Plans shall be furnished to NTPC in NTPC's online system C folder.
The quality plans shall be submitted for Cat-I & II items as per with additional essential attributes as per NTPC requirement (quantum of check, acceptance norms). Vendor's name may be provided on separate sheet attached with QAP.
Extracts of reference documents will be annexed. However, any other interlinking documents mentioned in the extracts can be viewed by NTPC in GE POWER/ collaborator's works. Acceptance criteria shall be reviewed by NTPC in case of deviation from NTPC specification.
For other equipment, quality plans shall be submitted in NTPC format during execution phase for approval. Witness points / documentation requirements shall be mutually agreed.

4.3.4 Reference documents which were already submitted along with MQP/RQP/SQP for the earlier projects need not be submitted provided there is no change/revision in the document submitted last, whereas for the new/fresh MQP/RQP/SQP, the relevant documents shall be submitted along with the above Quality plans. Resubmission of RQP/SQP shall be done wherever changes are made in the already approved RQP/SQP for the earlier projects.

4.3.5 RQP/SQP shall be furnished along with all reference documents such as purchase specification, drg, data sheet, test procedure, plant standards, etc. In case where RQPs are already finalized, GE POWER shall confirm that items required for Lot-2 FGD projects (7 projects) is exactly same or shall state minor changes that are applicable. For exactly same items, RQPs already finalized shall be made applicable for Lot-2 FGD projects (7 projects) also.

4.3.6 Monthly progress report of quality plan submission/approval shall be furnished by GE POWER overall coordinator in attached format.

4.4 FIELD WELDING AND FIELD QUALITY PLAN

4.4.1 The field quality plan for equipment and services shall be furnished by GE POWER and their Vendors, so as to finalize the same at least 2 months prior to start of work and shall include the quality practices and procedures followed by them during various stages of site activities from receipt of material/equipment till final erection. The list of FQP to be approved by NTPC shall be tied up during execution.

4.4.2 The welding consumable approved by OEM/Main contractor shall be used for site welding.

4.4.3 M/s GE POWER's FQA manpower deployment shall be tied up after award.

4.5 INSPECTION

4.5.1 The notice period for inspection of materials/components/equipments for witnessing of the CHP stages by NTPC at the vendor's works shall be as follows:

(a)	Vendors of Indian origin	-	10 working days.
(b)	Vendors of Foreign origin	-	45 days

4.5.2 All the matters regarding inspection call shall be coordinated as follows:

4.5.4.1 **For supplies of other than Indian origin:** GE POWER shall issue inspection call notice to NTPC-QA coordinator.

4.5.4.2 **For supplies of Indian origin:** GE POWER/ their vendors will issue an inspection call to the concerned NTPC-RIO office. GE POWER's relevant offices shall closely co-ordinate with NTPC RIO for inspection of bought out items.

4.5.5 Where witnessing of the test is waived off in writing by NTPC, GE POWER/vendors shall proceed with the test which shall be deemed to have been carried out in the presence of NTPC inspector and shall forward duly certified copies of the test reports to the concerned NTPC inspection office as follows:

a. For the tests conducted within the GE POWER's premises shall be within one week
b. For the tests conducted at vendors' premises shall be within two weeks.

In case of any objection, the concerned RIO office shall notify the same to the concerned GE POWER/vendors within 5 working days from receipt of the test reports.

4.5.6 For the witnessed tests, when the factory test at identified CHP stages have been satisfactorily completed including computation of test results wherever applicable, NTPC inspector shall sign jointly with GE POWER/vendors/authorized representative(as applicable as per approved QAP) on the CHP Clearance/Interim Inspection report in the format .

4.5.7 For the witnessed tests, in case of deviation, NTPC inspector shall convey their non-conformities in writing on the CHP report itself for clarification by GE POWER/Vendors, who shall give due considerations to the objections raised and shall take corrective measures (as per the procedure laid down in clause 4.7 after due approval from NTPC) to rectify the non-conformities and shall confirm in writing to the concerned inspection office on rectification of the objections raised. However decision of NTPC shall be final and binding upon GE POWER/vendors within the purview of the contract requirements.

4.5.8 GE POWER will make available to the NTPC inspector their relevant documents and plant standards/procedure relevant to the checks/tests carried out on material/items equipments. Further, GE POWER/vendors shall also ensure the availability of approved drawings/data sheets and approved Quality Plan at the place of inspection.

4.5.9 **INSPECTION PLAN:** To facilitate advance planning of inspection of supplies, in addition to giving inspection notice at identified CHP stages as per approved QAP, GE POWER shall furnish three monthly rolling inspection programme every month indicating schedule dates of inspection at identified CHP stages. Such a programme shall be updated each month and a copy of the same is made available to the resident inspector/RIO as applicable. Such programme shall be confirmed by specific inspection call in accordance with clause 4.5.1 above.

4.5.10 Three monthly inspection programme for shop manufactured & BOIs shall be furnished directly to respective NTPC-RIO.

4.5.11 GE POWER contracts/commercial/QA shall furnish monthly Inspection status report for previous month including pending calls and exception reports/NCR on or before 7th of every month.

4.6 **QUALITY AUDIT: GE POWER/VENDORS** shall provide the necessary facilities to NTPC inspector/team for carrying out of the Quality Surveillance and Audits as envisaged in the contract.

4.7 NON-CONFORMITY DISPOSITIONING PROCEDURE:

4.7.1 Whenever any deviation is observed with respect to relevant document and good Engg practices, the same shall be referred along with justification to NTPC office where inspection call has been raised by GE POWER/vendors. The details shall be furnished in the format attached for NTPC review and necessary action. NCR can be raised irrespective of the CHP stages to the concerned inspection office in whose jurisdiction the item/equipment is being manufactured.

4.7.2 Non-conformities with respect to the site activities shall also be dealt with similarly except that the NCR in the specified format shall be routed through NTPC-FQA group.

4.8 **Material Despatch Clearance Certificate (MDCC)** upon satisfactory completion of all tests/inspection including type test as required by the approved documents (Cat-1 approved Quality Plan drawing/data sheet as applicable). NTPC inspector/Authorized Representative shall issue the MDCC in prescribed format attached against approved BBU

4.8.1 Responsibility for Issuing MDCC:

Before requesting NTPC for issuance of MDCC, GE POWER shall verify and confirm that the equipment meets the stipulated technical requirements as per the contract. In NTPC, the responsibility of issuing MDCC shall be as follows:

4.8.1.1 Where inspection by NTPC is envisaged in QP.

4.8.1.1(a) **INDIGENOUS SUPPLIES:**

The concerned Regional Inspection Office under whose jurisdiction the manufacturer is located. Inspecting Engineer or reviewing engineer (in case of waiver of presence of NTPC engineer) shall issue the MDCC.

4.8.1.1(b) **FOREIGN SUPPLIES:**

For items directly dispatchable to site from foreign manufacturer, the MDCC shall be issued by NTPC's inspecting engineer. In case of waiver of presence of NTPC engineer, the MDCC shall be issued by CQA Engineer on satisfactory review of test reports.

For items to be brought to GE POWER works from foreign manufacturer, before final despatch to site, MDCC shall be issued by relevant Resident Inspector/RIO after satisfactory activities at GE POWER works and on review of CHP report of NTPC's Inspecting Engineer for inspection at foreign manufacturer's works or on verifying acceptance report of CQA, incase of waiver of presence of NTPC Engineer for inspection at foreign source.

NOTE: MATERIAL inspected by RIO-A at the work of sub-contractor in their respective jurisdiction & dispatched to the works of the other contractor for assembly or otherwise in the jurisdiction of RIO-B for

final despatch to project site, shall be accorded despatch clearance on a CHP clearance report by RIO-A and the MDCC of the completed item/equipment will be issued by RIO-B as per the approved BBU.

4.8.1.2 In case only review of TC by NTPC has been envisaged as per approved QP, for such items test certificates shall be submitted to NTPC resident inspection in respect of GE POWER manufactured item and to concerned RIO where level-1 vendor is located for such BOIs, for issuance of MDCC. It is clarified that wherever multilevel vendors are not applicable, for bought out items of this category, GE POWER's shall submit the test certificate to NTPC's resident inspection.

4.8.1.3 In case where QP has not been envisaged, all such materials shall be cleared on the basis of COC from GE POWER. COC shall be submitted on similar line as per Clause No. 4.8.1.2.

4.8.1.4 As per Tech specification, no item shall be dispatched by GE POWER without obtaining MDCC from NTPC.

4.9 **QUALITY ASSURANCE DOCUMENTATION PACKAGES:** GE POWER shall submit to NTPC QA the Quality Assurance documents in two hard copies and two CD ROM.

4.10 **QP/INSPECTION CATEGORY :**

CAT – I: For those items the Quality Plans are approved by NTPC and final acceptance will be on physical inspection witness by NTPC.

CAT – II: For those items the Quality Plans are approved by NTPC. However no physical inspection shall be done by NTPC. The final acceptance by NTPC shall be on the basis of review of documents as per QP.

CAT-III: For those items main supplier approved Quality Plan. The final acceptance by NTPC shall on the basis of Certificate of Conformance by main supplier.

Further, as it is clearly understood that NTPC reserves the right to conduct Surveillance Inspection/ Audit of the material, which will be identified in inspection category Cat-II/ Cat-III by NTPC QA during detailed engg., to verify the effectiveness of Quality System of M/s GE POWER and conformance of the offered lot, to the applicable Standards/ requirements. It is agreed that M/s GE POWER will submit the copies of unpriced Purchase Order (as provided in GTR) of the orders placed on vendors for the items other than those listed in table at Sl. No. 2.0 above, to NTPC for the purpose of surveillance audit, if desired by NTPC, prior to issue of Despatch Clearance of the concerned item.

(NTPC)

(GE POWER)
(SURYYA CHOUDHURY)
GE POWER

PROJECT : FGD SYSTEM PACKAGE LOT-2 PACKAGE: FGD PACKAGE SYSTEM SUPPLIER :GE Power CONT. NO.: CS-00011-109(2)-9	**LIST OF ITEMS REQUIRING QUALITY PLANAND SUB- SUPPLIER APPROVAL** SUB SYSTEM: MECHANICAL-BOP WS	DOC. No. : DATE: 21.12.2018 PAGE 1 OF 1

ITEM	QP/ INSPN CAT	QP NO. CS-	PROPOSED SUB- SUPPLIER BY MAIN CONTRACTOR	PLACE	SUB-SUPPLIER APPROVAL STATUS/ CATEGORY	REMARKS
OIL FREE SCREW COMPRESSOR			ELGI EQUIPMENTS	COIMBATORE	A	UP TO 74M3/MINUTE (AIR ENDS FROM HITACHI JAPAN), 45 M3/MINUTE FORM OWN
			ATLAS COPCO	PUNE.((SCREW ASSEMBLY FROM ATLOS COPCO , BELGIUM)	A	UP TOZR 630-MODEL CAPACITY 75 NM3/MINUTE
			INGERSOLL RAND	AHEMDABAD	A	UP TO 36 NM3/MINUTE

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S:

TE-1 SYSTEM SUPPLIER / SUB-SUPPLIERSTATUS CATEGORY (SHALL BE FILLED BY NTPC).

For those items proposed vendor to NTPC. To be indicated with letter "A" in the list along with condition of approval, if any.

- 2. INSPECTION CATEGORY:

: For these items the quality plans are approved by NTPC and final acceptance will be after physical inspection witness by NTPC.
II : For these items the quality plans are approved by NTPC. However, no physical inspection will be done by NTPC. The final acceptance by NTPC shall be on the basis ew of documents as per QP.
III: For these items Main Supplier approves quality plans. The final acceptance by NTPC shall be on the basis of certificate of conformance by Main Supplier

21/12/18
NTPC Manan Sharma Sr. Mgr (QA)

(SURYYA CHOUDHURY)
Main Contractor
GE POWER

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	PROJECT: FGD LOT-2	LIST AND STATUS OF ITEM REQUIRING QP AND SUB-SUPPLIER APPROVAL Sub systems: Mechanical				NTPC DOC NO	QA-MH-01
	PACKAGE: FGD PACKAGE					REVISION NO	0
	MAIN SUPPLIER: GE POWER INDIA					DATE	21.12.2018
	CONTRACT NO.: CS-0011-109(2)-9						
	Item	QP/ Insp. Cat.	QP No.	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Remarks
	CRUSHER & VIBRATING GRIZZLY FEEDER FOR LIME/ GYPSUM HANDLING SYSTEM	I		PENNSYLVANIA CRUSHER CORPORATION	USA	DR	
		I		SANDVIK	FINLAND	DR	
		I		AMERICAN PULVERISER	USA	DR	
		I		TKII	PUNE	DR	
		I		L&T	KANSBAHAL	DR	
		I		TRF	JAMSHEDPUR	DR	
		I		ELECON	V V NAGAR	DR	
		I		MCNALLY SAYAJI	VADODARA	A	UP TO 660 TPH FOR CRUSHER
		I		MCNALLY SAYAJI	KUMARDHUBI	DR	
	FABRIC BELTING (FR GRADE)	I	RQP	PHOENIX CONVEYOR BELT	KOLKATA	A	UPTO 2200 MM WIDTH
		I		IMASS S.A	GREECE	A	UPTO 2400 MM WIDTH
		I		MRF	CHENNAI	A	UPTO 1600 MM WIDTH
		I	RQP	SEMPELTRAN NIRLON	MUMBAI	A	UPTO 1600 MM WIDTH
		I		HINDUSTAN RUBBER	SILVASA	A	UPTO 1600 MM WIDTH
		I		NORTHLAND RUBBER	SONEPAT	A	UPTO 2200 MM WIDTH.
		I		RAVASCO TRANSMISSION LTD.	VAPI	A	UPTO 2200 MM WIDTH
		I		ORIENTAL RUBBER	PUNE	A	UPTO 2200 MM WIDTH
		I		FORECH	CHENNAI	A	UPTO 2000 MM WIDTH
		I		YOKOHAMA	JAPAN	A	UPTO 2400 MM WIDTH
	HELICAL GEARBOX	I		SHANTI GEARS	COIMBATORE	A	Upto size 560
		I	RQP	ELECON	V V NAGAR	A	
		I		SIEMENS (FLENDER)	KHARAGPUR	A	
		I		PREMIUM TRANMISSION LTD	PUNE/FALTA	A	Up to size 710 / 450
		I		SIEMENS (FLENDER)	GERMANY	A	
		I	RQP	NEW ALLENBURY WORKS	KOLKATA	A	
	PLANETARY GEARBOX	I	RQP	ELECON	V V NAGAR	A	
		I		SIEMENS (FLENDER)	GERMANY	A	
		I		MOVENTAS	GERMANY	A	
		I		PREMIUM TRANMISSION LTD	PUNE/FALTA	DR	
		I		BREVINI	ITALY	A	
		I		SEW EURODRIVE GMBH & CO.	GERMANY	A	

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	PROJECT: FGD LOT-2	LIST AND STATUS OF ITEM REQUIRING QP AND SUB-SUPPLIER APPROVAL Sub systems: Mechanical				NTPC DOC NO	QA-MH-01
	PACKAGE: FGD PACKAGE					REVISION NO	0
	MAIN SUPPLIER: GE POWER INDIA					DATE	21.12.2018
	CONTRACT NO.: CS-0011-109(2)-9						
	Item	QP/ Insp. Cat.	QP No.	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Remarks
	FLUID COUPLING(TRACTION TYPE)	I	RQP	PREMIUM TRANMISSION LTD	AURANGABAD	A	
		I	RQP	ELECON	VV NAGAR	A	
		I		FLUIDOMAT	INDORE	A	
		I		VOITH(INDIA)	HYDERABAD	A	
		I		VOITH	GERMANY	A	
	FLUID COUPLING(SCOOP TYPE)	I	RQP	FLUIDOMAT	INDORE	A	UPTO SC-1330
		I		VOITH	GERMANY	A	
		I	RQP	PREMIUM TRANMISSION LTD	AURANGABAD	A	UPTO PST 1150
		I		ELECON	V V NAGAR	A	UPTO MODEL ESC 760
		I		VOITH(INDIA)	HYDERABAD	A	UPTO SVNL 1330
	LIMESTONE SAMPLING SYSTEM	I		EAST MAN CRUSHER	KOLKATA	DR	
		I		ADVANCE SYSTEMS SAMPLING	KOLKATA	DR	

3ENDS
'YSTEM SUPPLIER/SUB-SUPPLIER APPROVAL STATUS CATEGORY (SHALL BE FILLED BY NTPC)
For these items proposed vendor is acceptable to NTPC. To be indicated with letter "A" in the list alongwith the condition of approval, if any.
– For these items "Detailed required" for NTPC review. To be identified with letter "DR" in the list.
TED – For these items vendors are approved by Main Supplier and accepted by NTPC without specific vendor approval from NTPC. To be identified with "N'
IP/INSPN CATEGORY:
'-I : For these items the Quality Plans are approved by NTPC and the final acceptance will be on physical inspection witness by NTPC.
'-II : For these items the Quality Plans approved by NTPC. However no physical inspection shall be done by NTPC. The final acceptance by NTPC shall be on the basis review of documents as per approved QP.
'-III : For these items Main Supplier approves the Quality Plans. The final acceptance by NTPC shall be on the basis certificate of conformance by the main supplier.

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
1	Power Transformer (Oil Filled) -Tie Transformer					ABB	Vadodara	DR		up to 765 kV Class	SUB-QR ITEM
						CG Power & Industrial Solutions Ltd	Mandideep	DR		Up to 765 kV class	SUB-QR ITEM
						GE T&D India Limited	Vadodara	DR		Up to 765 kV class including Shunt Reactor, Approval Conditions Apply	SUB-QR ITEM
						BHEL	Bhopal	DR		up to 400 kV Class	SUB-QR ITEM
						GE T&D India Limited	Naini	DR		up to 400 kV Class	SUB-QR ITEM
						TELK	Angamally, Kerala	DR		up to 400 kV Class	SUB-QR ITEM
						Toshiba	Hyderabad	DR		up to 400 kV Class	SUB-QR ITEM
						CG Power & Industrial Solutions Ltd	Kanurmarg	DR		up to 400 kV Class	SUB-QR ITEM
						EMCO	Thane	DR		up to 400 kV Class	SUB-QR ITEM
						Siemens	Mumbai	DR		up to 400 kV Class	SUB-QR ITEM
						BHEL	Jhansi	DR		Up to 220 kV Class	SUB-QR ITEM
2	Oil Filled Transformer	I				GE T&D	ALLAHABAD	DR			SUB-QR ITEM
						ABB	VADODARA	DR			SUB-QR ITEM
						SIEMENS	NAVI MUMBAI	DR			SUB-QR ITEM
						CG Power & Industrial Solutions Ltd	KANJUR MARG	DR			SUB-QR ITEM
						EMCO	THANE	DR			SUB-QR ITEM
						TELK	ANGAMALY (KERALA)	DR			SUB-QR ITEM
						BHEL	JHANSI	DR			SUB-QR ITEM
						TOSHIBA	HYDERABAD	DR			SUB-QR ITEM
						Schneider	Vadodara	DR		Up to 50 MVA, 132 kV Class	SUB-QR ITEM
						T & R	Ahmedabad	DR		Up to 90 MVA, 132 kV Class	SUB-QR ITEM
						Prime Meiden Ltd	Nellur	DR		up to 63 MVA, 132 kV Class	SUB-QR ITEM
						CG Power & Industrial Solutions Ltd	Malanpur	DR		up to 7.5 MVA, 33 KV Class	SUB-QR ITEM
						ECE	Sonepat	DR		up to 4.0 MVA, 11 KV Class	SUB-QR ITEM
						Andrew Yule	Chennai	DR		up to 10.0 MVA, 33 KV Class	SUB-QR ITEM
						EMCO	Jalgaon	DR		Up to 16 MVA, 33 kV Class	SUB-QR ITEM
						EMCO	Umala	DR		up to 2.0 MVA, 33 KV Class	SUB-QR ITEM
						Essenar	Medak	DR		Up to 16 MVA, 66 kV Class	SUB-QR ITEM
						Indotech Transformers	Chennai	DR		Up to 16 MVA, 11 KV Class	SUB-QR ITEM
						Kanohar	Meerut	DR		Upto 16 MVA, 33 kV Class	SUB-QR ITEM
						Kirloskar	Mysore	DR		up to 16 MVA, 33 kV Class	SUB-QR ITEM
						Kirloskar	Pune	DR		up to 2.0 MVA, 33 KV Class	SUB-QR ITEM
						Kotsons	Agra	DR		up to 2.5 MVA, 11 KV Class , Approval Conditions Apply	SUB-QR ITEM
						KRYFS Power Components Ltd	Silvassa	DR		Up to 2.5 MVA, 33 kV Class	SUB-QR ITEM
						Hammond Power Solutions	Hyderabad	DR		up to 10.0 MVA, 33 KV Class	SUB-QR ITEM
						Raychem RPG	Pune	DR		Up to 5 MVA, 33 kV Class	SUB-QR ITEM
						Sudhir Transformer	Bangalore	DR		Up to 12.5 MVA, 33 kV Class	SUB-QR ITEM
						SUDHIR POWER LTD	SILVASSA	DR		Up to 12.5 MVA, 33 kV Class	SUB-QR ITEM

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No :			
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No :		CS-0011-109(2)-9	
	Supplier : GE							Date :		21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page :			
Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
						Technical Associate Ltd	Sitarganj	DR		up to 16 MVA, 33 kV Class, Approval Conditions Apply	SUB-QR ITEM
						Tesla, Unit-2	23-A, B-Sector, Industrial Area, Govindpura, Bhopal	DR		up to 5.0 MVA, 33 KV Class	SUB-QR ITEM
3	L T (415 V) Motors	See Note-2				CGL	Ahmednagar	A			
						MARATHON	KOLKATA	A			
						SIEMENS	MUMBAI	A			
						JYOTI	BARODA	A			
						BHARAT BIJLEE	NAVI MUMBAI	A		Upto 690 V, 500 KW for Inverter Duty & upto 415V, 200 KW for Non-Inverter Duty	
						ABB	FARIDABAD	A		UPTO 55KW	
						ABB	BANGALORE	A		55KW – 200KW	
						NGEF	BANGALORE	A		UPTO 15KW	
						KEC	BANGALORE	A			
						KEC	HUBLI	A		UPTO 90KW	
						LHP	SOLAPUR	A		UPTO 120KW	
4	GEARED MOTOR	II				PETL	AURANGABAD	A		Motor to be supplied from NTPC approved sources	
						PBL	VV NAGAR	A			
						INTERNAL COMBUSTION	Aurangabad	A			
						NEW ALLENBURRY WORKS	Kolkata	A			
5	HT MOTOR	I				ABB	VADODARA	DR		Upto 6.6kV, 2500kW & 11kV, 2000kW	SUB-QR ITEM
						MARATHON	KOLKATA	DR		Upto 11kV,1600kW	SUB-QR ITEM
						CGL(D5 Industrial Area)	MANDIDEEP	DR		Upto 6.6kV,1650kW & 11kV, 1350kW	SUB-QR ITEM
						CGL(Plot 9)	MANDIDEEP	DR		Upto 11kV, 4MW	SUB-QR ITEM
						BHEL	BHOPAL	DR			SUB-QR ITEM
						WEG	HOSUR	DR		Uptoo 11kV, 7000kW	SUB-QR ITEM
						SIEMENS	THANE	DR		Upto 690 V, 500 KW	SUB-QR ITEM
						KEC	BANGALORE	DR		3.3 kV, 240 kW	SUB-QR ITEM
						JYOTI	VADODARA	DR		Upto 6.6kV,2250kW	SUB-QR ITEM
6	VFD Motor	I				ABB	BANGALORE	A		Upto 690V, 250KW	
						MARATHON ELECTRIC MOTORS	KOLKATA	A		Upto 690V, 100KW	
						BHARAT BIJLEE	NAVI MUMBAI	A		UPTO 690V, 500 KW	
						SIEMENS	THANE	A		Upto 690 V, 500 KW	
	LT VFD Panel					Powertech	Sonepat	A		upto 55 KW with following conditions: i) VFD from Schneider- France, upto 415V, 50KW, ii) Enclosure & bought out items shall be from NTPC acceptable makes & 3) Engineering support for integration will be provided by M/s Schneider/ Authorized integrator of M/s Schneider	

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	Project : LOT-2			ELECTRICAL ITEMS					Doc No :			
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL					Rev No :	CS-0011-109(2)-9		
NTPC	Supplier : GE								Date :	21.12.2018		
	Contract No.: CS-0011-109(2)-9								Page :			
Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark		
7		I				DANFOSS	Oragadam	A		(upto 690V, 1200kW), VFD drives with VFD sourced from Danfoss-Denmark/USA and Panel sourced from Rittal		
						YASAKAWA	Japan	A		VFD from Yasakawa- Japan, Upto 415V, 132KW		
						ROCKWELL AUTOMATION-AB	SAHIBABAD	A		VFD from Rockwell(Allen Bradley)- USA, (Upto 415 V, 600 KW)		
						ABB	BANGALORE	A		VFD from ABB-Finland, Upto 690V, 750 KW		
						SIEMENS	NASIK	A		VFD from SIEMENS- Germany, Upto 690V,900KW		
						VACON	BANGALORE	A		VFD(NXP model) from VACON Finland, upto 400KW,415V and upto 900KW, 690V		
8	MV Switchgear panel up to 33 KV	I				Siemens	Mumbai	DR			SUB-QR ITEM	
						BHEL	Bhopal	DR			SUB-QR ITEM	
						Megawin	Salem	DR			SUB-QR ITEM	
						Jyoti	Vadodara	DR			SUB-QR ITEM	
						ABB	Nasik	DR			SUB-QR ITEM	
						L&T	Ahmednagar	DR			SUB-QR ITEM	
						Areva	Kolkata	DR		Upto 11 kV only	SUB-QR ITEM	
9	Indoor LT Switchgear Panel	I				Switching Circuits	Kolkata	DR			SUB-QR ITEM	
						Tricolite	Sahibabad / Manesar	DR			SUB-QR ITEM	
						Hindustan Control & equipment Ltd	Kolkata	DR		With fabrication & painting at unit II & MP Electrical Narendrapur	SUB-QR ITEM	
						Maktel	Vadodara	DR			SUB-QR ITEM	
						Jakson	Greater Noida	DR			SUB-QR ITEM	
						Vidyut Control	Gaziabad	DR			SUB-QR ITEM	
						Adlec Power	Rohad (Jhajjar)	DR			SUB-QR ITEM	
						Pyrotech	Udaipur	DR			SUB-QR ITEM	
						L&T	Mumbai / Coimbatore	DR			SUB-QR ITEM	
						GE	Bangalore	DR			SUB-QR ITEM	
						Siemens	Mumbai	DR			SUB-QR ITEM	
						C&S Electric	Noida / Hardwar	DR			SUB-QR ITEM	
						Nitya Electrocontrols	Noida	DR			SUB-QR ITEM	
						Control & Schematics	Hyderabad	DR			SUB-QR ITEM	
						Schneider	Nasik	DR		ACB from Schneider, France	SUB-QR ITEM	
	Numerical Relays for Switchgear (IEC 61850 Compliant)	*				SEL	Pullman, USA	DR				

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
NTPC	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
Sl No	ITEM DESCRIPTION	QP/ Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status/ category	Sub-supplier Details submission sch	Remark	
		(with switch gear MQP)						DR			
						ALSTOM T&D	Stafford, UK	DR		P14X, P34X, P44X, P64X, P74X models only.	
						ALSTOM T&D	Chennai	DR		P14X, P34X, P44X, P64X, P74X models only.	
						GE Multilin	Zamudio, Vizcaya, Spain/ Markham, Ontario, Canada	DR	F 650 only		
10						Schneider	UK, France	DR	PX30 & PX40, VAMP 5X and VAMP 2XX models only.		
						ABB	Finland	DR			
						ABB	Baroda	DR	For 6XX Series		
						Siemens	Goa	DR	7SR2X,7SJ66X series only		
						Siemens	Germany	DR	7SX Series only		
	Wall mounted fixed type indoor/ outdoor LT Switchgear non compartmentalized Panel (Lighting panels / AC / DC Fuse boards / MCB boxes)										SUB-QR ITEM
						Control Devices	Kolkata	DR			SUB-QR ITEM
						Jasper	Noida	DR			SUB-QR ITEM
						Conquerent Control Systems	Manesar	DR			SUB-QR ITEM
						Havells	Faridabad	DR			SUB-QR ITEM
11		I				Novateur Electrical & distribution systems	Murthal	DR			SUB-QR ITEM
						Avaid Technovator	Manesar	DR			SUB-QR ITEM
						Additionally all vendors identified in seriel no. 8 are also acceptable		DR			SUB-QR ITEM
	1.1 KV AC/DC Power cable (PVC & XLPE)					Universal Cable Ltd.	Satna	A			
						NICCO	Shamnagar, Kolkata	A			
						Incab	Pune	A			
						Hindustan Vidyut Products	Faridabad	A			
						KEI Industries	Bhiwadi	A			
						Delton Cable Ltd	Faridabad	A		A)Unarmoured cable all sizes. B) Armoured cable up to 3.5 x 240 sq. Mm with GI strip armour and 1Cx70 sq mm with Al strip armour	
						Paramount Cable	Khushkhera	A			

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	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
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Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
12		I				Polycab Wires Pvt. Ltd	Daman	A			
						Gemscabs Industries	Bhiwadi	A			
						Cords Cables	Bhiwadi	A			
						Havells India Ltd.	Alwar	A			
						Sri ram Cables	Bhiwadi	A			
						Thermocables	Hyderabad	A			
						Sbee Cables	Bangalore	A			
						Suyog Cables	Vadodara	A			
						Finolex	Pune	A			
						Scot Innovation wires and cables	Baddi	A			
						Indo Alusys	Bhiwadi	A			
						Radiant Cables	Hyderabad	A			
13	1.1 KV Control Cable	I				Universal Cable Ltd.	Satna	A			
						NICCO	Shamnagar, Kolkata	A			
						Incab	Pune	A			
						Polycab WiresPvt. Ltd	Daman	A			
						Hindustan Vidvut Products Ltd	Faridabad	A			
						KEI Industries	Bhiwadi	A			
						Delton Cable Ltd	Faridabad	A			
						Paramount Cable	Khushkhera	A			
						Gemscabs Industries	Bhiwadi	A			
						Cords Cables	Bhiwadi	A			
						SPM Cables	Hyderabad	A			
						Elkav Telelink	Faridabad	A			
						Havells India Ltd.	Alwar	A			
						R.R. Kabel	Silvasa	A			
						Thermocables	Hyderabad	A			
						Finolex	Pune	A			
						Sbee Cables	Bangalore	A			
						Suyog Cables	Vadodara	A			
						Scot Innovation wires & Cables	Baddi	A			
						Indo Alusys	Bhiwadi	A			
						Radiant Cables	Hyderabad	A			
14	H.T. CABLE Grade- upto 33kV	I				Apar Industries	Valsad	A			
						Finolex	Pune	A			
						Gemscab	Bhiwadi	A			
						Gupta Power	Kashipur	A			
						Havells India Ltd.	Alwar	A			
						Incab	Pune	A			
						KEC International	Vadodara	A		upto 11kV only	
						KEI Industries	Bhiwadi	A			
						Krishna Electrical Industries Ltd	Gwalior	A		upto 11kV only	
						NICCO	Shamnagar, Kolkata	A		upto 11kV only	
						Paramount	Khushkhera	A			
						Polycab Wires Pvt. Ltd	Daman	A			

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Package : FGD
Supplier : GE
Contract No.: CS-0011-109(2)-9

ELECTRICAL ITEMS

INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL

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						Sri ram Cables	Bhiwadi	A		upto 11kV only
						Sterlite	Haridwar	A		
						Tirupati Plastomatics	Jaipur	A		upto 11kV only
						Torrent Cable Ltd	Nadaid	A		
						Universal Cable Ltd.	Satna	A		
15	Battery Charger (48V/110V/220V)	I				Chabbi India Ltdi Electricals	Jalgaon	A		
						HBL Power	Hyderabad	A		
						Dubas Engineering	Bangalore	A		
						Chloride Power	Kolkatta	A		
						Statcon	Hapur	A		
						Masstech	Jalgaon	A		
16	Battery	I				Exide	Kolkata	A*		* For lead acid plante type only
						Hoppekkee	Brilon, Germany	A*		* For lead acid plante type only
						HBL Power Systesm	Hyderabad	A#		# For Ni-cd type only
						Amcosaft	Bangalore	A#		# For Ni-cd type only
17	ELEVATOR	I				ECE	GHAZIABAD	A		
						TECHNO	AHMEDABAD	A		
						OTIS	MUMBAI	A		
						KONE	CHENNAI	A		
						OMEGA	AHMEDABAD	A		
						SAMIL ELTEC	KOREA	A		
18	DG Set	I				TIL	Ghaziabad	A		UP TO 1500KVA
						Powerica	Silvasa	A		UP TO 500KVA
						Jakson	Kathua	A		
						Sterling Generators Pvt Ltd	Silvasa	A		
						Supernova	Rajpur	A		
						Kohler	Singapore	A		
19	HV Busduct (SPBD)	I				BHEL	Rudrapur	A		
						C&S	G.Noida/Haridwar	A		
						KGS Engg	Chennai	A		Upto 11KV only
						Powergear	Chennai/Bangalore	A		
20	GI CABLE TRAYS	II				Inar Profiles Ltd	Ankapally (Vizag)	A		
						Vatco	Mumbai	A		Galvanization at Sigma Mumbai
						Indiana cable trays	Mumbai	A		Galvanization at Karamtara galvaniser
						Industrial Perforation	Kolkata	A		
						Ratan Projects	Howrah	A		Galvanization at DMP Projects
						India Electric Syndicate	Kolkata	A		Galvanization at BMW Industries/B.P Projects
						Steelite engg.	Mumbai	A		
						Premier Power Products	Kolkata	A		Galvanising at Neha Galvaniser
						Indiana Gratings	Pune	A		Galvanization at Poona Galvanizer
						M.J. Engineering	Okhla/ Bhiwadi	A		

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						T.R.G	Chennai	A		Galvanization at TM Radhakrishna Chetty & Co	
						Amtech	Pune	A		Galvanization at B.G. Shirke - Pune	
						Rukmani	Raipur	A		Ladder type cable trays only	
						Passive Infra	Hasangarh (Rohtak)	A			
						Unitech Fabricators & Engineers	Howrah/ Hoogly	A			
						Patny System	Hyderabad	A			
						Rabi Engg	Kolkata	A		Galvanizing from NTPC approved sources	
	CABLE TRAY FLEXIBLE SUPPORT SYSTEM					Indmarkformtech Pvt Ltd	Pune	A		Galvanizing at B.G.Shirke - Pune	
						Vatco	Mumbai	A		Galvanising at Sigma Mumbai	
						Inar profiles	Enkapalli	A			
21		II				Industrial perforations	Kolkata	A			
						Premier power products	Kolkata	A		Galvanising at Neha Galvaniser	
						Steelite engg.	Mumbai	A			
						Indiana gratings	Pune	A		Galvanising at Poona Galvaniser	
						Patny Systems	Hyderabad	A			
	LT Busduct					Amtech	Pune	A		Galvanising at B.G. Shirke	
						KGS Engg	Chennai	A			
						Spaceage	Gurgaon	A			
22		II				C&S	Noida/Haridwar	A			
						BHEL	Rudrapur	A			
						Nitva Electrocontrols	G.Noida	A			
						Unilec	Gurgaon	A			
						REEP	Chennai	A			
	Lighting Transformer (Epoxy Insulated)					Gujarat Plug In	Vadodara	A		SQP	
						Prayog	Pune	A		SQP	
23		III				Indcoil	Mumbai	A		SQP	
						Pragati	Thane	A		SQP	
						Southern Elect	Chennai	A		SQP	
						Pactil	Thane	A		SQP	
						AE	Mumbai	A		SQP	
	Lighting Fixtures & Luminaries					KPEL	Pune	A		SQP	
						Wipro	Pune	A		For Filament and LED	
24		III				Crompton	Mumbai	A		For Filament only	
						Philips	Noida	A		For Filament and LED	
						Bajaj	Mumbai	A		For Filament and LED	
						Surya Roshni	Noida	A		For Filament and LED	
	Welding Recepticles					Goldwyn	Noida	A		For LED only	
						SCHEINDER	Nasik	A			
						AJMERA	Mumbai	A			
25		III				Best & Cropmpton	Chennai	A			
						BCH	Faridabad	A			
						Additionally Any make with VDE or CE or UL or CSA marking or BIS approved with valid CML number is acceptable					
	Cable Gland										
27		III				Any make with VDE or CE or UL or CSA marking or BIS approved with valid CML number.is acceptable					

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28	Lugs	III				Dowells	Mumbai	A		
						Chetna	Nasik	A		
						3D	Umbergaon	A		
						Additionally Any make with VDE or CE or UL or CSA marking or BIS approved with valid CML number is acceptable				
29	Emergency Light, Trefoil Clamps, Ceiling Fans	III				Main Contractor Approved Sources		A		GALVANISING AT NTPC APPROVED SOURCES
30	M.S. ROD, G.I. Flat, G.I. Wire, Earth Wire	III				Main Contractor Approved Sources		A		
31	Local Motor Starter Panels	III				SIEMENS	Mumbai	A		
						L&T	Mumbai	A		
						Any other make with VDE or CE or UL or CSA marking or BIS approved with valid CML number is acceptable				
32	Limit Switches	III				KAKU BHILLAI	Chennai	A		Any other make with VDE or CE or UL or CSA marking or *BIS approved with valid CML number* .
						Jai Balaji	Chennai	A		
						AG System	Mumbai	A		
						Electromag	Mumbai	A		
						BCH	Faridabad	A		
33	HT Termination & Jointing Kits	III				3M	Pune	A		
						Raychem	Pune	A		
34	Fire sealing system - Type A Material supplier	III				3M India	Bangalore	A		
						GE Silicon	USA	A		
						Hilti	Germaney	A		
						DOW Corning	USA	A		
35	Fire sealing system - Type B Material supplier	III				LLOYDS	Delhi	A		
						Signum	Nagpur	A		
						Vijay System Engineers Pvt Ltd	Mumbai	A		
36	Executing Agency for Fire sealing system	I				LLOYDS	Delhi	A		
						Signum	Nagpur	A		
						Vijay System Engineers Pvt Ltd	Mumbai	A		
						3M India	Bangalore	A		

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37	CIRCUIT BREAKER	I				GE T&D	KANCHIPURAM	A				
						ABB	VADODARA	A			SUB-QR ITEM	
						SIEMENS	AURANGABAD	A			SUB-QR ITEM	
38	ISOLATOR	I				CGL	NASHIK	A			SUB-QR ITEM	
						GR POWER	HYDERABAD	A			SUB-QR ITEM	
						HIVELM	CHENNAI	A			SUB-QR ITEM	
						S&S POWER	PONDICHERRY	A			SUB-QR ITEM	
						SIEMENS	HYDERABAD	A			SUB-QR ITEM	
						SWITCHGEAR & STRUCTURALS	HYDERABAD	A			SUB-QR ITEM	
39	CURRENT TRANSFORMER	I				ABB	VADODARA	A			SUB-QR ITEM	
						GE T&D	HOSUR	A			SUB-QR ITEM	
						BHEL	JHANSI	A			SUB-QR ITEM	
						CGL	NASHIK	A			SUB-QR ITEM	
						MEHRU	BHIWADI	A			SUB-QR ITEM	
40	CVT	I				ABB	VADODARA	A			SUB-QR ITEM	
						GE T&D	HOSUR	A			SUB-QR ITEM	
						BHEL	JHANSI	A			SUB-QR ITEM	
						CGL	NASHIK	A			SUB-QR ITEM	
41	SURGE ARRESTOR	I				CGL	NASIK	A			SUB-QR ITEM	
						LAMCO	HYDERABAD	A			SUB-QR ITEM	
						OBLUM	HYDERABAD	A			SUB-QR ITEM	
42	POST INSULATOR	I				ADITYA BIRLA	HALOL	A			SUB-QR ITEM	
						IEC	BHOPAL	A				
						SARVANA GLOBAL	CUDDALORE	A				
						MODERN INSULATOR	ABU ROAD	A				
						WSI	CHENNAI	A				
43	CLAMPS & CONNECTORS & WELDING SLEEVES	II				ELCTROMECH TRANSTECH	KOLKATA	A				
						EXALT	MUMBAI	A				
						KLEMMEN ENGG	CHENNAI	A				
						MEGHA ENGG	CHENNAI	A				
						MILIND	MUMBAI	A				
						PEE VEE ENGG	BANGALORE	A				
44	INSULATOR HARDWARE, CONDUCTOR ACCESSORIES & EARTHWIRE ACCESSORIES	II				ELECTROMECH TRANSTECH	KOLKATA	A				
						EMI TRANSMISSION	MUMBAI	A				
						IAC ELECTRICALS	KOLKATA	A				
						ITPL	MUMBAI	A				
						RASHTRA UDYOG	KOLKATA	A				
						TAG CORPORATION	CHENNAI	A				
45	DISC INSULATOR/ PIN INSULATOR	I				ADITYA BIRLA	RISHRA (W.B.)	A				
						BHEL	BANGALORE	A				
						IEC	BHOPAL	A				
						IMPERIAL CERAMICS	BIKANER	A	UPTO 90 KN			
						MODERN INSULATOR	ABU ROAD	A				
						SARVANA	CUDDALORE	A				

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						WSI	CHENNAI	A		
						APAR INDUSTRIES	SILVASSA	A		
46	ACSR CONDUCTOR	I				CABCON	KOLKATA	A		
						DIAMOND	VADODARA	A		
						GALAXY	SANGLI	A		
						GUPTA POWER INFRA	BHUBANESWAR	A		
						HIRA CABLES	HIRAKUD	A		
						JSK	SILVASSA	A		
						LUMINO	KOLKATA	A		
						SARAVATHY	BANGALORE	A		
						SMITA	GHAZIABAD	A		
		I				ALOM EXTRUSIONS	KOLKATA	A		
47	ALUMINIUM TUBE					BANCO	VADODARA	A		
						CENTURY EXTRUSION	KOLKATA	A		
						HINDALCO	RENUKUT	A		
						HINDALCO	ALUPURAM	A		
						JINDAL ALUMINIUM	BANGALORE	A		
						SUDAL	NASIK	A		
		I				GE T&D	CHENNAI	A		
	SUB STATION AUTOMATION					ABB	PEENYA	A		
48	SYSTEM (BCU, GRP, ENERGY METER, NUMERICAL RELAYS, SWITCHYARD PROTECTION) (Item subject to Sub QR approval)					SCHNEIDER	NOIDA	A		
						SIEMENS	KALWA	A	*: Approved only for C&R Panel	
						BHEL	BHOPAL	A*	*: Control Measure of items shall be same as in the Quality Plan of SAS.	
49	COMPONENTS FOR CONTROL & RELAY PANELS, PROTECTION PANELS, ISLANDING SCHEME & BAY CONTROL UNIT :	I								
						CONZERV	BANGALORE	A		
a	ENERGY METER	*				ELSTER	MUMBAI	A		
						SEMS	UDAIPUR	A		
						L&T	MYSORE	A		
						AKSH OPTIFIBRE	BHIWARI	A		
b	FIBRE OPTIC CABLE	*				BIRLA ERICSSON	REWA	A		
						FINOLEX	PUNE	A		

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c	EVENT LOGGER	*				GE T&D	UK / FRANCE/CHENNAI	A			
						HATHWAY	UK	A			
d	GPS TIME SYNCHRONISATION EQUIPMENT	*				ARBITER	USA	A			
						HATHWAY	UK / USA	A			
						HOPF	GERMANY	A			
						SERTEL	CHENNAI	A			
e	RELAY TEST KIT	*				DOBLE ENGG	USA	A			
						MEGGER	UK	A			
						OMICRON	USA/AUSTRALIA	A			
						SCOPE T & M	PUNE	A			
f	DISTURBANCE RECORDER	*				ABB	FINLAND	A			
						GE T&D	USA	A			
						HATHWAY	UK	A			
						SIEMENS	GERMANY	A			
g	LARGE VIDEO SCREEN (LVS)	*				BARCO	NOIDA	A			
						DELTA	GURGAON	A			
						PLANAR	USA	A			
h	RELAYS for SWITCHYARD (NUMERICAL AND AUXILLARY)	*				ABB	SWEDEN/ BANGALORE	A			
						GE T&D	UK/CHENNAI	A			
						SCHNEIDER	UK	A			
						SIEMENS	GERMANY	A			
50	SF6 Gas Filling and Evacuating Plant, Gas Recycling & Purifying Plant, Gas Leakage Detecter	III				AI QUALITEK	USA	A			
						DILO	GERMANY	A			
						ENERVAC	CANADA	A			
						VACCUUM PLANT INDUSTRIES	PUNE	A			

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51	OPERATIONAL ANALYSER WITH DCRM KIT	III				MEGGER	UK	A			
						OMICRON	USA	A			
						MEGGER	SWEDEN	A			
52	LEAKAGE CURRENT ANALYSER	III				DOBLE ENGG	USA	A			
						ISA	ITALY	A			
						SCOPE T & M	PUNE	A			
						TRANSINOR	NORWAY	A			
53	GS FLAT/ 40MM DIA M.S.ROD/ M.S EARTH RODS /U CLAMP/ GI EARTH PIPE / GI PIPE / GI CONDUIT (INCLUDING BENDS) / PVC PIPES	III				MAIN CONTRACTOR APPROVED SOURCES					
54	GS EARTHWIRE / LIGHTING WIRE	III				MAIN CONTRACTOR APPROVED SOURCES					
55	LIGHTING POLE	III				BIS approved Vendors as per IS-2713					
56	BAY IDENTIFICATION TAGS, PHASE MARKERS & DANGER PLATES	III	*			MAIN CONTRACTOR APPROVED SOURCES					
57	PIANO SWITCHES	III	*			BIS APPROVED SOURCES					
58	WPS (Aluminium Tube)	I	W-010			MAIN CONTRACTOR APPROVED SOURCES					
59	WPS (Earthing Grid)	I	W-020			MAIN CONTRACTOR APPROVED SOURCES					
60	BELT WEIGHER	I				AVERY INDIA	BALLABHGARH	A			
						ELECON EPC	SAVALI	A			
						KISTLER MORSE	HYDERABAD	A	UP TO 2500 TPH		
						SCHENCK PROCESS	GURGAON	A			
						IPA	BANGLORE	A	UP TO 3700 TPH		
61	WEIGH BRIDGE	I				AVERY INDIA	BALLABHGARH	A			
						RICELAKE	SRIPEREMBUDUR	A			
62	IN LINE MAGNETIC SEPARATOR / SUSPENDED MAGNET	I				ELECON EPC	SAVLI	A			
						MAGNETIC CORPORATION	BANGALORE	A			
						ELECTRO ZAVOD	KOLKATA	A			
						ELECTROMAG	MUMBAI	A			
63	METAL DETECTOR	II				ELECTROMAG	MUMBAI	A			
						THERMO RAMSEY	AUSTRALIA	A			
						ELECON EPC	SAVALI	A			
						SIVA SYSTEMS	GOA	A			
	ELECTROMAGNETIC (EM) BRAKE					BCH	FARIDABAD	A			
						STORM CRAFT	MUM3AI	A			

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64		II				ELECTROMAG	MUMBAI	A			
						WITTON KRAMMER BROOK CROMPTON	UK	A	FOR WAGON TRIPPLER BRAKE ONLY		
65	CABLE REELING DRUMS	III				BENGAL TECHNOCRAT	KOLKATA	A	With Demag Germany make stall torque motor		
						ELECTRO ZAVOD	KOLKATA	A	With Demag Germany make stall torque motor		
						ELECON	VV NAGAR	A			
						ELEKTROMAG	VAPI	A	With Demag Germany make stall torque motor		
66	EH THRUSTER BRAKE / RAIL CLAMP	II				WMI	MUMBAI	A			
						PINTCH BUBNEZER	GERMANY	A	FOR DISC TYPE ONLY		
						ELECTROMAG	MUMBAI	A			
67	PULL CORD / BELTSWAY INDICATION SYSTEM	II				JAYASHREE	PUNE	A			
						PROTO CONTROL	PUNE	A			
						AG SYSTEMS	MUMBAI	A			
68	ELECTRONIC SPEED SWITCH,ZSS,TILT SWITCH,MAGNETIC SWEITCH,PROXIMITY SWITCH	III				JAYASHREE	PUNE	A			
						PROTO CONTROL	PUNE	A			
						PG ELECTRONICS	MUMBAI	A			
						VIRTUAL INDUSTRIES	JAMSHEDPUR	A	For Magnetic Limit Switches only		

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No :			
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No :		CS-0011-109(2)-9	
	Supplier : GE							Date :		21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page :			
1 No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
69	HEAVY DUTY LIMIT SWITCHES	III				JAI BALAJEE	CHENNAI	A			
						JAYASHREE	PUNE	A			
						BCH	FARIDABAD	A			
						A.G.SYSTEM	MUMBAI	A			
						ELECTROMAG	MUMBAI	A			
70	PULL CORD/BELT SWAY SEITCHES,UNDER BELT SWITCH	III				JAYASHREE	PUNE	A			
						PROTO CONTROL	PUNE	A			
						AG SYSTEMS	MUMBAI	A			
71	GEARED MOTOR	II				INTERNATIONAL COMBUSION	ARURANGABAD	A			
						NAW	KOLKATA	A			
						PBL	V.V.NAGAR	A			
						SEW EURODRIVE	GERMANY	A	Up to 30 kw		
						SIEMENS	GERMANY	A	Up to 30 kw		
72	Lighting Wires / GI Conduit	III				BIS Licencee with valid CML no					
73	FQP for electrical works	I									

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EGENDS :

1. SYSTEM SUPPLIERS/SUB-SUPPLIERS APPROVAL STATUS CATEGORY(SHALL BE FILLED BY NTPC)
   A-For this items proposed vendor is acceptable to NTPC.To be indicated with letter "A" in the list along with condition of approval,if any
   DR-For these items "Detailed required for NTPC review.To be identified with letter "DR" in the list.
2. QP/INSPN CATEGORY
   CAT-I :For these items the Quality Plans approved by NTPC & final acceptance will be on physical inspection witness by NTPC
   CAT-II :For these items the Quality Plans approved by NTPC.However no physical inspection shall be done by NTPC.The final acceptance by NTPC shall be on basis of review of documents as per approved QP
   CAT-III :For these items Main supplier approves the Quality Plans.The final acceptance by NTPC shall be on basis of certificate of conformance by the main supplier.
   * : Control measure of item covered in quality plan of main item.
3. UNITS/WORKS : Place of manufacturing Place of Main Supplier of multi units/works.

OTES:

ote 1: Relevant certificates shall be submitted for NTPC approval.Approval conditions attached to above identified vendors, as applicable shall be adhered to.

ote 2: For LT Motors:

a) Up to 50 KW: Cat-III: Acceptance of Motor up to 50 KW is based on COC of the manufacturer & the Main Contractor confirming NTPC's technical specifications.

b.i) Above 50 KW and up to 75KW: Cat-III : For manufacturers who have already supplied this range of motors to NTPC which have been commissioned and no adverse feedback has been reported from RIO/project-site AND for skid mounted motor supplied with the driven equipment. Acceptance based on review of Routine Test Inspection report as per IS-325 along with COC of the Manufacturer and Main Contractor confirming NTPC's technical specifications.

b.ii) Above 50 KW and up to 75KW : Cat-I: For Other Manufacturers, as per NTPC approved Quality Plan

c) Above 75 KW: Cat-I: as per NTPC approved Quality Plan

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
NTPC	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	

Note 3: Category of inspection for Cable Trays & Cable Tray Flexible Support System:

For Total Contract Quantity per Size	*Category of Inspection*
For cable total quantity ≤ 2.5 KM	Cat-III - submission of TC & Certificate of Conformance by Main Contractor for the manufacturers having successfully supplied to any NTPC project-site through Corporate contracts for atleast 2 years
For cable total quantity above 2.5 km & up to ≤ 10 km per size/type	Cat-II for the manufacturers having successfully supplied to any NTPC project-site through Corporate contracts for atleast 2 years
For cable total quantity above 10 km per size/type	Cat-I

Note 4: Category of inspection for LT Cables:

For Total Contract Quantity per Size	*Category Of Inspection*
For cable total quantity ≤ 2.5 KM	Cat-III - submission of TC & Certificate of Conformance by Main Contractor for the manufacturers having successfully supplied to any NTPC project-site through Corporate contracts for atleast 2 years
For cable total quantity above 2.5 km & up to ≤ 10 km per size/type	Cat-II for the manufacturers having successfully supplied to any NTPC project-site through Corporate contracts for atleast 2 years
For cable total quantity above 10 km per size/type	Cat-I

Note 5: VDE / CE / UL / CSA Marking Certification preferably from Third Party Agency or BIS Approval Letter shall be submitted for NTPC's Verification /Information.

Note 6: NTPC approved Galvanizers:

1. M/s M J Engg,Delhi	8. M/s National Galvanizer, Kolkata	15. M/s Sigma, Mumbai
2. M/s Jamna Metal,Delhi	9. M/s Unistar Galvanizer, Kolkata	16. M/s Radhakrishnan Shetty, Chennai
3. M/s A.V. Engg, Kolkata	10. M/s B.P. Project. Kolkata	17. Karamtara Mumbai
4. M/s Inar Profiles, Vishakapatnam	11. M/s Bajaj Pune	18. Poona Galvanizers Pune
5. M/s Anand Udyog, Mumbai	12. M/s Electrocare Industries, Mumbai	19. Neha Galvanizer- Kolkata
6. M/s Techno Engg,Chandigarh	13. M/s B.G. Shirke, Pune	20. Unitech Fabricators & Galvanizers- Hoogly
7. M/S Steelite Engg, Mumbai	14. M/s Gurpreet Galvanizer, Hyderabad	

(S. Mythili) (SURYYA CHOUDHURY) GE POWER

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		PROJECT : LOT-2 PROJECTS				LIST OF ITEMS REQUIRING QP			REF. NO:			
		PACKAGE : FGD FOR LOT 2 PROJECTS				APPROVAL & ACCEPTABLE			REVISION NO: 00			
		CONTRACTOR: GE POWER				VENDOR AS APPROVED BY			DATE: 21.12.2018			
		CONTRACT NO: CS-0011-109(2) -9										
No.	Major Equipment	QP/ Insp. Cat.	QP No	QP Sub. Schedule	QP approval schedule	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Sub-supplier Details submission schedule	Sub-supplier approval schedule	Sub QR Note - 1	Remark
1	DDCMIS											
		I				SIEMENS	Germany / Gurgaon	A				
		I				ABB	Germany / Bangalore	A				
		I				Emerson	USA / Pawane / Singapore	A				
		I				GE (ALSTOM)	Noida	A				
		I				GE (ALSTOM)	France	A				
		I				Honeywell	USA / Pune	A				
		I				Yokogawa	Bangalore	A				
		I				Toshiba	Japan	A				
		I				Invensys (Schneider)	Singapore / Mumbai / Chennai	A				
		I				Hitachi nest / Hitachi	Bangalore / Japan	A				
		*				GE (ALSTOM)	Pune	DR				
2	Dust Emision Monitor											
		III				Land Instruments International	UK	A				Optical Transreceiver type
		III				Codel	UK	A				Optical Transreceiver type
		III				Durag	Germany	A				Optical Transreceiver type
		III				Emerson Process Management	Ireland	A				Optical Transreceiver type
		III				SICK AG	Germany	A				Optical Transreceiver type
		*				Forbes Marshall	Pune	DR				CODEL MAKE
		*				FPI	India/China	DR				
		*				Fuji Electric	Japan	DR				
		*				Sintrol	Japan	DR				
3	Flue Gas Analyser (CO)											
		III				Emerson Process Management	Pawane	A				Analyser from principals M/S Emerson Germany/ USA
		III				Codel	UK	A				
		III				Land Instruments International	UK	A				
		III				Sick AG	Germany	A				
		III				Siemens	Germany	A				
		*				AIC	KOTA	DR				
		*				ENVOIRENMENT SA	MUMBAI	DR				
		*				HORIVA	PUNE	DR				
		*				Fuji Electric	Japan	DR				
		*				FPI	India/China	DR				
		*				Yokogawa	India	DR				
4	Flue Gas Analyser (CO2)											
		*				Emerson Process Management	Pawane	DR				
		*				Codel	UK	DR				
		*				Land Instruments International	UK	DR				
		*				Sick AG	Germany	DR				
		*				Siemens	Germany	DR				
		*				Fuji Electric	Japan	DR				
		*				FPI	India/China	DR				
		*				Yokogawa	India	DR				
		*				AIC	KOTA	DR				
		*				ENVOIRENMENT SA	MUMBAI	DR				
		*				HORIVA	PUNE	DR				
5	Flue Gas Analyser (SOX and Nox)											
		III				Emerson Process Management	Pawane	A				Analyser from principals M/S Emerson Germany/ USA
		III				SICK AG	Germany	A				
		III				Fuji Electric	Japan	A				
		III				Siemens	Germany	A				
		III				Yokogawa Electric Corporation	Japan	A				IR-400 SERIES
		*				PROTIA LTD	UK	DR				

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		PROJECT : LOT-2 PROJECTS					LIST OF ITEMS REQUIRING QP			REF. NO:		
		PACKAGE : FGD FOR LOT 2 PROJECTS					APPROVAL & ACCEPTABLE			REVISION NO: 00		
		CONTRACTOR: GE POWER					VENDOR AS APPROVED BY			DATE: 21.12.2018 -		
		CONTRACT NO: CS-0011-109(2) -9										
No.	Major Equipment	QP/ Insp. Cat.	QP No	QP Sub. Schedule	QP approval schedule	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Sub-supplier Details submission schedule	Sub-supplier approval schedule	Sub QR Note - 1	Remark
		•				UNISEARCH	CANADA	DR				
		•				OPSIS	SWEDEN	DR				
		•				FPI	India/China	DR				
		•				Codel	UK	DR				
		•				AIC	KOTA	DR				
		•				ENVOIRENMENT SA	MUMBAI	DR				
		•				HORIVA	PUNE	DR				
6	Flue Gas Analyser Panel											
		I				M/S YOKOGAWA India Ltd	Banglore	A				1. BOI used in the sample handling system shall be from the makes sent/oned in Annex-1 2. SOX, NOX & CO2 Analyser will be from M/S Yokogawa Electric Corporation Japan . 3. The item shall be as per NTPC approved data sheet/Specification/QP requirements. 4. M/S Yokogawa Japan will inspect & validate the assembled system at Yokogawa Bangalore works for the first system & will also be involved in the final commissioning of the system at site . 5..NTPC inspection category will be treated as CAT-1
		I				ADAGE AUTOMATION PVT. LTD.	GOA	A				1. SOX,NOX &CO2 analysers will be imported from M/S SIEMENS Germany . 2. Analysers cabinets & BOI items to be supplied as per annex -1 3. M/S Adage will perform FAT & commissioning of the CEMS system at site in presence of M/S SIEMENS representative.
		I				M/s Thermo Fisher Scientific India Pvt. Ltd	Mumbai	A				ONLY FOR DILUTION EXTRACTIVE TECHNIQUE 1)Analyser (SOX,NOX,CO,CO2,Mercury),sampling probe ,sample handling system ,umbical cord etc to be supplied from M/S Thermo Fisher USA . 2) Blank panel ,PC and printers are procured indigenously by M/S TFIPL as per NTPC agreed sources indicated in the LOA .UPS requirement shall be tied up during approval of QP , in case required . 3) Opacity monitor to be supplied from M/S Durag , Germany . 4) Presence of M/S Thermofisher Scientific USA official during final inspection and testing at M/S TFIPL , Mumbai works for the first unit & commissioning of the first unit at site
		I				Emerson Process Management Pvt Ltd	Pawane	A				SOX NOX & CO ANALYSER PANEL
		I				Analyser Instrument Co Pvt Ltd	Kota	A				ANALYSERS FROM FUJI JAPAN & OTHERS ITEMS FROM LOA APPROVED SOURCES

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		PROJECT : LOT-2 PROJECTS					LIST OF ITEMS REQUIRING QP			REF. NO:		
		PACKAGE : FGD FOR LOT 2 PROJECTS					APPROVAL & ACCEPTABLE			REVISION NO: 00		
		CONTRACTOR: GE POWER					VENDOR AS APPROVED BY			DATE: 21.12.2018		
		CONTRACT NO: CS-0011-109(2) -9										
No.	Major Equipment	QP/ Insp. Cat.	QP No	QP Sub. Schedule	QP approval schedule	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Sub-supplier Details submission schedule	Sub-supplier approval schedule	Sub QR Note - 1	Remark
		I				Chemtrols Engineering Ltd	Goa	A				ANALYSERS FROM SICK AG Germany & OTHERS ITEMS FROM LOA APPROVED SOURCES
		•				Forbes Marshall	Pune	DR				
		•				SICK INDIA PVT LTD	PUNE/MUMBAI	DR				
		•				ICE (ASIA) PVT LTD	MUMBAI	DR				
7	Mercury Analyser											
		III				DURAG	BANGLORE	A				Analyser from M/S Verawa Umwelt Germany
		III				SICK AG	Germany	A				FOR CEMS PACKAGE
		•				FPI	India/China	DR				
		•				Thermo Scientific	India	DR				
		•				AIC	KOTA	DR				
		•				ENVOIRENMENT SA	MUMBAI	DR				
		•				HORIVA	PUNE	DR				
8	Conductivity Analyser											
		III				Emerson Process Management	Pawane	A				procured from USA, assembly & testing in pawane
		III				Hach	USA	A				
		III				ABB	UK	A				
		III				Yokogawa	Japan	A				
		•				E&H	India	DR				
		•				Khrone	India	DR				
		•				GF Signet	India	DR				
		•				Honeywell	India	DR				
		•				Teledyne	India	DR				
		•				Systea	KOTA	DR				
		•				AIC	MUMBAI	DR				
		•				ENVOIRENMENT SA	PUNE	DR				
		•				HORIVA						
9	PH Analyser											
		III				Emerson Process Management Pvt Ltd	Pawane	A				procured from USA, assembly & testing in pawane
		III				ABB	UK	A				
		III				Hach	USA	A				
		III				Yokogawa	Japan	A				
		•				E&H	India	DR				
		•				Khrone	India	DR				
		•				GF Signet	India	DR				
		•				Honeywell	India	DR				
		•				Teledyne	India	DR				
		•				Systea	India	DR				
10	Silica Analyser											
		III				Hach	USA	A				
		III				ABB	UK	A				
		III				Hach	Switzerland	A				
		III				Eutech Instrument PTE Ltd (part of Thermofisher Scientific Inc)	Singapore	A				FOR ORION BRAND SILICA ANALYSER
		•				Thermo Orion	USA	DR				
		•				Teledyne	India	DR				
11	Turbidity Analyser											
		III				HACH	USA	A				
		III				ABB	UK	A				
		III				E & H	Germany	A				
		III				Emerson	USA	A				

		PROJECT : LOT-2 PROJECTS					LIST OF ITEMS REQUIRING QP			REF. NO:		
		PACKAGE : FGD FOR LOT 2 PROJECTS					APPROVAL & ACCEPTABLE			REVISION NO: 00		
		CONTRACTOR: GE POWER					VENDOR AS APPROVED BY			DATE: 21.12.2018		
		CONTRACT NO: CS-0011-109(2) -9										
No.	Major Equipment	QP/ Insp. Cat.	QP No	QP Sub. Schedule	QP approval schedule	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Sub-supplier Details submission schedule	Sub-supplier approval schedule	Sub QR Note - 1	Remark
		III				WTW	Germany	A				
		*				Khrone	India	DR				
		*				GF Signet	India	DR				
		*				Honeywell	India	DR				
		*				Teledyne	India	DR				
		*				Syatea	India	DR				
12	DENSITY METER	*				Yokogawa	India	DR				
		*				Thermofisher						
		*				E&H	Mumbai	DR				
		*				Forbes Marshall	Aurangabad	DR				
		*				Emerson	Pune	DR				
		*				IPRO (Promech)	Mumbai	DR				
		*				Berthold Technologies	Chandigarh	DR				
13	VMS						Chennai	DR				
		II				M/S Schenck Rotec India Ltd	Noida	A				Loop powered sensor with indicator .Main sensor LPS-420 procured from M/S Hansford sensor UK
		II				Forbes Marshall Pvt Limited	Pune	A				VMS hardware and sensors with integral cable shall be shinkawa Japan make . 2. All other BOIL shall be from LOA agreed sources
		II				GE	Pune	A				FOR GE BENTLEY , USA MAKE SYSTEM
		II				Meggit	Bangalore	A				FOR MEGGITT SWITZERLAND VIBRATION SYSTEM
		II				Rockwell Automation	Sahibabad	A				FOR ROCKWELL USA MAKE SYSTEM
		II				SKF	Pune	A				FOR SKF USA MAKE SYSTEM
		II				Shinkawa	Japan	A				
		II				GE (Bentley Nivada)	USA	A				
		II				MEGITT (Vibrometer)	Switzerland	A				
		II				Rockwell Automation	USA	A				
		II				SKF	USA	A				
		II				Vibrometer	Switzerland	A				
						FOLLOWING ITEMS TO BE SUPPLIED AS PER MAIN CONTRACTOR APPROVED SOURCES						
1	Residual Chlorine Analyser	III										

Notes:-

1.0 SYSTEM SUPPLIER/SUB SUPPLIER APPROVAL STATUS CATEGORY

A - For those items proposed vendor is acceptable to customer. To be indicated with letter "A" in the list alongwith the condition of approval, if any

DR - For those items "Detailed Required" for customer review. To be identified with letter "DR" in the list. For these itmes, vendor shall be proposed for owner acceptance with-in the agreed contract schedule of the package.

SQP - Standard Quality Plan RQP- Reference Quality Plan

2.0 QP INSPECTION CATEGORY

CAT-1 : For those items the Quality Plans are approved by Owner and final acceptance will be on physical inspection witness by Owner .

CAT - II : For those items the Quality plans are approved by Owner . However no physical inspection shall be done by Owner . The final acceptance by Owner shall be on the basis of review of documents .

CAT-III : For those items Main supplier approves Quality Plans . The final acceptance by Owner shall be on the basis of Certificate of Conformance by main supplier .

UNITS/WORKS : Place of manufacturing-place of main supplier of multi units/works

* - Inspection category will be decided during vendor evaluation.

Note - 1 : Approval is conditional and subject to sub QR/provennes clearance as specified in the contract specification. Further for any change in the Technical specification at later stage vendor approval will be reviewed accoedingly.

Note - 2: For instrument cable up to 1 KM inspection category CAT -III, For 1 KM to 2.5 KM inspection category CAT - II.

Note - 3: For the items not appearing in the preaward list and falls in the scope of supply of the bidder, bidder and Customer will mutually discuss in future.

Note - 4: EMPTY CABINETS, COMUTERS, SIGNAL ISOLATER/MULTIPLIER and TB SHALL ALSO BE ACCEPTABLE FROM OWNER ACCEPTED IN QP. IF THE TOTAL INTEGRATED PANEL AND FAT IS CONDUCTED INDEGENEOUSLY.

Note - 5: For the C & I instruments mounted on the skid of the main item or supplied as integral part of main item, instrument to be supplied as per proven practice of the manufacturer meeting the Customer technical specification requirement.

Note - 6: This item is bought out components of main equipments like DDCMIS, PLC, TSI, CCTV, PA system etc.

Note - 7: For these controlled items, vendor shall be proposed for owner acceptance with-in agreed contract schedule of the package

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POST BID DISCUSSIONS ON SAFTEY PLAN TO FINALISE THE SAFTEY COORDINATION PROCEDURE HELD BETWEEN NTPC LIMITED (NTPC) AND M/s GE POWER INDIA LTD. ON 03.01.2019 & 06.02.2019 AT ENGG OFFICE COMPLEX, NOIDA FOR "FLUE GAS DESULPHARISATION (FGD) SYSTEM PACKAGE FOR LOT-2 PROJECTS"

PRESENT

NTPC

1. Mr. Arin Bordoloi (AGM- Saftey)
2. Mr. Subodh Khare (Mgr Safety)

M/s GE POWER INDIA LTD

1. Mr. Lalit Sankrani, Executive (Business Operations)
2. Mr. DS Baghel, Sr. Regional Leader (EHS)
3. Mr. Roshan Singh, Sr. Manager (Sales)

With reference to the Techno-Commercial Bid of M/s GE POWER INDIA LTD. ref no QFECS1326662 dated 03.12.2018 against NTPC Bidding Document No. CS-0011-109(2)- 9 issued vide NIT dated 31.08.2018 of which Technical bid was opened on 04.12.2018, post bid discussions were held between M/s GE POWER INDIA LTD and NTPC - Safety to discuss and finalize the Safety Coordination procedure. The following were discussed and agreed to:

1. During discussions, M/s GE POWER INDIA LTD informed that they have submitted their detailed information regarding safety management at Appendix-I to Attachment- 19 of their Technical bid covering various aspects for compliance to Safety during the execution , in case they are considered for award, M/s GE POWER INDIA LTD further informed that they are having well-established Safety Manual / Plan which has been submitted along with bid and further discussion on safety plan on 03.01.2019 and finalized on 06.02.2019.

2. GE POWER INDIA LTD confirmed that would comply with all the points listed in Attachment - 19 of Techno-Commercial bid. "Safety Plan" submitted by GE POWER INDIA LTD (enclosed as Annexure-I to this MOM). GE POWER INDIA LTD further, confirmed that they shall submit their final "Safety Plan" to Project Manager/ Engineer-in- charge for approval by Project Manager/ Engineer-in- charge/Head of the Project before start of the work at site.

3. The Safety Coordination Procedure shall form an integral part of the Contract and shall be complied with, in case of award on GE POWER INDIA LTD.

NTPC

18/02/2019

GE POWER INDIA LTD

(FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE FOR LOT-2 PROJECTS COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

(INFORMATION REGARDING SAFETY MANAGEMENT)

NTPC LOT 2 (APPLICABLE FOR ALL PROJECTS)

Bidder's Name and Address :
GE Power India Limited,
Building, Plot No. 7,
Noida-201301,
Pradesh,

To
Contract Services-I IHDP
NTPC Limited, 6th Sector-127,
Floor, Engg.Office Uttar
Complex, Plot No. A-
8A, Sector-21, Noida -
201301

Dear Sirs,

We have read the provisions pertaining to Safety and hereby undertake to comply all the provisions of Bidding Documents in this regard.

We hereby confirm that all the measures to ensure highest level of Safety during execution at Site shall be taken by us.

Further, in terms of the provisions of Clause No. ***44.00.00 of Part-D*** of Technical Specification (Section-VI) of Bidding Documents, a proposed "Safety Plan" is attached herewith as Appendix-I to this Attachment.

A "Safety Co-ordination Procedure" shall be finalized during post bid discussions of Techno-Commercial Bid.

The above proposed "Safety Plan" shall be further discussed/ finalized at Site, in line with the agreements made in "Safety Co-ordination Procedure", and shall be approved by Project Manager/Engineer-In-Charge/ Head of Project before start of work at Site.

Date : 27/11/2018
Place : Noida

(Signature).....
(Printed Name) **Lalit Sankrahi**
(Designation) **Executive – Business Operations**
(Company Seal) .....

Note : Continuation sheets of like size and format, may be used as per Bidder's requirement and shall be annexed to this Attachment.

* Clause no. to be inserted by the Package Coordinator in the Bidding documents.

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APPENDIX-I to ATTACHMENT-19

SAFETY PLAN

01. Safety Policy of the Contractor to be enclosed: *Refer attached Safety Policy in EHS plan*

02. When was the Safety Policy last reviewed: *April 2016*

03. Details of implementation procedure / methods to implement Safety Policy /Safety Rules: *Refer attached EHS Plan – Page no 3-26*

04. Name, Qualification, experience of Safety Officer: *Degree or diploma engineer/ B.Sc. + 1 year diploma in industrial safety from a recognized institute or 4-year engineering degree in Safety, plus 3 to 4 years of practical experience in Safety at construction sites. EHS Resources – 3 EHS Officer (1 nos. from GE and 2 nos. of subcontractor of GE)*

05. Review of Accidents Analysis Method, Methods to ensure Safety and Health: *Refer attached EHS Plan – (Section - 2.4.3)*

06. Unit executive responsible to ensure Safety at various levels in work area: *Refer attached EHS Plan – (Section - 1.6.2)*

07. List of employees trained in safety employed before execution of the job. Give the details of training: *All employees are trained as per their job category. Name & training records will be shared once employees get identified & finalized before execution of the job. Safety training Programme are mentioned Refer attached EHS Plan – (Section - 2.6). As well as training schedule and matrix is attached.*

08. Safety Training Targets, Schedules, methods Adopting to providing safety training to all employee: *All trainings have been schedule to every individual employee based on the job category and managed online by every GE employee. In case of contractors Please Refer attached EHS Plan – (Section - 2.6).*

09. Details of checklist for different jobs / work and responsible person to ensure compliance (copy of checklist to be enclosed): *Refer attached Checklist.*

10. Regular Safety Inspection Methods and Periodicity and list of members to be enclosed: *Refer attached EHS Plan – (Section - 2.4.7.2 & 2.4.7.3).*

11. Risk Assessment, Safety Audit by Professional Agencies, Periodicity: *Safety Audit Internal / external will be performed after 3-4 months of site mobilization and will continue at construction site – (Section -2.4.7). Internal audit in each quarter, after 3 to 4 months of mobilization of site. Refer attached EHS Plan – (Section - 2.4). Sample copy of RA for Turbine island is attached.*

12. Implementation of Recommendations of Audit / Inspections, Procedures for Implementation and follow up: *Refer attached EHS Plan – (Section - 2.4.7.4)*

13. Provision for treatment of injured persons at work site: *First Aid boxes equipped with requisite articles shall be provided at construction sites for the use of workers. Basic*

training has to be provided on first aid to workmen & office bearers working at site. Refer attached EHS Plan – (Section - 2.5.2).

14. Review of overall safety by top Management and Periodicity: *Refer attached EHS Plan – (Section - 2.7)*

15. System for Implementation of Statutory legislations: *Refer attached EHS Plan – (Section - 3.2.4)*

16. Issue of PPEs to employees, Periodicity / stock on hand etc.: *Will be done at site by the responsible site admin person. Refer attached EHS Plan – (Section -3.1.17). Safety Shoes & Helmets shall be provided to all site personals along with other necessary applicable PPE's & shall be replaced on damage. 10% of stock should be maintained.*

PPE matrix & periodicity of replacement

#	PPEs	Replacement Frequency	IS/ EN/ CE code
1	Safety Helmet	Twice in year	IS2925
2	Safety Shoe	Yearly	IS15298
3	Nose Protection	As and when required	IS9473
4	Safety Glass	As and when required	EN 166
5	Ear Protection	As and when required	IS: 9167-1979
6	Reflective Jackets	As and when required	---------
7	Full Body Harness	As and when required	EN 361 / IS3521
8	Fall Arrestor	As and when required	EN 361
9	Hand Gloves	As and when required	IS: 6994
10	Ear Plug / Muffs	As and when required	IS: 6994
12	Face Shield	As and when required	IS : 8520-1977

17. Specify safety measures for round the clock working (especially during night): *Deployment of safety officers in day/night shift before mobilization to ensure complete hold on the activities round the clock and we will ensure adequate illumination for performing GE activities. All activities shall be done as per PTW - (Section 2.4.2)*

Signature Head of the Organization With date & stamp

MINUTES OF POST BID DISCUSSION (COMMERCIAL ISSUES) HELD BETWEEN M/s NTPC LIMITED (NTPC) AND M/s GE POWER INDIA LIMITED (GEPIL) ON 15.04.2019 FOR FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE FOR SIPAT SUPER THERMAL POWER STATION STAGE-I (3 X 660 MW) UNDER LOT-2 PROJECTS

PRESENT:

NTPC	GEPIL
Mr. Adesh, GM (CS)	Mr. Lalit Sankrani
Mr. Udayan Kumar, GM (PE-Mech)	Mr. Roshan Singh
Mr. V. N. Jain, GM (FIN)	Mr. Hiren Nariyelwala
Mr. Bikram Mandal, AGM (CS)	
Mr. Shrish Kumar Singh, DGM (CS)	
Mr. P. Vijay, Manager (CS)	

With reference to Price Bid ref. No. QFECS1326662 dated 03.12.2018 for FGD System Package for Sipat STPS Stage-I (3 x 660 MW) under lot-2 Projects opened on 08.04.2019 and Reverse Auction conducted on 08.04.2019 for the subject Package, discussions were held between GEPIL and NTPC, wherein the following have been agreed to:

1.0 GEPIL has confirmed the compliance to the terms and conditions of Bidding Documents read in conjunction with all the Amendments and Clarifications to Bidding Documents issued by NTPC for the subject Package. GEPIL have also confirmed that they shall complete the work in accordance with the provisions of Technical Specifications/Bidding Documents, in case of award.

2.0 GEPIL in Attachment-3P of their bid have indicated percentage of Import content in Ex-works price is <30% of Supply Value. Further, GE confirmed that value of import content in Ex-work Price is INR 127,40,00,000/-.

Further, GEPIL confirmed that as declared in Attachment 3P(A), CIF value of the Construction Equipment to be imported by the Bidder including sub-contractor(s) of the Bidder is 'NIL'.

3.0 Break-Up of Prices/Final Prices after Reverse Auction

GE have quoted lump sum prices against Schedule-1 in their bid. GE have not indicated breakup against Main Equipment and Mandatory Spares. Further, GE have also not quoted breakup of Prices in Schedule-2 & 3 (Transportation, Installation, Civil Works, Structural Steel Works and AMC Charges etc.).

During discussions, GE have furnished price breakup of Schedule-1, Schedule-2 and Schedule-3.

Further, GE confirmed that in line with the provisions of the Bidding Documents, they have applied uniform percentage (%) discount (as applicable after Reverse Auction) over the original items rate quoted in various Price Schedules/Attachments of their Price Bid.

During discussions, GE also confirmed the following with regard to Main Equipment, Mandatory Spares, Type tests and Site fabricated items:

Main Equipment

GE confirmed that based on the break-up of Prices submitted in Schedule-1 for Main Equipment, further Billing break-up (BBU) shall be submitted and finalized atleast 60 days prior to start of dispatch.

Mandatory Spares

GE have indicated lumpsum cost in Schedule-1 for Mandatory Spares specified in the Technical Specifications. GE confirmed that they shall provide the detailed Price break-up of Mandatory Spares before release of initial advance and supply all the Mandatory Spares within the quoted cost.

Site fabricated items

GE confirmed that they shall submit the list of items to be fabricated at Site within 90 days from the date of NOA.

4.0 Taxes & Duties

GEPIL in Schedule-6 (Taxes and Duties) furnished the details of Goods and Services Tax [as on Seven (07) days prior to the last date for submission of Price Bids] applicable on the price of Goods and Services quoted in Schedule-1, 2 & 3 not included in the Bid Price. The details of Taxes and Duties (after considering discount as applicable after Reverse Auction and same rates of Taxes & Duties as mentioned in Schedule-6) are as under:

Bid Price Component	Rate of GST (%)	Amount on which GST applicable (INR) (rounded off)	Total GST payable (INR) (rounded off)
Ex-Works-Main Equipment (Schedule-1)	18%	701,69,38,918	126,30,49,005
Ex-Works-Mandatory Spares (Schedule-1)			
Type Test Charges (Schedule - 1)			
F&I-Main Equipment (Schedule-2)			
F&I-Mandatory Spares (Schedule-2)			
Erection Services (Schedule-3)			
Civil Works (Schedule-3)			
Structural Works (Schedule-3)			
Training Charges (Schedule-3)			
AMC Charges (Schedule-3)			
TOTAL (GST)			

Taxes, Duties & levies shall be paid/ reimbursed to GEPIL as per the provisions of Bidding Documents.

5.0 Unit Rates

GEPIL in Schedule 8 (Unit Rates) of their Bid have not filled Unit Rates of items referred therein. During the discussions, GEPIL confirmed that they shall submit the Unit Rates along with price justification as and when required.

6.0 GEPIL confirmed that, as per the provisions of the Bidding Documents and as per the details furnished by the Bidder, after Reverse Auction, there will be two Contracts only viz First Contract (for Ex-works (India) Supply Portion) and Second Contract (for Installation, Civil & all Services portion). The details of the aforesaid two Contracts as agreed by GE are as under:

(A) <u>First Contract</u>:

1.	Ex-Manufacturing Works/Place of Dispatch Price (both in India) for Plant & Equipment	INR 399,48,84,379/-
2.	Ex-Manufacturing Works/Place of Dispatch Price (both in India) for Mandatory spares	INR 26,60,63,239/-
3	Type Test Charges	INR 3,73,241/-
4	**Total (A) [1+2+3]**	**INR 426,13,20,859/-**

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(B) Second Contract:

1.	Local Transportation including Inland insurance charges for Plant and Equipment covered under First contract	INR 7,07,60,918/-
2.	Local Transportation including Inland insurance charges for Mandatory Spares covered under First Contract	INR 50,00,000/-
3.	Installation Services	INR 64,73,39,446/-
4.	Civil & Architectural Works	INR 195,01,91,170/-
5.	Structural Steel Works	INR 8,04,97,100/-
6.	Training Charges	INR 8,29,425/-
7.	AMC Charges	INR 10,00,000/-
8.	**Total (B) [1+2+3+4+5+6+7]**	**INR 275,56,18,059/-**
Grand Total (A+B)		**INR 701,69,38,918/- (INR Seven Hundred One Crore, Sixty Nine Lakh Thirty Eight Thousand Nine Hundred and Eighteen Only)**

7.0 GEPIL re-confirmed that all other conditions/stipulation/deviation/non-conformity/undeclared deviation etc. contrary to the provisions of Bidding Documents (to be read in conjunction with Amendments/Clarifications/Errata) stands withdrawn without any financial implication to NTPC.

8.0 The aforesaid resolutions are subject to Management Approval of NTPC.

(NTPC)

(GEPIL)

.UE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

ider's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

HEDULE OF RATES AND PRICES

HEDULE- 1 : PLANT AND EQUIPMENT INCLUDING TYPE TESTS CHARGES AND MANDATORY SPARES TO BE SUPPLIED FROM WITHIN THE EMPLOYER'S COUNTRY

em	Description	Qty.	Unit	Unit rate (INR)	Total Ex-works (India) Price (INR)
1	2	3	4	5	6=3*5
A	MAIN EQUIPMENT INCLUDING FACTORY FABRICATED STEEL STRUCTURES FOR FLUE GAS DESULPHURISATION SYSTEM PACKAGE FOR SIPAT SUPER THERMAL POWER PROJECT, STAGE-I (3x660 MW)				
)	FGD SYSTEM	1	lot		Included in TOTAL (A) (MAIN EQUIPMENT) of Schedule 1
)	LIMESTONE AND GYPSUM HANDLING SYSTEM	1	lot		Included in TOTAL (A) (MAIN EQUIPMENT) of Schedule 1
)	ITEMS RELATED TO CHIMNEY	1	lot		Included in TOTAL (A) (MAIN EQUIPMENT) of Schedule 1
)	ANY OTHER				
	TOTAL (A) (MAIN EQUIPMENT)				NIL
	MANDATORY SPARES [BOQ AS SPECIFIED IN SUB-SECTION VII, PART-A, SECTION-VI] (Bidder is reqired to fill the prices of all the items serially as specified in Part-A, Section-VI)				3,99,48,84,379
	Sub total B				26,60,63,239
	SUB TOTAL (A+B)				4,26,09,47,618
	SUB-TOTAL OF TYPE TEST CHARGES AS PER SCHEDULE-7				3,73,241
	GRAND TOTAL (A+B+C) -Schedule-1 (To be filled up in Item Data)				4,26,13,20,859

Deleted

Unless stated otherwise a 'set' means items or sub-items required for each type/size range of the assembly/sub-assembly, required for complete replacement in one unit. It is further, intended that the assembly/sub-assembly which have different orientation (like left hand or right hand, top or bottom), different direction of rotation or mirror image positioning or any other reasons which result in maintaining two different sets of the spares to be used for the subject assembly/sub-assembly, these shall be considered as different types of assembly/sub-assembly.

Wherever quantity has been specified as percentage (%), the quantity of mandatory spares to be provided by the Contractor shall be the specified percentage (%) of the total population required to meet the specification requirements. In case the quantity of Mandatory Spares so calculated to be fraction, the same shall be rounded off to next higher whole number.

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	Wherever the quantities have been indicated for each type, size, thickness, materials, radius, range etc. these shall cover all the items supplied and installed and the breakup for these shall be furnished in the bid.
	In case spares indicated in the list are not applicable to the particular design offered by the bidder, the bidder should offer spares applicable to offered design with quantities generally in line with approach followed in the above list
	Bidder are required to indicate the break-up of type test charges as per Schedule-7.
	In case the description / quantity for any item mentioned in Schedule is at variance from what has been stated in Technical Specification and its subsequent amendments and clarifications, the latter shall prevail.

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION,STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

idder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

chedule No. 3 : Installation Services (Erection, Civil, Factory Fabricated Steel Structural Works (Erection) & allied works) including insurance (other than ransit insurance and other services as specified in the Bidding Documents)

Item	Description	Total Price in Indian Rupees
1	2	3
(I)	**MAIN EQUIPMENT INCLUDING FACTORY FABRICATED STEEL STRUCTURES**	**64,73,39,446**
(II)	**CIVIL & ARCHITECTURAL WORKS**	**1,95,01,91,170**
(a)	Geo-Technical investigation & slope protection works	Included in (II) Civil & Architectural works of Schedule 3, above
(b)	Infrastructure works	Included in (II) Civil & Architectural works of Schedule 3, above
(c)	FGD facilities	Included in (II) Civil & Architectural works of Schedule 3, above
(d)	Other works not covered in the above items but required to cover complete scope of works.	Included in (II) Civil & Architectural works of Schedule 3, above
(III)	**Structural Steel Works**	**8,04,97,100**
(IV)	**Training Charges (Refer Clause 28.00.00, Part-C, Technical Specification, Section-VI)**	**8,29,425**
(V)	**AMC Charges as per scope**	**10,00,000**
	TOTAL (I) + (II) + (III) + (IV) + (V) (TO SCHEDULE 4 GRAND SUMMARY AND TO SRM E-TENDER SITE)	**2,67,98,57,141**

)TE:

Bidder is required to indicate the Total of Schedule-3 in "Item Details" Tab of E-Tender Site.

n case the description/ quantity for any item mentioned in schedule is at variance from what has been stated in Technical Specification and its subsequent amendments and clarifications, latter shall prevail.

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LUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

dder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

CHEDULE OF RATES AND PRICES

CHEDULE- 2 : Local Transportation including Inland Transit Insurance and other local costs incidental to delivery of plant & equipment including mandatory spares

Item	Description	Qty	Unit	Total Price (Indian Rupees)
1	2	3	4	5
1	TOTAL (I) MAIN EQUIPMENT	1	lot	7,07,60,918
i)	FGD SYSTEM	1	lot	Included in TOTAL (I) MAIN EQUIPMENT of Schedule 2 above
ii)	LIMESTONE AND GYPSUM HANDLING SYSTEM	1	lot	Included in TOTAL (I) MAIN EQUIPMENT of Schedule 2 above
iii)	ITEMS RELATED TO CHIMNEY	1	lot	Included in TOTAL (I) MAIN EQUIPMENT of Schedule 2 above
iv)	ANY OTHER		lot	NIL
2	TOTAL (II) MANDATORY SPARES (Refer Technical Specification)		lot	50,00,000
	TOTAL (I + II) (TO GRAND SUMMARY (SCHEDULE-4) AND TO SRM E-TENDER SITE)			7,57,60,918
ote:	Bidder is required to indicate the Total of Schedule-2 in "Item Details" Tab of E-Tender Site.			

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

chedule No.4 : Grand Summary

REFER ITEM DATA

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 5 : Recommended Spare Parts

Item	Description	Quantity	Unit	Unit Price *Ex-Works (India) (INR)	Total Price *Ex-Works (India) (INR)	*Local transportation charges (including inland insurance, port clearance & port charges (INR)	Total Price (as delivered at Project) FOR Site (INR)
1	**Absorber Recycle Pump**			**PRICE SHALL BE FURNISHED BEFORE AWARD OF CONTRACT**			
	Impeller CPS	3	No.				
	Mechnical Seal Complete	3	No.				
	Suction Cover	2	No.				
	Set of O rings/ Gasket	12	No.				
	Mechnical Seal repair kit	3	No.				
	Bearings	2	No.				
2	**Oxidation Blower**						
	Air Filter	18	No.				
	Oil filter cartridge	3	No.				
	O-Ring	3	No.				
	Oil filter	3	No.				
	Oil seal	3	No.				
	Seal	3	No.				
	Bearings	3	No.				
	Anti-Vibration Pads	252	No.				
	Bearings RTDs	6	No.				
	Acuator VDV	2	No.				
	Acuator IGV	2	No.				
	Bearing Vibration Sens	6	No.				
3	**Ball Mill**						
	Major Components						
	Main bearing Insert	2	No.				
	Pinion bearings (without housing)	3	No.				
	Wear Components						
	Mill Liners (Shell and Head) with hardware	2	No.				
	Feed spout	2	No.				
	Feed Trunnion Liner	2	No.				
	Discharge Trunnion Liner	2	No.				
	Trommel Screen	2	No.				
	Seals						
	Main bearing oil seal	6	No.				
	Feed Spout Seals	2	No.				
	Discharge end Seals	2	No.				
	Pinion shaft (gear guard) seals	4	No.				
	O-ring for Trunnion Liner	4	No.				
	RTD's						
	Pinion Shaft RTD	2	No.				
	Main Bearing RTD	3	No.				
	Main Bearing Lubrication System						
	Filter elements	6	No.				
	Suction strainer	2	No.				
	Breather	2	No.				
	Low Pressure Pump	2	No.				
	High pressure pump	2	No.				
	Heat Exchanger (Cooler)	2	No.				
	Flow divider valve	2	No.				
	Electric heater	2	No.				
	Pinion Spray System						
	Spray Nozzles	3	No.				
	Air Filter	2	No.				
	Cycle switch	2	No.				
	Air solenoid valve	2	No.				

	Divider valve w/flow indicator	2	No.
	Pneumatic Pump	2	No.
	Regulator	2	No.
4	**Agitator**		
	Gearbox/ V Belt Drive		
	V belts	2	No.
	Flexible Coupling parts	2	No.
	Shaft Seal Ring	2	No.
	Antifriction Bearing	2	No.
	Impeller		
	Cap nuts for Impeller	2	No.
	Gaskets	2	No.
	Mechanical Seal		
	Seal rings, O rings	2	No.
	Springs, Shaft seal rings, Anti friction bearing	2	No.
5	**Vacuum Belt Filter**		
	Filter Cloth	6	No.
	Scraper for Cake	6	No.
	Wear-out Belt	6	No.
	Deflexion-correcting aircell	6	No.
	Sensitive valve for deflexion-correcting	2	No.
	Nozzles For Washing	18	No.
	Bearing UPC208CD	36	No.
	Valve Plate For Vacuum Pump	6	No.
	V-Belt For Vacuum Pump	6	No.
	Seal Packing For Vacuum Pump	6	No.
	Bearings - Vacuum pump	3	No.
	Bearings - Filtrate pump	3	No.
	Seals - Filtrate pump	3	No.
6	**Hydrocyclone**		
	VF Body	24	No.
	VF Insert	60	No.
	Bosy Extension	24	No.
	Cone	36	No.
	Spigot	96	No.
	O/F Pipe	12	No.
	Rubber Hose	132	No.
7	**Booster Fan**		
	O Rings For Bearing	3	No.
	Metallic Rings For Bearings	3	No.
	Filter For Lube Oil System	3	No.
8	**Booster Fan Inlet Damper**		
	Leaf Seal (Stainless Seal)	30	m
	Loof Seal (Plugs for Seal)	6	No.
	Limits switch (DPDT)	10	No.
9	**Booster Fan Outlet Damper**		
	Leaf Seal (Stainless Seal)	30	m
	Loof Seal (Plugs for Seal)	6	No.
	Limits switch (DPDT)	10	No.
10	**FGD Outlet Damper**		
	Leaf Seal (Stainless Seal)	30	m
	Loof Seal (Plugs for Seal)	6	No.
	Limits switch (DPDT)	10	No.
11	**Bypass Damper**		
	Leaf Seal (Stainless Seal)	30	m
	Loof Seal (Plugs for Seal)	6	No.
	Limits switch (DPDT)	10	No.
12	**Material Handling System**		

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	20° Trough carrying idlers complete with base boards & mounting brackets etc. for A size belt width	30	No.
	Flat type return idlers complete with mounting base boards & mounting bracket etc. for A size belt width	15	No.
	20° Trough Impact Idlers complete with mounting base boards and brackets etc. for B size belt width	8	No.
	20° Trough Self aligning carrying Idlers complete with mounting base boards and brackets etc. for B size belt width	4	No.
	Flat Self aligning return Idlers complete with mounting base boards and brackets etc. for B size belt width	4	No.
	10° Transition Idlers complete with mounting base boards and brackets etc. for B size belt width	2	No.
	Rubber disc for the impact idlers	5% of the total qty	No.
	Rollers for idlers	10% of the installed capacity	No.
	Pulley complete with shaft but excluding plummer block and bearings	01 no of each size in pulley shaft diameter	No.
	Plummer block complete with bearing and sleeves	02 nos of each type and size	No.
	Rubber/nylon strip for belt cleaners and skirt board	20% of total quantity used	No.
	Complete Belt Scrapper (Primary & Secondary)	1 set for each Conveyor	Set
	Conveyor belt A size width	01 full length of each rating	
	Complete set of gear box	1 no each type, size and rating	No.
	Oil seal for gear box	4 sets of each type and rating	Set
	Bearing for gear box	1 set of each size and rating	Set
	Cooling fan for gear box	1 set of each size and rating	Set
	Fluid coupling complete set	1 no each type, size and rating.	No.
	Multi disc assembly for fluid coupling	1 set of each size	Set
	Fusible plug for fluid coupling	6	No.
	Complete Brakes	1 no. for each type and size	No.
	Brake shoes	1 set of each type and size	Set

	Plummer block assembly complete with lock washer/lock nut etc. for drive and non-drive end for crusher	2 Set each	Set
	Rotor assembly for crusher	1	Set
	Shaft seal for crusher	4	No.
	Head sprocket assembly complete with shaft and plummer block with bearings	1	Set
	Tail sprocket assembly complete with shaft and plummer block with bearings	1	Set
	Traction rollers carrying side	10% of total qty	No.
	Traction roller return side	10% of total qty	No.
	Sprocket segment	2 set of each type and size	Set
	Chain link	10% of population each type and size	No.
	Pans (flights)	10% of population	No.
	Pulleys complete with shaft including bearing & plummer blocks (complete with lagging) for magnetic separator	01 set of each type and size	Set
	V belt for magnetic separator	01 No of each type and size	No.
	Load cell for belt weigher	1	No.
	SMPS for belt weigher	1	No.
	Regulated power supply for belt weigher	1	No.
	Fan bearing for dust extraction system	1 set of each type	Set
	V belt	1 set of each size	Set
	Filter bags	10% of the total quantity used	No.
	Coils for solenoid valve	4 no each type and rating	No.
	Motor	01 no of each rating	No.
	Driving End & Non-Driving End Bearing	01 no for each type and rating of Motor	No.
	Cooling Fan	01 no for each type and rating of Motor	No.

We also confirm that the items of Recommended Spares with same specification having same identification number but with different item code have been quoted by us at the same price. Further all such items of spares have been clubbed together and enclosed separately at Annexure... . to our offer.

*Bidders shall Quote prices in INR and fill in the amount in figures and words.

Note:

1. Spares shall be quoted on Ex-works (India) basis.
2. Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 6 : Goods and Services Tax (GST), applicable on Schedules - 1, 2 & 3, not included in bid price.

The details of Goods and Services Tax (as on seven (07) days prior to the last date for submission of price bids) applicable on the price of goods and services quoted in Schedule-1, 2 & 3, not included in the Bid Price and which may be payable by the Employer in accordance with the provisions of Bidding Documents are as under :

S. no.	Bid Price Component	Rate of GST (%)	Amount on which GST applicable (in INR)	Total GST payable (in INR)
1	Ex-Works-Main Equipment (Schedule-1)	18%	As mentioned in TOTAL (A) (MAIN EQUIPMENT) of Schedule-1	Included in Total (GST) of schedule 6 below
2	Ex-Works-Mandatory Spares (Schedule-1)	18%	As mentioned in Sub total B of Schedule-1	Included in Total (GST) of schedule 6 below
3	Type Test charges (Schedule-1)	18%	As mentioned in Item C Sub total of type test charges of Schedule-1	Included in Total (GST) of schedule 6 below
4	F&I-Main Equipment (Schedule-2)	18%	As mentioned in TOTAL (I) MAIN EQUIPMENT of Schedule 2	Included in Total (GST) of schedule 6 below
5	F&I-Mandatory Spares (Schedule-2)	18%	As mentioned inTOTAL (II) MANDATORY SPARES of Schedule 2	Included in Total (GST) of schedule 6 below
6	Erection - Main Equipment (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (I) of Schedule-3	Included in Total (GST) of schedule 6 below
7	Civil Works (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (II) of Schedule-3	Included in Total (GST) of schedule 6 below
8	Training charges (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (IV) of Schedule-3	Included in Total (GST) of schedule 6 below
9	AMC charges (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (V) of Schedule-3	Included in Total (GST) of schedule 6 below
10	Structural Works (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (III) of Schedule-3	Included in Total (GST) of schedule 6 below
11	Any other Price Component (not covered above)	NIL	NIL	NIL
	TOTAL (GST)			1,26,30,49,005.265

Notes:	
1	Bidder shall quote the GST as applicable in the Employer's country as on seven (7) days prior to the last date of submission of price bids.
2	In case rate of GST is different for various items, such different rates of GST along with the amount on which such GST is applicable shall be suitably indicated by the bidders in this schedule.
3	**Bidder is required to indicate the Total of Schedule-6 in "Item Data" Tab of Bid invitation at NTPC E-Tender Site.**

FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 7 : Break up of Type Test Charges priced in Schedule-1.

We Confirm that the charges for all the type tests stipulated in the bidding documents are included in our bid price. Further, the break-up of various type test charges are given below which, at your option, can be used for adjustment in contract price in case any of the type tests is not to be carried out.

Sl. No.	Description of equipment	Description of Type Test	*Charges for one Type /Rating	Number of Type/Rating	Total Type Test Charges*	Remarks Test charges*
1	2	3	4	5	6	7
1	H.T. Motors **for each type and rating of HT motor**		29,030	6	1,74,179	
		(a) No load saturation and loss curves				
		(b) Measurement of noise at no load				
		(c) Momentary excess torque test (subject to test bed constraint).				
		d) Full load test (subject to test bed constraint)				
		(e) Temperature rise test at rated conditions				
2	Leak tightness testing of dampers at shop for (eachtype and size) (Refer clause no. 18.01.02 of Sub-section-I-M1, Part-B of Section-VI)		8,294	4	33,177	
3	Full range and full scale performance tests, to be conducted at shop using actual fan for following fans (as per BS 848, Part-1) (Refer clause no. 18.01.01 of Sub-section-I-M1, Part-B of Section-VI)					
	(a) Booster Fan		82,943	1	82,943	
4	MV VFD **(for each type and rating)**		82,943	1	82,943	
		(a) Overall efficiency determination of VFD system including transformer/ Harmonic filters etc at motor full load				
		(b) Temperature rise test				
		(c) Noise level				
		(d) Harmonics of No load current.(Input/Output)				
	Grand Total Break-Up of Type Test Charges to Schedule-1				3,73,241	

Note :

1 * Please fill in the amount in figures and words in INR.

2 The currency of charges for Type Tests shall be INR in which the corresponding equipment is being offered in Schedule-1.

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3	In case of additional type/rating for any particular item are found during engineering, the type tests for the same shall be carried out without any additional cost to the Employer. Further, in case of waiver of any type tests on such additional type/rating, the unit rate for same as stated in this schedule for that particular item shall be applicable for working out the rebate.

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 8 : Schedule of Unit Rates

Unit Rates of various items are given as under. We confirm that the prices of these items as per the requirement of Technical Specifications are already included in the lump-sum prices quoted in Schedule-1. We further confirm that these unit rates shall be used for contract price adjustment in case of any changes in quantities/components of the package.

S. No.	Description of Equipment	Qty	Unit Price in INR
1	**Control & Instrumentation (C&I) (Unit rates for the following C&I Items)**		
A	**Microprocessor based Control System with HMI for FGD and other systems being provided in the Contract**		
(a)	**Control System**		
(i)	Controller, each type		
(ii)	Input modules, each type		
	§ 4-20 mA input		
	(Model No.....)		
	§ RTD Input		
	(Model No.....)		
	§ T/C Input		
	(Model No. .....)		
	§ Digital input		
	(Model No.....)		
	§ SOE Input		
	(Model No.....)		
	§ Others (Bidder to specify)		
(iii)	Output Modules, each type		
	§ Analog output (4-20 mA)		
	(Model No. .....)		
	§ Binary Output		
	(Model No. .....)		
	§ Other, if any		
(iv)	Communication Controller each type		
	(Model No. .....)		
	(Model No. .....)		
	(Model No. .....)		
	(Model No. .....)		

(v)	Power Supply Module, each type		
(vi)	Other modules, each type		
(b)	**HMIPIS**		
(i)	Operator Works Station		
(ii)	Server/work staion		
(iii)	Laser printer		
(iv)	Other modules, components used		
(c)	**Other modules used in Microprocessor based Control System with HMI (if any)**		
(B.)	**Measuring Instruments**		
a)	Primary & Secondary Instrument		
(i)	Pressure Indicator (PI)		
(ii)	Pressure Transmitter (PT)		
(iii)	Differential Pressure Indicator (DPI)		
(iv)	Differential Pressure Transmitter (DPT)		
(v)	Pressure Switch (PS)		
(vi)	Differential Pressure Switch (DPS)		
(vii)	Temperature Guage (TG)		
(viii)	Temperature Element – RTD		
(ix)	Temperature Element – T/C		
(x)	Temperature Transmitter (TTx)		
(xi)	Temperature Switch (TS)		
(xii)	Flow Element (FE)		
	a. Orifice Plate		
	b. Flow Nozzle		
	c. Any other type		
(xiii)	Flow Indicator (FI)	Bidder will furnish this breakup during contract execution phase	Bidder will furnish this breakup during contract execution phase
(xiv)	Flow Transmitter (FT)		
(xv)	Flow Switch (FS)		
(xvi)	Level Gauge (LG)		
(xvii)	Level Transmitters (LT)		
(xviii)	Density meter		
(xix)	pH analyser		
(xx)	SO2 Analyser		
(xxi)	Vibration Monitoring System:		
	a) Contact type vibration measurement point (vibration sensor comprising of associated vibration monitor, probe drivers (if applicable), prefab cables, prefab extension cables, mounting pads/brackets)		
	b) Junction boxes for vibration sensors		
(C)	**Instrumentation cable of each type & size**		
(I)	**Instrumentation Cable**		
(a)	**G TYPE**		

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1	2 PAIR STRANDED COPPER (0.5 MM^2)
2	4 PAIR STRANDED COPPER (0.5 MM^2)
3	8 PAIR STRANDED COPPER (0.5 MM^2)
4	12 PAIR STRANDED COPPER (0.5 MM^2)
5	16 PAIR STRANDED COPPER (0.5 MM^2)
6	24 PAIR STRANDED COPPER (0.5 MM^2)
7	48 PAIR STRANDED COPPER (0.5 MM^2)
(b)	**F TYPE**
1	2 PAIR STRANDED COPPER (0.5 MM^2)
2	4 PAIR STRANDED COPPER (0.5 MM^2)
3	8 PAIR STRANDED COPPER (0.5 MM^2)
4	12 PAIR STRANDED COPPER (0.5 MM^2
5	16 PAIR STRANDED COPPER (0.5 MM^2)
6	24 PAIR STRANDED COPPER (0.5 MM^2)
(II)	**CONTROL CABLES**
1	10C (2.5 MM^2)
2	5C (1.5 MM^2)
3	3C (1.5 MM^2)
4	2C (1.5 MM^2)
5	5C Unarmoured (2.5 MM^2)
6	3C Unarmoured (2.5 MM^2)
7	2C Unarmoured (2.5 MM^2)
8	4 Core single Mode OFC
9	12 Core single Mode OFC
(D)	**Electrical Power Supply System**
(i)	**24 V DC CHARGER SYSTEM WITH BATTERIES of each type and rating**
(a)	24 V DC Charger System - Complete Charger System comprising of Controller, Rectifier Modules, Transformer, DCDB, Ni Cd battery bank, Battery Health Monitoring, Cabinet and Other Accessories.
(ii)	**UPS SYSTEM WITH BATTERIES of each type and rating**
(a)	UPS with chargers and inverters with input isolation transformers, Ni Cd battery bank , Bypass line transformers & voltage stabilizer, static switch manual bypass switch, ACDB, Battery Health Monitoring system (BHMS), Cabinets and other necessary protective devices and accessories.
(b)	MINI UPS of each type and rating
	.....
	.....

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 9: SCHEDULE OF TAKE OUT PRICE

Take out price for certain items/services are indicated below. We confirm that the prices for these items are already included in the Bid Price. We further confirm that the Employer may delete from our scope any of the items given below based on the prices given in this schedule.

Sl. No.	Description	*Ex-Works (India) (Indian Rupees)	Local transportation & Insurance charges (Indian Rupees)	*Installation (Indian Rupees)	Reference of Bid where Technical Details have been furnished	Remarks
1	2	3	4	5	6	7
1	Training as per clause no. 28.00.00, Part-C, Section-VI for					
(a)	O&M personnel	-	-	5,80,598	-	
(b)	Engineering personnel	-	-	2,48,828	-	

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आनन्द प्रकाश / ANAND PRAKASH
अपर महाप्रबन्धक (प्रोजेक्ट प्लानिंग एवं मॉनिटरिंग)
Addl. General Manager (P P & M)
एन टी पी सी लिमिटेड / NTPC Limited

Activity ID	Activity Name	DUR	Start	Finish
		1066	24-May-19	23-Apr-22
LOT-20005	Notice of Award	0	24-May-19	
LOT-20010	Initial Mobilization for Site enabling activities	0		23-Jul-19
LOT-20015	Civil and Structural Works- Start	0	23-Aug-19	
LOT-20020	FGD Ordering -Start	0	23-Aug-19	
LOT-20025	Basic Engineering Completion	0		23-Sep-19
M-LOT-20030	Finalisation of Engineering related to FGD inlet duct connection with ID Chimney Duct	0		23-Nov-19
M-LOT-20035	Manufacturing & Supply of Equipment- Start	0	23-Dec-19	
M-LOT-20040	FGD Ordering -Finish	0		23-Jan-20
M-LOT-20045	Equipment Erection Starts	0	23-May-20	
M-LOT-20050	Detail Engineering Completion	0		23-May-20
M-LOT-20055	Manufacturing & Supply of gate, support structure required for FGD inlet duct connection with ID chimney duct	0		23-May-20
M-LOT-20060	Civil and Coal Erection Starts	0		23-Jan-21
	Supply of Mandatory Spares	0		23-Jan-21
	Manufacturing & Supply of Equipment- Completion	883	23-Nov-19	23-Apr-22
LOT-20075	Civil and Structural Works- Finish	0		23-Oct-21
M-LOT-20080	Equipment Erection Finish	0		23-Oct-21
M-LOT-20085	Electrical and C&I Erection Finish	0		23-Oct-21
M-LOT-20090	Commissioning of FGD	0		23-Oct-21
M-LOT-20095	Completion of Facilities	0		23-Jan-22
M-LOT-20100U2	Civil and Structural Works- Start			
M-LOT-20101U2	Manufacturing & Supply of Equipment- Start			
M-LOT-20105U2	Equipment Erection Starts			
M-LOT-20110U2	Manufacturing & Supply of Equipment- Completion			
M-LOT-20115U2	Civil and Structural Works- Finish			
M-LOT-20120U2	Equipment Erection Finish			
M-LOT-20125U2	Electrical and C&I Erection Finish			
M-LOT-20130U2	Commissioning of FGD			
M-LOT-20135U2	Completion of Facilities			
M-LOT-20140U3	Civil and Structural Works- Start			
M-LOT-20141U3	Manufacturing & Supply of Equipment- Start			
M-LOT-20145U3	Equipment Erection Starts			
M-LOT-20150U3	Manufacturing & Supply of Equipment- Completion			
M-LOT-20155U3	Civil and Structural Works- Finish			
M-LOT-20160U3	Equipment Erection Finish			
M-LOT-20165U3	Electrical and C&I Erection Finish			
M-LOT-20170U3	Commissioning of FGD			
M-LOT-20175U3	Completion of Facilities			

2019 | 2020 | 2021 | 2022

Project Management

L2 Schedule

NTPC SIPAT STPP STAGE-I (3X660MW) FGD System L2

FGD SYSTEM PACKAGE

Project Milestone Unit 2

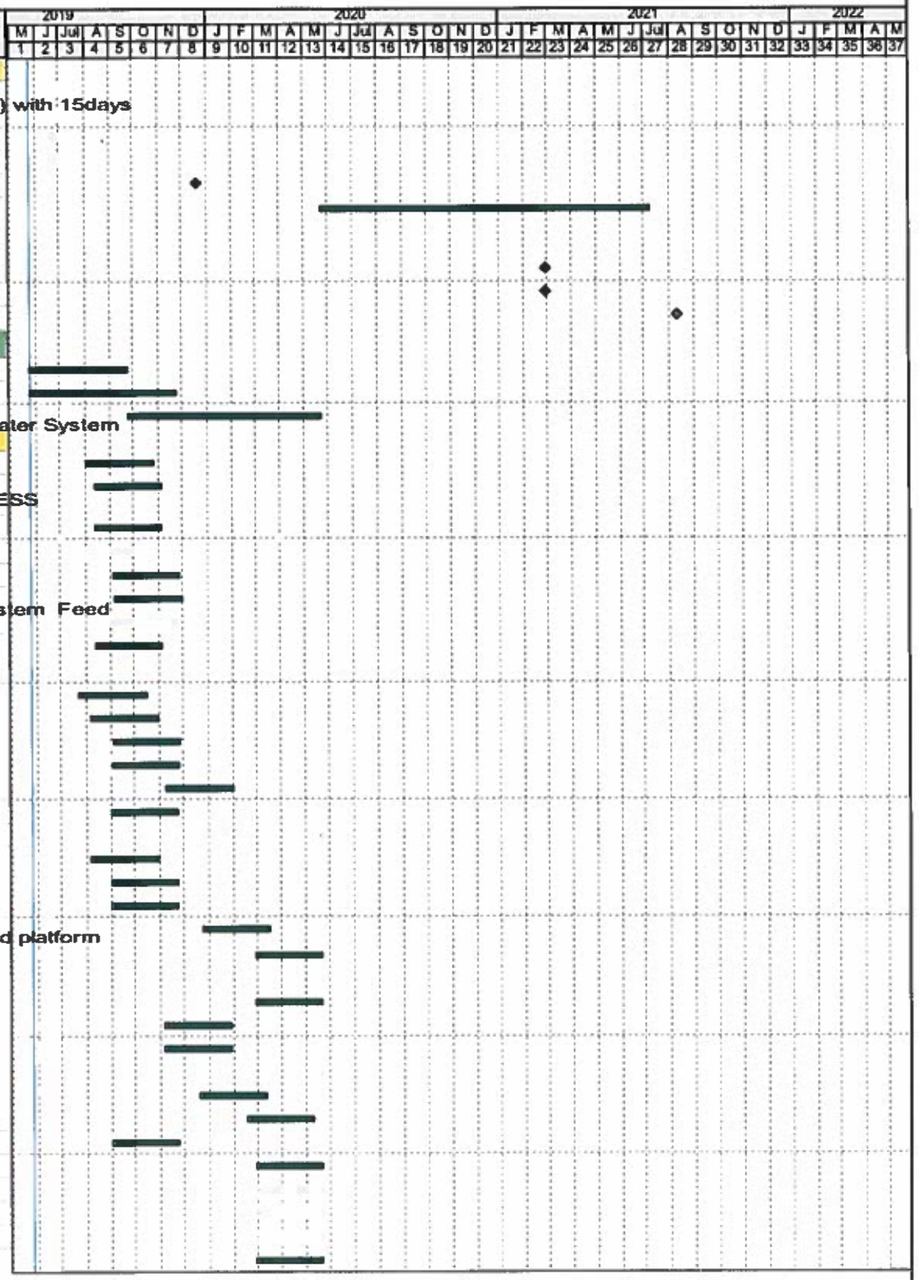
NOA, 24-May-19

Forecast
Critical
Actual
Milestone Forecast
Milestone Critical
Milestone Actual

Atrey Parashar
Saxena

Anand Prakash 06.19 PRAKA

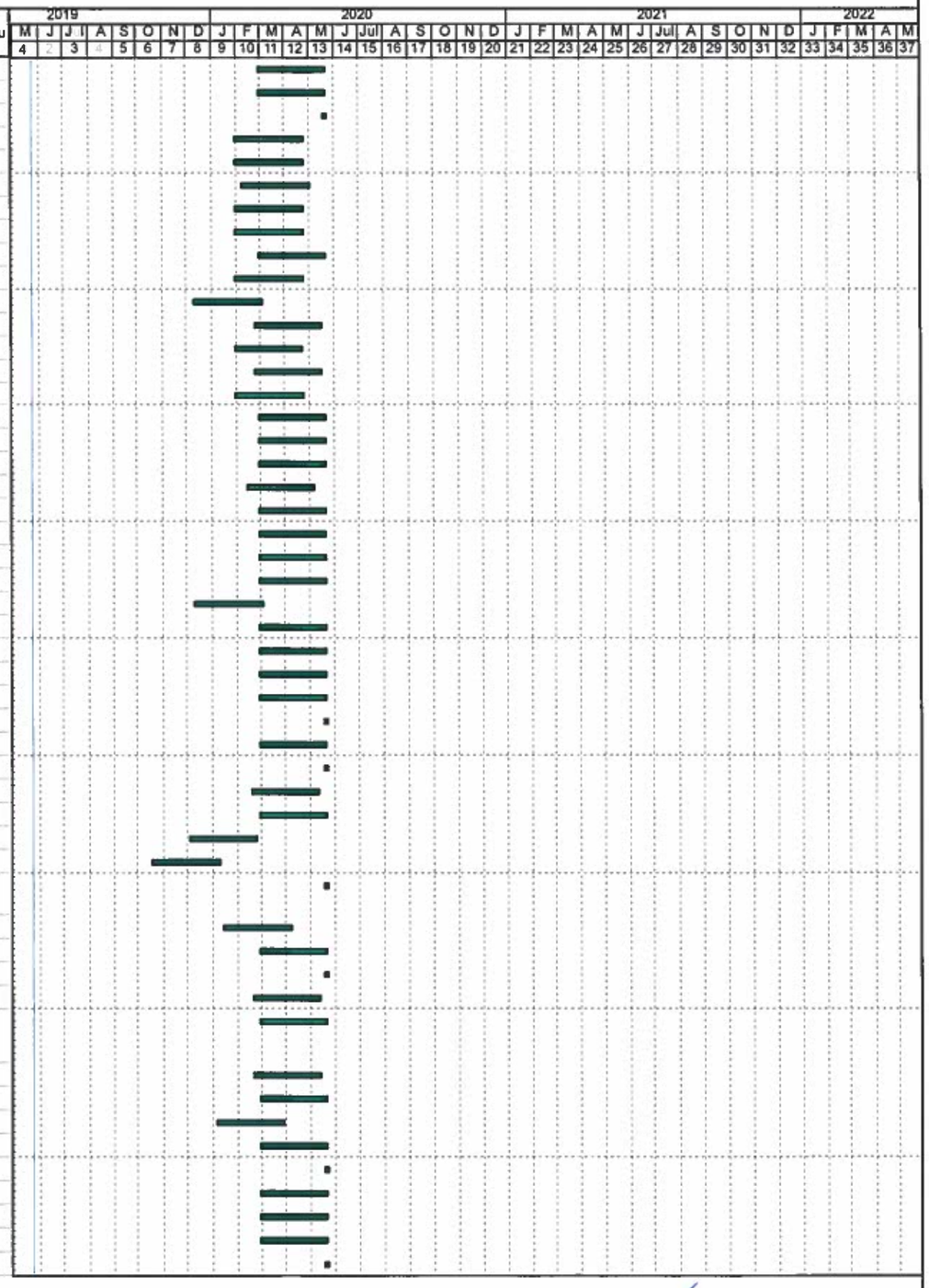
Activity ID	Activity Name	DUR	Start	Finish
M-LOT-20180	Ac ess to Levelled FGD Area			
M-LOT-20185	Ac ess to Site for Geo Technical Investigation by GE			
M-LOT-20190	Land abotment, Legal and physical possession of site and other required areas			
M-LOT-20195	Bench Marks reference marks and lines for setting-out of the Facilities			
M-LOT-20200	Availability of Construction Power			
M-LOT-20205	15days Unit shutdown for FGD duct connection in a window between (12M+1 days) to (26M-15days) with 15days prior notice			
M-LOT-20210	Power Availability for Cold and Hot Commissioning			
M-LOT-20215	Availability of DM Water Clarified Water and Instrument & Service Air at Terminal Point			
M-LOT-20220	Availability of Limestone, Flue gas for commissioning from Client			
M-LOT-11230	Basic Engineering			
M-LOT-11575	Finalisation of Engineering related to FGD inlet duct Connection with ID chimney duct			
M-LOT-12335	Engineering Detail Engineering Completion	388	24-May-19	23-M 20
M-LOT-MDL1002	Geotechnical investigation work Location of Borehole and other field test			
M-LOT-MDL1003	P&ID along with process description - Absorber Oxidation Blower,Gypsum Bleed Pump & Filtrate Water System ,Mist Elimina			
M-LOT-MDL1004	P&ID Primary & secondary Dewatering,Waste Water Discharge System			
M-LOT-MDL1005	Mass Flow Balance (Design Point & Guarantee point) data and FGD System Design Basis PROCESS			
M-LOT-MDL1006	Flue gas system design, Chimney and Duct Sizing Calculation			
M-LOT-MDL1007	ABSORBER DESIGN BASIS/CRITERIA			
M-LOT-MDL1008	Sizing Calculation Selection parameter for all tanks (Slurry & Water)			
M- OT-MDL1009	P&ID along with process description - Limestone Pulverizer Wet Ball Mill & ,Reagent Preparation System Feed tank& Pump			
M- OT-MDL1010	Process Flow Diagram of FGD System			
M- OT-MDL1011	Sizing Calculation & Selection parameter for Slurry Recirculation Pumps			
M- OT-MDL1012	Sizing Calculation & Selection parameter for BOOSTER FANS			
M-LOT-MDL1013	Sizing Calculation& Selection parameter for Wet ball Mil			
M-LOT-MDL1014	General Layout of FGD Ducting			
M-LOT-MDL1015	Sizing Calculation & Selection parameter for all slurry pumps			
M-LOT-MDL1016	GA and Datasheet for Equipment Closed Water Cooling System			
M-LOT-MDL1017	Sizing Calculation & Selection parameter for Oxdation Air Blower			
M-LOT-MDL1018	Sizing Calculation& Selection parameter for Emergency Quench Water System			
M-LOT-MDL1019	Sizing Calculation & Selection parameter for all Water Pumps			
M-LOT-MDL1020	Data sheet & General Arrangement and Foundation load data for Absorber along with staircase and platform			
M-LOT-MDL1021	General arrangement of Ball Mill Building & gypsum De-water Building			
M-LOT-MDL1022	Electrical load list for complete FGD system			
M-LOT-MDL1023	DESIGN GUIDELINES FOR LIGHTNING PROTECTION			
M-LOT-MDL1024	PLOT PLAN OF LIME STONE & GYPSUM HANDLING PLANT			
M-LOT-MDL1025	FLOW DIAGRAM OF limestone AND GYPSUM HANDLING PLANT			
M-LOT-MDL1026	General Arrangement of Limestone Day Silos			
M-LOT-MDL1027	FGD Wet Stack-General Arrangement of Wet Stack			
M-LOT-MDL1028	Condensate Study for Low Height Chimney			
M-LOT-MDL1029	Sizing Calculation & Selection parameter for S mp pumps			
M-LOT-MDL1030	Sizing Calculation & Selection parameter for Vacuum Belt filters			
M-LOT-MDL1031	GA & RCC Detail of Fou dation of Reagent Feed Tank			
M LOT-MDL1032	General Arrangement and Load data of Auxiliary Ab orbent (Storage) Tank			
M-LOT-MDL1033	CRUSHER HOUSE STRUCTURAL ELEVATION AND CROSS SECTION			
M-LOT MDL1034	STRUCTURAL GA OF TRANSFER POINT (FLOORS, SECTIONS)			



L2 Schedule

NTPC SIPAT STPP STAGE-I (3X660MW)
FGD SYSTEM PACKAGE

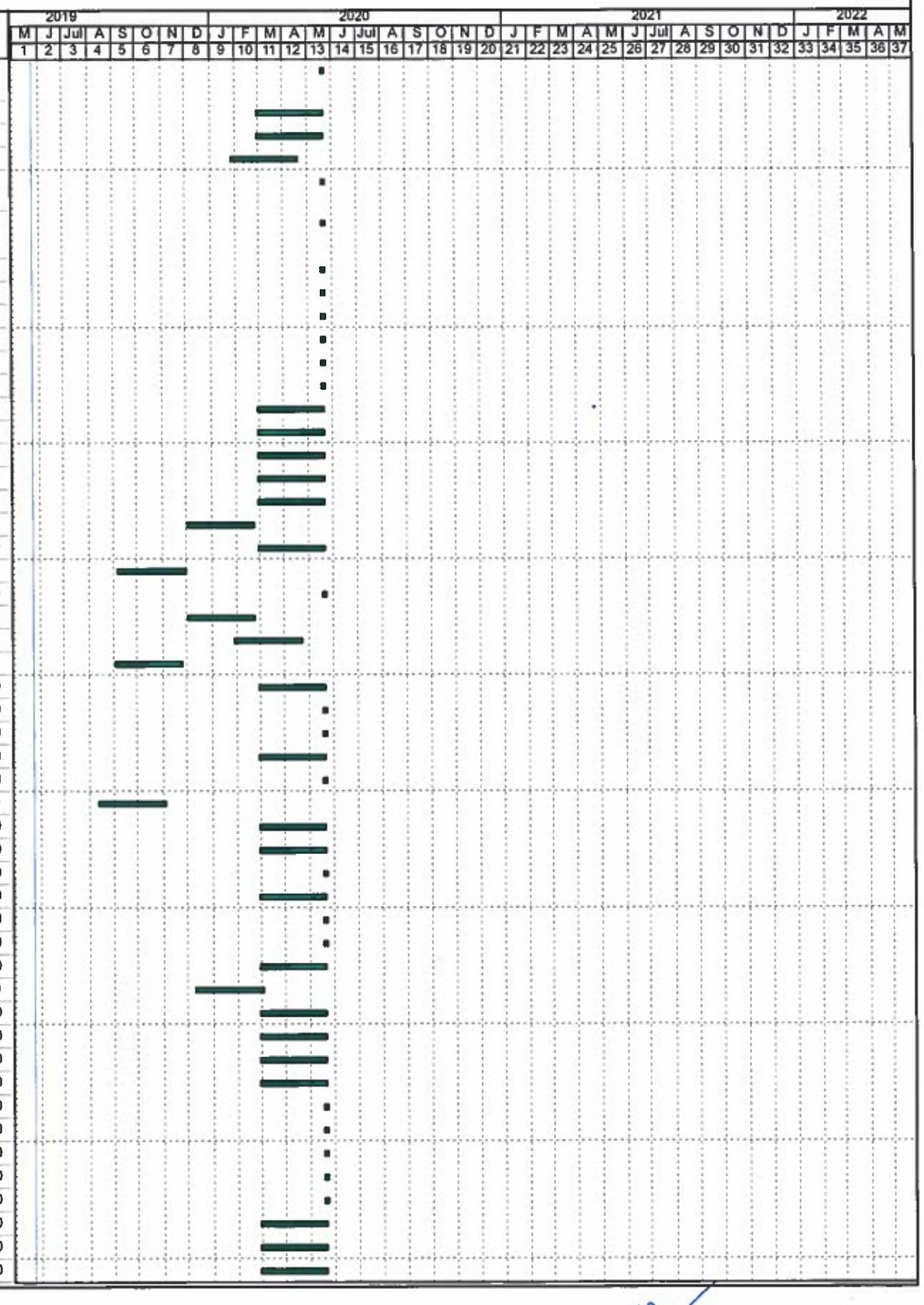
ActivityID	Activity Name	DUR	Start	Finish
M-LOT-MDL1035	GA OF STANDARD GALLERY ALONG WITH DESIGN CALCULATION FOR Limestone and Gypsum CONVEYOI	85	28-Feb-20	22-May-20
M-LOT-MDL1036	Structural GA OF GALLERY & TRESTLES FOR Limestone and Gypsum CONVEYORS	85	28-Feb-20	22-May-20
M-LOT-MDL1037	GA of Weigh Bridge for Truck Tippler	6	18-May-20	23-May-20
M-LOT-MDL1038	TYP MECHANICAL CROSS SECTION OF CONV	85	31-Jan-20	24-Apr-20
M-LOT-MDL1039	GA OF BRU/ Surface feeder	85	31-Jan-20	24-Apr-20
M-LOT-MDL1040	GA OF LIME STONE TP-1	85	08-Feb-20	02-May-20
M-LOT-MDL1041	GA OF CONVEYOR- LC 1A/B, 2A/B, 3A/B, 4A/B, 5A/B	85	31-Jan-20	24-Apr-20
M-LOT-MDL1042	GA OF CONVEYOR- GC 1A/1B	85	31-Jan-20	24-Apr-20
M-LOT-MDL1043	G.A. & Load Data of Vibrating Feeder	85	28-Feb-20	22-May-20
M-LOT-MDL1044	DESIGN CALCULATION FOR CONVEYOR INCLUDING POWER TENSION AND BELT RATING	85	31-Jan-20	24-Apr-20
M-LOT-MDL1045	Sizing calculation of Limestone storage silos	85	10-Dec-19	03-Mar-20
M-LOT-MDL1046	Sizing calculation of Gypsum storage shed.	85	23-Feb-20	17-May-20
M-LOT-MDL1047	G.A. OF CRUSHED LIMESSTONE STORAGE SILO	85	30-Jan-20	23-Apr-20
M-LOT-MDL1048	GA of Gypsum Storage Shed	85	23-Feb-20	17-May-20
M-LOT-MDL1049	Design Basis and P&ID for De-Dusting System for limestone handling system and gypsum storage area	85	31-Jan-20	24-Apr-20
M-LOT-MDL1050	Data sheet & General Arrangement for Slurry Recirculation Pumps	85	28-Feb-20	22-May-20
M-LOT-MDL1051	Data sheet & General Arrangement for Oxidation Air Blower	85	28-Feb-20	22-May-20
M-LOT-MDL1052	Data sheet & General Arrangement for all slurry pumps	85	28-Feb-20	22-May-20
M-LOT-MDL1053	Data sheet & General Arrangement of Limestone Pulverizer(Wet ball Mill)	85	13-Feb-20	07-May-20
M-LOT-MDL1054	GA. Datasheet, Terminal Box arrangement and Curves of Slurry Recirculation pump-Motor	85	28-Feb-20	22-May-20
M-LOT-MDL1055	GA. Datasheet, Terminal Box arrangement and Curves of Oxidation Blower-Motor	85	28-Feb-20	22-May-20
M-LOT-MDL1056	Drawing for medium voltage VFD Panels for slurry recirculation pump	85	28-Feb-20	22-May-20
M-LOT-MDL1057	TTR of Slurry Recirculation pump-Motor	85	28-Feb-20	22-May-20
M-LOT-MDL1058	GA OF LIME STONE CRUSHER HOUSE	85	10-Dec-19	03-Mar-20
M-LOT-MDL1059	General arrangement of Recycle Pump & Oxidation Blower Building	85	28-Feb-20	22-May-20
M-LOT-MDL1060	General Arrangement & Data sheet for Booster fan	85	28-Feb-20	22-May-20
M-LOT-MDL1061	GA. Datasheet, Terminal Box arrangement and Curves of Booster fan Motor	85	28-Feb-20	22-May-20
M-LOT-MDL1062	Detail Cable Routing Plan for complete FGD Area & Limestone & Gypsum Handling area	85	28-Feb-20	22-May-20
M-LOT-MDL1063	Earthing Layout for complete FGD Area & Limestone & Gypsum Handling area	6	18-May-20	23-May-20
M-LOT-MDL1064	Design Guildelines for Cabling including fixing arrangement of flexible cable tray support system	85	28-Feb-20	22-May-20
M-LOT-MDL1065	GA &Data sheet of Primary & Secondary Dewatering Hydrocyclone	6	18-May-20	23-May-20
M-LOT-MDL1066	Data sheet & General Arrangement of Vacuum Belt filters	85	18-Feb-20	12-May-20
M-LOT-MDL1067	General Arrangement & Schedule of expansion joint	85	28-Feb-20	22-May-20
M-LOT-MDL1068	GA & RCC detail of Foundation of Absorber	85	03-Dec-19	25-Feb-20
M-LOT-MDL1069	ABSORBER LOAD DATA	85	18-Oct-19	10-Jan-20
M-LOT-MDL1070	Data sheet & General Arrangement of Agitators (Horizontal & Vertical) for Absorber Reaction Tank & all other tanks	6	18-May-20	23-May-20
M-LOT-MDL1071	GA & Data Sheet for Mist Eliminator	85	15-Jan-20	08-Apr-20
M-LOT-MDL1072	CRUSHER HOUSE - G.A OF VIS	85	28-Feb-20	22-May-20
M-LOT-MDL1073	Lightning Protection Layout for complete FGD Area & Limestone & Gypsum Handling area	6	18-May-20	23-May-20
M-LOT-MDL1074	I/O and Drive List	85	20-Feb-20	14-May-20
M-LOT-MDL1075	CONTROL SYSTEM FDS INCLUDING FIELDBUS(HARDWARE FEATURES, OLCS/CLCS IMPLEMENTATION, DRIVE MACROS ALONG WITH POP-UPS)	85	28-Feb-20	22-May-20
M-LOT-MDL1076	CONTROL SYSTEM CONFIGURATION DIAGRAM of FGD System	85	20-Feb-20	14-May-20
M-LOT-MDL1077	GA & RCC detail of Foundation of Ball Mill	85	28-Feb-20	22-May-20
M-LOT-MDL1078	GA & RCC Detail of Limestone Conveyor Trestle Foundation	85	06-Jan-20	30-Mar-20
M-LOT-MDL1079	GA. Datasheet, Terminal Box arrangement and Curves of BALL MILL Motor	85	28-Feb-20	22-May-20
M-LOT-MDL1080	G.A & DATA SHEET OF ELEVATOR FOR LIMESTONE CRUSHER HOUSE	6	18-May-20	23-May-20
M-LOT-MDL1081	Drawing & datasheet of Radar type Level Transmitter (for Silo)	85	28-Feb-20	22-May-20
M-LOT-MDL1082	Data Sheet & GA for Sump Pumps for FGD ,Milling and Dewatering Area	85	28-Feb-20	22-May-20
M-LOT-MDL1083	General Layout of Pipe rack/trestle & Cable ways	85	28-Feb-20	22-May-20
M-LOT-MDL1084	Documents for Seal Air System of Guillotine Damper	6	18-May-20	23-May-20



L2 Schedule

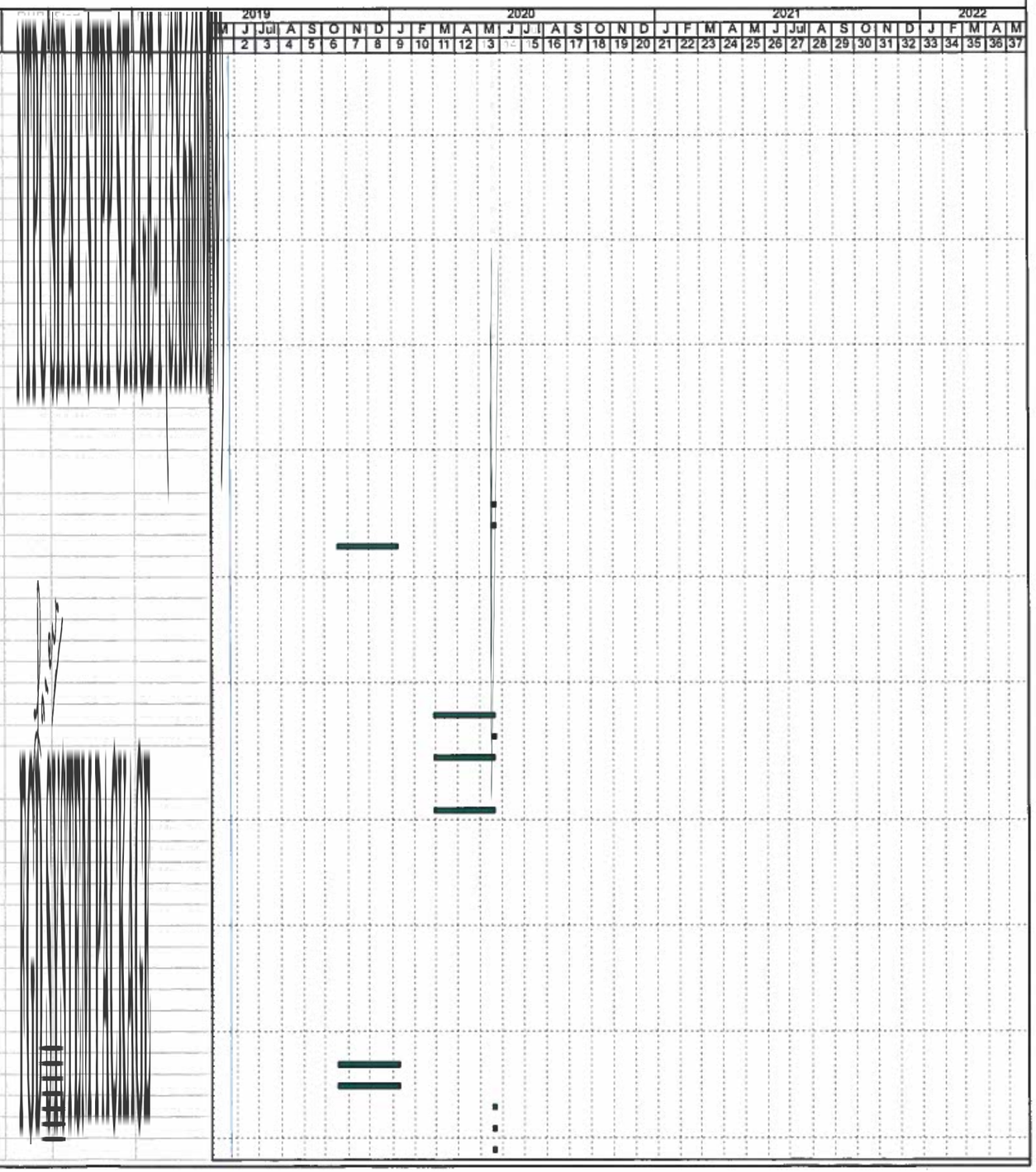
NTPC SIPAT STPP STAGE-I (3X660MW)
FGD SYSTEM PACKAGE

Activity ID	Activity Name	DUR	Start	Finish
M-LOT-MDL1182	DG SETS LAYOUT DRAWINGS AND SECTIONAL DETAILS INCLUDING FOUNDATION DRAWING & DETAILS FOR ACOUSTIC ENCLOSURE	6	18-May-20	23-May-20
M-LOT-MDL1183	CABLE TRAY SUPPORT SYSTEM - TYPE TEST REPORTS.	85	28-Feb-20	22-May-20
M-LOT-MDL1184	BATTERY and BATTERY CHARGER (FLOAT CUM BOOST CHARGER) - TYPE TEST REPORTS	85	28-Feb-20	22-May-20
M-LOT-MDL1185	CONTROL WRITE UP / FUNCTIONAL PHILOSOPHY OF LIME HANDLING PLANT & GYPSUM HANDLING	85	27-Jan-20	20-Apr-20
M-LOT-MDL1186	SCHEME DIAGRAM, TERMINAL DETAILS, GA, BOM AND CONTROL CIRCUIT FOR CAGE & BASE ELEVATOR PANEL FOR Wet Stack	6	18-May-20	23-May-20
M-LOT-MDL1187	LIGHTING PANEL, POWER PANEL , AVAITION LIGHTING PANEL , EMERGENCY LIGHTING PANEL & MLDB - GL, SLD & SCHEMATICS FOR Wet S	6	18-May-20	23-May-20
M-LOT-MDL1188	DATA SHEET FOR FIXED POWER AND CONTROL CABLES	6	18-May-20	23-May-20
M-LOT-MDL1189	DATA SHEET FOR TRAILING POWER CABLE	6	18-May-20	23-May-20
M-LOT-MDL1190	LAYOUT FOR AVIATION LIGHTING SYSTEM	6	18-May-20	23-May-20
M-LOT-MDL1191	HT CABLE JOINTING & TERMINATIONS KIT- INSTALLATION PROCEDURE.	6	18-May-20	23-May-20
M-LOT-MDL1192	HT CABLE JOINTING & TERMINATIONS KIT- TYPE TESTS REPORT.	6	18-May-20	23-May-20
M-LOT-MDL1193	GA AND SLD FOR AC AND DC LIGHTING DB AND WELDING DB	6	18-May-20	23-May-20
M-LOT-MDL1194	RELAY CONFIGURATION & SETTINGS FOR HT SWITCHGEAR	85	28-Feb-20	22-May-20
M-LOT-MDL1195	O & M MANUAL FGD SYSTEM	85	28-Feb-20	22-May-20
M-LOT-MDL1196	RELAY CONFIGURATION & SETTINGS FOR LT SWITCHGEAR	85	28-Feb-20	22-May-20
M-LOT-MDL1197	Type test report for Booster fan motor	85	28-Feb-20	22-May-20
M-LOT-MDL1198	Type Test Performance Report for BOOSTER FANS	85	28-Feb-20	22-May-20
M-LOT-MDL1199	Leak tightness performance test Report of damper/gates	85	01-Dec-19	23-Feb-20
M-LOT-MDL1200	Wind Tunnel Procedure	85	28-Feb-20	22-May-20
M-LOT-MDL1201	Design Basis - Civil, Structural, Architectural, Structural	85	06-Sep-19	29-Nov-19
M-LOT-MDL1202	ATST REPORT-FGD CONTROL SYSTEM	6	18-May-20	23-May-20
M-LOT-MDL1203	GA of Gates and dampers	85	01-Dec-19	23-Feb-20
M-LOT-MDL1204	Sizing of Equipment Closed Water Cooling System	85	29-Jan-20	22-Apr-20
M-LOT-MDL1205	Geotechnical Investigation Report	85	02-Sep-19	25-Nov-19
M-LOT-MDL1206	GA and load data of all tanks (Slurry tank, Filtrate tank & Water tank)	85	28-Feb-20	22-May-20
M-LOT-MDL1207	Datasheet and Cross Section Drawings for LT Power Cables	6	18-May-20	23-May-20
M-LOT-MDL1208	Type Test Report for LT Power cable	6	18-May-20	23-May-20
M-LOT-MDL1209	Layout of Electrical & control Building	85	28-Feb-20	22-May-20
M-LOT-MDL1210	Sizing Calculation of Limestone day silo	6	18-May-20	23-May-20
M-LOT-MDL1211	P&ID along with process description ,Sizing Calculation and selection Criteria of waste water Neutralization system	85	12-Aug-19	04-Nov-19
M-LOT-MDL1212	FDS of HMI	85	28-Feb-20	22-May-20
M-LOT-MDL1213	Data Sheet/Drawing for SO2 Analyser	85	28-Feb-20	22-May-20
M-LOT-MDL1214	Data Sheet of Operator Desk and Computer furniture	6	18-May-20	23-May-20
M-LOT-MDL1215	SCHEMATIC DRAWING SHOWING INTERFACING OF CEMS ANALYSERS WITH DDCMIS AND CLOUD SERV	85	28-Feb-20	22-May-20
M-LOT-MDL1216	FIELDBUS SEGMENTATION AND LOOP DIAGRAM ALONG WITH TERMINATION DETAILS	6	18-May-20	23-May-20
M-LOT-MDL1217	DATASHEET FOR FIELDBUS CABLES	6	18-May-20	23-May-20
M-LOT-MDL1218	DATASHEET FOR FIELD BUS COMPONENTS/DEVICES/ FIELDBUS JBS	85	28-Feb-20	22-May-20
M-LOT-MDL1219	G.A. OF LIME STONE CRUSHER	85	10-Dec-19	03-Mar-20
M-LOT-MDL1220	Type test procedure of DG.	85	28-Feb-20	22-May-20
M-LOT-MDL1221	Type test procedure of Ball mill motor.	85	28-Feb-20	22-May-20
M-LOT-MDL1222	Type test procedure of Booster fan motor.	85	28-Feb-20	22-May-20
M-LOT-MDL1223	Schedule of Hoists	85	28-Feb-20	22-May-20
M-LOT-MDL1224	GA & Data Sheet for Butterfly Valves,Globe, Ball,Gate	6	18-May-20	23-May-20
M-LOT-MDL1225	GA, Datasheet, SLD for UPS and battery-230 VAC	6	18-May-20	23-May-20
M-LOT-MDL1226	GA, Datasheet, SLD for Charger and battery-24DC	6	18-May-20	23-May-20
M-LOT-MDL1227	TTR for UPS and battery-230VAC	6	18-May-20	23-May-20
M-LOT-MDL1228	GA, Datasheet and Wiring Diagram for VMS	6	18-May-20	23-May-20
M-LOT-MDL1229	Architectural drawing of Gypsum Dewatering Building	85	28-Feb-20	22-May-20
M-LOT-MDL1230	Architectural drawing of Ball Mill Building	85	28-Feb-20	22-May-20
M-LOT-MDL1231	Architectural dwg of Electrical equipment & control Building-I	85	28-Feb-20	22-May-20



L2 Schedule
7 of 25

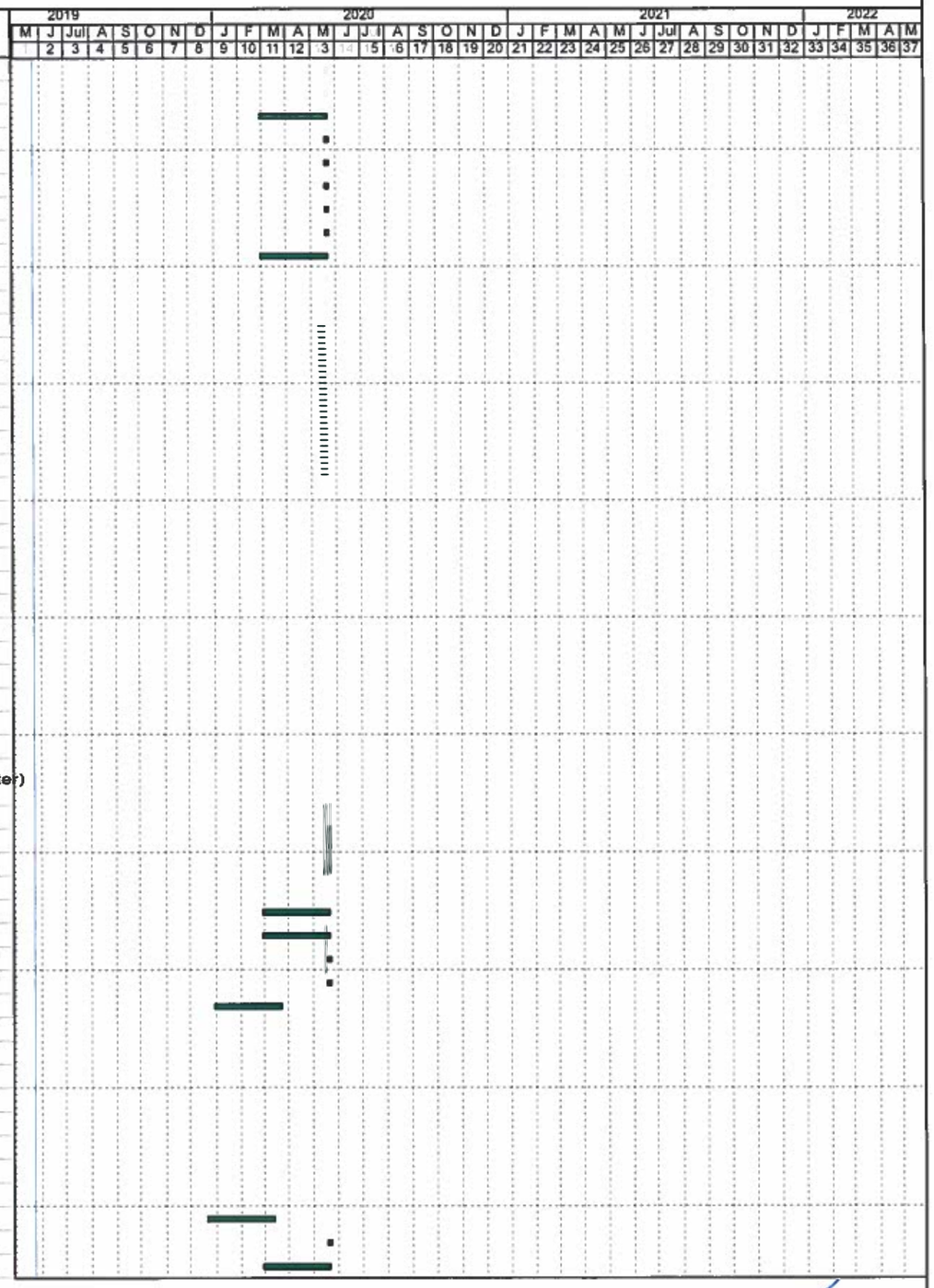
Activity ID	tivity ame Ac N	DUR	Start	Finish
M-LOT-MDL1232	Architectural dwg of Electrical equipment & control Building-II	6	18-May-20	23-May-20
M-LOT-MDL1233	Architectural dwg of Gypsum Storage Shed	6	18-May-20	23-May-20
M-LOT-MDL1234	Instrument list	6	18-May-20	23-May-20
M-LOT-MDL1235	G.A. OF TYP. CHUTE & SKIRT	6	18-May-20	23-May-20
M-LOT-MDL1236	IO ASSIGNMENT , GA / IA SYSTEM, MARSHALLING/RELAY and REMOTE CABINET ALONG WITH BOM	6	18-May-20	23-May-20
M-LOT-MDL1237	Drawing & Datasheet of LIE/LIR	6	18-May-20	23-May-20
M-LOT-MDL1238	GA, Datasheet and Wiring diagram of Limestone Sampling System Local Control Panel	6	18-May-20	23-May-20
M-LOT-MDL1239	FGD Wet Stack-Details of Louvers For Air inlet opening	6	18-May-20	23-May-20
M-LOT-MDL1240	FGD Wet Stack-Details of Door For Aviation warning lights & Relief opening	6	18-May-20	23-May-20
M-LOT-MDL1241	FGD Wet Stack-Details of Access Door	6	18-May-20	23-May-20
M-LOT-MDL1242	FGD Wet Stack-Details of Rolling Shutter	6	18-May-20	23-May-20
M-LOT-MDL1243	GA and Wiring Oxidation Blower Local Control Panel	6	18-May-20	23-May-20
M-LOT-MDL1244	Cable Schedule for power, control & instrument cables.	6	18-May-20	23-May-20
M-LOT-MDL1245	Installation Scheme, Instrument wiring and tubing diagrams (hook up)	6	18-May-20	23-May-20
M-LOT-MDL1246	LIE/LIR & JB Grouping	6	18-May-20	23-May-20
M-LOT-MDL1247	Data sheets and type test for Instrumentation, control optical fiber Cable.	6	18-May-20	23-May-20
M-LOT-MDL1248	Datasheet & GA Drawing of Temperature Element with Thermowell	6	18-May-20	23-May-20
M-LOT-MDL1249	Datasheet & GA Drawing of Ultrasonic Level Transmitter	6	18-May-20	23-May-20
M-LOT-MDL1250	Datasheet & GA Drawing of Flow Meter	6	18-May-20	23-May-20
M-LOT-MDL1251	DATA SHEET, GA DRAWING, TRANSDUCER MOUNTING DRAWINGS JB DRAWINGS CONFIGURATION DRAWING, BOM & TYPE TEST REPORT FOR VIBR	6	18-May-20	23-May-20
M-LOT-MDL1252	Drawing and Datasheet for Universal HART Communicator	6	18-May-20	23-May-20
M-LOT-MDL1253	GA OF RACK & PINION GATE	6	18-May-20	23-May-20
M-LOT-MDL1254	GA OF FLAP GATE ALONG WITH THRUST AND ACTUATOR SELECTION	85	17-Oct-19	09-Jan-20
M-LOT-MDL1255	G.A OF BRAKES FOR CONVEYORS	6	18-May-20	23-May-20
M-LOT-MDL1256	GA OF SCRAPPERS- INTERNAL & EXTERNAL	6	18-May-20	23-May-20
M-LOT-MDL1257	GA and data sheet of centrifugal fan FOR Ventilation system & DE	6	18-May-20	23-May-20
M-LOT-MDL1258	GA and data sheet of EHT Rail Clamp for Travelling Tripper	6	18-May-20	23-May-20
M-LOT-MDL1259	GA and data sheet of Brake for Travelling Tripper	6	18-May-20	23-May-20
M-LOT-MDL1260	FGD Wet Stack- Details of Ladders, Hatches and other Miscellaneous Items	6	18-May-20	23-May-20
M-LOT-MDL1261	FGD Wet Stack- Scheme for Aviation Obstruction Markings	6	18-May-20	23-May-20
M-LOT-MDL1262	FGD Wet Stack- Details of Sampling Ports in Flue Liner	85	28-Feb-20	22-May-20
M-LOT-MDL1263	FGD Wet Stack-Details of Rain Water Downtake pipe	6	18-May-20	23-May-20
M-LOT-MDL1264	FGD Wet Stack-DESIGN OF EXTRA REINFORCEMENT AROUND PLATFORM BEAM RECESSES AND OTHER MISCELLANEOUS OPENINGS	85	28-Feb-20	22-May-20
M-LOT-MDL1265	FGD Wet Stack-DESIGN OF STAIRCASE	85	28-Feb-20	22-May-20
M-LOT-MDL1266	DETAILS OF FLUE LINER WITH MANHOLES-All CANS	6	18-May-20	23-May-20
M-LOT-MDL1267	Control system Functional Grouping	6	18-May-20	23-May-20
M-LOT-MDL1268	Type Test Report of FGD control System	6	18-May-20	23-May-20
M-LOT-MDL1269	GI RIGID CONDUITS & ACCESSORIES - OUTLINE DIMENSION, GA DRAWINGS & DATASHEET	6	18-May-20	23-May-20
M-LOT-MDL1270	COASTING TIME CALCULATION	6	18-May-20	23-May-20
M-LOT-MDL1271	G.A OF ELECTRIC HOIST	6	18-May-20	23-May-20
M-LOT-MDL1272	G.A OF MANUAL HOIST/ CHAIN PULLEY BLOCK (MORE THAN 5T)	6	18-May-20	23-May-20
M-LOT-MDL1273	JUNCTION BOXES (TYPE F) - OUTLINE DIMENSION DRAWING/GA DRAWINGS & DATA SHEET	6	18-May-20	23-May-20
M-LOT-MDL1274	GA DRAWINGS & DETAILS OF CABLE TRAY & ACCESSORIES	6	18-May-20	23-May-20
M-LOT-MDL1275	G.A OF GEARBOX FOR CONVEYORS	6	18-May-20	23-May-20
M-LOT-MDL1276	G.A of High Speed and Low Speed Couplings	6	18-May-20	23-May-20
M-LOT-MDL1277	Standard Notes for Concrete Works	85	18-Oct-19	10-Jan-20
M-LOT-MDL1278	Standard Details for Concrete Works	85	18-Oct-19	10-Jan-20
M-LOT-MDL1279	GA & RCC Detail of Foundation of Process Water Tank	6	18-May-20	23-May-20
M-LOT-MDL1280	GA & RCC Detail of Foundation of Waste water Tank	6	18-May-20	23-May-20
M-LOT-MDL1281	GA & RCC Detail of Foundation of Primary & Secondary HC Feed Tank	6	18-May-20	23-May-20



NTPC SIPAT STPP STAGE-I (3X660MW)

FGD SYSTEM PACKAGE

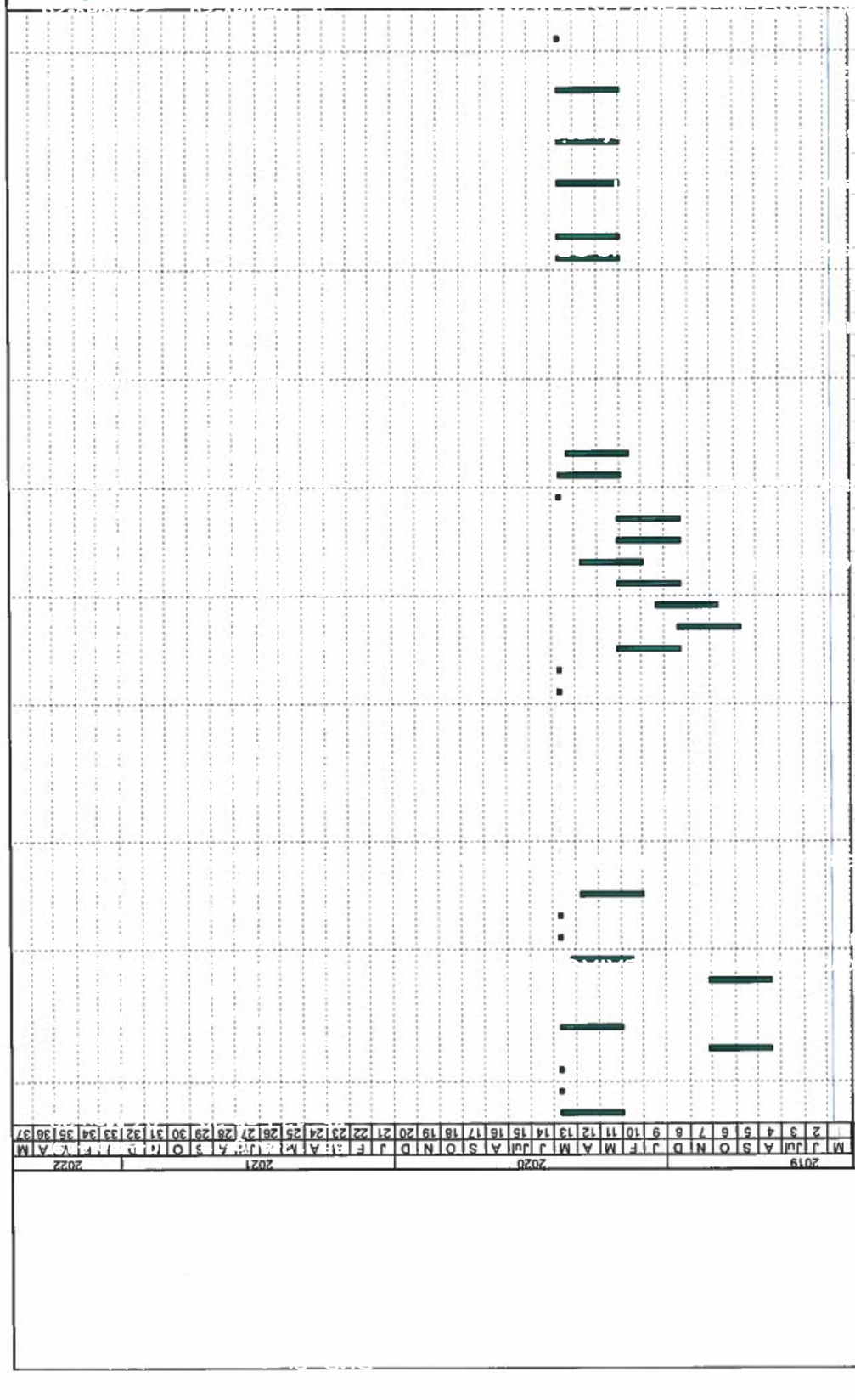
Activity ID	Activity Name
M-LOT-MDL1282	GA & RCC Detail of Foundation of Filtrate Water Tank
M-LOT-MDL1283	Gypsum Dewatering Building : GA & RC Details of Foundation
M-LOT-MDL1284	Gypsum Dewatering Building : RC Details of Column
M-LOT-MDL1285	Gypsum Dewatering Building : GA & RC Details of Grade Beam
M-LOT-MDL1286	Gypsum Dewatering Building : GA & RC Details of Lintel Beam
M-LOT-MDL1287	Gypsum Dewatering Building : GA & RC Details of Floor Beam & Slab
M-LOT-MDL1288	Gypsum Dewatering Building : GA & RC Detail of Roof Beam & Slab
M-LOT-MDL1290	Gypsum Dewatering Building : GA & RC Details of Grade Slab
M-LOT-MDL1292	Ball Mill Building : RC Detail of Column
M-LOT-MDL1293	Ball Mill Building : GA & RC Detail of Grade Beam
M-LOT-MDL1294	Ball Mill Building : GA & RC Detail of Lintel Beam
M-LOT-MDL1295	Ball Mill Building : GA & RC Detail of Floor Beam & Slab
M-LOT-MDL1296	Ball Mill Building : GA & RC Detail of Roof Beam & Slab
M-LOT-MDL1297	Ball Mill Building : GA & RC Details of Grade Slab
M-LOT-MDL1298	GA & RCC Details of Foundation of Electrical equipment & control Building-I
M-LOT-MDL1299	Electrical equipment & control Building-I: RC detail of column
M-LOT-MDL1300	Electrical equipment & control Building-I: GA & RC detail of grade beam
M-LOT-MDL1301	Electrical equipment & control Building-I: GA & RC detail of lintel beam
M-LOT-MDL1303	Electrical equipment & control Building-I: GA & RC detail of roof beam & slab
M-LOT-MDL1304	Electrical equipment & control Building-I: GA & RC detail of staircases
M-LOT-MDL1305	Electrical equipment & control Building-I: GA & RC detail of grade slab
M-LOT-MDL1306	GA & RCC Details of Foundation of Electrical equipment & control Building-II
M-LOT-MDL1307	Electrical equipment & control Building-II: RC detail of column
M-LOT-MDL1308	Electrical equipment & control Building-II: GA & RC detail of grade beam
M-LOT-MDL1309	Electrical equipment & control Building-II: GA & RC detail of lintel beam
M-LOT-MDL1310	Electrical equipment & control Building-II: GA & RC detail of floor beam & slab
M-LOT-MDL1311	Electrical equipment & control Building-II: GA & RC detail of roof beam & slab
M-LOT-MDL1312	Electrical equipment & control Building-II GA & RC detail of staircases
M-LOT-MDL1313	Electrical equipment & control Building-II GA & RC detail of grade slab
M-LOT-MDL1314	GA & RCC Detail of Foundation of Recycle Pump
M-LOT-MDL1315	GA & RCC Detail of Foundation of Oxidation blower
M-LOT-MDL1316	GA & RCC detail of miscellaneous pump-I(Belt Filter Wash Aux. Storage Mist Eleminator,Process water)
M-LOT-MDL1317	GA & RCC detail of miscellaneous pump-II(Cooling water, Gypsum Bleed, Reagent Feed)
M-LOT-MDL1318	GA & RCC detail of Foundation of Transformer
M-LOT-MDL1319	GA & RCC Details of Foundation of Recycle Pump & Oxdation Blower Building
M-LOT-MDL1320	GA & RCC Detail of Foundation for Absorber Inlet Duct Support
M-LOT-MDL1321	GA & RCC Detail of Foundation for Fan Handling Support
M-LOT-MDL1322	GA & RCC detail of Foundation of Pipe & Cable Rack structure
M-LOT-MDL1323	GA & RCC detail of trench and sump
M-LOT-MDL1324	GA & RCC Detail of equipment closed water cooling system
M-LOT-MDL1325	GA & RCC Details of Foundation of Gypsum Storage Shed
M-LOT-MDL1326	Gypsum Storage Shed : RC Detail of Column
M-LOT-MDL1327	Gypsum Storage Shed : GA & RC Detail of Grade Beam
M-LOT-MDL1328	Gypsum Storage Shed : GA & RC Detail of Lintel Beam
M-LOT-MDL1329	Gypsum Storage Shed : GA & RC Detail of Roof Beam & Slab
M-LOT-MDL1330	GA & RCC Detail of Gypsum Conveyor Trestle Foundation
M-LOT-MDL1331	CRUSHER HOUSE-GA & RCC DETAIL OF GRADE SLAB
M-LOT-MDL1332	TRANSFER POINT- GA & RCC DET OF GRADE SLAB
M-LOT-MDL1333	GA & RCC Detail of Bucket Elevator Support Foundation
M-LOT-MDL1334	GA & RCC Detail of Silo Support Foundation
M-LOT-MDL1335	GA & RCC Detail of Weigh Bridge Foundation
M-LOT-MDL1336	GA & RCC Detail of Truck Trippler Foundation



Недостающее

Итс шаг спринта (экспромт)

Задачи



NTPC SIPAT STPP STAGE-I (3X660MW)

FGD SYSTEM PACKAGE

L2 Schedule

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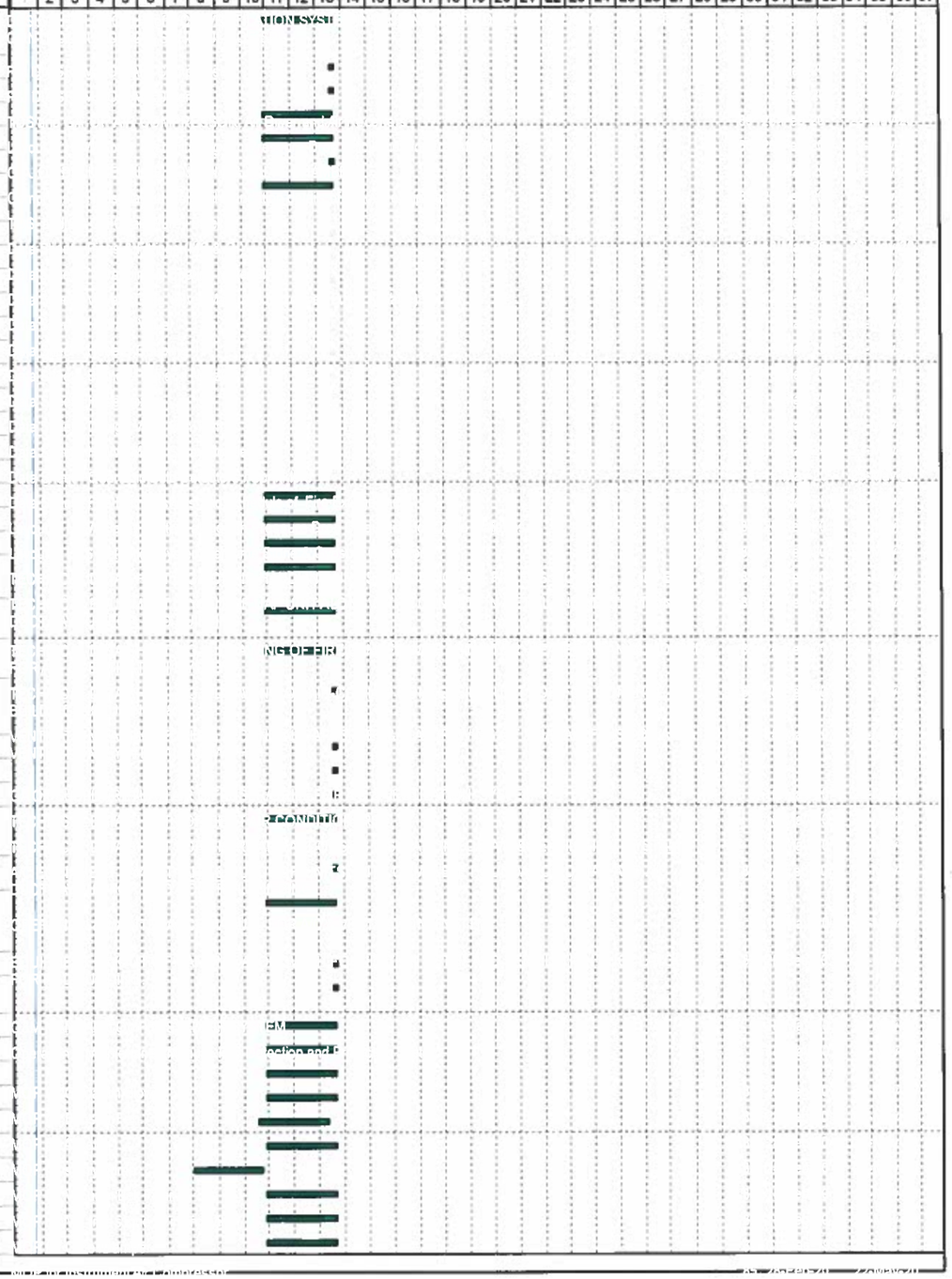


47 07-Jul-19

857 19-Jun-19 22-Oct-21

M-LOT-MDL1425 MQP for HT Motor
M-LOT-MDL1426 MQP for HT Switchgear
M-LOT-MDL1427 MQP for LT MCC/ACP/PMCC
M-LOT-MDL1428 MQP for LT/HT Bus duct
M-LOT-MDL1429 MQP for Battery & Battery Charger
M-LOT-MDL1430 MQP for DG Set
M-LOT-MDL1431 MQP for VFD Control Panel
M-LOT-MDL1432 MQP for Passenger Elevator
M-LOT-MDL1433 MQP FOR PDCMIC
M-LOT-MDL1435 MQP FOR BATTERIES FOR UPS
MQP FOR FLUE GAS ANALYSER
MQP FOR Crusher
MQP FOR Vibrating Screen feeder
MQP FOR Limestone Sampling System
MQP FOR Belt
MQP FOR Gearbox
MQP FOR Fluid Coupling
MQP for Absorber
MQP for Pneumatic Control Valves
MQP for Re-circulation Slurry Pump
MQP for FGD (including Receipt & Storage)
General Information of Building and Facilities
Basis along with process description - Flue Gas Ducting and Dampers System
Basis- Machine Foundation

Stack / Chimney - Spec and Ordering
Stack / Chimney -Vendor Engineering

M-LOT-MDL1436
M-LOT-MDL1437
M-LOT-20540
M-LOT-MDL1440
M-LOT-20541
M-LOT-MDL1444
M-LOT-MDL1445
Erection Contractor

Civil Works Purchase Order
Civil Works Contractor Mobilisation

M-LOT-22505U3 Stack / Chimney Found. Excavation & Foundation
M-LOT-23280U3 Stack / Chimney - Civil Works
M-LOT-23280U8 Stack / Chimney -Erection Works
M-LOT-23355U3 Stack / Chimney - Duct Connection

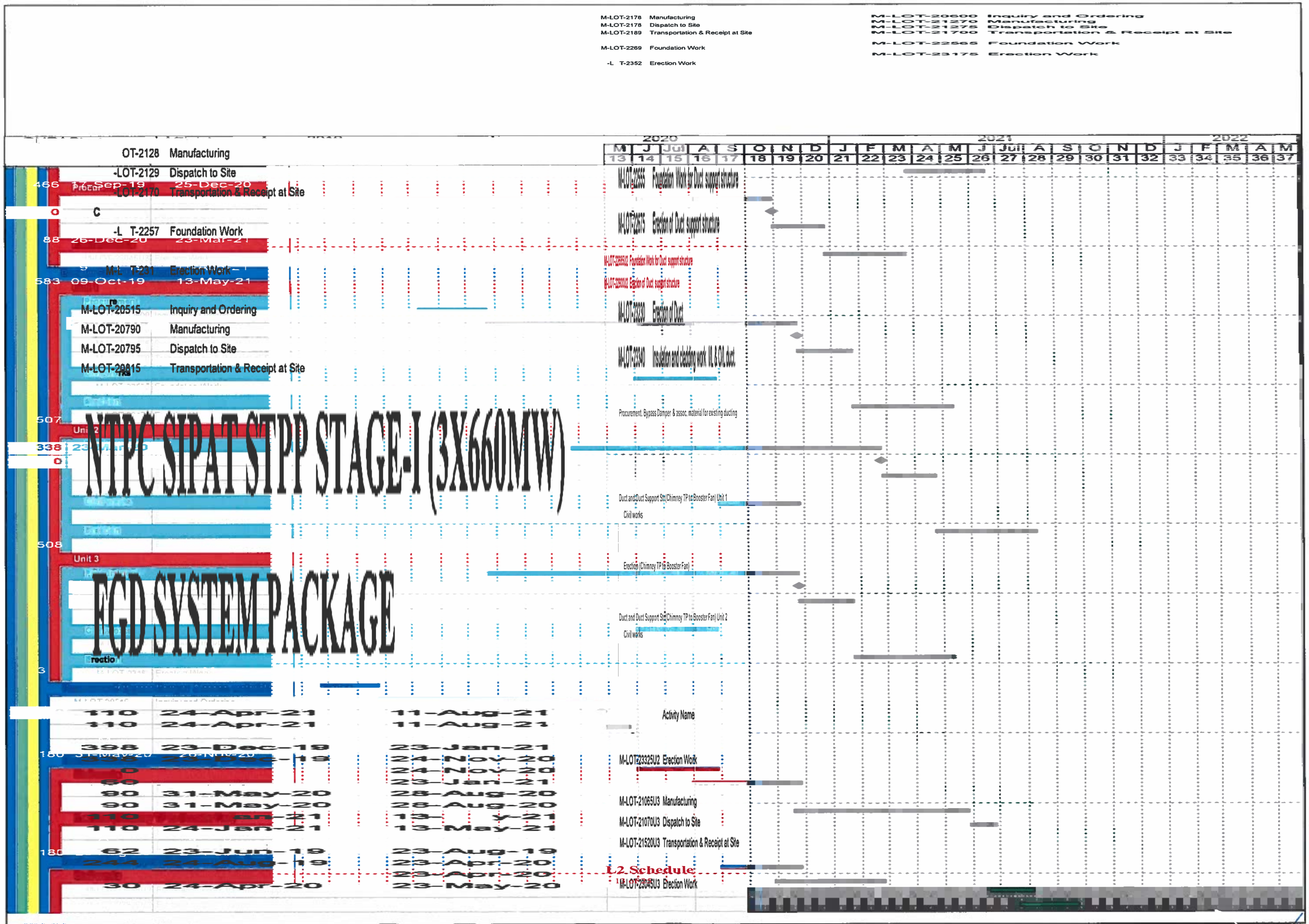
M-LOT-23405U3 Stack / Chimney - Electrical works, Painting & Finishing

Activity Name	DUR	Start	Finish
45 18-Feb-20 02-Apr-20	511	18-Feb-20	12-Jul-21
03-Apr-20 17-Apr-21	496	18-Fe	27-Jun-21
	380		
		09-Nov-20	
M-LOT-20775U3 Manufacturing of C-Shaped Absorber Sections	105	30-Mar-21	12-Jul-21
M-LOT-20780U3 Dispatch to Site of C-Shaped Absorber Sections			un-21
M-LOT-20805U3 Transportation & Receipt at Site of C-Shaped Absorber Sections	269	11-Aug-19	05-May-20
		10-Dec-19	
M-LOT-22525U3 Excavation & Foundation Work of Absorber Shell/Area	105	29-Jan-20	12-May-20
	380	23-May-20	06-Jun-21
M-LOT-23085U3 Erection of Absorber Shell and internal support before lining	607	08-Jan-20	05-Sep-21
M-LOT-23275U3 Lining of Joints on welding done at site	105	28-Apr-20	10-Aug-20
M-LOT-20535 Inquiry and Ordering-Plates & C276 lining for Absorber Sections		Aug-20	05-Sep-21
M-LOT-20765 Manufacturing of C-Shaped Absorber Sections	605	Oct-19	06-Jun-21
M-LOT-20770 Dispatch to Site for Absorber Sections			5 May-20
M-LOT-20800 Transportation & Receipt at Site of C-Shaped Absorber Sections	10	2	
178 05-Apr-20			
M-LOT-22515 Excavation & Foundation Work of Absorber Shell/Area			
30 06-Apr-20 05-May-20	73	9-Jun-19	21-D 20
M-LOT-23145 Erection of Absorber Shell and internal support before lining			
M-LOT-23275 Lining of Joints on welding done at site			
	5		
56 27-Oct-20 21-Dec-20	3		
55 25-Jan-21 22-Apr-21	30	06-Apr-20	05-May-20
409 13-Dec-19 24-Jan-21	105	29-Jan-20	12-May-20
0 24-Jun-21	335	23-May-20	22-Apr-21
57 25-Jan-21 22-Mar-21	45	23-Apr-21	06-Jun-21
	5		

M-LOT-21045 Manufacturing
M-LOT-21470 Transportation & Receipt at Site
M-LOT-21715U2 Dispatch to Site
M-LOT-21845U2 Transportation & Receipt at Site

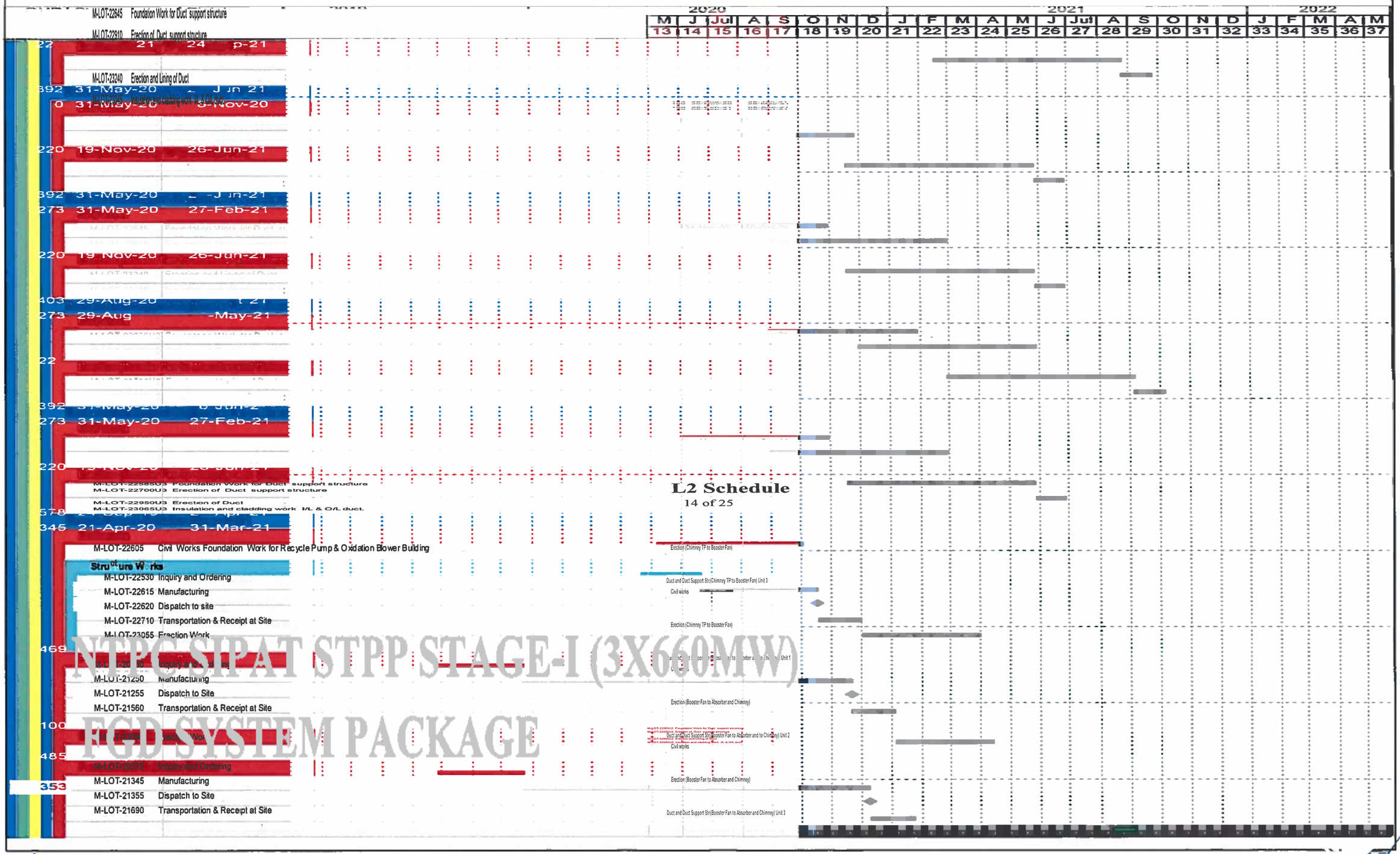
NTPC SIPAT STPP STAGE-I (3X660MW)

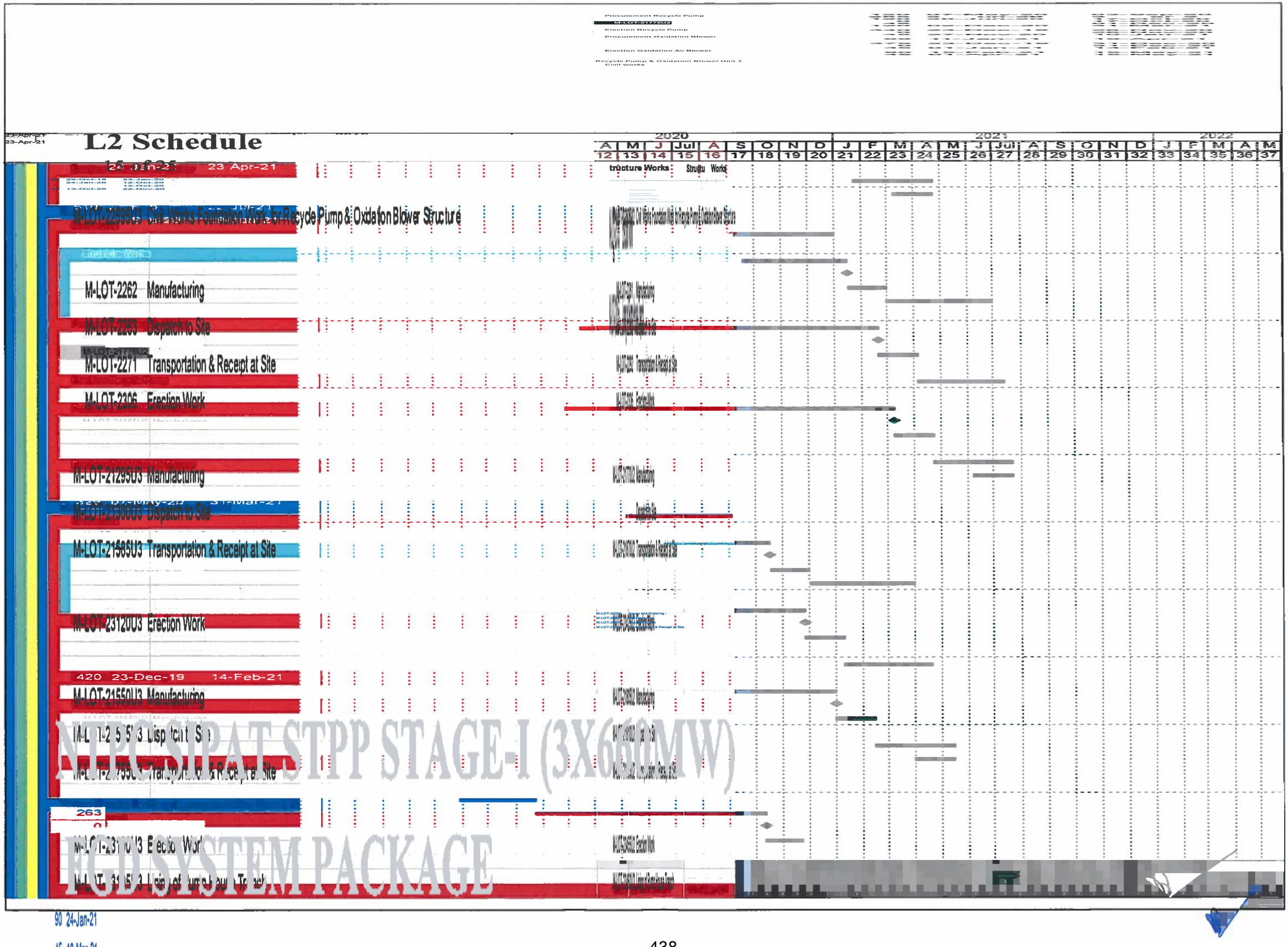
FGD SYSTEM PACKAGE



M-LOT-22655U3 Foundation Work for Duct support structure
M-LOT-22915U3 Erection of Duct support structure

M-LOT-23285U3 Erection and Lining of Duct
M-LOT-23370U3 Insulation and cladding work I/L & O/L duct.





M-LOT-21575U2 Manufacturing
M-LOT-21580U2 Dispatch to Site
M-LOT-21790U2 Transportation & Receipt at Site

M-LOT-20710 Inquiry and Ordering
M-LOT-21475
M-LOT-21660 Transportation & Receipt at Site
M-LOT-22970 Foundation
M-LOT-23305 Erection Work

M-LOT-21055U3 Manufacturing
M-LOT-21060U3
M-LOT-21375U3 Transportation & Receipt at Site
M-LOT-23050U3 Erection Work
M-LOT-21510U3 Manufacturing
Erection
M-LOT-23310U3 Erection Work
Civil works
Erection
Civil works
Civil works
Erection
Civil works
Erection
Civil works
M-LOT-22760 Foundation Work for Cooling Water & Booster Pump,Process water Tank and Mist Eliminator wash pump
Procurement Cooling Water Booster Pump
M-LOT-20630 Inquiry and Ordering
M-LOT-21165 Manufacturing
M-LOT-21170 Dispatch to Site
M-LOT-21525 Transportation & Receipt at Site
Erection Cooling Water Booster Pump

90	23-Oct-19	20-Jan-20	
30	22-Dec-20	20-Mar-21	
120	16-Nov-20	15-Mar-21	
90	18-Mar-21	15-Jun-21	
0	12-Oct-20		
41	13-Oct-20	22-Nov-20	
09	25-Apr-20	11-Aug-21	
456	23-Oct-19		
120	16-Nov-20	15-Mar-21	
120	16-Nov-20	15-Mar-21	
550	08-Oct-19	09-Apr-21	
180	01-Jun-20	19-Dec-20	
180	01-Jun-20	19-Dec-20	
60	08-Oct-19	30-Dec-20	
90	08-Oct-19	05-Jan-20	
315	06-Jan-20	15-Nov-20	
0		15-Nov-20	
45	16-Nov-20	30-Dec-20	
100	31-Dec-20	09-Apr-21	

2019 2020 2021 2022

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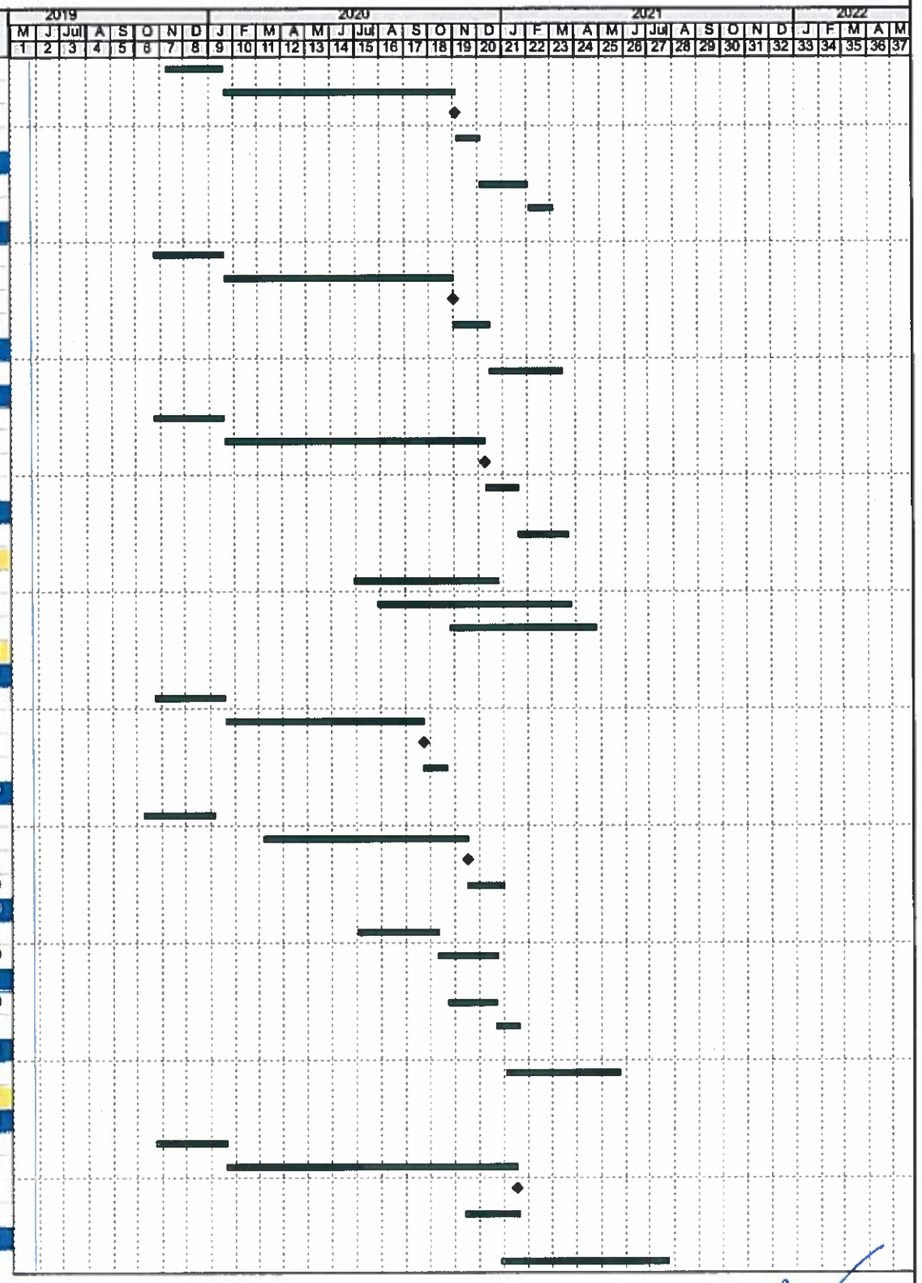
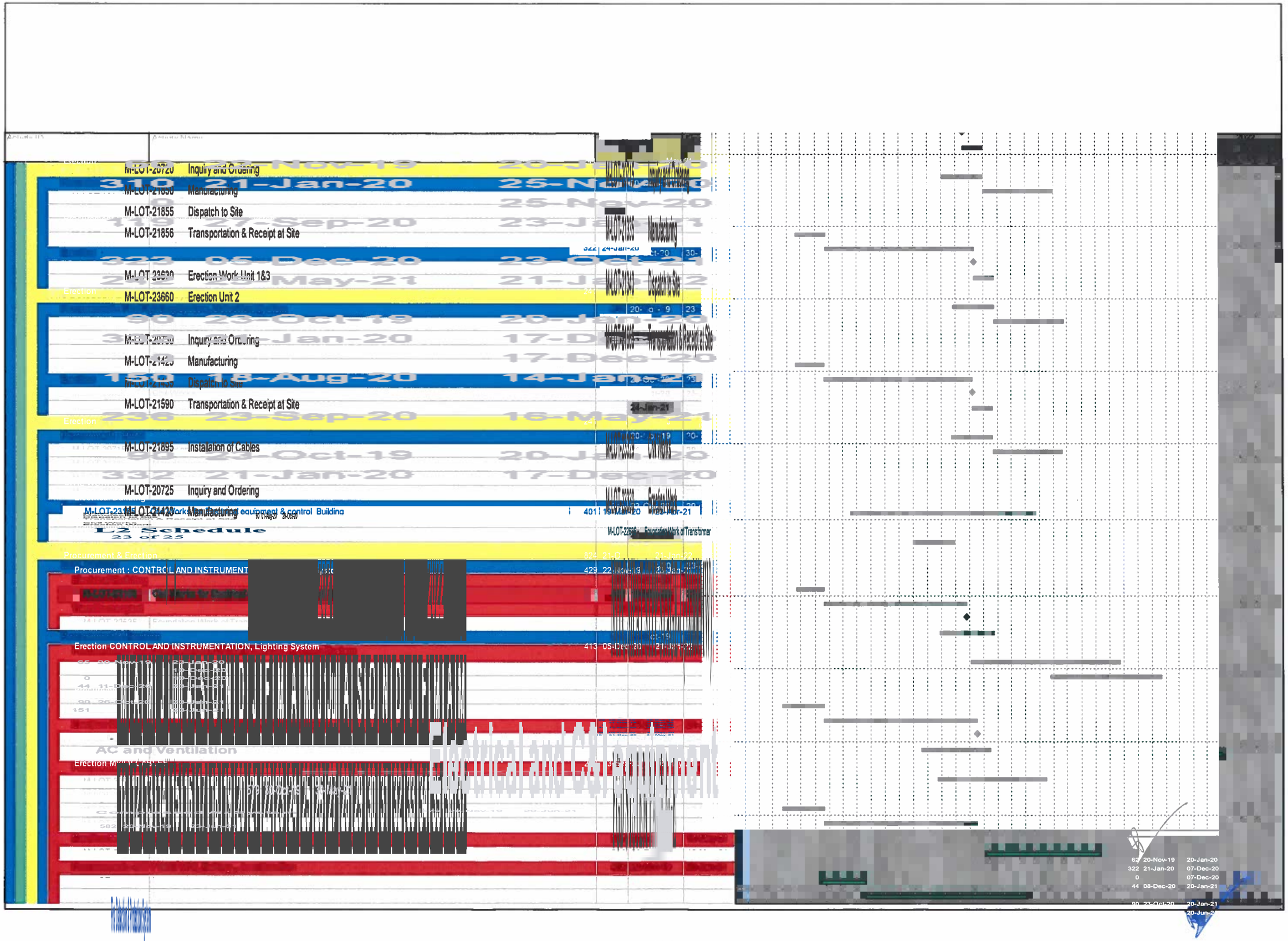
8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

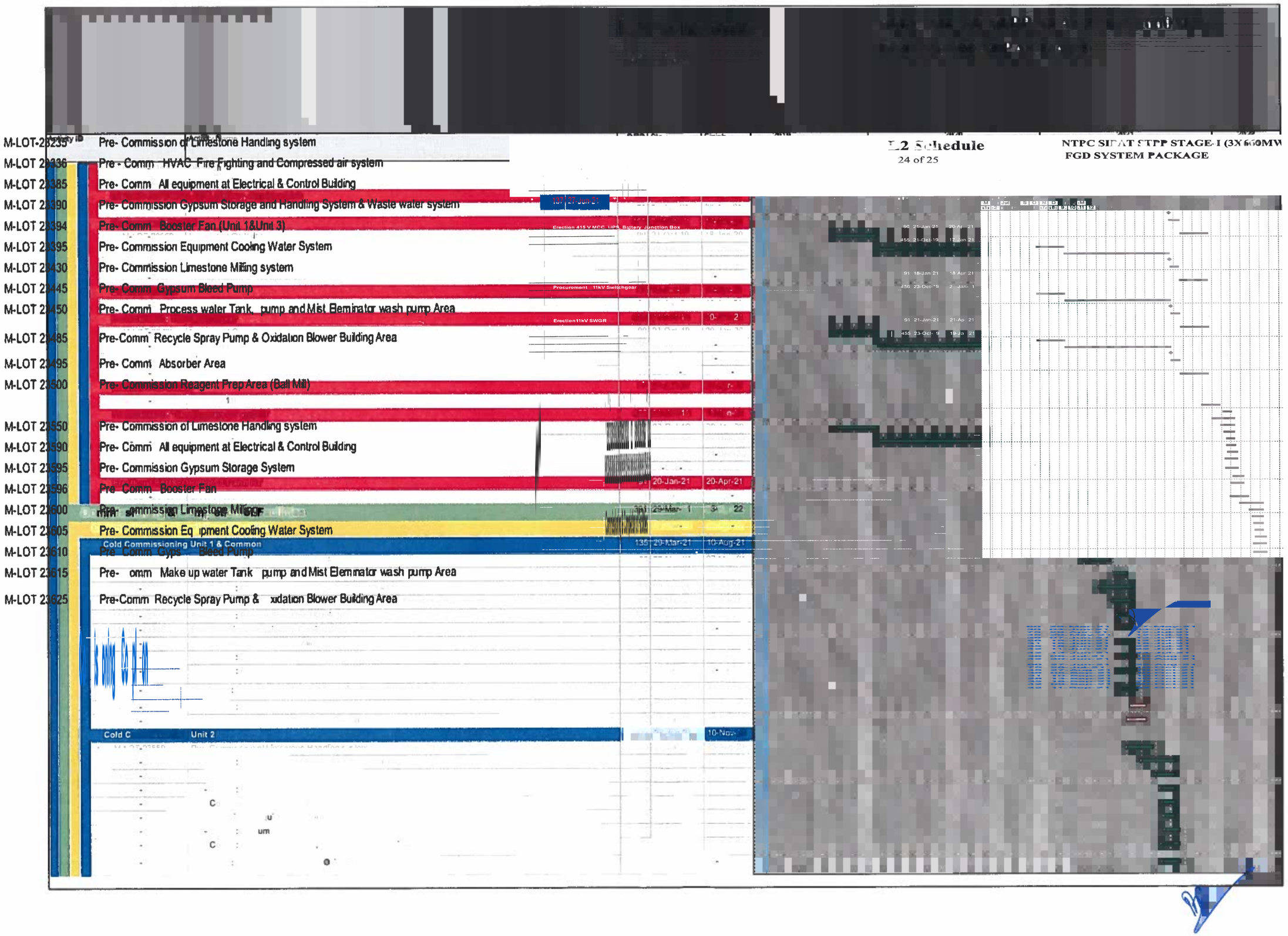
L2 Schedule

NTPC SIPAT STPP STAGE-I (3X660MW)
FGD SYSTEM PACKAGE

Activity ID	Activity Name	DUR	Start	Finish
M-LOT-20665	Inquiry and Ordering	71	10-Nov-19	19-Jan-20
M-LOT-21110	Manufacturing	290	20-Jan-20	04-Nov-20
M-LOT-21125	Dispatch to Site	0		04-Nov-20
M-LOT-21320	Transportation & Receipt at Site	30	05-Nov-20	04-Dec-20
Erection ECW Overhead Tank		90	05-Dec-20	04-Mar-21
M-LOT-22870	Erection Work	60	05-Dec-20	02-Feb-21
M-LOT-22925	Lining - ECW Overhead Tank	30	03-Feb-21	04-Mar-21
Procurement : ECW Pumps		419	24-Oct-19	15-Dec-20
M-LOT-20670	Inquiry and Ordering	88	24-Oct-19	19-Jan-20
M-LOT-21080	Manufacturing	286	20-Jan-20	31-Oct-20
M-LOT-21085	Dispatch to Site	0		31-Oct-20
M-LOT-21395	Transportation & Receipt at Site	45	01-Nov-20	15-Dec-20
Erection ECW Pumps		90	16-Dec-20	15-Mar-21
M-LOT-22975	Erection Work	90	16-Dec-20	15-Mar-21
Procurement : ECW Heat Exchanger		454	24-Oct-19	19-Jan-21
M-LOT-20675	Inquiry and Ordering	88	24-Oct-19	19-Jan-20
M-LOT-21350	Manufacturing	325	20-Jan-20	09-Dec-20
M-LOT-21360	Dispatch to Site	0		09-Dec-20
M-LOT-21635	Transportation & Receipt at Site	41	10-Dec-20	19-Jan-21
Erection ECW Heat Exchanger		61	20-Jan-21	21-Mar-21
M-LOT-23035	Erection Work	61	20-Jan-21	21-Mar-21
PIPE RACK		300	29-Jun-20	24-Apr-21
M-LOT-22795	Foundation Work	180	29-Jun-20	25-Dec-20
M-LOT-22800	Inquiry, Order, Manufacturing, dispatch and receipt at site	240	29-Jul-20	25-Mar-21
M-LOT-23170	Erection of Pipe Rack	180	27-Oct-20	24-Apr-21
Waste Water Treatment Area		593	09-Oct-19	23-May-21
Procurement : Waste Water Tank		365	24-Oct-19	22-Oct-20
M-LOT-20680	Inquiry and Ordering	88	24-Oct-19	19-Jan-20
M-LOT-20900	Manufacturing	247	20-Jan-20	22-Sep-20
M-LOT-20905	Dispatch to Site	0		22-Sep-20
M-LOT-21040	Transportation & Receipt at Site	30	23-Sep-20	22-Oct-20
Procurement : Waste Water Pump		450	09-Oct-19	31-Dec-20
M-LOT-20640	Inquiry and Ordering	90	09-Oct-19	06-Jan-20
M-LOT-21200	Manufacturing	255	07-Mar-20	16-Nov-20
M-LOT-21215	Dispatch to Site	0		16-Nov-20
M-LOT-21540	Transportation & Receipt at Site	45	17-Nov-20	31-Dec-20
Civil works		175	03-Jul-20	24-Dec-20
M-LOT-22610	Foundation Work for Waste Water Tank	100	03-Jul-20	10-Oct-20
M-LOT-22790	Foundation Work for Waste Water Pump	75	11-Oct-20	24-Dec-20
Erection Waste WaterTank		90	23-Oct-20	20-Jan-21
M-LOT-22785	Erection Work	60	23-Oct-20	21-Dec-20
M-LOT-22840	Lining work	30	22-Dec-20	20-Jan-21
Erection Waste WaterPump		140	04-Jan-21	23-May-21
M-LOT-23220	Erection Work	140	04-Jan-21	23-May-21
Piping & Valve		639	24-Oct-19	23-Jul-21
Procurement : Piping & Valve		455	24-Oct-19	20-Jan-21
M-LOT-20690	Inquiry and Ordering	89	24-Oct-19	20-Jan-20
M-LOT-21610	Manufacturing	362	21-Jan-20	16-Jan-21
M-LOT-21615	Dispatch to Site	0		16-Jan-21
M-LOT-21655	Transportation & Receipt at Site	68	14-Nov-20	20-Jan-21
Erection Piping and valves		207	29-Dec-20	23-Jul-21
M-LOT-23480	Erection Work	207	29-Dec-20	23-Jul-21




M-LOT-20720 Inquiry and Ordering
M-LOT-21590 Manufacturing
M-LOT-21855 Dispatch to Site
M-LOT-21856 Transportation & Receipt at Site
M-LOT-23630 Erection Work Unit 1&3
M-LOT-23660 Erection Unit 2
M-LOT-20730 Inquiry and Ordering
M-LOT-21425 Manufacturing
M-LOT-21590 Transportation & Receipt at Site
M-LOT-21895 Installation of Cables
M-LOT-20725 Inquiry and Ordering
L2 Schedule
23 of 25
Procurement : CONTROL AND INSTRUMENT
Erection CONTROL AND INSTRUMENTATION, Lighting System
AC and Ventilation
20-Nov-19 20-Jan-20
21-Jan-20 07-Dec-20
07-Dec-20
08-Dec-20 20-Jan-21
23-Oct-20 20-Jan-21
20-Jun-2


M-LOT-23235 Pre- Commission of Limestone Handling system
M-LOT 23236 Pre - Comm HVAC Fire Fighting and Compressed air system
M-LOT 23385 Pre- Comm All equipment at Electrical & Control Building
M-LOT 23390 Pre- Commission Gypsum Storage and Handling System & Waste water system
M-LOT 23394 Pre- Comm Booster Fan (Unit 1&Unit 3)
M-LOT 23395 Pre- Commission Equipment Cooling Water System
M-LOT 23430 Pre- Commission Limestone Milling system
M-LOT 23445 Pre- Comm Gypsum Bleed Pump
M-LOT 23450 Pre- Comm Process water Tank, pump and Mist Eleminator wash pump Area
M-LOT 23485 Pre-Comm Recycle Spray Pump & Oxidation Blower Building Area
M-LOT 23495 Pre- Comm Absorber Area
M-LOT 23500 Pre- Commission Reagent Prep Area (Ball Mill)
M-LOT 23550 Pre- Commission of Limestone Handling system
M-LOT 23590 Pre- Comm All equipment at Electrical & Control Building
M-LOT 23595 Pre- Commission Gypsum Storage System
M-LOT 23596 Pre- Comm Booster Fan
M-LOT 23600 Pre- ommission Limestone Mill
M-LOT 23605 Pre- Commission Eq ipment Cooling Water System
M-LOT 23610 Pre- Comm Gyps Bleed Pump
M-LOT 23615 Pre- omm Make up water Tank pump and Mist Elemnator wash pump Area
M-LOT 23625 Pre-Comm Recycle Spray Pump & xdation Blower Building Area
Erection 415 V MCC, UPS, Battery, Junction Box
Procurement 11kV Switchgear
Erection11kV SWGR
20-Jan-21
20-Apr-21
Cold Commissioning Unit 1 & Common
135 29-Mar-21 10-Aug-21
Cold C Unit 2
10-Nov-

एनटीपीसी NTPC

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

Ref. No.: CS-9518-109(2)-9-SC-NOA-6816 **Date: 24.05.2019**

M/s GE Power India Limited
Plot No.7, IHDP Building,
Sector-127, Noida-201301

Kind Attn.: Mr. Lalit Sankarni, Executive-Business Operations

Sub.: Notification of Award (NOA) for Inland Transportation, Inland Insurance, Installation, Testing & Commissioning for Sipat Super Thermal Power Station Stage-I (3 x 660 MW) as per Common Bidding Document No. CS-0011-109(2)-9.

Dear Sir,

1.0 This has reference to the following:

i) Our Invitation for Bids (IFB) No. 40087737 dated 31.08.2018 inviting Envelope-I (Techno-Commercial) Bids and IFB no. 40087818 for Envelope-II (Price) Bids.

ii) Bidding Documents for the subject package downloaded by you from SRM portal comprising the following:

S. No.	Description of Bidding Documents
1	Section-I : Invitation for Bids (IFB)
2	Section-II : Instructions to Bidders (ITB)
3	Section-III : Bid Data Sheets (BDS)
4	Section-IV : General Conditions of Contract (GCC)
5	Section- V : Special Conditions of Contract (SCC)
6	Section-VI : Technical Specifications including Tender Drawings and Technical Data Sheets
7	Section-VII : Forms & Procedures (FP) consisting of Part-1 of 3, Part-2 of 3 and Part-3 of 3

iii) Various Amendments/Clarifications/Errata issued to the Bidding Documents for the subject package as per details given below:

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
Dy. General Manager (Contract Services)
एनटीपीसी लिमिटेड / NTPC Limited
EOC, A-8A, Sector-24, NOIDA-201301 (U.P.)

अभियांत्रिकी कार्यालय परिसर, प्लाट न. ए - ८ ए, सेक्टर २४, पोस्ट बॉक्स नं. १३, नोएडा (उ.प्र.), पिन: २०१३०१
ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No. 13, NOIDA (U.P.), Pin: 201301
कॉरपोरेट पहचान नंबर: एल. ४०१०१ डी. एल. १९७५ जी. ओ. आई. ००७९६६, वेबसाइट: www.ntpc.co.in
Corporate Identification Number : L40101DL1975GOI007966, Website: www.ntpc.co.in
टेलीफोन नं.: ०१२०-२४१०३३३ (१० लाईनें), ०१२०-२४१०११६ (५ लाईनें), फैक्स: ०१२०-२४१०१३६, ०१२०-२४१०१३७
Telephone No.:0120-2410333 (10 Lines), 0120-2410116 (5-Lines), Fax: 0120-2410136, 0120-2410137
पंजीकृत कार्यालय : एन.टी.पी.सी. भवन, स्कोप काम्प्लेक्स, ७ इन्स्टीट्यूशनल एरिया, लोदी रोड, नई दिल्ली - ११०००३
Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

List of Clarifications			
Commercial Clarifications			
S. No.	**Description**	**Ref. no.**	**Issuance/ Uploading Date**
1	Clarification no. 1 (Commercial) to Bidding Documents	CS-0011-109(2)-9-CLRF.01 (Comm)	03.10.2018
2	Clarification no. 2 (Commercial) to Bidding Documents	CS-0011-109(2)-9-CLRF.02 (Comm.)	24.10.2018
Technical Clarifications			
S. No.	**Description**	**Ref. no.**	**Issuance Date**
1	Clarification no. 1 (Technical)	CS-0011-109(2)-9-CLRF-01(TECH)	26.10.2018
2	Clarification no. 2 (Technical)	CS-0011-109(2)-9-CLRF-02(TECH)	19.11.2018
3	Clarification no. 3 (Technical)	CS-0011-109(2)-9-CLRF-03(TECH)	28.11.2018
List of Amendments			
S. No.	**Description**	**Ref. no.**	**Issuance Date**
1	Amendment no. 1 to Bidding Documents consisting of : (i) Amendment No. 01 to Section VII	CS-0011-109(2)-9-AMDT.01	19.09.2018
2	Amendment no. 2 to Bidding Documents consisting of : (i) Amendment No. 01 to BDS (Section-III) (ii) Amendment No. 01 to SCC (Section-V) (iii) Amendment No. 02 to Section VII	CS-0011-109(2)-9-AMDT-02	03.10.2018
3	Amendment no. 3 to Bidding Documents consisting of : (i) Amendment No. 01 to Technical Specification (Section-VI)	CS-0011-109(2)-9-AMDT-03	26.10.2018
4	Amendment no. 4 to Bidding Documents consisting of :	CS-0011-109(2)-9-AMDT-04	27.10.2018

अभियांत्रिकी कार्यालय परिसर, प्लाट न. ए - ८ ए, सेक्टर २४, पोस्ट बॉक्स नं. १३, नोएडा (उ.प्र.), पिन: २०१३०१
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Corporate Identification Number : L40101DL1975GOI007966, Website: www.ntpc.co.in
टेलीफोन नं.: ०१२०-२४१०३३३ (१० लाईनें), ०१२०-२४१०११६ (५ लाईनें), फैक्स: ०१२०-२४१०१३६, ०१२०-२४१०१३७
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पंजीकृत कार्यालय : एन.टी.पी.सी. भवन, स्कोप काम्प्लेक्स, ७ इन्स्टीट्यूशनल एरिया, लोदी रोड, नई दिल्ली - ११०००३
Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
Dy. General Manager (Contract Services)
एनटीपीसी लिमिटेड / NTPC Limited
EOC, A-8A, Sector-24, NOIDA-201301 (U.P.)

	(i) Amendment No. 3 to Section VII		
5	Amendment no. 5 to Bidding Documents consisting of : (i) Amendment No. 02 to Technical Specification (Section-VI)	CS-0011-109(2)-9-AMDT-05	19.11.2018

List of Errata

S. No.	Description	Ref. no.	Issuance Date
1	Errata No.1 to Bidding Documents	CS-0011-109(2)-9-ERRATA.01	05.10.2018
2.	Errata No.2 to Bidding Documents	CS-0011-109(2)-9-ERRATA.02	03.12.2018

iv) Your Envelope-I (Techno-commercial) Bid dated 03.12.2018 opened on 04.12.2018.

v) Post Bid Discussions we had with you on 19.12.2018, 26.12.2018, 03.01.2019 and 06.02.2019 resulting into the following Minutes of Meeting enclosed herein with this Notification of Award:

a) Minutes of Meeting (MOM) on Commercial issues-Appendix-A
b) Minutes of Meeting (MOM) on Technical issues -Appendix-B
c) Minutes of Meeting(MOM) on QA&I issues - Appendix-C
d) Minutes of Meeting (MOM) on Safety issues – Appendix-D

vi) Your Envelope-II (Price) Bid dated 03.12.2018 opened on 08.04.2019 and Reverse Auction held for subject Package on 08.04.2019.

vii) Our email dated 13.04.2019 inviting you for Post Bid Discussions on Price Bid.

viii) Minutes of Discussion (commercial) held on 15.04.2019 with regards to issues related to Price Bid. Enclosed at Appendix-E.

2.0 We confirm having accepted your Envelope-I (Techno-commercial) Proposal opened on 04.12.2018 and Envelope-II (Price) Proposal opened on 08.04.2019, read in conjunction with all the Specifications, Terms and Conditions of the Bidding Documents & its Amendments/ Clarifications/ Errata, agreed Minutes of Meeting as referred to in para 1.0 above and award on you the contract for the work of all services i.e. Transportation from manufacturer's works/ place of dispatch to site (both in India), transit insurance, delivery at site, receipt, unloading, handling, storage, in-plant transportation, taking delivery of employer supplied equipment from site stores, comprehensive all risk insurance, installation, supervision, pre-

अभियांत्रिकी कार्यालय परिसर, प्लाट न. ए - ८ ए, सेक्टर २४, पोस्ट बॉक्स नं. १३, नोएडा (उ.प्र.), पिन: २०१३०१
ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No. 13, NOIDA (U.P.), Pin: 201301
कॉरपोरेट पहचान नंबर: एल. ४०१०१ डी. एल. १९७५ जी. ओ. आई. ००७९६६, वेबसाइट: www.ntpc.co.in
Corporate Identification Number : L40101DL1975GOI007966, Website: www.ntpc.co.in
टेलीफोन नं.: ०१२०-२४१०३३३ (१० लाईनें), ०१२०-२४१०११६ (५ लाईनें), फैक्स: ०१२०-२४१०१३६, ०१२०-२४१०१३७
Telephone No.:0120-2410333 (10 Lines), 0120-2410116 (5-Lines), Fax: 0120-2410136, 0120-2410137
पंजीकृत कार्यालय : एन.टी.पी.सी. भवन, स्कोप कॉम्प्लेक्स, ७ इन्स्टीट्यूशनल एरिया, लोदी रोड, नई दिल्ली - ११०००३
Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
Dy. General Manager (Contract Services)
एनटीपीसी लिमिटेड / NTPC Limited
EOC, A-8A, Sector-24, NOIDA-201301 (U.P.)

commissioning, testing, commissioning and performance testing of all Equipments/ systems and materials, and all other services leading to successful "completion of facilities" and handing over to Employer of the Equipment/ Materials including Mandatory Spares etc. covered under Flue Gas Desulphurisation (FGD) System Package for Sipat Super Thermal Power Station Stage-I (3 X 660 MW), as per Bidding Document and its Amendments/ Clarifications/ Errata read in conjunction with agreed Minutes of Meeting, as referred to in para 1.0 above (hereinafter referred to as the 'Second Contract').

3.0 We have also issued Notification of Awards to you vide our NOA no. **CS-9518-109(2)-9-FC-NOA-6815 dated 24.05.2019** for the work of Design, Engineering, Manufacturing, Shop fabrication, Assembly, Inspection and Testing at Supplier's works, Type Testing, Packing, Forwarding to site of all Ex-Manufacturing Works/Place of Dispatch (both in India) Equipments/ materials/ Special tools & tackles and Mandatory Spares etc. (hereinafter referred to as the 'First Contract') covered under Flue Gas Desulphurisation (FGD) System Package for Sipat Super Thermal Power Station Stage-I (3 x 660 MW), as per Bidding Document and its Amendments/ Clarifications/ Errata read in conjunction with agreed Minutes of Meeting, as referred to in para 1.0 above.

3.1 You shall also be fully responsible for the works to be executed under the 'First Contract' and it is expressly understood and agreed by you that any breach under the 'First Contract' shall automatically be deemed as a breach of this 'Second Contract' and vice- versa and any such breach or occurrence or default giving us a right to terminate the 'First Contract' and/or recover damages there under, shall give us an absolute right to terminate this Contract and/or recover damages under this 'Second Contract' as well and vice- versa. However, such breach or default or occurrence in the 'First Contract' shall not automatically relieve you of any of your responsibilities/obligations under this 'Second Contract'. It is also expressly understood and agreed by you that the equipment/ materials to be supplied by you under 'First Contract' when installed and commissioned under the 'Second Contract' shall give satisfactory performance in accordance with the provisions of the Contract.

4.0 CONTRACT PRICE

4.1 The total Contract Price for the entire scope of work covered under this NOA shall be **₹ 275,56,18,059/- (INR Two Hundred and Seventy Five Crore, Fifty Six Lakh, Eighteen Thousand and Fifty Nine only)** as per the following break up:

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
Dy. General Manager (Contract Services)
एनटीपीसी लिमिटेड / NTPC Limited
EOC, A-8A, Sector-24, NOIDA-201301 (U.P.)

अभियांत्रिकी कार्यालय परिसर, प्लाट न. ए - ८ ए, सेक्टर २४, पोस्ट बॉक्स नं. १३, नोएडा (उ.प्र.), पिन: २०१३०१
ENGINEERING OFFICE COMPLEX, Plot No. A-8A, Sector-24, Post Box No. 13, NOIDA (U.P.), Pin: 201301
कॉरपोरेट पहचान नंबर: एल. ४०१०१ डी. एल. १९७५ जी. ओ. आई. ००७९६६, वेबसाइट: www.ntpc.co.in
Corporate Identification Number : L40101DL1975GOI007966, Website: www.ntpc.co.in
टेलीफोन नं.: ०१२०-२४१०३३३ (१० लाईनें), ०१२०-२४१०११६ (५ लाईनें), फैक्स: ०१२०-२४१०१३६, ०१२०-२४१०१३७
Telephone No.:0120-2410333 (10 Lines), 0120-2410116 (5-Lines), Fax: 0120-2410136, 0120-2410137
पंजीकृत कार्यालय : एन.टी.पी.सी. भवन, स्कोप काम्प्लेक्स, ७ इन्स्टीट्यूशनल एरिया, लोदी रोड, नई दिल्ली - ११०००३
Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

S. No.	Particulars	Contract Price
1.	Local Transportation including Inland insurance charges for Plant and Equipment covered under First contract	₹ 7,07,60,918/-
2.	Local Transportation including Inland insurance charges for Mandatory Spares covered under First Contract	₹ 50,00,000/-
3.	Installation Services	₹ 64,73,39,446/-
4.	Civil & Architectural Works	₹ 195,01,91,170/-
5.	Structural Steel Works	₹ 8,04,97,100/-
6.	Training Charges	₹ 8,29,425/-
7.	AMC Charges	₹ 10,00,000/-
8.	**Total (B) [1+2+3+4+5+6+7]**	**₹ 275,56,18,059/-**

5.0 You shall prepare and finalize the Contract Documents for signing of the formal contract Agreement and shall enter into the Contract Agreement with us, as per Performa enclosed with the Bidding Documents, on non-judicial stamp paper of appropriate value within 28 days from the date of this Notification of Award.

6.0 This NOA is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including all the enclosed Appendices, by the authorized signatory of your Company as a proof of your acknowledgement and confirmation.

Please take necessary action to commence the work and confirm action.

Thanking You,

Yours faithfully,
For and on behalf of NTPC Ltd.

24/05/19

श्रीश सिंह / SHRISH SINGH
उप महाप्रबन्धक (संविदा सेवाएं)
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Regd. Office: NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi-110003

Encl:

i. **Minutes of Meeting(MOM) on Commercial issues-Appendix-A (02 Pages)**
ii. **Minutes of Meeting (MOM) on Technical issues -Appendix-B (03 Pages)**
iii. **Minutes of Meeting(MOM) on QA&I issues - Appendix-C (30 Pages)**
iv. **Minutes of Meeting (MOM) on Safety issues – Appendix-D (04 Pages)**
v. **Minutes of Discussions (Commercial) -Appendix-E (21 Pages)**

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MINUTES OF POST BID DISCUSSIONS (COMMERCIAL) HELD BETWEEN NTPC LIMITED (NTPC AND GE POWER INDIA LIMITED (GEPIL) ON 26.12.2018 FOR FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE UNDER LOT-2 (AS PER COMMON BIDDING DOCUMENT NO. CS-0011 109(2)-9.

PRESENT

NTPC	**GEPIL**
Mr. Naveen Jain, GM (CS-I& P&S) Mr. V. N. Jain, GM (Fin.) Mr. P K Singh, AGM (CS-I) Mr. Binay Mallik, AGM (CS-I) Mrs Priyanka Kumari, Sr. Manager (CS-I)	Mr. Lalit Sankarni, Executive (Business Operations) Mr. Roshan Singh, Lead Manager (Sales)

With reference to GEPIL Envelope-I (Techno-Commercial) Bid Ref No. **QFECS1326662 dated 3rd December 2018** submitted online for Flue Gas Desulphurization (FGD) System Package for Lot-2 Projects, discussions were held between GEPIL and NTPC at NTPC EOC, NOIDA, wherein the following have been agreed to with respect to Projects under FGD Lot-2:

1.0 GEPIL confirmed that all Deviations/ Exceptions/Variations, if any, explicit or implicit contained in their proposal with respect to NTPC's bidding documents including its Amendments/Clarifications/Errata shall stand withdrawn. Further, GEPIL confirmed that they would execute the work strictly as per the provisions of the Bidding Documents including its Amendments/ Clarifications/Errata in case of award.

2.0 GEPIL in **Attachment 4** has stated that the facilities viz. all plant and equipment to be supplied and installed and services to be carried out under the flue gas desulphurisation package for TALCHER, SIMHADRI, SIMHADRI Projects. However, during the discussion GEPIL confirmed that the facilities offered are eligible facilities and conform to the Bidding Documents for TALCHER, SIMHADRI, SIPAT Projects.

3.0 GEPIL confirmed that any additional **Special Maintenance Tools & Tackles**, other than those indicated by them at **Attachment-4A**, required for the equipment supplied under this package shall be furnished by them at no extra cost to NTPC, in case of award.

4.0 GEPIL submitted details with regard **to Erection Tools & Plant and Safety Equipments & Safety Personnel Protective Equipments (as required in Attachment-10)**. Further, GEPIL confirmed that they will deploy the quantity and type of tools and equipment as per the requirement of NTPC and agreed to bring more equipment, if so warranted, in the opinion of the Project Manager. Further, with regards to Safety issues including bringing the minimum suggestive Safety Equipments & Safety Personal Protective Equipments to site, separate Minutes of meeting are being finalized by GEPIL with Safety department of NTPC.

Priyanka

5.0 GEPIL submitted **a list of Commissioning/Start-up Spares (Attachment-11)** and further confirmed that they shall ensure the availability of the required quantity of Commissioning spares, in line with the Bidding Documents, without any additional cost before start-up/initial operation.

6.0 With reference to **Attachment-16**, GEIPL has confirmed that they will submit the value of all indices for Price Adjustment as per Appendix-2 Section VII book 3 of 3 of bidding document during the signing of Contract agreement.

Appendix-A
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MINUTES OF POST BID DISCUSSIONS (COMMERCIAL) HELD BETWEEN NTPC LIMITED (NTPC) AND GE POWER INDIA LIMITED (GEPIL) ON 26.12.2018 FOR FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE UNDER LOT-2 (AS PER COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9.

7.0 With regards to the Work Schedule, GEPIL confirmed that they shall strictly adhere to the Work Schedule specified in the BDS and comply to the requirements stipulated in the Bidding Documents in this regard.

8.0 GEPIL has confirmed that they have carried out a comprehensive assessment of the capacity and capability of **M/s General Electric Company, USA** Associate/Collaborator/QFGDM for packages under FGD LOT-2 and confirmed that **M/s General Electric Company, USA** have sufficient capacity and capability to execute the scope of work as per the provisions of the Bidding Documents.

9.0 It was agreed by GEPIL that these discussions with them on their Techno-Commercial offer shall not be construed by GEPIL that they have been considered qualified and eligible for calling/opening of their price bid and award.

(NTPC) **(GEPIL)**

Appendix-B
Page 1 of 3

ANNEXURE-II

MINUTES OF POST BID TECHNICAL DISCUSSIONS BETWEEN NTPC LIMITED & GE POWER INDIA LTD. IN RESPECT OF TECHNO COMMERCIAL BID PROPOSAL FOR FLUE GAS DESULPHURIZATION SYSTEM PACKAGE FOR LOT-2 PROJECTS AT ENGG. OFFICE COMPLEX, NTPC, NOIDA ON 19.12.2018

Participants:

NTPC LIMITED	GE POWER INDIA LTD.
Udayan Kumar GM (PE-Mech/SG)	Lalit Sankrani Executive Business Operations
Deepak AGM (PE-Mech/SG)	Naresh Sharma Manager (Commercial Proposal)
P.K.Gupta AGM(PE-Mech/SG)	Prashant Sapkal Lead Project Engineer
P. K. Behera DGM (PE-Mech/WS)	Sunil Sahu Manager (Commercial Proposal)
Pramod Chandra Nath DGM (PE-Mech/Piping)	Hiren Nariyelwala Manager (Sales)
Prabhat Ranjan Deen Sr. Manager (PE-Mech/Layout)	Roshan Singh Manager (Sales)
Md Suhel Khan Sr. Manager (PE-Mech/SG)	
Sujeet Kumar Sr. Manager (PE-Mech/MH)	
Anuj Kumar Shahi Sr. Manager (PE-Mech/PU)	
Raj Seth Sr. Manager (PE-C&I)	
Kuntal Bhuiyan Manager (PE-Electrical)	
Abuzar Ahmed Manager (PE-Civil)	
Adarsh Agarwal Manager (PE-Mech/SG)	

FGD System Package for Lot-2 Projects covers seven (7) projects and GE have furnished bids for three (3) projects namely Sipat STPS Stage-I (3x660 MW), Talcher Stage-I&II (2X500 MW+4X500 MW) and Simhadri Stage-I & II (2X500MW+2X500 MW). Further, GE has declared to be interested in taking award of only two (2) projects as per Attachment-1A. Based on the discussion between NTPC and GE on submitted bids for three (3) nos. of projects, following agreements were reached.

1. **Compliance to Tender Documents:**
GE confirmed that all deviations, variations, exceptions and clarifications with respect to the NTPC specification contained in their bid proposal, implicit or explicit, except those specifically agreed herein, stand unconditionally withdrawn without any cost implications to NTPC. GE further confirmed that all work shall be performed by them in total conformity with the Technical Specification, Bid Document No. CS-0011-109(2)-9 including its amendments/clarifications issued by NTPC from time to time for FGD System Package for Lot-2 Projects.

2. **FGD System Layout:**
With regard to Project wise Layouts for FGD system, NTPC pointed out that, some of the equipment/facilities indicated in bidder's layout are outside the specified area for FGD in GLP included in tender document. GE stated that the layouts submitted in the bid are indicative and final layout showing arrangement of equipment shall be finalised during detailed engineering. Further, GE confirmed that final layout shall be such that all equipment for FGD system shall be located within the identified space in GLP as included in technical specification.
Further, the layout shall be prepared such that the noise levels of equipment covered under this contract shall not exceed the ambient noise standards specified by CPCB (i.e. 55 dBA in day time and 45 dBA in night time) in nearby residential areas such as Township etc.

3. **Provenness Criteria:**
GE has indicated name of the sub-vendors in the bid. GE confirmed that complete provenness data along with end user certificates as per Sub-section I-A, Part-A, Section-VI of the bidding documents to establish the provenness of the systems, equipment, auxiliaries and bought out items shall be submitted to NTPC for review and approval, in case of award, within time schedule as indicated in biding documents along with Deed of Joint Undertaking (DJU), if required, before placement of order on the sub-vendor.

4. **Technical Data Sheet**
NTPC stated that GE has not furnished most of the data in the Bid Data Sheet and has indicated 'During Detailed Engineering' at many places.GE has also indicated "Refer attached Curves" in the bid data sheet which are not attached. GE agreed to furnish the complete data sheet including missing data, which could not be finalised and given at the bidding stage, within four weeks after award of contract in case of award.

5. **Special Maintenance Tools & Tackles:**
GE has furnished the list of special maintenance tools and tackles in Attachment-4A. NTPC asked GE to furnish the justification for the completeness of the list. GE stated that the items covered under the list are exhaustive and are as per their practice adopted in earlier projects. However, in case any additional maintenance tools and tackles are required at a later stage, same shall be supplied to NTPC without any additional cost implication.

6. **Performance Guarantee & Demonstration Parameters:**
GE has indicated demonstration parameters in Attachment-9B for various guaranteed parameters. GE stated that the guaranteed figures for Booster fan head, Wet Ball Mill capacity and Vacuum Belt filter capacity are indicative value. GE agreed that in case any chage during detailed engineering (w.r.t. the guaranteed figures) in line with technical specification requirement, the same will be considered for guarantee [illegible]

GE has informed that vacuum belt filter capacity indicated in attachment-9B for Sipat project is 69.5 T/hr which is on dry basis and confirmed that the corresponding value with 10% moisture (wet basis) shall be 77.2 T/hr. Accordingly vacuum belt filter capacity will be demonstrated.

7. **Specific Confirmations:**

GE made following specific confirmations with regard to their proposal to emphasize their commitment/focus on issues.

i. GE confirmed that mandatory spares shall be included and supplied in line with the specification requirements.

ii. GE confirmed that number of flue in the stack, Stack height and its location shall be in line with the specification requirements.

iii. GE confirmed that terminal points shall be in line with the specification requirements.

iv. GE confirmed that erection strategy for FGD System of the awarded project shall be furnished by them after award.

v. GE confirmed that the duct lining from absorber outlet to chimney shall be in line with specification and not flake glass lining which was inadvertently declared in data sheet.

vi. GE confirmed that the max purge flow rate to waste water treatment system shall not be more than 12 m^3/hr for 660 MW Unit and 10 m3/hr for 500 MW unit averaged over a 24 hour period.

19/12/2018

Md. Sohel Khan (NTPC)

(GE)

Sunil Kumar Sahu

Chiren J. Narlyelu

MINUTES OF MEETING OF POST BID DISCUSSIONS HELD AT NTPC EOC OFFICE, ON 19/12/2018 BETWEEN NTPC LTD AND M/s GE POWER INDIA LTD. REGARDING QA&I ISSUES FOR FGD SYSTEM PKG. FOR LOT-2 PROJECTS (7 PROJECTS)

BID DOCUMENT NO. CS-0011-109 (2)-9

Present:

M/s NTPC Ltd.		M/s GE POWER
K K Chattopadhyay, (GM/QA)	S K. Lal, AGM(QA)	Suryya Nath Choudhury, HOD/Quality ECS
Sankar Bajal, AGM(QA)	Mukesh Kashyap –DGM(QA)	Abhimanyu Sharma, Manager-Tendering
B C Roy, AGM(QA)	S. N. Tripathy –DGM(QA)	Roshan Singh, Manager- Sales
K J Rao, AGM(QA)	M Khaliquzzama, DGM (QA)	
Alok Srivastav, AGM(QA)	Manan Sharma, Sr Manager (QA)	
Nishith Agarwal, AGM(QA)	Ankush Birla, Manager (QA)	

Following was discussed and agreed:

1.0 Deviation in Bid:

M/s GE POWER confirmed that there are no deviations in the bid w.r.t. QA&I requirements of the tender. M/s GE POWER shall comply with the QA&I requirements, as contained in the bid documents.

2.0 Sub-Contractors/ Sub-Vendors/ Sub-Suppliers:

In exercise of provisions of Cl. 19.1 of GCC (General Conditions of Contract), NTPC-QA will control the items/Systems as listed below, for the purpose of acceptance of their suppliers:

SN.	Item/system	SN.	Item/system
1	Booster Fans	15	FGD Tie Transformer(100 MVA 220/34.5kV)
2	Slurry Recirculation Pumps	16	Auxiliary Oil Filled Transformers
3	Oxidation Blowers	17	Switchyard 220KV Equipment(220kV Circuit Breakers, 220 kV Instrument Transformers, 220kV Disconnectors, 220kV Surge Arrestors)
4	Wet Limestone Grinding Mills	18	Control & Protection (for Switchyard)
5	Slurry Pumps	19	Control & Instrumentation(C&I) Equipments / Systems
6	Agitators	20	RO based Desalination Plant Equipment/Systems for FGD
7	Vacuum Belt Filters	21	Water Pre-treatment Equipment/Systems for FGD
8	Limestone Sampling System	22	Oil Free compressor(HVAC)
9	Agency for civil works	23	Gear Box for Limestone/Gypsum handling system
10	Design agency for civil & steel structural works	24	Fluid Coupling for Limestone/Gypsum handling system
11	HT motor- booster fan motor	25	Crusher for Limestone/Gypsum handling system
12	LT Switchgear	26	Conveyor belt for Limestone/Gypsum handling system
13	33KV/11KV/6.6KV/3.3KV Switchgears	27	Analyzers for FGD
14	Numerical relays & Net working	28	Control Systems for FGD

Jagannohan NTPC

The process of vendor approval of the above items shall be as under:

i) In case the item is also covered under Sub QR list, the proposed vendors for the same shall be accepted by QA after acceptance of the vendor by NTPC Engg. For these items, M/s GE POWER will submit the relevant vendor details of the proposed vendors for sub QR clearance to NTPC PE.

ii) For the item not covered under Sub QR but has been listed in above table, NTPC approved vendors shall only be employed by the main contractor. A list of proposed vendors for such items have been placed at **Annex-I** to this MOM. List of NTPC approved vendors against similar package/item has shared with the main contractor to enable him to consider the same, if he so wishes. However, the main contractor has specifically advised to carry out his own due diligence before consider the sub vendor previously known to NTPC. List of sub vendors placed at Annex I has been drawn with 'A' identified against such vendors previously known to NTPC. M/s GE POWER agreed to comply with the NTPC approval conditions, if any, for vendors identified with "A" in this list. For vendor proposals where status of proposal is in "DR" category (details required, as NTPC does not have any past experience with them) in the above mentioned list, M/s GE POWER agreed to furnish the following details of such proposals, in NTPC Formats (copies handed over), **in time bound manner, so as not to impede the progress of the Project/ Works -**

i. Duly Filled Main supplier Evaluation Report.
ii. Duly Filled Sub-Supplier Questionnaire.
iii. Factory Registration Certificate.
iv. Overall Organization Chart with Manpower details (Design, Manufacturing, Quality etc.)
v. Supply reference list of the Sub-Supplier indicating similar product supply order reference no., customer name, rating of product, date /year of supply, date / year of commissioning.
vi. List of Manufacturing Equipment available with sub vendor.
vii. List of Testing Equipment available with sub vendor.
viii. Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any.
ix. Details of Outsourced Manufacturing Processes, if any.
x. Quality control exercised during receipt, in-process & final inspection.

M/s GE POWER will furnish the required details, as detailed out above, of the proposed Manufacturer/ Sub-Vendor, along with their own detailed recommendations, in the NTPC-formats (copies handed over). NTPC informed that proposals/ details shall be received only up to **3 months prior to ordering date of the concerned item (L-2 Network/ BOI Schedule),** for NTPC review and assessment. M/s GE POWER will accordingly plan the submissions.

It is understood that in terms of provisions of Cl. 19.1 of GCC (General Conditions of Contract), in case M/s GE POWER opts for additional Vendor proposals, over & above the agreed list herein, may be given by M/s GE POWER, in sufficient time, so as not to impede the progress of the work. Accordingly, all such proposals along with required details (as given above), shall be received only up to **3 months prior to ordering date of the concerned item/ Scheduled start of the Manufacture of Self Manufactured Item,** for NTPC review and assessment.

iii) In case the item is not covered under Sub. QR and list of items at sl. No. 2.0 above, the vendors proposed for the same shall be accepted based on Main Contractor's certification regarding past experience with the vendor for supply of similar items. The certification to be submitted to NTPC, before placing the order on the vendor. In case, proposed vendors for such items are not having past experience with Main Contractor, these vendors shall be assessed by the Main Contractor for their capability, and the assessment report shall be submitted to NTPC for reference & record, before placing order on the vendor.

iv) During detailed engineering, NTPC QA will review list of all items to be used for completion of FGD system pkg. Based on its review, NTPC will decide the inspection categorization of all items. There will be 3 inspection categories of items –

a) CAT-I: For these items the Quality Plans are approved by NTPC and the final acceptance will be after physical inspection witness by NTPC.

b) CAT-II: For these items the Quality Plans approved by NTPC. However no physical inspection shall be done by NTPC. The final acceptance by NTPC shall be on the basis review of documents as per approved QP.

c) CAT-III: For these items Main Contrator approves the Quality Plans. The final acceptance by NTPC shall be on the basis certificate of conformance by the main contractor.

It is clearly understood that NTPC reserves the right to conduct Surveillance Inspection/ Audit of the material, which are identified in Cat-II/ Cat-III, to verify the effectiveness of Quality System of M/s GE POWER and conformance of the offered lot, to the applicable Standards/ requirements. It is agreed that M/s GE POWER will submit the copies of unpriced Purchase Order (as provided in GTR) of the orders placed on vendors for the items other than those listed in table at Sl. No. 2.0 above, to NTPC for the purpose of surveillance audit, if desired by NTPC, **prior to issue of Despatch Clearance of the concerned item.**

3.0 The schedule of submission and approval of QP shall be finalized within three weeks of effective date as per LOI/NOA of the contract. The schedule shall be dovetailed with L2 network in such a manner the QP is approved at least 6 weeks prior to scheduled start of manufacturing of the respective item and FQP is approved at least three months before scheduled start of field activity.

4.0 M/s GE POWER confirmed that they shall deploy appropriate Batching Plant for producing Concrete, which will be having digitized recording system. This plant shall be calibrated with NPL traceable weights. The plant shall have the facility of delivering the output on recorder, giving separate details of the various constituents (cement, aggregate, water, admixtures, fly ash etc.) in each batch of concrete being produced.

5.0 M/s GE POWER confirmed that for Schedule-I/ Schedule-II supplies, orders shall be placed suitably on approved Sub-Vendors' manufacturing location (Foreign/ Indigenous), keeping the Contractual requirements in view.

6.0 M/s GE POWER confirmed that the QA Documentation Package shall include copy of approved Data Sheets/ Drawings & QP, along with all Material Test Certificate (MTCs), CHPs, Material Dispatch Clearance Certificate (MDCCs) for all items. The same shall be reviewed by M/s GE POWER for its completeness and only thereafter it shall be submitted to NTPC.

7.0 M/s GE POWER confirmed that requisite storage facilities for the equipment/materials shall be established by M/s GE POWER at site prior to receipt of equipment/material at site, after allotment of land by NTPC. For this purpose, requisite storage plan and schedule for the same shall be agreed between M/s GE POWER and NTPC site within 3 months of effective date as per LOI/NOA.

8.0 M/s GE POWER confirmed that similar to supply portion of the work, the non-conformities observed during field erection activities shall also be dispositioned according to NTPC's NCR dispositioning system in the prescribed format of NTPC.

9.0 A QA&I coordination procedure has been mutually agreed upon and has been placed as annexure to this MOM.

(NTPC)

(GE POWER)

(SURYYAN CHOWDHURY)
GE - POWER

QA CO-ORDINATION PROCEDURE for FGD SYSTEM PKG. OF LOT -2 PROJECTS (7 PROJECTS)

1. **PURPOSE:**

This document specifies procedure to be adopted for the coordination of QA&I activities relating to FGD System pkg. of Lot-2 projects (7 projects) to satisfy the QA&I requirements laid down in contract.

2. **SCOPE:**

This document specifies procedure of:

- Vendor Approval
- Quality Plan - Bought-out items/Manufacturing items approval/finalization.
- Field Quality Plan approval/finalization.
- Inspection/Testing of equipments/items.
- Dispositioning of Non-conformities.
- Dispatch clearance of equipments/items.
- QA documentation Package
- Quality audit & surveillance.

3. **DEFINATIONS:**

3.1 **NTPC Inspector:** Means NTPC's Own Inspector/duly authorized third party inspection agency.

3.2 **Resident Inspector:** Means NTPC's own inspector posted in the country of origin of the equipment or manufacturing works. NTPC Inspectors at Regional Inspection Offices near the works of GE POWER and at other Regional Inspection Offices are considered as resident inspectors.

4. **PROCEDURE:**

4.1 **CO ORDINATORS AND CORRESPONDANCE**

4.1.1 Overall QA coordinator of GE POWER for this contract shall be informed within four week's of LOI / effective date of contract.

4.2 **VENDOR APPROVAL**

4.2.1 List of items requiring vendor approval is identified and enclosed with LOA. The List contains, the vendors as proposed by GE POWER, and acceptable vendors to NTPC are marked with "A" as APPROVED. Vendors not known to NTPC for which details are required to be submitted by GE POWER as per agreement are marked 'DR'. Other information regarding vendor approval is as per agreed MOM.

4.2.2 GE POWER shall submit the complete vendor details for "DR" Category vendors (in NTPC prescribed format) as per MOM.

4.2.3 Upon receipt of complete vendor details, NTPC shall review and respond expeditiously.

4.2.4 Monthly progress report of vendor approval for vendors identified in 'DR' category shall be furnished by GE POWER overall coordinator.

4.2.5 Within three weeks of release of purchase order for bought out items/ components, GE POWEI shall furnish to NTPC a copy of the purchase order without price details but together with detailed purchase specification, QP and delivery conditions.

4.3 QUALITY PLANS

4.3.1 List of items requiring approval of quality plans shall be finalized by NTPC during detailed engineering.

4.3.2 GE POWER shall finalize a realistic schedule of submission of QPs based on project requirements prior to LOA which shall be incorporated on L-2 network.

4.3.3 GE POWER shall submit to NTPC, the Quality Plans with reference documents as per schedule of submission. The final submission of Quality Plans shall be furnished to NTPC in NTPC's online system C folder.
The quality plans shall be submitted for Cat-I & II items as per with additional essential attributes as per NTPC requirement (quantum of check, acceptance norms). Vendor's name may be provided on separate sheet attached with QAP.
Extracts of reference documents will be annexed. However, any other interlinking documents mentioned in the extracts can be viewed by NTPC in GE POWER/ collaborator's works.
Acceptance criteria shall be reviewed by NTPC in case of deviation from NTPC specification.
For other equipment, quality plans shall be submitted in NTPC format during execution phase for approval. Witness points / documentation requirements shall be mutually agreed.

4.3.4 Reference documents which were already submitted along with MQP/RQP/SQP for the earlier projects need not be submitted provided there is no change/revision in the document submitted last, whereas for the new/fresh MQP/RQP/SQP, the relevant documents shall be submitted along with the above Quality plans. Resubmission of RQP/SQP shall be done wherever changes are made in the already approved RQP/SQP for the earlier projects.

4.3.5 RQP/SQP shall be furnished along with all reference documents such as purchase specification, drg, data sheet, test procedure, plant standards, etc. In case where RQPs are already finalized, GE POWER shall confirm that items required for Lot-2 FGD projects (7 projects) is exactly same or shall state minor changes that are applicable. For exactly same items, RQPs already finalized shall be made applicable for Lot-2 FGD projects (7 projects) also.

4.3.6 Monthly progress report of quality plan submission/approval shall be furnished by GE POWER overall coordinator in attached format.

4.4 FIELD WELDING AND FIELD QUALITY PLAN

4.4.1 The field quality plan for equipment and services shall be furnished by GE POWER and their Vendors, so as to finalize the same at least 2 months prior to start of work and shall include the quality practices and procedures followed by them during various stages of site activities from receipt of material/equipment till final erection. The list of FQP to be approved by NTPC shall be tied up during execution.

4.4.2 The welding consumable approved by OEM/Main contractor shall be used for site welding.

4.4.3 M/s GE POWER's FQA manpower deployment shall be tied up after award.

4.5 INSPECTION

4.5.1 The notice period for inspection of materials/components/equipments for witnessing of the CHP stages by NTPC at the vendor's works shall be as follows:

(a)	Vendors of Indian origin	-	10 working days.
(b)	Vendors of Foreign origin	-	45 days

4.5.2 All the matters regarding inspection call shall be coordinated as follows:

4.5.4.1 **For supplies of other than Indian origin:** GE POWER shall issue inspection call notice to NTPC-QA coordinator.

4.5.4.2 **For supplies of Indian origin:** GE POWER/ their vendors will issue an inspection call to the concerned NTPC-RIO office. GE POWER's relevant offices shall closely co-ordinate with NTPC RIO for inspection of bought out items.

4.5.5 Where witnessing of the test is waived off in writing by NTPC, GE POWER/vendors shall proceed with the test which shall be deemed to have been carried out in the presence of NTPC inspector and shall forward duly certified copies of the test reports to the concerned NTPC inspection office as follows:

a. For the tests conducted within the GE POWER's premises shall be within one week
b. For the tests conducted at vendors' premises shall be within two weeks.

In case of any objection, the concerned RIO office shall notify the same to the concerned GE POWER/vendors within 5 working days from receipt of the test reports.

4.5.6 For the witnessed tests, when the factory test at identified CHP stages have been satisfactorily completed including computation of test results wherever applicable, NTPC inspector shall sign jointly with GE POWER/vendors/authorized representative(as applicable as per approved QAP) on the CHP Clearance/Interim Inspection report in the format .

4.5.7 For the witnessed tests, in case of deviation, NTPC inspector shall convey their non-conformities in writing on the CHP report itself for clarification by GE POWER/Vendors, who shall give due considerations to the objections raised and shall take corrective measures (as per the procedure laid down in clause 4.7 after due approval from NTPC) to rectify the non-conformities and shall confirm in writing to the concerned inspection office on rectification of the objections raised. However decision of NTPC shall be final and binding upon GE POWER/vendors within the purview of the contract requirements.

4.5.8 GE POWER will make available to the NTPC inspector their relevant documents and plant standards/procedure relevant to the checks/tests carried out on material/items equipments. Further, GE POWER/vendors shall also ensure the availability of approved drawings/data sheets and approved Quality Plan at the place of inspection.

4.5.9 **INSPECTION PLAN:** To facilitate advance planning of inspection of supplies, in addition to giving inspection notice at identified CHP stages as per approved QAP, GE POWER shall furnish three monthly rolling inspection programme every month indicating schedule dates of inspection at identified CHP stages. Such a programme shall be updated each month and a copy of the same is made available to the resident inspector/RIO as applicable. Such programme shall be confirmed by specific inspection call in accordance with clause 4.5.1 above.

4.5.10 Three monthly inspection programme for shop manufactured & BOIs shall be furnished directly to respective NTPC-RIO.

4.5.11 GE POWER contracts/commercial/QA shall furnish monthly Inspection status report for previous month including pending calls and exception reports/NCR on or before 7th of every month.

4.6 **QUALITY AUDIT: GE POWER/VENDORS** shall provide the necessary facilities to NTPC inspector/team for carrying out of the Quality Surveillance and Audits as envisaged in the contract.

4.7 NON-CONFORMITY DISPOSITIONING PROCEDURE:

4.7.1 Whenever any deviation is observed with respect to relevant document and good Engg practices, the same shall be referred along with justification to NTPC office where inspection call has been raised by GE POWER/vendors. The details shall be furnished in the format attached for NTPC review and necessary action. NCR can be raised irrespective of the CHP stages to the concerned inspection office in whose jurisdiction the item/equipment is being manufactured.

4.7.2 Non-conformities with respect to the site activities shall also be dealt with similarly except that the NCR in the specified format shall be routed through NTPC-FQA group.

4.8 **Material Despatch Clearance Certificate (MDCC)** upon satisfactory completion of all tests/inspection including type test as required by the approved documents (Cat-1 approved Quality Plan drawing/data sheet as applicable). NTPC inspector/Authorized Representative shall issue the MDCC in prescribed format attached against approved BBU

4.8.1 Responsibility for Issuing MDCC:

Before requesting NTPC for issuance of MDCC, GE POWER shall verify and confirm that the equipment meets the stipulated technical requirements as per the contract. In NTPC, the responsibility of issuing MDCC shall be as follows:

4.8.1.1 Where inspection by NTPC is envisaged in QP.

4.8.1.1(a) **INDIGENOUS SUPPLIES:**

The concerned Regional Inspection Office under whose jurisdiction the manufacturer is located. Inspecting Engineer or reviewing engineer (in case of waiver of presence of NTPC engineer) shall issue the MDCC.

4.8.1.1(b) **FOREIGN SUPPLIES:**

For items directly dispatchable to site from foreign manufacturer, the MDCC shall be issued by NTPC's inspecting engineer. In case of waiver of presence of NTPC engineer, the MDCC shall be issued by CQA Engineer on satisfactory review of test reports.

For items to be brought to GE POWER works from foreign manufacturer, before final despatch to site, MDCC shall be issued by relevant Resident Inspector/RIO after satisfactory activities at GE POWER works and on review of CHP report of NTPC's Inspecting Engineer for inspection at foreign manufacturer's works or on verifying acceptance report of CQA, incase of waiver of presence of NTPC Engineer for inspection at foreign source.

NOTE: MATERIAL inspected by RIO-A at the work of sub-contractor in their respective jurisdiction & dispatched to the works of the other contractor for assembly or otherwise in the jurisdiction of RIO-B for

final despatch to project site, shall be accorded despatch clearance on a CHP clearance report by RIO-A and the MDCC of the completed item/equipment will be issued by RIO-B as per the approved BBU.

4.8.1.2 In case only review of TC by NTPC has been envisaged as per approved QP, for such items test certificates shall be submitted to NTPC resident inspection in respect of GE POWER manufactured item and to concerned RIO where level-1 vendor is located for such BOIs, for issuance of MDCC. It is clarified that wherever multilevel vendors are not applicable, for bought out items of this category, GE POWER's shall submit the test certificate to NTPC's resident inspection.

4.8.1.3 In case where QP has not been envisaged, all such materials shall be cleared on the basis of COC from GE POWER. COC shall be submitted on similar line as per Clause No. 4.8.1.2.

4.8.1.4 As per Tech specification, no item shall be dispatched by GE POWER without obtaining MDCC from NTPC.

4.9 **QUALITY ASSURANCE DOCUMENTATION PACKAGES:** GE POWER shall submit to NTPC QA the Quality Assurance documents in two hard copies and two CD ROM.

4.10 **QP/INSPECTION CATEGORY :**

CAT – I: For those items the Quality Plans are approved by NTPC and final acceptance will be on physical inspection witness by NTPC.

CAT – II: For those items the Quality Plans are approved by NTPC. However no physical inspection shall be done by NTPC. The final acceptance by NTPC shall be on the basis of review of documents as per QP.

CAT-III: For those items main supplier approved Quality Plan. The final acceptance by NTPC shall on the basis of Certificate of Conformance by main supplier.

Further, as it is clearly understood that NTPC reserves the right to conduct Surveillance Inspection/ Audit of the material, which will be identified in inspection category Cat-II/ Cat-III by NTPC QA during detailed engg., to verify the effectiveness of Quality System of M/s GE POWER and conformance of the offered lot, to the applicable Standards/ requirements. It is agreed that M/s GE POWER will submit the copies of unpriced Purchase Order (as provided in GTR) of the orders placed on vendors for the items other than those listed in table at Sl. No. 2.0 above, to NTPC for the purpose of surveillance audit, if desired by NTPC, prior to issue of Despatch Clearance of the concerned item.

(NTPC)

(GE POWER)
(SURYYA CHOUDHURY)
GE Power

PROJECT : FGD SYSTEM PACKAGE LOT-2 PACKAGE: FGD PACKAGE SYSTEM SUPPLIER :GE Power CONT. NO.: CS-00011-109(2)-9	**LIST OF ITEMS REQUIRING QUALITY PLANAND SUB- SUPPLIER APPROVAL** SUB SYSTEM: MECHANICAL-BOP WS	DOC. No. : DATE: 21.12.2018 PAGE 1 OF 1

ITEM	QP/ INSPN CAT	QP NO. CS-	PROPOSED SUB- SUPPLIER BY MAIN CONTRACTOR	PLACE	SUB-SUPPLIER APPROVAL STATUS/ CATEGORY	REMARKS
OIL FREE SCREW COMPRESSOR			ELGI EQUIPMENTS	COIMBATORE	A	UP TO 74M3/MINUTE (AIR ENDS FROM HITACHI JAPAN), 45 M3/MINUTE FORM OWN
			ATLAS COPCO	PUNE.((SCREW ASSEMBLY FROM ATLOS COPCO , BELGIUM)	A	UP TOZR 630-MODEL CAPACITY 75 NM3/MINUTE
			INGERSOLL RAND	AHEMDABAD	A	UP TO 36 NM3/MINUTE

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TE-1 SYSTEM SUPPLIER / SUB-SUPPLIERSTATUS CATEGORY (SHALL BE FILLED BY NTPC).

For those items proposed vendor to NTPC. To be indicated with letter "A" in the list along with condition of approval, if any.

- 2. INSPECTION CATEGORY:

: For these items the quality plans are approved by NTPC and final acceptance will be after physical inspection witness by NTPC.
I : For these items the quality plans are approved by NTPC. However, no physical inspection will be done by NTPC. The final acceptance by NTPC shall be on the basis ew of documents as per QP.
II: For these items Main Supplier approves quality plans. The final acceptance by NTPC shall be on the basis of certificate of conformance by Main Supplier

21/12/18
NTPC Manan Sharma Sr. Mgr (QA)

(SURYYA CHOUDHURY)
Main Contractor
GE POWER

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PROJECT: FGD LOT-2	LIST AND STATUS OF ITEM REQUIRING QP AND SUB-SUPPLIER APPROVAL Sub systems: Mechanical				NTPC DOC NO	QA-MH-01
PACKAGE: FGD PACKAGE					REVISION NO	0
MAIN SUPPLIER: GE POWER INDIA					DATE	21.12.2018
CONTRACT NO.: CS-0011-109(2)-9						

	Item	QP/ Insp. Cat.	QP No.	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Remarks
	CRUSHER & VIBRATING GRIZZLY FEEDER FOR LIME/ GYPSUM HANDLING SYSTEM	I		PENNSYLVANIA CRUSHER CORPORATION	USA	DR	
		I		SANDVIK	FINLAND	DR	
		I		AMERICAN PULVERISER	USA	DR	
		I		TKII	PUNE	DR	
		I		L&T	KANSBAHAL	DR	
		I		TRF	JAMSHEDPUR	DR	
		I		ELECON	V V NAGAR	DR	
		I		MCNALLY SAYAJI	VADODARA	A	UP TO 660 TPH FOR CRUSHER
		I		MCNALLY SAYAJI	KUMARDHUBI	DR	
	FABRIC BELTING (FR GRADE)	I	RQP	PHOENIX CONVEYOR BELT	KOLKATA	A	UPTO 2200 MM WIDTH
		I		IMASS S.A	GREECE	A	UPTO 2400 MM WIDTH
		I		MRF	CHENNAI	A	UPTO 1600 MM WIDTH
		I	RQP	SEMPELTRAN NIRLON	MUMBAI	A	UPTO 1600 MM WIDTH
		I		HINDUSTAN RUBBER	SILVASA	A	UPTO 1600 MM WIDTH
		I		NORTHLAND RUBBER	SONEPAT	A	UPTO 2200 MM WIDTH.
		I		RAVASCO TRANSMISSION LTD.	VAPI	A	UPTO 2200 MM WIDTH
		I		ORIENTAL RUBBER	PUNE	A	UPTO 2200 MM WIDTH
		I		FORECH	CHENNAI	A	UPTO 2000 MM WIDTH
		I		YOKOHAMA	JAPAN	A	UPTO 2400 MM WIDTH
	HELICAL GEARBOX	I		SHANTI GEARS	COIMBATORE	A	Upto size 560
		I	RQP	ELECON	V V NAGAR	A	
		I		SIEMENS (FLENDER)	KHARAGPUR	A	
		I		PREMIUM TRANMISSION LTD	PUNE/FALTA	A	Up to size 710 / 450
		I		SIEMENS (FLENDER)	GERMANY	A	
		I	RQP	NEW ALLENBURY WORKS	KOLKATA	A	
	PLANETARY GEARBOX	I	RQP	ELECON	V V NAGAR	A	
		I		SIEMENS (FLENDER)	GERMANY	A	
		I		MOVENTAS	GERMANY	A	
		I		PREMIUM TRANMISSION LTD	PUNE/FALTA	DR	
		I		BREVINI	ITALY	A	
		I		SEW EURODRIVE GMBH & CO.	GERMANY	A	

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	PROJECT: FGD LOT-2	LIST AND STATUS OF ITEM REQUIRING QP AND SUB-SUPPLIER APPROVAL Sub systems: Mechanical				NTPC DOC NO	QA-MH-01
NTPC	PACKAGE: FGD PACKAGE					REVISION NO	0
	MAIN SUPPLIER: GE POWER INDIA					DATE	21.12.2018
	CONTRACT NO.: CS-0011-109(2)-9						
	Item	QP/ Insp. Cat.	QP No.	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Remarks
	FLUID COUPLING(TRACTION TYPE)	I	RQP	PREMIUM TRANMISSION LTD	AURANGABAD	A	
		I	RQP	ELECON	VV NAGAR	A	
		I		FLUIDOMAT	INDORE	A	
		I		VOITH(INDIA)	HYDERABAD	A	
		I		VOITH	GERMANY	A	
	FLUID COUPLING(SCOOP TYPE)	I	RQP	FLUIDOMAT	INDORE	A	UPTO SC-1330
		I		VOITH	GERMANY	A	
		I	RQP	PREMIUM TRANMISSION LTD	AURANGABAD	A	UPTO PST 1150
		I		ELECON	V V NAGAR	A	UPTO MODEL ESC 760
		I		VOITH(INDIA)	HYDERABAD	A	UPTO SVNL 1330
	LIMESTONE SAMPLING SYSTEM	I		EAST MAN CRUSHER	KOLKATA	DR	
		I		ADVANCE SYSTEMS SAMPLING	KOLKATA	DR	

GENDS

YSTEM SUPPLIER/SUB-SUPPLIER APPROVAL STATUS CATEGORY (SHALL BE FILLED BY NTPC)

For these items proposed vendor is acceptable to NTPC. To be indicated with letter "A" in the list alongwith the condition of approval, if any.

– For these items "Detailed required" for NTPC review. To be identified with letter "DR" in the list.

TED – For these items vendors are approved by Main Supplier and accepted by NTPC without specific vendor approval from NTPC. To be identified with "N'

P/INSPN CATEGORY:

-I : For these items the Quality Plans are approved by NTPC and the final acceptance will be on physical inspection witness by NTPC.

-II : For these items the Quality Plans approved by NTPC. However no physical inspection shall be done by NTPC. The final acceptance by NTPC shall be on the basis review of documents as per approved QP.

-III : For these items Main Supplier approves the Quality Plans. The final acceptance by NTPC shall be on the basis certificate of conformance by the main supplier.

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GE POWER

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
NTPC	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		

Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
1	Power Transformer (Oil Filled) -Tie Transformer					ABB	Vadodara	DR		up to 765 kV Class	SUB-QR ITEM
						CG Power & Industrial Solutions Ltd	Mandideep	DR		Up to 765 kV class	SUB-QR ITEM
						GE T&D India Limited	Vadodara	DR		Up to 765 kV class including Shunt Reactor, Approval Conditions Apply	SUB-QR ITEM
						BHEL	Bhopal	DR		up to 400 kV Class	SUB-QR ITEM
						GE T&D India Limited	Naini	DR		up to 400 kV Class	SUB-QR ITEM
						TELK	Angamally, Kerala	DR		up to 400 kV Class	SUB-QR ITEM
						Toshiba	Hyderabad	DR		up to 400 kV Class	SUB-QR ITEM
						CG Power & Industrial Solutions Ltd	Kanurmarg	DR		up to 400 kV Class	SUB-QR ITEM
						EMCO	Thane	DR		up to 400 kV Class	SUB-QR ITEM
						Siemens	Mumbai	DR		up to 400 kV Class	SUB-QR ITEM
						BHEL	Jhansi	DR		Up to 220 kV Class	SUB-QR ITEM
2	Oil Filled Transformer	I				GE T&D	ALLAHABAD	DR			SUB-QR ITEM
						ABB	VADODARA	DR			SUB-QR ITEM
						SIEMENS	NAVI MUMBAI	DR			SUB-QR ITEM
						CG Power & Industrial Solutions Ltd	KANJUR MARG	DR			SUB-QR ITEM
						EMCO	THANE	DR			SUB-QR ITEM
						TELK	ANGAMALY (KERALA)	DR			SUB-QR ITEM
						BHEL	JHANSI	DR			SUB-QR ITEM
						TOSHIBA	HYDERABAD	DR			SUB-QR ITEM
						Schneider	Vadodara	DR			SUB-QR ITEM
						T & R	Ahmedabad	DR		Up to 50 MVA, 132 kV Class	SUB-QR ITEM
						Prime Meiden Ltd	Nellur	DR		Up to 90 MVA, 132 kV Class	SUB-QR ITEM
						CG Power & Industrial Solutions Ltd	Malanpur	DR		up to 63 MVA, 132 kV Class	SUB-QR ITEM
						ECE	Sonepat	DR		up to 7.5 MVA, 33 KV Class	SUB-QR ITEM
						Andrew Yule	Chennai	DR		up to 4.0 MVA, 11 KV Class	SUB-QR ITEM
						EMCO	Jalgaon	DR		up to 10.0 MVA, 33 KV Class	SUB-QR ITEM
						EMCO	Umala	DR		Up to 16 MVA, 33 kV Class	SUB-QR ITEM
						Essenar	Medak	DR		up to 2.0 MVA, 33 KV Class	SUB-QR ITEM
						Indotech Transformers	Chennai	DR		Up to 16 MVA, 66 kV Class	SUB-QR ITEM
						Kanohar	Meerut	DR		Up to 16 MVA, 11 KV Class	SUB-QR ITEM
						Kirloskar	Mysore	DR		Upto 16 MVA, 33 kV Class	SUB-QR ITEM
						Kirloskar	Pune	DR		up to 16 MVA, 33 kV Class	SUB-QR ITEM
						Kotsons	Agra	DR		up to 2.0 MVA, 33 KV Class	SUB-QR ITEM
						KRYFS Power Components Ltd	Silvassa	DR		up to 2.5 MVA, 11 KV Class , Approval Conditions Apply	SUB-QR ITEM
						Hammond Power Solutions	Hyderabad	DR		Up to 2.5 MVA, 33 KV Class	SUB-QR ITEM
						Raychem RPG	Pune	DR		up to 10.0 MVA, 33 KV Class	SUB-QR ITEM
						Sudhir Transformer	Bangalore	DR		Up to 5 MVA, 33 kV Class	SUB-QR ITEM
						SUDHIR POWER LTD	SILVASSA	DR		Up to 12.5 MVA, 33 kV Class	SUB-QR ITEM
										Up to 12.5 MVA, 33 kV Class	SUB-QR ITEM

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
NTPC	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
l No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
						Technical Associate Ltd	Sitarganj	DR		up to 16 MVA, 33 kV Class, Approval Conditions Apply	SUB-QR ITEM
						Tesla, Unit-2	23-A, B-Sector, Industrial Area, Govindpura, Bhopal	DR		up to 5.0 MVA, 33 KV Class	SUB-QR ITEM
3	L T (415 V) Motors	See Note-2				CGL	Ahmednagar	A			
						MARATHON	KOLKATA	A			
						SIEMENS	MUMBAI	A			
						JYOTI	BARODA	A			
						BHARAT BIJLEE	NAVI MUMBAI	A		Upto 690 V, 500 KW for Inverter Duty & upto 415V, 200 KW for Non-Inverter Duty	
						ABB	FARIDABAD	A		UPTO 55KW	
						ABB	BANGALORE	A		55KW – 200KW	
						NGEF	BANGALORE	A		UPTO 15KW	
						KEC	BANGALORE	A			
						KEC	HUBLI	A		UPTO 90KW	
						LHP	SOLAPUR	A		UPTO 120KW	
4	GEARED MOTOR	II				PETL	AURANGABAD	A		Motor to be supplied from NTPC approved sources	
						PBL	VV NAGAR	A			
						INTERNAL COMBUSTION	Aurangabad	A			
						NEW ALLENBURRY WORKS	Kolkata	A			
5	HT MOTOR	I				ABB	VADODARA	DR		Upto 6.6kV, 2500kW & 11kV, 2000kW	SUB-QR ITEM
						MARATHON	KOLKATA	DR		Upto 11kV,1600kW	SUB-QR ITEM
						CGL(D5 Industrial Area)	MANDIDEEP	DR		Upto 6.6kV,1650kW & 11kV, 1350kW	SUB-QR ITEM
						CGL(Plot 9)	MANDIDEEP	DR		Upto 11kV, 4MW	SUB-QR ITEM
						BHEL	BHOPAL	DR			SUB-QR ITEM
						WEG	HOSUR	DR		Uptoo 11kV, 7000kW	SUB-QR ITEM
						SIEMENS	THANE	DR		Upto 690 V, 500 KW	SUB-QR ITEM
						KEC	BANGALORE	DR		3.3 kV, 240 kW	SUB-QR ITEM
						JYOTI	VADODARA	DR		Upto 6.6kV,2250kW	
6	VFD Motor	I				ABB	BANGALORE	A		Upto 690V, 250KW	
						MARATHON ELECTRIC MOTORS	KOLKATA	A		Upto 690V, 100KW	
						BHARAT BIJLEE	NAVI MUMBAI	A		UPTO 690V, 500 KW	
						SIEMENS	THANE	A		Upto 690 V, 500 KW	
	LT VFD Panel					Powertech	Sonepat	A		upto 55 KW with following conditions: i) VFD from Schneider- France, upto 415V, 50KW, ii) Enclosure & bought out items shall be from NTPC acceptable makes & 3) Engineering support for integration will be provided by M/s Schneider/ Authorized integrator of M/s Schneider	

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	Project : LOT-2			ELECTRICAL ITEMS					Doc No	:		
NTPC	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL					Rev No	:	CS-0011-109(2)-9	
	Supplier : GE								Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9								Page	:		
Sl No	ITEM DESCRIPTION	QP/ Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark		
7		I				DANFOSS	Oragadam	A		(upto 690V, 1200kW), VFD drives with VFD sourced from Danfoss-Denmark/USA and Panel sourced from Rittal		
						YASAKAWA	Japan	A		VFD from Yasakawa- Japan, Upto 415V, 132KW		
						ROCKWELL AUTOMATION-AB	SAHIBABAD	A		VFD from Rockwell(Allen Bradley)- USA, (Upto 415 V, 600 KW)		
						ABB	BANGALORE	A		VFD from ABB-Finland, Upto 690V, 750 KW		
						SIEMENS	NASIK	A		VFD from SIEMENS- Germany, Upto 690V,900KW		
						VACON	BANGALORE	A		VFD(NXP model) from VACON Finland, upto 400KW,415V and upto 900KW, 690V		
8	MV Switchgear panel up to 33 KV	I				Siemens	Mumbai	DR			SUB-QR ITEM	
						BHEL	Bhopal	DR			SUB-QR ITEM	
						Megawin	Salem	DR			SUB-QR ITEM	
						Jyoti	Vadodara	DR			SUB-QR ITEM	
						ABB	Nasik	DR			SUB-QR ITEM	
						L&T	Ahmednagar	DR			SUB-QR ITEM	
						Areva	Kolkata	DR		Upto 11 kV only	SUB-QR ITEM	
9	Indoor LT Switchgear Panel	I				Switching Circuits	Kolkata	DR			SUB-QR ITEM	
						Tricolite	Sahibabad / Manesar	DR			SUB-QR ITEM	
						Hindustan Control & equipment Ltd	Kolkata	DR		With fabrication & painting at unit II & MP Electrical Narendrapur	SUB-QR ITEM	
						Maktel	Vadodara	DR			SUB-QR ITEM	
						Jakson	Greater Noida	DR			SUB-QR ITEM	
						Vidyut Control	Gaziabad	DR			SUB-QR ITEM	
						Adlec Power	Rohad (Jhajjar)	DR			SUB-QR ITEM	
						Pyrotech	Udaipur	DR			SUB-QR ITEM	
						L&T	Mumbai / Coimbatore	DR			SUB-QR ITEM	
						GE	Bangalore	DR			SUB-QR ITEM	
						Siemens	Mumbai	DR			SUB-QR ITEM	
						C&S Electric	Noida / Hardwar	DR			SUB-QR ITEM	
						Nitya Electrocontrols	Noida	DR			SUB-QR ITEM	
						Control & Schematics	Hyderabad	DR			SUB-QR ITEM	
						Schneider	Nasik	DR		ACB from Schneider, France	SUB-QR ITEM	
	Numerical Relays for Switchgear (IEC 61850 Compliant)					SEL	Pullman, USA	DR				

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
		(with switch gear MQP)						DR			
						ALSTOM T&D	Stafford, UK	DR		P14X, P34X, P44X, P64X, P74X models only.	
						ALSTOM T&D	Chennai	DR		P14X, P34X, P44X, P64X, P74X models only.	
						GE Multilin	Zamudio, Vizcaya, Spain/ Markham, Ontario, Canada	DR	F 650 only		
10						Schneider	UK, France	DR	PX30 & PX40, VAMP 5X and VAMP 2XX models only.		
						ABB	Finland	DR			
						ABB	Baroda	DR	For 6XX Series		
						Siemens	Goa	DR	7SR2X,7SJ66X series only		
						Siemens	Germany	DR	7SX Series only		
	Wall mounted fixed type indoor/ outdoor LT Switchgear non compartmentalized Panel (Lighting panels / AC / DC Fuse boards / MCB boxes)										SUB-QR ITEM
						Control Devices	Kolkata	DR			SUB-QR ITEM
						Jasper	Noida	DR			SUB-QR ITEM
						Conquerent Control Systems	Manesar	DR			SUB-QR ITEM
						Havells	Faridabad	DR			SUB-QR ITEM
						Novateur Electrical & distribution systems	Murthal	DR			SUB-QR ITEM
11		I				Avaid Technovator	Manesar	DR			SUB-QR ITEM
						Additionally all vendors identified in seriel no. 8 are also acceptable		DR			SUB-QR ITEM
	1.1 KV AC/DC Power cable (PVC & XLPE)					Universal Cable Ltd.	Satna	A			
						NICCO	Shamnagar, Kolkata	A			
						Incab	Pune	A			
						Hindustan Vidyut Products	Faridabad	A			
						KEI Industries	Bhiwadi	A			
						Delton Cable Ltd	Faridabad	A		A)Unarmoured cable all sizes. B) Armoured cable up to 3.5 x 240 sq. Mm with GI strip armour and 1Cx70 sq mm with Al strip armour	
						Paramount Cable	Khushkhera	A			

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
12		I				Polycab Wires Pvt. Ltd	Daman	A			
						Gemscabs Industries	Bhiwadi	A			
						Cords Cables	Bhiwadi	A			
						Havells India Ltd.	Alwar	A			
						Sri ram Cables	Bhiwadi	A			
						Thermocables	Hyderabad	A			
						Sbee Cables	Bangalore	A			
						Suyog Cables	Vadodara	A			
						Finolex	Pune	A			
						Scot Innovation wires and cables	Baddi	A			
						Indo Alusys	Bhiwadi	A			
						Radiant Cables	Hyderabad	A			
	1.1 KV Control Cable					Universal Cable Ltd.	Satna	A			
						NICCO	Shamnagar, Kolkata	A			
						Incab	Pune	A			
						Polycab WiresPvt. Ltd	Daman	A			
						Hindustan Vidvut Products Ltd	Faridabad	A			
						KEI Industries	Bhiwadi	A			
						Delton Cable Ltd	Faridabad	A			
						Paramount Cable	Khushkhera	A			
						Gemscabs Industries	Bhiwadi	A			
13		I				Cords Cables	Bhiwadi	A			
						SPM Cables	Hyderabad	A			
						Elkav Telelink	Faridabad	A			
						Havells India Ltd.	Alwar	A			
						R.R. Kabel	Silvasa	A			
						Thermocables	Hyderabad	A			
						Finolex	Pune	A			
						Sbee Cables	Bangalore	A			
						Suyog Cables	Vadodara	A			
						Scot Innovation wires & Cables	Baddi	A			
						Indo Alusys	Bhiwadi	A			
						Radiant Cables	Hyderabad	A			
	H.T. CABLE Grade- upto 33kV					Apar Industries	Valsad	A			
						Finolex	Pune	A			
						Gemscab	Bhiwadi	A			
						Gupta Power	Kashipur	A			
						Havells India Ltd.	Alwar	A			
						Incab	Pune	A		upto 11kV only	
						KEC International	Vadodara	A			
14		I				KEI Industries	Bhiwadi	A			
						Krishna Electrical Industries Ltd	Gwalior	A		upto 11kV only	
						NICCO	Shamnagar, Kolkata	A		upto 11kV only	
						Paramount	Khuskhera	A			
						Polycab Wires Pvt. Ltd	Daman	A			

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	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
						Sri ram Cables	Bhiwadi	A		upto 11kV only	
						Sterlite	Haridwar	A			
						Tirupati Plastomatics	Jaipur	A		upto 11kV only	
						Torrent Cable Ltd	Nadaid	A			
						Universal Cable Ltd.	Satna	A			
15	Battery Charger (48V/110V/220V)	I				Chabbi India Ltdi Electricals	Jalgaon	A			
						HBL Power	Hyderabad	A			
						Dubas Engineering	Bangalore	A			
						Chloride Power	Kolkatta	A			
						Statcon	Hapur	A			
						Masstech	Jalgaon	A			
16	Battery	I				Exide	Kolkata	A*		* For lead acid plante type only	
						Hoppekkee	Brilon, Germany	A*		* For lead acid plante type only	
						HBL Power Systesm	Hyderabad	A#		# For Ni-cd type only	
						Amcosaft	Bangalore	A#		# For Ni-cd type only	
17	ELEVATOR	I				ECE	GHAZIABAD	A			
						TECHNO	AHMEDABAD	A			
						OTIS	MUMBAI	A			
						KONE	CHENNAI	A			
						OMEGA	AHMEDABAD	A			
						SAMIL ELTEC	KOREA	A			
18	DG Set	I				TIL	Ghaziabad	A		UP TO 1500KVA	
						Powerica	Silvasa	A		UP TO 500KVA	
						Jakson	Kathua	A			
						Sterling Generators Pvt Ltd	Silvasa	A			
						Supernova	Rajpur	A			
						Kohler	Singapore	A			
19	HV Busduct (SPBD)	I				BHEL	Rudrapur	A			
						C&S	G.Noida/Haridwar	A		Upto 11KV only	
						KGS Engg	Chennai	A			
						Powergear	Chennai/Bangalore	A			
20	GI CABLE TRAYS	II				Inar Profiles Ltd	Ankapally (Vizag)	A			
						Vatco	Mumbai	A		Galvanization at Sigma Mumbai	
						Indiana cable trays	Mumbai	A		Galvanization at Karamtara galvaniser	
						Industrial Perforation	Kolkata	A			
						Ratan Projects	Howrah	A		Galvanization at DMP Projects	
						India Electric Syndicate	Kolkata	A		Galvanization at BMW Industries/B.P Projects	
						Steelite engg.	Mumbai	A			
						Premier Power Products	Kolkata	A		Galvanising at Neha Galvaniser	
						Indiana Gratings	Pune	A		Galvanization at Poona Galvanizer	
						M.J. Engineering	Okhla/ Bhiwadi	A			

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	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
						T.R.G	Chennai	A		Galvanization at TM Radhakrishna Chetty & Co	
						Amtech	Pune	A		Galvanization at B.G. Shirke - Pune	
						Rukmani	Raipur	A		Ladder type cable trays only	
						Passive Infra	Hasangarh (Rohtak)	A			
						Unitech Fabricators & Engineers	Howrah/ Hoogly	A			
						Patny System	Hyderabad	A			
						Rabi Engg	Kolkata	A		Galvanizing from NTPC approved sources	
						Indmarkformtech Pvt Ltd	Pune	A		Galvanizing at B.G.Shirke - Pune	
	CABLE TRAY FLEXIBLE SUPPORT SYSTEM					Vatco	Mumbai	A		Galvanising at Sigma Mumbai	
						Inar profiles	Enkapalli	A			
21		II				Industrial perforations	Kolkata	A			
						Premier power products	Kolkata	A		Galvanising at Neha Galvaniser	
						Steelite engg.	Mumbai	A			
						Indiana gratings	Pune	A		Galvanising at Poona Galvaniser	
						Patny Systems	Hyderabad	A			
						Amtech	Pune	A		Galvanising at B.G. Shirke	
	LT Busduct					KGS Engg	Chennai	A			
						Spaceage	Gurgaon	A			
22		II				C&S	Noida/Haridwar	A			
						BHEL	Rudrapur	A			
						Nitya Electrocontrols	G.Noida	A			
						Unilec	Gurgaon	A			
						REEP	Chennai	A			
	Lighting Transformer (Epoxy Insulated)					Gujarat Plug In	Vadodara	A		SQP	
						Prayog	Pune	A		SQP	
23		III				Indcoil	Mumbai	A		SQP	
						Pragati	Thane	A		SQP	
						Southern Elect	Chennai	A		SQP	
						Pactil	Thane	A		SQP	
						AE	Mumbai	A		SQP	
	Lighting Fixtures & Luminaries					KPEL	Pune	A		For Filament and LED	
						Wipro	Pune	A		For Filament only	
24		III				Crompton	Mumbai	A		For Filament and LED	
						Philips	Noida	A		For Filament and LED	
						Bajaj	Mumbai	A		For LED only	
						Surya Roshni	Noida	A			
	Welding Recepticles					Goldwyn	Noida	A			
						SCHEINDER	Nasik	A			
						AJMERA	Mumbai	A			
25		III				Best & Cropmpton	Chennai	A			
						BCH	Faridabad	A			
						Additionally Any make with VDE or CE or UL or CSA marking or BIS approved with valid CML number is acceptable					
27	Cable Gland	III				Any make with VDE or CE or UL or CSA marking or BIS approved with valid CML number is acceptable					

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:			
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9		
	Supplier : GE							Date	:	21.12.2018		
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No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark		
8	Lugs	III				Dowells	Mumbai	A				
						Chetna	Nasik	A				
						3D	Umbergaon	A				
						Additionally Any make with VDE or CE or UL or CSA marking or BIS approved with valid CML number is acceptable						
29	Emergency Light, Trefoil Clamps, Ceiling Fans	III				Main Contractor Approved Sources		A				
30	M.S. ROD, G.I. Flat, G.I. Wire, Earth Wire	III				Main Contractor Approved Sources		A		GALVANISING AT NTPC APPROVED SOURCES		
31	Local Motor Starter Panels	III				SIEMENS	Mumbai	A				
						L&T	Mumbai	A				
						Any other make with VDE or CE or UL or CSA marking or BIS approved with valid CML number is acceptable						
32	Limit Switches	III				KAKU BHILLAI	Chennai	A		Any other make with VDE or CE or UL or CSA marking or *BIS approved with valid CML number* .		
						Jai Balaji	Chennai	A				
						AG System	Mumbai	A				
						Electromag	Mumbai	A				
						BCH	Faridabad	A				
33	HT Termination & Jointing Kits	III				3M	Pune	A				
						Ravchem	Pune	A				
34	Fire sealing system - Type A Material supplier	III				3M India	Bangalore	A				
						GE Silicon	USA	A				
						Hilti	Germaney	A				
						DOW Corning	USA	A				
35	Fire sealing system - Type B Material supplier	III				LLOYDS	Delhi	A				
						Signum	Nagpur	A				
						Vijay System Engineers Pvt Ltd	Mumbai	A				
36	Executing Agency for Fire sealing system	I				LLOYDS	Delhi	A				
						Signum	Nagpur	A				
						Vijay System Engineers Pvt Ltd	Mumbai	A				
						3M India	Bangalore	A				

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
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Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
37	CIRCUIT BREAKER	I				GE T&D	KANCHIPURAM	A			
						ABB	VADODARA	A			SUB-QR ITEM
						SIEMENS	AURANGABAD	A			SUB-QR ITEM
38	ISOLATOR	I				CGL	NASHIK	A			SUB-QR ITEM
						GR POWER	HYDERABAD	A			SUB-QR ITEM
						HIVELM	CHENNAI	A			SUB-QR ITEM
						S&S POWER	PONDICHERRY	A			SUB-QR ITEM
						SIEMENS	HYDERABAD	A			SUB-QR ITEM
39	CURRENT TRANSFORMER	I				SWITCHGEAR & STRUCTURALS	HYDERABAD	A			SUB-QR ITEM
						ABB	VADODARA	A			SUB-QR ITEM
						GE T&D	HOSUR	A			SUB-QR ITEM
						BHEL	JHANSI	A			SUB-QR ITEM
						CGL	NASHIK	A			SUB-QR ITEM
40	CVT	I				MEHRU	BHIWADI	A			SUB-QR ITEM
						ABB	VADODARA	A			SUB-QR ITEM
						GE T&D	HOSUR	A			SUB-QR ITEM
						BHEL	JHANSI	A			SUB-QR ITEM
						CGL	NASHIK	A			SUB-QR ITEM
41	SURGE ARRESTOR	I				CGL	NASIK	A			SUB-QR ITEM
						LAMCO	HYDERABAD	A			SUB-QR ITEM
						OBLUM	HYDERABAD	A			SUB-QR ITEM
42	POST INSULATOR	I				ADITYA BIRLA	HALOL	A			SUB-QR ITEM
						IEC	BHOPAL	A			
						SARVANA GLOBAL	CUDDALORE	A			
						MODERN INSULATOR	ABU ROAD	A			
						WSI	CHENNAI	A			
43	CLAMPS & CONNECTORS & WELDING SLEEVES	II				ELCTROMECH TRANSTECH	KOLKATA	A			
						EXALT	MUMBAI	A			
						KLEMMEN ENGG	CHENNAI	A			
						MEGHA ENGG	CHENNAI	A			
						MILIND	MUMBAI	A			
44	INSULATOR HARDWARE, CONDUCTOR ACCESSORIES & EARTHWIRE ACCESSORIES	II				PEE VEE ENGG	BANGALORE	A			
						ELECTROMECH TRANSTECH	KOLKATA	A			
						EMI TRANSMISSION	MUMBAI	A			
						IAC ELECTRICALS	KOLKATA	A			
						ITPL	MUMBAI	A			
						RASHTRA UDYOG	KOLKATA	A			
						TAG CORPORATION	CHENNAI	A			
45	DISC INSULATOR/ PIN INSULATOR	I				ADITYA BIRLA	RISHRA (W.B.)	A			
						BHEL	BANGALORE	A			
						IEC	BHOPAL	A			
						IMPERIAL CERAMICS	BIKANER	A	UPTO 90 KN		
						MODERN INSULATOR	ABU ROAD	A			
						SARVANA	CUDDALORE	A			

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Project : LOT-2
Package : FGD
Supplier : GE
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l No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark
						WSI	CHENNAI	A		
						APAR INDUSTRIES	SILVASSA	A		
	ACSR CONDUCTOR	I				CABCON	KOLKATA	A		
						DIAMOND	VADODARA	A		
						GALAXY	SANGLI	A		
						GUPTA POWER INFRA	BHUBANESWAR	A		
46						HIRA CABLES	HIRAKUD	A		
						JSK	SILVASSA	A		
						LUMINO	KOLKATA	A		
						SARAVATHY	BANGALORE	A		
						SMITA	GHAZIABAD	A		
	ALUMINIUM TUBE	I				ALOM EXTRUSIONS	KOLKATA	A		
						BANCO	VADODARA	A		
						CENTURY EXTRUSION	KOLKATA	A		
						HINDALCO	RENUKUT	A		
47						HINDALCO	ALUPURAM	A		
						JINDAL ALUMINIUM	BANGALORE	A		
						SUDAL	NASIK	A		
						GE T&D	CHENNAI	A		
	SUB STATION AUTOMATION SYSTEM (BCU, GRP, ENERGY METER, NUMERICAL RELAYS, SWITCHYARD PROTECTION) (Item subject to Sub QR approval)	I				ABB	PEENYA	A		
						SCHNEIDER	NOIDA	A		
						SIEMENS	KALWA	A		
48						BHEL	BHOPAL	A*	*: Approved only for C&R Panel	
49	COMPONENTS FOR CONTROL & RELAY PANELS, PROTECTION PANELS, ISLANDING SCHEME & BAY CONTROL UNIT :	I							*: Control Measure of Items shall be same as in the Quality Plan of SAS.	
	ENERGY METER	*				CONZERV	BANGALORE	A		
						ELSTER	MUMBAI	A		
a						SEMS	UDAIPUR	A		
						L&T	MYSORE	A		
	FIBRE OPTIC CABLE	*				AKSH OPTIFIBRE	BHIWARI	A		
b						BIRLA ERICSSON	REWA	A		
						FINOLEX	PUNE	A		

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	Project : LOT-2			ELECTRICAL ITEMS					Doc No	:		
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	Supplier : GE								Date	:	21.12.2018	
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Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark		
c	EVENT LOGGER	*				GE T&D	UK / FRANCE/CHENNAI	A				
						HATHWAY	UK	A				
d	GPS TIME SYNCHRONISATION EQUIPMENT	*				ARBITER	USA	A				
						HATHWAY	UK / USA	A				
						HOPF	GERMANY	A				
						SERTEL	CHENNAI	A				
e	RELAY TEST KIT	*				DOBLE ENGG	USA	A				
						MEGGER	UK	A				
						OMICRON	USA/AUSTRALIA	A				
						SCOPE T & M	PUNE	A				
f	DISTURBANCE RECORDER	*				ABB	FINLAND	A				
						GE T&D	USA	A				
						HATHWAY	UK	A				
						SIEMENS	GERMANY	A				
g	LARGE VIDEO SCREEN (LVS)	*				BARCO	NOIDA	A				
						DELTA	GURGAON	A				
						PLANAR	USA	A				
h	RELAYS for SWITCHYARD (NUMERICAL AND AUXILLARY)	*				ABB	SWEDEN/ BANGALORE	A				
						GE T&D	UK/CHENNAI	A				
						SCHNEIDER	UK	A				
						SIEMENS	GERMANY	A				
50	SF6 Gas Filling and Evacuating Plant, Gas Recycling & Purifying Plant, Gas Leakage Detecter	III				AI QUALITEK	USA	A				
						DILO	GERMANY	A				
						ENERVAC	CANADA	A				
						VACCUUM PLANT INDUSTRIES	PUNE	A				

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Project : LOT-2
Package : FGD
Supplier : GE
Contract No.: CS-0011-109(2)-9

ELECTRICAL ITEMS

INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL

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I No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark
51	OPERATIONAL ANALYSER WITH DCRM KIT	III				MEGGER	UK	A		
						OMICRON	USA	A		
						MEGGER	SWEDEN	A		
52	LEAKAGE CURRENT ANALYSER	III				DOBLE ENGG	USA	A		
						ISA	ITALY	A		
						SCOPE T & M	PUNE	A		
						TRANSINOR	NORWAY	A		
53	GS FLAT/ 40MM DIA M.S.ROD/ M.S EARTH RODS /U CLAMP/ GI EARTH PIPE / GI PIPE / GI CONDUIT (INCLUDING BENDS) / PVC PIPES	III				MAIN CONTRACTOR APPROVED SOURCES				
54	GS EARTHWIRE / LIGHTING WIRE	III				MAIN CONTRACTOR APPROVED SOURCES				
55	LIGHTING POLE	III				BIS approved Vendors as per IS-2713				
56	BAY IDENTIFICATION TAGS, PHASE MARKERS & DANGER PLATES	III	*			MAIN CONTRACTOR APPROVED SOURCES				
57	PIANO SWITCHES	III	*			BIS APPROVED SOURCES				
58	WPS (Aluminium Tube)	I	W-010			MAIN CONTRACTOR APPROVED SOURCES				
59	WPS (Earthing Grid)	I	W-020			MAIN CONTRACTOR APPROVED SOURCES				
60	BELT WEIGHER	I				AVERY INDIA	BALLABHGARH	A		
						ELECON EPC	SAVALI	A		
						KISTLER MORSE	HYDERABAD	A	UP TO 2500 TPH	
						SCHENCK PROCESS	GURGAON	A		
						IPA	BANGLORE	A	UP TO 3700 TPH	
61	WEIGH BRIDGE	I				AVERY INDIA	BALLABHGARH	A		
						RICELAKE	SRIPEREMBUDUR	A		
62	IN LINE MAGNETIC SEPARATOR / SUSPENDED MAGNET	I				ELECON EPC	SAVLI	A		
						MAGNETIC CORPORATION	BANGALORE	A		
						ELECTRO ZAVOD	KOLKATA	A		
						ELECTROMAG	MUMBAI	A		
63	METAL DETECTOR	II				ELECTROMAG	MUMBAI	A		
						THERMO RAMSEY	AUSTRALIA	A		
						ELECON EPC	SAVALI	A		
						SIVA SYSTEMS	GOA	A		
	ELECTROMAGNETIC (EM) BRAKE					BCH	FARIDABAD	A		
						STORM CRAFT	MUMBAI	A		

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NTPC	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
SI No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
64		II				ELECTROMAG	MUMBAI	A			
						WITTON KRAMMER BROOK CROMPTON	UK	A	FOR WAGON TRIPPLER BRAKE ONLY		
65	CABLE REELING DRUMS	III				BENGAL TECHNOCRAT	KOLKATA	A	With Demag Germany make stall torque motor		
						ELECTRO ZAVOD	KOLKATA	A	With Demag Germany make stall torque motor		
						ELECON	VV NAGAR	A			
						ELEKTROMAG	VAPI	A	With Demag Germany make stall torque motor		
66	EH THRUSTER BRAKE / RAIL CLAMP	II				WMI	MUMBAI	A			
						PINTCH BUBNEZER	GERMANY	A	FOR DISC TYPE ONLY		
						ELECTROMAG	MUMBAI	A			
67	PULL CORD / BELTSWAY INDICATION SYSTEM	II				JAYASHREE	PUNE	A			
						PROTO CONTROL	PUNE	A			
						AG SYSTEMS	MUMBAI	A			
68	ELECTRONIC SPEED SWITCH,ZSS,TILT SWITCH,MAGNETIC SWEITCH,PROXIMITY SWITCH	III				JAYASHREE	PUNE	A			
						PROTO CONTROL	PUNE	A			
						PG ELECTRONICS	MUMBAI	A			
						VIRTUAL INDUSTRIES	JAMSHEDPUR	A	For Magnetic Limit Switches only		

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
I No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	
69	HEAVY DUTY LIMIT SWITCHES	III				JAI BALAJEE	CHENNAI	A			
						JAYASHREE	PUNE	A			
						BCH	FARIDABAD	A			
						A.G.SYSTEM	MUMBAI	A			
						ELECTROMAG	MUMBAI	A			
70	PULL CORD/BELT SWAY SEITCHES,UNDER BELT SWITCH	III				JAYASHREE	PUNE	A			
						PROTO CONTROL	PUNE	A			
						AG SYSTEMS	MUMBAI	A			
71	GEARED MOTOR	II				INTERNATIONAL COMBUSION	ARURANGABAD	A			
						NAW	KOLKATA	A			
						PBL	V.V.NAGAR	A			
						SEW EURODRIVE	GERMANY	A	Up to 30 kw		
						SIEMENS	GERMANY	A	Up to 30 kw		
72	Lighting Wires / GI Conduit	III				BIS Licencee with valid CML no					
73	FQP for electrical works	I									

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EGENDS :

1. SYSTEM SUPPLIERS/SUB-SUPPLIERS APPROVAL STATUS CATEGORY(SHALL BE FILLED BY NTPC)
   A-For this items proposed vendor is acceptable to NTPC.To be indicated with letter "A" in the list along with condition of approval,if any
   DR-For these items "Detailed required for NTPC review.To be identified with letter "DR" in the list.
2. QP/INSPN CATEGORY
   CAT-I :For these items the Quality Plans approved by NTPC & final acceptance will be on physical inspection witness by NTPC
   CAT-II :For these items the Quality Plans approved by NTPC.However no physical inspection shall be done by NTPC.The final acceptance by NTPC shall be on basis of review of documents as per approved QP
   CAT-III :For these items Main supplier approves the Quality Plans.The final acceptance by NTPC shall be on basis of certificate of conformance by the main supplier.
   * : Control measure of item covered in quality plan of main item.
3. UNITS/WORKS : Place of manufacturing Place of Main Supplier of multi units/works.

IOTES:

Iote 1: Relevant certificates shall be submitted for NTPC approval.Approval conditions attached to above identified vendors, as applicable shall be adhered to.

Iote 2: For LT Motors:

a) Up to 50 KW: Cat-III: Acceptance of Motor up to 50 KW is based on COC of the manufacturer & the Main Contractor confirming NTPC's technical specifications.

b.i) Above 50 KW and up to 75KW: Cat-III : For manufacturers who have already supplied this range of motors to NTPC which have been commissioned and no adverse feedback has been reported from RIO/project-site AND for skid mounted motor supplied with the driven equipment. Acceptance based on review of Routine Test Inspection report as per IS-325 along with COC of the Manufacturer and Main Contractor confirming NTPC's technical specifications.

b.ii) Above 50 KW and up to 75KW : Cat-I: For Other Manufacturers, as per NTPC approved Quality Plan

c) Above 75 KW: Cat-I: as per NTPC approved Quality Plan

(Manufacturer)

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	Project : LOT-2			ELECTRICAL ITEMS				Doc No	:		
	Package : FGD			INDICATIVE VENDOR LIST FOR ITEMS REQUIRING QUALITY PLAN AND SUB-VENDOR APPROVAL				Rev No	:	CS-0011-109(2)-9	
	Supplier : GE							Date	:	21.12.2018	
	Contract No.: CS-0011-109(2)-9							Page	:		
Sl No	ITEM DESCRIPTION	QP / Insp. Cat.	QP No:	QP Sub. Sch.	QP approval Sch.	Proposed sub-supplier	Place	Sub-Supplier approval status / category	Sub-supplier Details submission sch	Remark	

Note 3: Category of inspection for Cable Trays & Cable Tray Flexible Support System:

For Total Contract Quantity per Size	*Category of Inspection*
For cable total quantity ≤ 2.5 KM	Cat-III - submission of TC & Certificate of Conformance by Main Contractor for the manufacturers having successfully supplied to any NTPC project-site through Corporate contracts for atleast 2 years
For cable total quantity above 2.5 km & up to ≤ 10 km per size/type	Cat-II for the manufacturers having successfully supplied to any NTPC project-site through Corporate contracts for atleast 2 years
For cable total quantity above 10 km per size/type	Cat-I

Note 4: Category of inspection for LT Cables:

For Total Contract Quantity per Size	*Category Of Inspection*
For cable total quantity ≤ 2.5 KM	Cat-III - submission of TC & Certificate of Conformance by Main Contractor for the manufacturers having successfully supplied to any NTPC project-site through Corporate contracts for atleast 2 years
For cable total quantity above 2.5 km & up to ≤ 10 km per size/type	Cat-II for the manufacturers having successfully supplied to any NTPC project-site through Corporate contracts for atleast 2 years
For cable total quantity above 10 km per size/type	Cat-I

Note 5: VDE / CE / UL / CSA Marking Certification preferably from Third Party Agency or BIS Approval Letter shall be submitted for NTPC's Verification / Information.

Note 6: NTPC approved Galvanizers:

1. M/s M J Engg,Delhi	8. M/s National Galvanizer, Kolkata	15. M/s Sigma, Mumbai
2. M/s Jamna Metal,Delhi	9. M/s Unistar Galvanizer, Kolkata	16. M/s Radhakrishnan Shetty, Chennai
3. M/s A.V. Engg, Kolkata	10. M/s B.P. Project, Kolkata	17. Karamtara Mumbai
4. M/s Inar Profiles, Vishakapatnam	11. M/s Bajaj Pune	18. Poona Galvanizers Pune
5. M/s Anand Udyog, Mumbai	12. M/s Electrocare Industries, Mumbai	19. Neha Galvanizer- Kolkata
6. M/s Techno Engg,Chandigarh	13. M/s B.G. Shirke, Pune	20. Unitech Fabricators & Galvanizers- Hoogly
7. M/S Steelite Engg, Mumbai	14. M/s Gurpreet Galvanizer, Hyderabad	

(S. Mitra) (SURYYA CHOUDHURY) GE POWER

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		PROJECT : LOT-2 PROJECTS					LIST OF ITEMS REQUIRING QP			REF. NO:		
		PACKAGE : FGD FOR LOT 2 PROJECTS					APPROVAL & ACCEPTABLE			REVISION NO: 00		
		CONTRACTOR: GE POWER					VENDOR AS APPROVED BY			DATE: 21.12.2018		
		CONTRACT NO: CS-0011-109(2) -9										
No.	Major Equipment	QP/ Insp. Cat.	QP No	QP Sub. Schedule	QP approval schedule	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Sub-supplier Details submission schedule	Sub-supplier approval schedule	Sub QR Note - 1	Remark
1	DDCMIS											
		I				SIEMENS	Germany / Gurgaon	A				
		I				ABB	Germany / Bangalore	A				
		I				Emerson	USA / Pawane / Singapore	A				
		I				GE (ALSTOM)	Noida	A				
		I				GE (ALSTOM)	France	A				
		I				Honeywell	USA / Pune	A				
		I				Yokogawa	Bangalore	A				
		I				Toshiba	Japan	A				
		I				Invensys (Schneider)	Singapore / Mumbai / Chennai	A				
		I				Hitachi nest / Hitachi	Bangalore / Japan	A				
		*				GE (ALSTOM)	Pune	DR				
2	Dust Emision Monitor											
		III				Land Instruments International	UK	A				Optical Transreceiver type
		III				Codel	UK	A				Optical Transreceiver type
		III				Durag	Germany	A				Optical Transreceiver type
		III				Emerson Process Management	Ireland	A				Optical Transreceiver type
		III				SICK AG	Germany	A				Optical Transreceiver type
		*				Forbes Marshall	Pune	DR				CODEL MAKE
		*				FPI	India/China	DR				
		*				Fuji Electric	Japan	DR				
		*				Sintrol	Japan	DR				
3	Flue Gas Analyser (CO)											
		III				Emerson Process Management	Pawane	A				Analyser from principals M/S Emerson Germany/ USA
		III				Codel	UK	A				
		III				Land Instruments International	UK	A				
		III				Sick AG	Germany	A				
		III				Siemens	Germany	A				
		*				AIC	KOTA	DR				
		*				ENVOIRENMENT SA	MUMBAI	DR				
		*				HORIVA	PUNE	DR				
		*				Fuji Electric	Japan	DR				
		*				FPI	India/China	DR				
		*				Yokogawa	India	DR				
4	Flue Gas Analyser (CO2)											
		*				Emerson Process Management	Pawane	DR				
		*				Codel	UK	DR				
		*				Land Instruments International	UK	DR				
		*				Sick AG	Germany	DR				
		*				Siemens	Germany	DR				
		*				Fuji Electric	Japan	DR				
		*				FPI	India/China	DR				
		*				Yokogawa	India	DR				
		*				AIC	KOTA	DR				
		*				ENVOIRENMENT SA	MUMBAI	DR				
		*				HORIVA	PUNE	DR				
5	Flue Gas Analyser (SOX and Nox)											
		III				Emerson Process Management	Pawane	A				Analyser from principals M/S Emerson Germany/ USA
		III				SICK AG	Germany	A				
		III				Fuji Electric	Japan	A				
		III				Siemens	Germany	A				
		III				Yokogawa Electric Corporation	Japan	A				IR-400 SERIES
		*				PROTIA LTD	UK	DR				

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		PROJECT : LOT-2 PROJECTS					LIST OF ITEMS REQUIRING QP			REF. NO:		
		PACKAGE : FGD FOR LOT 2 PROJECTS					APPROVAL & ACCEPTABLE			REVISION NO: 00		
		CONTRACTOR: GE POWER					VENDOR AS APPROVED BY			DATE: 21.12.2018 -		
		CONTRACT NO: CS-0011-109(2) -9										
No.	Major Equipment	QP/ Insp. Cat.	QP No	QP Sub. Schedule	QP approval schedule	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Sub-supplier Details submission schedule	Sub-supplier approval schedule	Sub QR Note - 1	Remark
		*				UNISEARCH	CANADA	DR				
		*				OPSIS	SWEDEN	DR				
		*				FPI	India/China	DR				
		*				Codel	UK	DR				
		*				AIC	KOTA	DR				
		*				ENVOIRENMENT SA	MUMBAI	DR				
		*				HORIVA	PUNE	DR				
6	Flue Gas Analyser Panel											
		I				M/S YOKOGAWA India Ltd	Banglore	A				1. BOI used in the sample handling system shall be from the makes mentioned in Annex-1 2. SOX, NOX & CO2 Analyser will be from M/S Yokogawa Electric Corporation Japan 3. The item shall be as per NTPC approved data sheet/Specification/QP requirements. 4. M/S Yokogawa Japan will inspect & validate the assembled system at Yokogawa Bangalore works for the first system & will also be involved in the final commissioning of the system at site . 5. NTPC inspection category will be treated as CAT-I
		I				ADAGE AUTOMATION PVT. LTD.	GOA	A				1. SOX,NOX &CO2 analysers will be imported from M/S SIEMENS Germany . 2. Analysers cabinets & BOI items to be supplied as per annex -1 3. M/S Adage will perform FAT & commissioning of the CEMS system at site in presence of M/S SIEMENS representative.
		I				M/s Thermo Fisher Scientific India Pvt. Ltd	Mumbai	A				ONLY FOR DILUTION EXTRACTIVE TECHNIQUE 1)Analyser (SOX,NOX,CO,CO2,Mercury),sampling probe ,sample handling system ,umbical cord etc to be supplied from M/S Thermo Fisher USA . 2) Blank panel ,PC and printers are procured indigenously by M/S TFIPL as per NTPC agreed sources indicated in the LOA .UPS requirement shall be tied up during approval of QP , In case required . 3) Opacity monitor to be supplied from M/S Durag , Germany . 4) Presence of M/S Thermofisher Scientific USA official during final inspection and testing at M/S TFIPL , Mumbai works for the first unit & commissioning of the first unit at site
		I				Emerson Process Management Pvt Ltd	Pawane	A				SOX NOX & CO ANALYSER PANEL
		I				Analyser Instrument Co Pvt Ltd	Kota	A				ANALYSERS FROM FUJI JAPAN & OTHERS ITEMS FROM LOA APPROVED SOURCES

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		PROJECT : LOT-2 PROJECTS				LIST OF ITEMS REQUIRING QP				REF. NO:		
		PACKAGE : FGD FOR LOT 2 PROJECTS				APPROVAL & ACCEPTABLE				REVISION NO: 00		
		CONTRACTOR: GE POWER				VENDOR AS APPROVED BY				DATE: 21.12.2018		
		CONTRACT NO: CS-0011-109(2) -9										Remark
No.	Major Equipment	QP/ Insp. Cat.	QP No	QP Sub. Schedule	QP approval schedule	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Sub-supplier Details submission schedule	Sub-supplier approval schedule	Sub QR Note - 1	
		I				Chemtrols Engineering Ltd	Goa	A				ANALYSERS FROM SICK AG Germany & OTHERS ITEMS FROM LOA APPROVED SOURCES
		•				Forbes Marshall	Pune	DR				
		•				SICK INDIA PVT LTD	PUNE/MUMBAI	DR				
		•				ICE (ASIA) PVT LTD	MUMBAI	DR				
7	Mercury Analyser	III				DURAG	BANGLORE	A				Analyser from M/S Vanwa Umwelt Germany
		III				SICK AG	Germany	A				FOR CEMS PACKAGE
		III				FPI	India/China	DR				
		•				Thermo Scientific	India	DR				
		•				ANC	KOTA	DR				
		•				ENVIOREMENT SA	MUMBAI	DR				
		•				HORIVA	PUNE	DR				
		•										
8	Conductivity Analyser	III				Emerson Process Management	Pawane	A				procured from USA, assembly & tasing in pawane
		III				Hach	USA	A				
		III				ABB	UK	A				
		III				Yokogawa	Japan	DR				
		•				E&H	India	DR				
		•				Knone	India	DR				
		•				GF Signet	India	DR				
		•				Honeywell	India	DR				
		•				Teledyne	India	DR				
		•				Systea	India	DR				
		•				ANC	KOTA	DR				
		•				ENVIOREMENT SA	MUMBAI	DR				
		•				HORIVA	PUNE	DR				
9	PH Analyser	III				Emerson Process Management Pvt Ltd	Pawane	A				procured from USA, assembly & tasing in pawane
		III				ABB	UK	A				
		III				Hach	USA	A				
		III				Yokogawa	Japan	A				
		III				E&H	India	DR				
		•				Knone	India	DR				
		•				GF Signet	India	DR				
		•				Honeywell	India	DR				
		•				Teledyne	India	DR				
		•				Systea	India	DR				
10	Silica Analyser	III				Hach	USA	A				
		III				ABB	UK	A				
		III				Hach	Switzerland	A				FOR ORION BRAND SILICA ANALYSER
		III				Eutech Instrument PTE Ltd (part of Thermofisher Scientific Inc)	Singapore	A				
		•				Tharma Orion	USA	DR				
		•				Teledyne	India	DR				
		•										
11	Turbidity Analyser	III				HACH	USA	A				
		III				ABB	UK	A				
		III				E & H	Germany	A				
		III				Emerson	USA	A				

		PROJECT : LOT-2 PROJECTS					LIST OF ITEMS REQUIRING QP			REF. NO:		
		PACKAGE : FGD FOR LOT 2 PROJECTS					APPROVAL & ACCEPTABLE			REVISION NO: 00		
		CONTRACTOR: GE POWER					VENDOR AS APPROVED BY			DATE: 21.12.2018		
		CONTRACT NO: CS-0011-109(2) -9										
No.	Major Equipment	QP/ Insp. Cat.	QP No	QP Sub. Schedule	QP approval schedule	Proposed sub-supplier	Place	Sub-suppliers approval status / category	Sub-supplier Details submission schedule	Sub-supplier approval schedule	Sub QR Note - 1	Remark
		III				WTW	Germany	A				
		*				Khrone	India	DR				
		*				GF Signet	India	DR				
		*				Honeywell	India	DR				
		*				Teledyne	India	DR				
		*				Systea	India	DR				
12	DENSITY METER	*				Yokogawa	India	DR				
		*				Thermofisher						
		*				E&H	Mumbai	DR				
		*				Forbes Marshall	Aurangabad	DR				
		*				Emerson	Pune	DR				
		*				IPRO (Promach)	Mumbai	DR				
13	VMS	*				Berthold Technologies	Chandigarh	DR				
							Chennai	DR				
		II				M/S Schenck Rotec India Ltd	Noida	A				Loop powered sensor with indicator .Main sensor LPS-420 procured from M/S Hansford sensor UK
		II				Forbes Marshall Pvt Limited	Pune	A				VMS hardware and sensors with integral cable shall be shinkawa Japan make . 2. All other BOIL shall be from LOA agreed sources
		II				GE	Pune	A				FOR GE BENTLEY , USA MAKE SYSTEM
		II				Meggit	Bangalore	A				FOR MEGGITT SWITZERLAND VIBRATION SYSTEM
		II				Rockwell Automation	Sahibabad	A				FOR ROCKWELL USA MAKE SYSTEM
		II				SKF	Pune	A				FOR SKF USA MAKE SYSTEM
		II				Shinkawa	Japan	A				
		II				GE (Bentley Nivada)	USA	A				
		II				MEGITT (Vibrometer)	Switzerland	A				
		II				Rockwell Automation	USA	A				
		II				SKF	USA	A				
		II				Vibrometer	Switzerland	A				
						FOLLOWING ITEMS TO BE SUPPLIED AS PER MAIN CONTRACTOR APPROVED SOURCES						
1	Residual Chlorine Analyser	III										

Notes:-

1.0 SYSTEM SUPPLIER/SUB SUPPLIER APPROVAL STATUS CATEGORY

A - For those items proposed vendor is acceptable to customer. To be indicated with letter "A" in the list alongwith the condition of approval, if any

DR - For those items "Detailed Required" for customer review. To be identified with letter "DR" in the list. For these itmes, vendor shall be proposed for owner acceptance with-in the agreed contract schedule of the package.

SQP - Standard Quality Plan RQP- Reference Quality Plan

2.0 QP INSPECTION CATEGORY

CAT-1 : For those items the Quality Plans are approved by Owner and final acceptance will be on physical inspection witness by Owner .

CAT - II : For those items the Quality plans are approved by Owner . However no physical inspection shall be done by Owner . The final acceptance by Owner shall be on the basis of review of documents .

CAT-III : For those items Main supplier approves Quality Plans . The final acceptance by Owner shall be on the basis of Certificate of Conformance by main supplier .

UNITS/WORKS : Place of manufacturing-place of main supplier of multi units/works

* - Inspection category will be decided during vendor evaluation.

Note - 1 : Approval is conditional and subject to sub QR/provennes clearance as specified in the contract specification. Further for any change in the Technical specification at later stage vendor approval will be reviewed accoedingly.

Note - 2: For instrument cable up to 1 KM inspection category CAT -III, For 1 KM to 2.5 KM inspection category CAT - II.

Note - 3: For the items not appearing in the preaward list and falls in the scope of supply of the bidder, bidder and Customer will mutually discuss in future.

Note - 4: EMPTY CABINETS, COMUTERS, SIGNAL ISOLATER/MULTIPLIER and TB SHALL ALSO BE ACCEPTABLE FROM OWNER ACCEPTED IN QP. IF THE TOTAL INTEGRATED PANEL AND FAT IS CONDUCTED INDEGENEOUSLY.

Note - 5: For the C & I instruments mounted on the skid of the main item or supplied as integral part of main item, instrument to be supplied as per proven practice of the manufacturer meeting the Customer technical specification requirement.

Note - 6: This item is bought out components of main equipments like DDCMIS, PLC, TSI, CCTV, PA system etc.

Note - 7: For these controlled items, vendor shall be proposed for owner acceptance with-in agreed contract schedule of the package

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Engg. Div/QA&I

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POST BID DISCUSSIONS ON SAFTEY PLAN TO FINALISE THE SAFTEY COORDINATION PROCEDURE HELD BETWEEN NTPC LIMITED (NTPC) AND M/s GE POWER INDIA LTD. ON 03.01.2019 & 06.02.2019 AT ENGG OFFICE COMPLEX, NOIDA FOR "FLUE GAS DESULPHARISATION (FGD) SYSTEM PACKAGE FOR LOT-2 PROJECTS"

PRESENT

NTPC

1. Mr. Arin Bordoloi (AGM- Saftey)
2. Mr. Subodh Khare (Mgr Safety)

M/s GE POWER INDIA LTD

1. Mr. Lalit Sankrani, Executive (Business Operations)
2. Mr. DS Baghel, Sr. Regional Leader (EHS)
3. Mr. Roshan Singh, Sr. Manager (Sales)

With reference to the Techno-Commercial Bid of M/s GE POWER INDIA LTD. ref no QFECS1326662 dated 03.12.2018 against NTPC Bidding Document No. CS-0011-109(2)- 9 issued vide NIT dated 31.08.2018 of which Technical bid was opened on 04.12.2018, post bid discussions were held between M/s GE POWER INDIA LTD and NTPC - Safety to discuss and finalize the Safety Coordination procedure. The following were discussed and agreed to:

1. During discussions, M/s GE POWER INDIA LTD informed that they have submitted their detailed information regarding safety management at Appendix-I to Attachment- 19 of their Technical bid covering various aspects for compliance to Safety during the execution , in case they are considered for award, M/s GE POWER INDIA LTD further informed that they are having well-established Safety Manual / Plan which has been submitted along with bid and further discussion on safety plan on 03.01.2019 and finalized on 06.02.2019.

2. GE POWER INDIA LTD confirmed that would comply with all the points listed in Attachment - 19 of Techno-Commercial bid. "Safety Plan" submitted by GE POWER INDIA LTD (enclosed as Annexure-I to this MOM). GE POWER INDIA LTD further, confirmed that they shall submit their final "Safety Plan" to Project Manager/ Engineer-in- charge for approval by Project Manager/ Engineer-in- charge/Head of the Project before start of the work at site.

3. The Safety Coordination Procedure shall form an integral part of the Contract and shall be complied with, in case of award on GE POWER INDIA LTD.

NTPC

18/02/2019

GE POWER INDIA LTD

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(FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE FOR LOT-2 PROJECTS
COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

(INFORMATION REGARDING SAFETY MANAGEMENT)

NTPC LOT 2 (APPLICABLE FOR ALL PROJECTS)

Bidder's Name and Address :
GE Power India Limited,
Building, Plot No. 7,
Noida-201301,
Pradesh,

To
Contract Services-I IHDP
NTPC Limited, 6th Sector-127,
Floor, Engg.Office Uttar
Complex, Plot No. A-
8A, Sector-21, Noida -
201301

Dear Sirs,

We have read the provisions pertaining to Safety and hereby undertake to comply all the provisions of Bidding Documents in this regard.

We hereby confirm that all the measures to ensure highest level of Safety during execution at Site shall be taken by us.

Further, in terms of the provisions of Clause No. ***44.00.00 of Part-D*** of Technical Specification (Section-VI) of Bidding Documents, a proposed "Safety Plan" is attached herewith as Appendix-I to this Attachment.

A "Safety Co-ordination Procedure" shall be finalized during post bid discussions of Techno-Commercial Bid.

The above proposed "Safety Plan" shall be further discussed/ finalized at Site, in line with the agreements made in "Safety Co-ordination Procedure", and shall be approved by Project Manager/Engineer-In-Charge/ Head of Project before start of work at Site.

Date : 27/11/2018
Place : Noida

(Signature).....
(Printed Name) **Lalit Sankrani**
(Designation) **Executive – Business Operations**
(Company Seal) .....

Note : Continuation sheets of like size and format, may be used as per Bidder's requirement and shall be annexed to this Attachment.

* Clause no. to be inserted by the Package Coordinator in the Bidding documents.

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APPENDIX-I to ATTACHMENT-19

SAFETY PLAN

01. Safety Policy of the Contractor to be enclosed: *Refer attached Safety Policy in EHS plan*

02. When was the Safety Policy last reviewed: *April 2016*

03. Details of implementation procedure / methods to implement Safety Policy /Safety Rules: *Refer attached EHS Plan – Page no 3-26*

04. Name, Qualification, experience of Safety Officer: *Degree or diploma engineer/ B.Sc. + 1 year diploma in industrial safety from a recognized institute or 4-year engineering degree in Safety, plus 3 to 4 years of practical experience in Safety at construction sites. EHS Resources – 3 EHS Officer (1 nos. from GE and 2 nos. of subcontractor of GE)*

05. Review of Accidents Analysis Method, Methods to ensure Safety and Health: *Refer attached EHS Plan – (Section - 2.4.3)*

06. Unit executive responsible to ensure Safety at various levels in work area: *Refer attached EHS Plan – (Section - 1.6.2)*

07. List of employees trained in safety employed before execution of the job. Give the details of training: *All employees are trained as per their job category. Name & training records will be shared once employees get identified & finalized before execution of the job. Safety training Programme are mentioned Refer attached EHS Plan – (Section - 2.6). As well as training schedule and matrix is attached.*

08. Safety Training Targets, Schedules, methods Adopting to providing safety training to all employee: *All trainings have been schedule to every individual employee based on the job category and managed online by every GE employee. In case of contractors Please Refer attached EHS Plan – (Section - 2.6).*

09. Details of checklist for different jobs / work and responsible person to ensure compliance (copy of checklist to be enclosed): *Refer attached Checklist.*

10. Regular Safety Inspection Methods and Periodicity and list of members to be enclosed: *Refer attached EHS Plan – (Section - 2.4.7.2 & 2.4.7.3).*

11. Risk Assessment, Safety Audit by Professional Agencies, Periodicity: *Safety Audit Internal / external will be performed after 3-4 months of site mobilization and will continue at construction site – (Section -2.4.7). Internal audit in each quarter, after 3 to 4 months of mobilization of site. Refer attached EHS Plan – (Section - 2.4). Sample copy of RA for Turbine island is attached.*

12. Implementation of Recommendations of Audit / Inspections, Procedures for Implementation and follow up: *Refer attached EHS Plan – (Section - 2.4.7.4)*

13. Provision for treatment of injured persons at work site: *First Aid boxes equipped with requisite articles shall be provided at construction sites for the use of workers. Basic*

training has to be provided on first aid to workmen & office bearers working at site. Refer attached EHS Plan – (Section - 2.5.2).

14. Review of overall safety by top Management and Periodicity: *Refer attached EHS Plan – (Section - 2.7)*

15. System for Implementation of Statutory legislations: *Refer attached EHS Plan – (Section - 3.2.4)*

16. Issue of PPEs to employees, Periodicity / stock on hand etc.: *Will be done at site by the responsible site admin person. Refer attached EHS Plan – (Section -3.1.17). Safety Shoes & Helmets shall be provided to all site personals along with other necessary applicable PPE's & shall be replaced on damage. 10% of stock should be maintained.*

PPE matrix & periodicity of replacement

#	PPEs	Replacement Frequency	IS/ EN/ CE code
1	Safety Helmet	Twice in year	IS2925
2	Safety Shoe	Yearly	IS15298
3	Nose Protection	As and when required	IS9473
4	Safety Glass	As and when required	EN 166
5	Ear Protection	As and when required	IS: 9167-1979
6	Reflective Jackets	As and when required	---------
7	Full Body Harness	As and when required	EN 361 / IS3521
8	Fall Arrestor	As and when required	EN 361
9	Hand Gloves	As and when required	IS: 6994
10	Ear Plug / Muffs	As and when required	IS: 6994
12	Face Shield	As and when required	IS : 8520-1977

17. Specify safety measures for round the clock working (especially during night): *Deployment of safety officers in day/night shift before mobilization to ensure complete hold on the activities round the clock and we will ensure adequate illumination for performing GE activities. All activities shall be done as per PTW - (Section 2.4.2)*

Signature Head of the Organization With date & stamp

MINUTES OF POST BID DISCUSSION (COMMERCIAL ISSUES) HELD BETWEEN M/s NTPC LIMITED (NTPC) AND M/s GE POWER INDIA LIMITED (GEPIL) ON 15.04.2019 FOR FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE FOR SIPAT SUPER THERMAL POWER STATION STAGE-I (3 X 660 MW) UNDER LOT-2 PROJECTS

PRESENT:

NTPC	GEPIL
Mr. Adesh, GM (CS)	Mr. Lalit Sankrani
Mr. Udayan Kumar, GM (PE-Mech)	Mr. Roshan Singh
Mr. V. N. Jain, GM (FIN)	Mr. Hiren Nariyelwala
Mr. Bikram Mandal, AGM (CS)	
Mr. Shrish Kumar Singh, DGM (CS)	
Mr. P. Vijay, Manager (CS)	

With reference to Price Bid ref. No. QFECS1326662 dated 03.12.2018 for FGD System Package for Sipat STPS Stage-I (3 x 660 MW) under lot-2 Projects opened on 08.04.2019 and Reverse Auction conducted on 08.04.2019 for the subject Package, discussions were held between GEPIL and NTPC, wherein the following have been agreed to:

1.0 GEPIL has confirmed the compliance to the terms and conditions of Bidding Documents read in conjunction with all the Amendments and Clarifications to Bidding Documents issued by NTPC for the subject Package. GEPIL have also confirmed that they shall complete the work in accordance with the provisions of Technical Specifications/Bidding Documents, in case of award.

2.0 GEPIL in Attachment-3P of their bid have indicated percentage of Import content in Ex-works price is <30% of Supply Value. Further, GE confirmed that value of import content in Ex-work Price is INR 127,40,00,000/-.

Further, GEPIL confirmed that as declared in Attachment 3P(A), CIF value of the Construction Equipment to be imported by the Bidder including sub-contractor(s) of the Bidder is 'NIL'.

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3.0 Break-Up of Prices/Final Prices after Reverse Auction

GE have quoted lump sum prices against Schedule-1 in their bid. GE have not indicated breakup against Main Equipment and Mandatory Spares. Further, GE have also not quoted breakup of Prices in Schedule-2 & 3 (Transportation, Installation, Civil Works, Structural Steel Works and AMC Charges etc.).

During discussions, GE have furnished price breakup of Schedule-1, Schedule-2 and Schedule-3.

Further, GE confirmed that in line with the provisions of the Bidding Documents, they have applied uniform percentage (%) discount (as applicable after Reverse Auction) over the original items rate quoted in various Price Schedules/Attachments of their Price Bid.

During discussions, GE also confirmed the following with regard to Main Equipment, Mandatory Spares, Type tests and Site fabricated items:

Main Equipment

GE confirmed that based on the break-up of Prices submitted in Schedule-1 for Main Equipment, further Billing break-up (BBU) shall be submitted and finalized atleast 60 days prior to start of dispatch.

Mandatory Spares

GE have indicated lumpsum cost in Schedule-1 for Mandatory Spares specified in the Technical Specifications. GE confirmed that they shall provide the detailed Price break-up of Mandatory Spares before release of initial advance and supply all the Mandatory Spares within the quoted cost.

Site fabricated items

GE confirmed that they shall submit the list of items to be fabricated at Site within 90 days from the date of NOA.

4.0 Taxes & Duties

GEPIL in Schedule-6 (Taxes and Duties) furnished the details of Goods and Services Tax [as on Seven (07) days prior to the last date for submission of Price Bids] applicable on the price of Goods and Services quoted in Schedule-1, 2 & 3 not included in the Bid Price. The details of Taxes and Duties (after considering discount as applicable after Reverse Auction and same rates of Taxes & Duties as mentioned in Schedule-6) are as under:

Bid Price Component	Rate of GST (%)	Amount on which GST applicable (INR) (rounded off)	Total GST payable (INR) (rounded off)
Ex-Works-Main Equipment (Schedule-1)	18%	701,69,38,918	126,30,49,005
Ex-Works-Mandatory Spares (Schedule-1)			
Type Test Charges (Schedule - 1)			
F&I-Main Equipment (Schedule-2)			
F&I-Mandatory Spares (Schedule-2)			
Erection Services (Schedule-3)			
Civil Works (Schedule-3)			
Structural Works (Schedule-3)			
Training Charges (Schedule-3)			
AMC Charges (Schedule-3)			
TOTAL (GST)			

Taxes, Duties & levies shall be paid/ reimbursed to GEPIL as per the provisions of Bidding Documents.

5.0 Unit Rates

GEPIL in Schedule 8 (Unit Rates) of their Bid have not filled Unit Rates of items referred therein. During the discussions, GEPIL confirmed that they shall submit the Unit Rates along with price justification as and when required.

6.0 GEPIL confirmed that, as per the provisions of the Bidding Documents and as per the details furnished by the Bidder, after Reverse Auction, there will be two Contracts only viz First Contract (for Ex-works (India) Supply Portion) and Second Contract (for Installation, Civil & all Services portion). The details of the aforesaid two Contracts as agreed by GE are as under:

(A) <u>First Contract</u>:

1.	Ex-Manufacturing Works/Place of Dispatch Price (both in India) for Plant & Equipment	INR 399,48,84,379/-
2.	Ex-Manufacturing Works/Place of Dispatch Price (both in India) for Mandatory spares	INR 26,60,63,239/-
3	Type Test Charges	INR 3,73,241/-
4	**Total (A) [1+2+3]**	**INR 426,13,20,859/-**

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(B) Second Contract:

1.	Local Transportation including Inland insurance charges for Plant and Equipment covered under First contract	INR 7,07,60,918/-
2.	Local Transportation including Inland insurance charges for Mandatory Spares covered under First Contract	INR 50,00,000/-
3.	Installation Services	INR 64,73,39,446/-
4.	Civil & Architectural Works	INR 195,01,91,170/-
5.	Structural Steel Works	INR 8,04,97,100/-
6.	Training Charges	INR 8,29,425/-
7.	AMC Charges	INR 10,00,000/-
8.	**Total (B) [1+2+3+4+5+6+7]**	**INR 275,56,18,059/-**
Grand Total (A+B)		**INR 701,69,38,918/- (INR Seven Hundred One Crore, Sixty Nine Lakh Thirty Eight Thousand Nine Hundred and Eighteen Only)**

7.0 GEPIL re-confirmed that all other conditions/stipulation/deviation/non-conformity/undeclared deviation etc. contrary to the provisions of Bidding Documents (to be read in conjunction with Amendments/Clarifications/Errata) stands withdrawn without any financial implication to NTPC.

8.0 The aforesaid resolutions are subject to Management Approval of NTPC.

(NTPC) (GEPIL)

FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

SCHEDULE OF RATES AND PRICES

SCHEDULE- 1 : PLANT AND EQUIPMENT INCLUDING TYPE TESTS CHARGES AND MANDATORY SPARES TO BE SUPPLIED FROM WITHIN THE EMPLOYER'S COUNTRY

Item	Description	Qty.	Unit	Unit rate (INR)	Total Ex-works (India) Price (INR)
1	2	3	4	5	6=3*5
A	MAIN EQUIPMENT INCLUDING FACTORY FABRICATED STEEL STRUCTURES FOR FLUE GAS DESULPHURISATION SYSTEM PACKAGE FOR SIPAT SUPER THERMAL POWER PROJECT, STAGE-I (3x660 MW)				
i)	FGD SYSTEM	1	lot		Included in TOTAL (A) (MAIN EQUIPMENT) of Schedule 1
ii)	LIMESTONE AND GYPSUM HANDLING SYSTEM	1	lot		Included in TOTAL (A) (MAIN EQUIPMENT) of Schedule 1
iii)	ITEMS RELATED TO CHIMNEY	1	lot		Included in TOTAL (A) (MAIN EQUIPMENT) of Schedule 1
iv)	ANY OTHER				
	TOTAL (A) (MAIN EQUIPMENT)				NIL
B	MANDATORY SPARES [BOQ AS SPECIFIED IN SUB-SECTION VII, PART-A, SECTION-VI] (Bidder is reqired to fill the prices of all the items serially as specified in Part-A, Section-VI)				3,99,48,84,379
	Sub total B				26,60,63,239
	SUB TOTAL (A+B)				4,26,09,47,618
C	SUB-TOTAL OF TYPE TEST CHARGES AS PER SCHEDULE-7				3,73,241
	GRAND TOTAL (A+B+C) -Schedule-1 (To be filled up in Item Data)				4,26,13,20,859

Note:	
1	Deleted
2	Unless stated otherwise a 'set' means items or sub-items required for each type/size range of the assembly/sub-assembly, required for complete replacement in one unit. It is further, intended that the assembly/sub-assembly which have different orientation (like left hand or right hand, top or bottom), different direction of rotation or mirror image positioning or any other reasons which result in maintaining two different sets of the spares to be used for the subject assembly/sub-assembly, these shall be considered as different types of assembly/sub-assembly.
3	Wherever quantity has been specified as percentage (%), the quantity of mandatory spares to be provided by the Contractor shall be the specified percentage (%) of the total population required to meet the specification requirements. In case the quantity of Mandatory Spares so calculated to be fraction, the same shall be rounded off to next higher whole number.

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4	Wherever the quantities have been indicated for each type, size, thickness, materials, radius, range etc. these shall cover all the items supplied and installed and the breakup for these shall be furnished in the bid.
5	In case spares indicated in the list are not applicable to the particular design offered by the bidder, the bidder should offer spares applicable to offered design with quantities generally in line with approach followed in the above list
6	Bidder are required to indicate the break-up of type test charges as per Schedule-7.
7	In case the description / quantity for any item mentioned in Schedule is at variance from what has been stated in Technical Specification and its subsequent amendments and clarifications, the latter shall prevail.

(LS)

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION,STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 3 : Installation Services (Erection, Civil, Factory Fabricated Steel Structural Works (Erection) & allied works) including insurance (other than transit insurance and other services as specified in the Bidding Documents)

Item	Description	Total Price in Indian Rupees
1	2	3
(I)	**MAIN EQUIPMENT INCLUDING FACTORY FABRICATED STEEL STRUCTURES**	**64,73,39,446**
(II)	**CIVIL & ARCHITECTURAL WORKS**	**1,95,01,91,170**
(a)	Geo-Technical investigation & slope protection works	Included in (II) Civil & Architectural works of Schedule 3, above
(b)	Infrastructure works	Included in (II) Civil & Architectural works of Schedule 3, above
(c)	FGD facilities	Included in (II) Civil & Architectural works of Schedule 3, above
(d)	Other works not covered in the above items but required to cover complete scope of works.	Included in (II) Civil & Architectural works of Schedule 3, above
(III)	**Structural Steel Works**	**8,04,97,100**
(IV)	**Training Charges (Refer Clause 28.00.00, Part-C, Technical Specification, Section-VI)**	**8,29,425**
(V)	**AMC Charges as per scope**	**10,00,000**
	TOTAL (I) + (II) + (III) + (IV) + (V) (TO SCHEDULE 4 GRAND SUMMARY AND TO SRM E-TENDER SITE)	**2,67,98,57,141**

NOTE:

1. Bidder is required to indicate the Total of Schedule-3 in "Item Details" Tab of E-Tender Site.
2. In case the description/ quantity for any item mentioned in schedule is at variance from what has been stated in Technical Specification and its subsequent amendments and clarifications, the latter shall prevail.

FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9				
Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301				
SCHEDULE OF RATES AND PRICES				
SCHEDULE- 2 : Local Transportation including Inland Transit Insurance and other local costs incidental to delivery of plant & equipment including mandatory spares				
Item	Description	Qty	Unit	Total Price (Indian Rupees)
1	2	3	4	5
1	TOTAL (I) MAIN EQUIPMENT	1	lot	7,07,60,918
i)	FGD SYSTEM	1	lot	Included in TOTAL (I) MAIN EQUIPMENT of Schedule 2 above
ii)	LIMESTONE AND GYPSUM HANDLING SYSTEM	1	lot	Included in TOTAL (I) MAIN EQUIPMENT of Schedule 2 above
iii)	ITEMS RELATED TO CHIMNEY	1	lot	Included in TOTAL (I) MAIN EQUIPMENT of Schedule 2 above
iv)	ANY OTHER		lot	NIL
2	TOTAL (II) MANDATORY SPARES (Refer Technical Specification)		lot	50,00,000
	TOTAL (I + II) (TO GRAND SUMMARY (SCHEDULE-4) AND TO SRM E-TENDER SITE)			7,57,60,918
Note:	Bidder is required to indicate the Total of Schedule-2 in "Item Details" Tab of E-Tender Site.			

FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9
Schedule No.4 : Grand Summary
REFER ITEM DATA

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 5 : Recommended Spare Parts

Item	Description	Quantity	Unit	Unit Price *Ex-Works (India) (INR)	Total Price *Ex-Works (India) (INR)	*Local transportation charges (including inland insurance, port clearance & port charges (INR)	Total Price (as delivered at Project) FOR Site (INR)
1	**Absorber Recycle Pump**			PRICE SHALL BE FURNISHED BEFORE AWARD OF CONTRACT			
	Impeller CPS	3	No.				
	Mechnical Seal Complete	3	No.				
	Suction Cover	2	No.				
	Set of O rings/ Gasket	12	No.				
	Mechnical Seal repair kit	3	No.				
	Bearings	2	No.				
2	**Oxidation Blower**						
	Air Filter	18	No.				
	Oil filter cartridge	3	No.				
	O-Ring	3	No.				
	Oil filter	3	No.				
	Oil seal	3	No.				
	Seal	3	No.				
	Bearings	3	No.				
	Anti-Vibration Pads	252	No.				
	Bearings RTDs	6	No.				
	Acuator VDV	2	No.				
	Acuator IGV	2	No.				
	Bearing Vibration Sens	6	No.				
3	**Ball Mill**						
	Major Components						
	Main bearing Insert	2	No.				
	Pinion bearings (without housing)	3	No.				
	Wear Components						
	Mill Liners (Shell and Head) with hardware	2	No.				
	Feed spout	2	No.				
	Feed Trunnion Liner	2	No.				
	Discharge Trunnion Liner	2	No.				
	Trommel Screen	2	No.				
	Seals						
	Main bearing oil seal	6	No.				
	Feed Spout Seals	2	No.				
	Discharge end Seals	2	No.				
	Pinion shaft (gear guard) seals	4	No.				
	O-ring for Trunnion Liner	4	No.				
	RTD's						
	Pinion Shaft RTD	2	No.				
	Main Bearing RTD	3	No.				
	Main Bearing Lubrication System						
	Filter elements	6	No.				
	Suction strainer	2	No.				
	Breather	2	No.				
	Low Pressure Pump	2	No.				
	High pressure pump	2	No.				
	Heat Exchanger (Cooler)	2	No.				
	Flow divider valve	2	No.				
	Electric heater	2	No.				
	Pinion Spray System						
	Spray Nozzles	3	No.				
	Air Filter	2	No.				
	Cycle switch	2	No.				
	Air solenoid valve	2	No.				

	Divider valve w/flow indicator	2	No.
	Pneumatic Pump	2	No.
	Regulator	2	No.
4	**Agitator**		
	Gearbox/ V Belt Drive		
	V belts	2	No.
	Flexible Coupling parts	2	No.
	Shaft Seal Ring	2	No.
	Antifriction Bearing	2	No.
	Impeller		
	Cap nuts for Impeller	2	No.
	Gaskets	2	No.
	Mechanical Seal		
	Seal rings, O rings	2	No.
	Springs, Shaft seal rings, Anti friction bearing	2	No.
5	**Vacuum Belt Filter**		
	Filter Cloth	6	No.
	Scraper for Cake	6	No.
	Wear-out Belt	6	No.
	Deflexion-correcting aircell	6	No.
	Sensitive valve for deflexion-correcting	2	No.
	Nozzles For Washing	18	No.
	Bearing UPC208CD	36	No.
	Valve Plate For Vacuum Pump	6	No.
	V-Belt For Vacuum Pump	6	No.
	Seal Packing For Vacuum Pump	6	No.
	Bearings - Vacuum pump	3	No.
	Bearings - Filtrate pump	3	No.
	Seals - Filtrate pump	3	No.
6	**Hydrocyclone**		
	VF Body	24	No.
	VF Insert	60	No.
	Bosy Extension	24	No.
	Cone	36	No.
	Spigot	96	No.
	O/F Pipe	12	No.
	Rubber Hose	132	No.
7	**Booster Fan**		
	O Rings For Bearing	3	No.
	Metallic Rings For Bearings	3	No.
	Filter For Lube Oil System	3	No.
8	**Booster Fan Inlet Damper**		
	Leaf Seal (Stainless Seal)	30	m
	Loof Seal (Plugs for Seal)	6	No.
	Limits switch (DPDT)	10	No.
9	**Booster Fan Outlet Damper**		
	Leaf Seal (Stainless Seal)	30	m
	Loof Seal (Plugs for Seal)	6	No.
	Limits switch (DPDT)	10	No.
10	**FGD Outlet Damper**		
	Leaf Seal (Stainless Seal)	30	m
	Loof Seal (Plugs for Seal)	6	No.
	Limits switch (DPDT)	10	No.
11	**Bypass Damper**		
	Leaf Seal (Stainless Seal)	30	m
	Loof Seal (Plugs for Seal)	6	No.
	Limits switch (DPDT)	10	No.
12	**Material Handling System**		

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	20° Trough carrying Idlers complete with base boards & mounting brackets etc. for A size belt width	30	No.
	Flat type return idlers complete with mounting base boards & mounting bracket etc. for A size belt width	15	No.
	20° Trough Impact Idlers complete with mounting base boards and brackets etc. for B size belt width	8	No.
	20° Trough Self aligning carrying Idlers complete with mounting base boards and brackets etc. for B size belt width	4	No.
	Flat Self aligning return Idlers complete with mounting base boards and brackets etc. for B size belt width	4	No.
	10° Transition Idlers complete with mounting base boards and brackets etc. for B size belt width	2	No.
	Rubber disc for the impact idlers	5% of the total qty	No.
	Rollers for idlers	10% of the installed capacity	No.
	Pulley complete with shaft but excluding plummer block and bearings	01 no of each size in pulley shaft diameter	No.
	Plummer block complete with bearing and sleeves	02 nos of each type and size	No.
	Rubber/nylon strip for belt cleaners and skirt board	20% of total quantity used	No.
	Complete Belt Scrapper (Primary & Secondary)	1 set for each Conveyor	Set
	Conveyor belt A size width	01 full length of each rating	
	Complete set of gear box	1 no each type, size and rating	No.
	Oil seal for gear box	4 sets of each type and rating	Set
	Bearing for gear box	1 set of each size and rating	Set
	Cooling fan for gear box	1 set of each size and rating	Set
	Fluid coupling complete set	1 no each type, size and rating.	No.
	Multi disc assembly for fluid coupling	1 set of each size	Set
	Fusible plug for fluid coupling	6	No.
	Complete Brakes	1 no. for each type and size	No.
	Brake shoes	1 set of each type and size	Set

	Plummer block assembly complete with lock washer/lock nut etc. for drive and non-drive end for crusher	2 Set each	Set
	Rotor assembly for crusher	1	Set
	Shaft seal for crusher	4	No.
	Head sprocket assembly complete with shaft and plummer block with bearings	1	Set
	Tail sprocket assembly complete with shaft and plummer block with bearings	1	Set
	Traction rollers carrying side	10% of total qty	No.
	Traction roller return side	10% of total qty	No.
	Sprocket segment	2 set of each type and size	Set
	Chain link	10% of population each type and size	No.
	Pans (flights)	10% of population	No.
	Pulleys complete with shaft including bearing & plummer blocks (complete with lagging) for magnetic separator	01 set of each type and size	Set
	V belt for magnetic separator	01 No of each type and size	No.
	Load cell for belt weigher	1	No.
	SMPS for belt weigher	1	No.
	Regulated power supply for belt weigher	1	No.
	Fan bearing for dust extraction system	1 set of each type	Set
	V belt	1 set of each size	Set
	Filter bags	10% of the total quantity used	No.
	Coils for solenoid valve	4 no each type and rating	No.
	Motor	01 no of each rating	No.
	Driving End & Non-Driving End Bearing	01 no for each type and rating of Motor	No.
	Cooling Fan	01 no for each type and rating of Motor	No.

We also confirm that the items of Recommended Spares with same specification having same identification number but with different item code have been quoted by us at the same price. Further all such items of spares have been clubbed together and enclosed separately at Annexure... . to our offer.

*Bidders shall Quote prices in INR and fill in the amount in figures and words.

Note:

1. Spares shall be quoted on Ex-works (India) basis.

2. Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this Schedule.

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 6 : Goods and Services Tax (GST), applicable on Schedules - 1, 2 & 3, not included in bid price.

The details of Goods and Services Tax (as on seven (07) days prior to the last date for submission of price bids) applicable on the price of goods and services quoted in Schedule-1, 2 & 3, not included in the Bid Price and which may be payable by the Employer in accordance with the provisions of Bidding Documents are as under :

S. no.	Bid Price Component	Rate of GST (%)	Amount on which GST applicable (in INR)	Total GST payable (in INR)
1	Ex-Works-Main Equipment (Schedule-1)	18%	As mentioned in TOTAL (A) (MAIN EQUIPMENT) of Schedule-1	Included in Total (GST) of schedule 6 below
2	Ex-Works-Mandatory Spares (Schedule-1)	18%	As mentioned in Sub total B of Schedule-1	Included in Total (GST) of schedule 6 below
3	Type Test charges (Schedule-1)	18%	As mentioned in Item C Sub total of type test charges of Schedule-1	Included in Total (GST) of schedule 6 below
4	F&I-Main Equipment (Schedule-2)	18%	As mentioned in TOTAL (I) MAIN EQUIPMENT of Schedule 2	Included in Total (GST) of schedule 6 below
5	F&I-Mandatory Spares (Schedule-2)	18%	As mentioned inTOTAL (II) MANDATORY SPARES of Schedule 2	Included in Total (GST) of schedule 6 below
6	Erection - Main Equipment (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (I) of Schedule-3	Included in Total (GST) of schedule 6 below
7	Civil Works (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (II) of Schedule-3	Included in Total (GST) of schedule 6 below
8	Training charges (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (IV) of Schedule-3	Included in Total (GST) of schedule 6 below
9	AMC charges (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (V) of Schedule-3	Included in Total (GST) of schedule 6 below
10	Structural Works (Schedule-3)	18%	As mentioned in Column no. "3" (Total Price in Indian Rupees) of Item (III) of Schedule-3	Included in Total (GST) of schedule 6 below
11	Any other Price Component (not covered above)	NIL	NIL	NIL
	TOTAL (GST)			**1,26,30,49,005.265**

Notes:	
1	Bidder shall quote the GST as applicable in the Employer's country as on seven (7) days prior to the last date of submission of price bids.
2	In case rate of GST is different for various items, such different rates of GST along with the amount on which such GST is applicable shall be suitably indicated by the bidders in this schedule.
3	**Bidder is required to indicate the Total of Schedule-6 in "Item Data" Tab of Bid invitation at NTPC E-Tender Site.**

FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 7 : Break up of Type Test Charges priced in Schedule-1.

We Confirm that the charges for all the type tests stipulated in the bidding documents are included in our bid price. Further, the break-up of various type test charges are given below which, at your option, can be used for adjustment in contract price in case any of the type tests is not to be carried out.

Sl. No.	Description of equipment	Description of Type Test	*Charges for one Type /Rating	Number of Type/Rating	Total Type Test Charges*	Remarks Test charges*
1	2	3	4	5	6	7
1	H.T. Motors **for each type and rating of HT motor**					
		(a) No load saturation and loss curves				
		(b) Measurement of noise at no load				
		(c) Momentary excess torque test (subject to test bed constraint).	29,030	6	1,74,179	
		d) Full load test (subject to test bed constraint)				
		(e) Temperature rise test at rated conditions				
2	Leak tightness testing of dampers at shop for (eachtype and size) (Refer clause no. 18.01.02 of Sub-section-I-M1, Part-B of Section-VI)		8,294	4	33,177	
3	Full range and full scale performance tests, to be conducted at shop using actual fan for following fans (as per BS 848, Part-1) (Refer clause no. 18.01.01 of Sub-section-I-M1, Part-B of Section-VI)					
	(a) Booster Fan		82,943	1	82,943	
4	MV VFD **(for each type and rating)**					
		(a) Overall efficiency determination of VFD system including transformer/ Harmonic filters etc at motor full load				
		(b) Temperature rise test	82,943	1	82,943	
		(c) Noise level				
		(d) Harmonics of No load current.(Input/Output)				
	Grand Total Break-Up of Type Test Charges to Schedule-1				3,73,241	

Note :

1. * Please fill in the amount in figures and words in INR.
2. The currency of charges for Type Tests shall be INR in which the corresponding equipment is being offered in Schedule-1.

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3	In case of additional type/rating for any particular item are found during engineering, the type tests for the same shall be carried out without any additional cost to the Employer. Further, in case of waiver of any type tests on such additional type/rating. the unit rate for same as stated in this schedule for that particular item shall be applicable for working out the rebate.

FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 8 : Schedule of Unit Rates

Unit Rates of various items are given as under. We confirm that the prices of these items as per the requirement of Technical Specifications are already included in the lump-sum prices quoted in Schedule-1. We further confirm that these unit rates shall be used for contract price adjustment in case of any changes in quantities/components of the package.

S. No.	Description of Equipment	Qty	Unit Price in INR
1	**Control & Instrumentation (C&I) (Unit rates for the following C&I Items)**		
A	**Microprocessor based Control System with HMI for FGD and other systems being provided in the Contract**		
(a)	**Control System**		
(i)	Controller, each type		
(ii)	Input modules, each type		
	§ 4-20 mA input		
	(Model No.....)		
	§ RTD Input		
	(Model No.....)		
	§ T/C Input		
	(Model No. .....)		
	§ Digital input		
	(Model No.....)		
	§ SOE Input		
	(Model No.....)		
	§ Others (Bidder to specify)		
(iii)	Output Modules, each type		
	§ Analog output (4-20 mA)		
	(Model No. .....)		
	§ Binary Output		
	(Model No. .....)		
	§ Other, if any		
(iv)	Communication Controller each type		
	(Model No. .....)		
	(Model No. .....)		
	(Model No. .....)		
	(Model No. .....)		

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(v)	Power Supply Module, each type		
(vi)	Other modules, each type		
(b)	**HMIPIS**		
(i)	Operator Works Station		
(ii)	Server/work staion		
(iii)	Laser printer		
(iv)	Other modules, components used		
(c)	**Other modules used in Microprocessor based Control System with HMI (if any)**		
(B.)	**Measuring Instruments**		
a)	Primary & Secondary Instrument		
(i)	Pressure Indicator (PI)		
(ii)	Pressure Transmitter (PT)		
(iii)	Differential Pressure Indicator (DPI)		
(iv)	Differential Pressure Transmitter (DPT)		
(v)	Pressure Switch (PS)		
(vi)	Differential Pressure Switch (DPS)		
(vii)	Temperature Guage (TG)		
(viii)	Temperature Element – RTD		
(ix)	Temperature Element – T/C		
(x)	Temperature Transmitter (TTx)		
(xi)	Temperature Switch (TS)		
(xii)	Flow Element (FE)		
	a. Orifice Plate		
	b. Flow Nozzle		
	c. Any other type		
(xiii)	Flow Indicator (FI)	Bidder will furnish this breakup during contract execution phase	Bidder will furnish this breakup during contract execution phase
(xiv)	Flow Transmitter (FT)		
(xv)	Flow Switch (FS)		
(xvi)	Level Gauge (LG)		
(xvii)	Level Transmitters (LT)		
(xviii)	Density meter		
(xix)	pH analyser		
(xx)	SO2 Analyser		
(xxi)	Vibration Monitoring System:		
	a) Contact type vibration measurement point (vibration sensor comprising of associated vibration monitor, probe drivers (if applicable), prefab cables, prefab extension cables, mounting pads/brackets)		
	b) Junction boxes for vibration sensors		
(C)	**Instrumentation cable of each type & size**		
(I)	**Instrumentation Cable**		
(a)	**G TYPE**		

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1	2 PAIR STRANDED COPPER (0.5 MM^2)
2	4 PAIR STRANDED COPPER (0.5 MM^2)
3	8 PAIR STRANDED COPPER (0.5 MM^2)
4	12 PAIR STRANDED COPPER (0.5 MM^2)
5	16 PAIR STRANDED COPPER (0.5 MM^2)
6	24 PAIR STRANDED COPPER (0.5 MM^2)
7	48 PAIR STRANDED COPPER (0.5 MM^2)
(b)	**F TYPE**
1	2 PAIR STRANDED COPPER (0.5 MM^2)
2	4 PAIR STRANDED COPPER (0.5 MM^2)
3	8 PAIR STRANDED COPPER (0.5 MM^2)
4	12 PAIR STRANDED COPPER (0.5 MM^2
5	16 PAIR STRANDED COPPER (0.5 MM^2)
6	24 PAIR STRANDED COPPER (0.5 MM^2)
(II)	**CONTROL CABLES**
1	10C (2.5 MM^2)
2	5C (1.5 MM^2)
3	3C (1.5 MM^2)
4	2C (1.5 MM^2)
5	5C Unarmoured (2.5 MM^2)
6	3C Unarmoured (2.5 MM^2)
7	2C Unarmoured (2.5 MM^2)
8	4 Core single Mode OFC
9	12 Core single Mode OFC
(D)	**Electrical Power Supply System**
(i)	**24 V DC CHARGER SYSTEM WITH BATTERIES of each type and rating**
(a)	24 V DC Charger System - Complete Charger System comprising of Controller, Rectifier Modules, Transformer, DCDB, Ni Cd battery bank, Battery Health Monitoring, Cabinet and Other Accessories.
(ii)	**UPS SYSTEM WITH BATTERIES of each type and rating**
(a)	UPS with chargers and inverters with input isolation transformers, Ni Cd battery bank , Bypass line transformers & voltage stabilizer, static switch manual bypass switch, ACDB, Battery Health Monitoring system (BHMS), Cabinets and other necessary protective devices and accessories.
(b)	MINI UPS of each type and rating
	.....
	.....

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FLUE GAS DESULPHURISATION SYSTEM (FGD) PACKAGE FOR SIPAT SUPER THERMAL POWER STATION, STAGE-I (3x660 MW) UNDER LOT-2 PROJECTS; COMMON BIDDING DOCUMENT NO. CS-0011-109(2)-9

Bidder's Name and Address : GE Power India Limited, IHDP Building, Plot No 7 Sec 127, Noida-201301

Schedule No. 9: SCHEDULE OF TAKE OUT PRICE

Take out price for certain items/services are indicated below. We confirm that the prices for these items are already included in the Bid Price. We further confirm that the Employer may delete from our scope any of the items given below based on the prices given in this schedule.

Sl. No.	Description	*Ex-Works (India) (Indian Rupees)	Local transportation & Insurance charges (Indian Rupees)	*Installation (Indian Rupees)	Reference of Bid where Technical Details have been furnished	Remarks
1	2	3	4	5	6	7
1	Training as per clause no. 28.00.00, Part-C, Section-VI for					
(a)	O&M personnel	-	-	5,80,598	-	
(b)	Engineering personnel	-	-	2,48,828	-	

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छत्तीसगढ़ स्टेट इण्डस्ट्रियल डेव्हलपमेंट कार्पोरेशन लिमिटेड

(छत्तीसगढ़ शासन का एक उपक्रम)
प्रथम तल, उद्योग भवन, तेलीबांधा, रिंग रोड़ नंबर–01, खनिज भवन के सामने, रायपुर (छत्तीसगढ़)
CIN: U45203CT1981SG001853, PAN : AABCM6288N, ST Regn No. AABCM6288NSD004
दूरभाष : कार्या.– 0771–6002071,72,73, फैक्सः 0771–2583794
Website: www.csidc.in Email address:csidc.cg@nic.in,csidc_raipur@yahoo.com

क्रमांक / सीएसआईडीसी / भू–आ. / 2016 / 1489 रायपुर, दिनांक 20 / 02 / 2017

प्रति,

समूह महाप्रबंधक,
एनटीपीसी लिमिटेड,
सीपत सुपर थर्मल पावर स्टेशन,
पोस्ट ऑफिस–उज्जवल नगर, सीपत,
जिला बिलासपुर – 495555(छ.ग.)

21/2/17
HOD (IMG)
cc. HOD (HR)

विषय :राख आधारित उद्योग लगाने हेतु ग्राम–सेलर, तहसील एवं जिला बिलासपुर में 70 एकड़ शासकीय जमीन की उपलब्धता।

संदर्भ :आपका पत्र क्रमांक Sipat/HOS/120/1891 दिनांक 04 / 02 / 2017

महोदय,

कृपया अपने संदर्भित पत्र का अवलोकन करें जिसमें ग्राम सेलर, तहसील एवं जिला बिलासपुर में निगम के आधिपत्य की लगभग 70 एकड़ भूमि के उपयोग के संदर्भ में जानकारी चाही गई है। इस तारतम्य में अवगत होना चाहेंगे कि उपरोक्त परियोजना के संदर्भ में इस निगम द्वारा परियोजना प्रतिवेदन के निर्माण तथा इस परियोजना के लिये आवश्यक भारत सरकार से अनुमतियों तथा लागत प्रतिपूर्ति के विषय में पत्राचार किया जा रहा है। आवश्यक अनुमतियां तथा वित्तीय व्यवस्था होने पर परियोजना का क्रियान्वयन किया जा सकेगा।

उपरोक्तानुसार सूचनार्थ।

धन्यवाद,

भवदीय,

(सोलोमन मैथ्यू सिलाह)
कार्यपालक संचालक

F.No.J-13012/112/2010-IA.I(T)
Government of India
Ministry of Environment, Forest and Climate Change

3rd Floor, Vayu Block,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, New Delhi-110003

Dated: 21.10.2020

To

Dr. Vijay Prakash, General Manager
M/s NTPC Ltd., Environmental Engineering Department
Engineering Office Complex, Plot No. A-8A, Sector – 24
Noida – 201 301.

Tel. No. 0120-2410331; E-mail: environment.ntpc@gmail.com

Sub: **2x800 MW (Stage-IV, Telangana STPP, Phase-I) at Village & Mandal Ramagundam, District Karimnagar, Telangana by M/s NTPC Ltd.-reg. amendment in EC.**

Sir,

The undersigned is directed to refer your online application Nos. IA/TG/THE/113457/2019 dated 05.08.2019 for amendment in Environmental Clearance (EC) condition regarding monitoring of Radio activity.

2. It has been noted that the Environmental Clearance to 2x800 MW Ramagundam Thermal Power Project was accorded vide Ministry's letter dated 20.1.2016. The specific condition No.xv of the said EC is as below:

"Condition No.xv: A long term study of radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute and results thereof analysed every two year and reported along with monitoring reports. Thereafter mechanism for an in-built continuous monitoring for radio-activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place."

3. It has been noted that you have requested for amendment in the above mentioned conditions. It has been informed that the continuous online instruments are not available for monitoring Radio-activity and heavy metal analysis in the Coal and heavy metals.

4. The above proposal for amendment in EC have been considered by the EAC (Thermal Power) in its meeting held on 23.8.2019. In acceptance of the recommendations of the EAC (Thermal Power), ***the Ministry hereby grants the amendment in EC dated 20.1.2016 with the following additional conditions***:

i. The General condition No.xv of EC dated 20.1.2016 is modified as:

"Radio activity and heavy metals' contents in coal and fly ash (including bottom ash) shall be carried out through a reputed institute once in a year and the analysis reports to be submitted to the Ministry and its Regional Office."

ii. The total Radio-activity in the working areas such as coal stock yard, flyash pond shall be calculated based on the analysis results per unit weight of coal/ash. The total radio-activity in the atmosphere is to be compared with the maximum permissible dosage levels of each person working in those areas. This is to be conducted once in a year.

Office of Collector, Bilaspur, Chhattisgarh

To,

Date : 01.03.2021

The Regional Director,
Central Pollution Control Board,
Parivesh Bhawan, ParyavaranParisar,
E-5, Arera Colony, Bhopal
Madhya Pradesh

The Regional Director of MOEF&CC,
Ministry of Environment, Forest and Climate Change
Regional Office (WCZ), Ground Floor, East Wing,
New Secretariat Building, Civil Lines,
Nagpur, Maharashtra

Subject: Report from District Administration in compliance of the order dated 27.02.2020 passed by the Honourable NGT in OA 459/2018

As per the direction of Hon'able NGT (Principal Bench) in the order dated 27.02.2020 in OA No 459/2018, a point wise report so drafted based on the primary reports submitted by NTPC and spot verifications done by the departmental sub-teams of the CECB and district administrationis herewith attached along with supporting documents for your pursual and further action.

Yours faithfully,

1/3/21

Dr.SaranshMittar, (I.A.S)
Collector Bilaspur
Bilaspur, Chhattisgarh

Attached :

1. **Compliance Report - 17 Pages**
2. **Annexures A to M – 90 Pages**

Before the National Green Tribunal, Principal Bench, New Delhi

Original Application number 459/2018

Earlier 196/2014(CZ)

Rashmi Singh Vs NTPC ltd & Others

Report based on the spot verifications against the Environmental clearances provided to NTPC.

Date of Submission:

M/s NTPC Limited is located at village Sipat, Tehsil Masturi, District Bilaspur, Chhattisgarh for generation of 2980 MW power in its Super Thermal Power Plant (STPP). The EC for Stage I and II was granted in the year 1999 and 2004 respectively with subsequent amendment thereon. The applicant has challenged the compliance of the EC conditions in OA 459/2018.

Honorable NGT (Principal Bench) vide order dated 27.02.2020 has directed the committee constituted in OA No 200/2018 Dukalu Ram & ors Vs Union of India vide order dated 14.02.2019 to consider the aspects raised by the applicant. The members of the Committee are

1. District Collector, Bilaspur
2. Regional Director of Central Pollution Control Board.
3. Regional Director of MOEF &CC, Nagpur.

S.No	EC Condition	Present Status of Compliance verified during visit to NTPC site
1	Coal should be used @ 10MT/year for Stage –I with Sulphur content not exceeding 0.24%. The coal should be transported from Korba Coalfields by Captive MGR in Closed wagons to avoid dust pollution.	As per the verification, no report has been presented by NTPC which states about the Sulphur content of coal. Only a research paper from IIT Delhi 2004 has been submitted which gives a generic view about Indian Coal. The spot verification of the coal transported from Korba Coalfields by Captive MGR showed that the wagons are covered using tarpaulin and in these tarpaulin sheets there is considerable amount of wear and tear. (Annex A) Hence the wagons are partially covered. Partially Complied

Inspection Team Members

Tehsildar

CECB Representative

Mining Inspector (Addl)

<table>
<tr><th>S.No</th><th>EC Condition</th><th>Present Status of Compliance verified during visit to NTPC site</th></tr>
<tr><td>2</td><td>As per the proposal submitted for Ash Utilization, it should be ensured that fly ash is used in cement industry, brick making and in raising the ash dyke etc. Efforts should also be made in the area of mine filling, land development and agriculture etc. For brick making, about 50 acres of land with all infrastructure facilities should be earmarked. Full fly ash utilization should be ensured at the end of 9th year from the date of commissioning of the project.</td><td>Generation of Fly ash as per NTPC records (Annex B) and its utilization is as given below (Table in MT):
<table>
<tr><th>Fin year</th><th>Ash Generation</th><th>Total Ash after adding remaining</th><th>Utilisation</th><th>Remaining</th><th>(%) Utilization</th></tr>
<tr><td>15-16</td><td>5511025.9</td><td></td><td>837409.87</td><td>4673616.03</td><td>15.20%</td></tr>
<tr><td>16-17</td><td>5449684.0</td><td>10123300.0</td><td>1246148.76</td><td>8877151.27</td><td>12%</td></tr>
<tr><td>17-18</td><td>5211382.9</td><td>14088534.2</td><td>970974.37</td><td>13117559.80</td><td>7%</td></tr>
<tr><td>18-19</td><td>4800059.4</td><td>17917619.2</td><td>2377816.57</td><td>15539802.63</td><td>13%</td></tr>
<tr><td>19-20</td><td>4905238.2</td><td>20445040.8</td><td>2408428.48</td><td>18036612.35</td><td>12%</td></tr>
</table>
No accounting has been provided by NTPC for the ash which remains unutilized from the previous years. Hence only 12% of fly ash has been utilized till date which does not follow Fly Ash utilization policy 1999.

For Ash Utilization the below points have been found:

a) Usage of Pond ash in NHAI Road: Pond Ash has been supplied to NHAI. As per the NHAI records, in Bilaspur-Pathrapali Road total pond ash to be supplied is 1910 MT, in which 1053 MT has been supplied whereas the rest is yet to be supplied. For Raipur-Dhamtari Road only 36MT have been provided. (ANNNEX C – a & b)

b) Usage in Brick making industries</td></tr>
</table>

		NPTC has claimed to supply fly ash for brick making to 100 brick making industries. A sample check for 30 industries has been carried out in which supply of fly ash for last 15 days has been checked, about 500 Metric Tonne of fly ash has been supplied. Hence for a period of a year extrapolated, the supply for brick making is around 40,000 metric tonne. However, this amount had been quoted to be around 3,60,075 metric tonne for Yr 2019-2020. Also, the permission given by SDM for transport of fly ash has been very minimal for about 15,000 metric tonne. The supply for fly ash cannot exceed the permission for transport. (Annex D) **c) Raising Ash Dyke:** 3 dykes are there in NTPC Sipat over an area of 958.94 acres. (Annex D-a) **d) Filling Manikpur OCM in Korba:** - NTPC has applied to fill 28 Lakh cum. fly ash in OCM Korba Manikpur. This is a proposal for Fly ash utilization. On field work has not started for the same. **e) No land has been earmarked by NTPC on its own for brick making industry**. Also, the land in Saler village has been acquired by CSIDC and CSIDC plans to use the same for Micro Small Enterprises Cluster Development. (Annex E) **f) For transport of fly ash to brick making industries**, the trucks carrying fly ash were randomly checked. Most of the trucks were found to be covered with tarpaulin sheets with considerable amount of wear and tear.

Inspection Team members:

SDM Tehsildar RTO GMDIC CECB Representative

S.No	EC Condition	Present Status of Compliance verified during visit to NTPC site
3.	Keeping in view the location of Sonthi Pahar Reserved Forest, additional Monitoring Station should be installed at the site to assess the ambient air quality. Monitoring should be initiated immediately to ascertain the project status and the scenario after commissioning of the project. A special study should be undertaken to ascertain impact of SO2 on the flora in the project impact zone particularly the forest patches.	The Hilltop adjacent to Sonthi village is known as Sonthi Pahar which is demarcated as RF 9 and 10. The Air Quality monitoring has been set up at Gudi village - Bharuadih which is at RF 04 and is about 3 km vertical displacement from Sonthi. Hence the monitoring of air quality is not done at Sonthi Pahar forest area. However, three CAAQMS were found to be installed in the NTPC plant and one in the township. The readings for the same were taken be the verification team. (Annex F) After comparison with the norms of the Central Pollution Control Board, air quality was tested to be within the permissible limit as reported by CPCB
4.	Regular monitoring for SPM, SO2, NOx around the power plant may be carried out and records maintained. A Monitoring Station should be established near Sonthi Pahar forest in NE direction of the power plant.	As stated in point 3
5.	Since maximum concentration for SO2 near Sonthi Pahar is likely to be close to permissible levels for sensitive area, continuous monitoring and analysis of ambient air quality in the region should be undertaken during planning, construction and operational phase of the project.	As stated in point 3 Also, as per the teams' observation in the nearby villages, portable air quality machines are available referred as Ambient Air quality stations are placed in villages Janji, Sipat and Darabhatta. The readings for the same were taken by the verification team. After comparison with the norms of the Central Pollution Control Board, air quality was tested to be within the permissible limit. (ANNEX F)

For Point 3, 4 and 5 - Inspection Team Members: Tehsildar CPCB Representative Forest Dept Representative

S.No	EC Condition	Present Status of Compliance verified during visit to NTPC site
6	Utilization of land for Stages I & II of the project shall be restricted to 4382.44 acres, which is already in possession of the project authorities. 70 acres of additional land will be acquired by M/s. NTPC for ash based units.	Land acquired is as given. However, there is extra land next to the ash dykes which have turned into marshy land is unfit for agriculture. NTPC provides crop yield compensation for these marshy areas next to the dykes. No land has been earmarked by NTPC on its own for ash based units of brick making. Also, the land in Saler village has been acquired by CSIDC and CSIDC plans to use the same for Micro Small Enterprises Cluster Development. (ANNEX E) Not Complied

Inspection team members: SDM CSIDC representative CECB Representative

SNo	EC Condition	Present Status of Compliance verified during visit to NTPC site
7.	Ash generated to the tune of 2.15 million tons per year shall be used in a phased manner as per the provisions of the Fly Ash Utilization Notification of September, 1999 and its subsequent amendments. By the end of ninth year, full fly ash utilization should be ensured. The cost of ash utilization measures proposed in the total project cost should be intimated.	As per report submitted by NTPC, fly ash generation per year has been around 4.5 to 5 million MT. (Annex B) As per the provision of Fly Ash Utilization 1999, directions were issued for promoting the use of fly ash in the manufacture of building material and construction activities within a specified radius of 100 kms from the coal or lignite based thermal plants. Also, the utilization notification states that 100% fly ash should be utilized as per norms. However as per NTPC only 12% of fly ash generated has been utilized till the 9th year of its operation. Hence it is far behind its target from fly ash utilization. Utilization is in the form of a) Use in road building in NH b) Use of fly Ash in Brick making industries This has already been stated in Point 2
8.	Details of the plan to develop ash utilizing industrial units in the 70-acre plot proposed by the project proponent should be worked out in consultation with the State government and the draft plan in this regard should be submitted to MOEF within 6 months of environmental clearance. 70 acres of land will only be utilized for setting up ash-based industries.	No land has been earmarked by NTPC on its own for ash setting up ash utilization units. Also, the land in Saler village has been acquired by CSIDC and CSIDC plans to use the same for Micro Small Enterprises Cluster Development. (Annex E)

S No.	EC Condition	Present Status of Compliance verified during visit to NTPC site
9.	Regular monitoring of the air quality should be carried out in and around the power plant and records be maintained. Periodic six-monthly reports should be submitted to this Ministry.	As stated in Point 3
10.	A long-term study on radioactivity and heavy metals contents on coal to be used shall be carried out through a reputed institute. Thereafter mechanism for an in- built continuous monitoring of radioactivity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	As per the documents submitted by NTPC, Study done by BARC, Mumbai and IICT Hyderabad, state that the contents of coal, fly ash as comparable to national average values.
11.	Monitoring of surface water quantity and quality shall also be regularly conducted and records maintained. The monitored data shall be submitted to the ministry regularly. Further, monitoring point shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring of heavy metals in ground water shall be undertaken.	Tests were conducted for drinking water quality, the water had been found drinkable and within permissible limits. Also, there are records given by NTPC for measuring Surface water quality. (ANNEX G)

Inspection Team for Point 11: EE PHE CECB Representative

Sno.	EC Condition	Present Status of Compliance verified during visit to NTPC site
12.	Minimum required environmental flow suggested by the competent authority of the state Govt. shall be maintained in the channel / Rivers (as applicable) even in lean season.	Since there is no notification issued by the Chhattisgarh Government regarding maintaining Minimum required environmental flow in the channel / Rivers, this point of Compliance is not applicable. Moreover, the NTPC derives water via a canal from the Hasdeo River and does not directly source its water requirement from the River.

Sno.	**EC Condition**	**Present Status of Compliance verified during visit to NTPC site**
13.	Fly ash shall not be used for agriculture purpose. No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall takes place at any point of time. In case, the option of mine void filling is to be adopted, prior detail study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the state pollution control board and implementation done in close co-ordination with the state pollution control board.	No visible use of fly ash is observed in agriculture. However as per the Map given by NTPC and field verification marshy land has been noticed in areas nearby dykes. (ANNEX I - a) Also, in the field visit by the team, around the dyke area it was found that considerable area has been turned into marshy land, like areas in villages Rank (Annex I – b)

<table>
<tr><th>Sno.</th><th>EC Condition</th><th>Present Status of Compliance verified during visit to NTPC site</th></tr>
<tr><td>14.</td><td>CSR schemes should address Public hearing issues and shall be undertaken based on need base assessment in and around the villages within 5 Km of the site and in constant consultation with the village panchayat and the district administration. As part of CSR prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken. development of fodder farm, fruit bearing orchard, vocational training etc. can form a part of such programmers. Company shall provide separate budget for community development activities and income generating programmers. Vocational training programmers for possible self-employment and jobs shall be important to identify villagers free of cost.</td><td>NTPC CSR details and OIC CSR report (ANNEX J)
According to the 4th Annual Report on CSR submitted by NTPC (19-20) for previous 3 financial years the CSR fund has been marked at 252.68 Cr in which the following amount has been budgeted for NTPC Sipat
<table>
<tr><th>Year</th><th>Amount in Lakh</th><th>Expenditure</th></tr>
<tr><td>18-19</td><td>658</td><td>898</td></tr>
<tr><td>19-20</td><td>1135</td><td>1077</td></tr>
<tr><td>20-21</td><td>95 (Covid Budget)</td><td>60.24 (Covid)
269 (Non Covid)</td></tr>
<tr><td>Total</td><td>1888</td><td>2304</td></tr>
</table>
In this amount, the only Rs 4 Crore has been spent as per the guidelines from the district administration. For these 4 crores all documentation has been well maintained at district administration level, however the remaining Rs 13 Crore has been invested directly by NTPC to the affected villages for which no correspondence was done with district administration. Like for the sectors such as Education, Vet nary, ITI, skill development and water supply, no correspondence has been done with district administration at Collector level. Since each department has its own departmental budget, district administration cannot ascertain that the amount spent in CSR is not the amount spent by its own department.

Also, the district administration has not been involved in making the Annual Budget proposal for CSR hence the focus areas are randomly picked by NTPC. Hence NGT is requested to issue directions to NTPC to execute the CSR as per district administration prerogative and EC 2014.</td></tr>
</table>

Inspection Team members : SDM Tehsildar CECB Representative

Sno.	EC Condition	Present Status of Compliance verified during visit to NTPC site
15.	The environment statement for each financial year ending 31 set march in form-V as is mandated to be submitted by the project proponent to the concern state pollution control board as prescribed under the Environment (protection) rule, I 986, as amended subsequently, shall also to be put on the website of the company along with the status of compliance of Environmental clearance conditions and shall also be sent to the respective regional offices of the ministry by e mail.	Report is submitted to the required agency.
16.	Top surface of the coal wagons shall be completely covered with tarpaulin sheet/Cloth so that coal will not get exposed to atmosphere and becomes secondary emissions. This will avoid fugitive dust emissions during the transport. Water sprinkling shall be done on the top surface of coal at loading point before covering with tarpaulin sheet. Due safety procedures shall be followed so that the covered sheet doesn't open up and fly away during transport which will endanger safety of nearby people, agricultural fields, etc. Water sprinkling measures as proposed at loading and unloading point shall be continued. Progress report of implementation shall be submitted to	The spot verification of the coal transported from Korba Coalfields by Captive MGR showed that the wagons are covered using tarpaulin and these tarpaulin sheets have had considerable amount of wear and tear. Hence the wagons are partially covered. Photos as attached in Annex A. Same as Point 1

	this ministry and concerned Regional office as part of Compliance report.	
Sno.	**EC Condition**	**Present Status of Compliance verified during visit to NTPC site**
17.	Dense avenue plantation shall be developed on either side of the track wherever habitations/agricultural lands exist in consultation with local forest department to minimize the dust and noise pollution.	EC 1999 (VII) and EC 2014 (X) have stated that plantation should be done in 215 acres as well as around the ash ponds and around the plant boundary. Plantations have been carried out by Chhattisgarh Van Vikas Nigam (ANNEX K) Few sample areas were checked and below reports have been observed: - In 2018-2019, 38769 trees have been planted in which about 89% are surviving. In Baniyadih MGR area, 25000 trees have been planted in which about 92% are surviving. In Dhaniya Overbridge NTPC, 22975 trees have been planted in which 82% show survival. In NTPC dyke area, 2000 trees have been planted in the year 2018 in which 90% show survival. For NTPC green belt development, in 2016, 60000 trees have been planted in which 82% show survival. Hence Partially Complied

Inspection Team members: SDO Forest SDO Social Forestry

Sno.	EC Condition	Present Status of Compliance verified during visit to NTPC site
18.	AAQ monitoring within 1 km on either side of track, close proximity to nearby habitation, shall be continued once in a quarter and the progress report shall be submitted.	As per the teams observation in the nearby villages, portable air quality machines are available referred as Ambient Air quality stations are placed in villages Janji, Sipat and Darabhatta. The readings for the same were taken be the verification team. After comparison with the norms of the Central Pollution Control Board, air quality was tested to be within the permissible limit. Monitoring records have been attached in Annex -F Hence complied.

Sno.	EC condition	Present Status of Compliance verified during visit to NTPC site
19.	Health survey study of the local people shall be carried out. The report should clearly bring out the impact on surrounding forests, agriculture/crop patterns, percentage of yield, public health due to open wagon coal transportation, etc.	NTPC has submitted a study conducted by CIMS Bilaspur in which a sample of 900 people staying in around MGR Korba and Bilaspur were taken and as per the study 21.4% have reported to have breathing difficulties,17.2% have stated cough problem, 12.1% have stated chest congestion, 12.3% have stated chest pain due to coughing, 8% have stated heavy breathing and 7.8% have stated insomnia. ANNEX L
20.	As stipulated by the earlier EAC on 31.03.2016, PP should study alternative Methodologies / technologies being utilized including abroad, to prevent coal dust blow from moving open wagons carrying coal, if any. The results of this study should be submitted within one year.	Covering of coal wagons using tarpulin sheets is being done as stated in point 1. NTPC has stated that more work in the same direction is being taken up with RSDO Lucknow.

Inspection Team for Point 19 : CMHO DPM Health

Other Observations

As investigated by the inspection team, the below issues have been sited: -

a) Destruction of Dawang Minor canal by NTPC which must be rectified and bears of cost of 8.10 Lakh (Annex H)

b) Kaudiya Distribution Canal gets blocked due to waste from NTPC township and other reasons which has to be rectified, a R.C.C duct should be made by NTPC to address this issue. The cost for the same is estimated to be 162.70 Lakh (Annex H)

c) For the point of Zero Liquid discharge: From the dykes, as seen by the team there is no overflow, however since visible marshy land can be seen around the dykes, there is definitely the question of ***subsurface leakage from the dykes***. As stated by NTPC representatives and the communication with villagers, NTPC identifies this issue and provides the farmers with crop yield compensation amount. But to ascertain that the flow is as seepage from the dykes, NTPC has informed that a study for the same is under tender process. Physically any other water body other than the ash dykes are not found close to the marshy land areas.

d) For the point of Fugitive dust (EC Condition 5, 2014): It was seen that 2 water fumigators were at the ash dyke areas along with sprinklers but there is a potent problem of ash dust storms as communicated by the villagers to the inspection team. Documents for the same have been attached. (Annex M)

In compliance of the NGT order dated 20.08.2020, at the district level, field verification teams were found and spot verification was conducted.

Attachments

Annex. No.	Page Numbers
A	Page 1 to 5
B	Page 1
C (a), C(b)	C(a) - Page 1 C(b) - Page 2
D, D(a)	D - Page 1 to 18 D(a) - Page 1
E	Page 1 to 3
F (a), F(b)	F(a) – Page 1 F(b) – Page 1-5
G	Page 1 to 4
I (a), I (b)	I (a) – Page 1 I (b) Page 1 to 10
J	Page 1 to 14
K	Page 1 to 19
L	Page 1 to 2
H	Page 1 to 2
M	Page 1 to 2

ANNEX A

Pg 1

न्यायालय अतिरिक्त तहसीलदार उप-तहसील सीपत,जिला बिलासपुर (छ.ग.)

क्रमांक/ 108 /अति.तह./वाघक/-2/2021 सीपत,दिनांक 16/02/2021

प्रति.

अतिरिक्त कलेक्टर बिलासपुर

द्वारा - अनुविभागीय अधिकारी (रा.) मस्तूरी जिला -बिलासपुर

विषय- कोरबा कोल्डफील्ड से एन.टी.पी.सी.सीपत तक आने वाले मालगाड़ियो के बंद एवं पुर्णतःढके होने की जाँच जाँच कर प्रतिवेदन बाबत ।

सन्दर्भ-क्र. 672 /स्टेनो-2/अति.कले./2021 बिलासपुर दिनांक 11 फरवरी 2021 ।

उपरोक्त सन्दर्भ अंतर्गत ए.जी.टी. के प्र.क्र. ओ.ए.459/2019 में दिनांक 27/02/2020 को पारित आदेश में सयुक्त समिति गठित कर अंतिम रिपोर्ट प्रस्तुत करने हेतु निर्देश दिया गया है । उक्त आदेश के परिपालन में पर्यावरण सम्बंधित मापदंडो के अनुपालन में कोरबा कोल्ड फिल्ड से ए.टी.पी.सी. सीपत तक आने वाली मालगाड़ियो के बंद एवं पुर्णतः ढके होने की जाँच करने हेतु अनुविभागीय अधिकारी (रा.)मस्तूरी की अध्यक्षता में गठित समिति श्रीमती तुलसी राठौर अति.तह. सीपत , श्री अनिल साहू सहायक खनी अधिकारी बिलासपुर ,श्री मनीष जायसवाल सहायक अभियंता छ.ग. पर्यावरण संरक्षण मंडल बिलासपुर द्वारा कोरबा कोल्ड फिल्ड से एन.टी.पी.सी. सीपत आवे वाली गाडियों का रेंडम तरीके से जाँच किया गया जिसका विवरण निम्नानुसार है :-

दिनांक	ट्रेन नं.	बोगी की संख्या	समय	पूर्ण रूप से ढके/खुले	रिमार्क
12/02/2021	501926D	44	13:30	हा	बोगी क्र.1,8,9 के तारपोलिन कटे फटे
12/02/2021	51927D	44	16:45	हा	-
13/02/2021	51939D	44	15:00	हा	बोगी क्र.17,19 के तारपोलिन कटे फटे
14/02/2021	51940D	44	17:00	हा	बोगी क्र.4,5 के तारपोलिन कटे फटे
15/02/2021	51966D	44	15:30	हा	बोगी क्र.10,11 के तारपोलिन कटे फटे

उक्त जाँच प्रतिवेदन अग्रिम कार्यवाही हेतु सादर संप्रेषित है ।

संलग्न :- पंचनामा

अतिरिक्त तहसीलदार सीपत

सहायक खनि. अधिकारी बिलासपुर

सहायक अभियंता छ.ग.पर्यावरण संरक्षण मंडल बिलासपुर

पंचनामा

आज दिनांक 12/02/2021 को एन.टी.पी.सी. सीपत जिला बिलासपुर में पदस्थ एक्जेक्टर बिलासपुर ई.डी. के आदेश क्रमांक 1/67/स्टे.-2/अति.कले. बिलासपुर दिनांक 11/02/2021 के अनुसार माननीय एन.जी.टी. के मूल आ.ए. क्र. 43/2013 मे दिनांक 27/2/2020 को पारित आदेश मे संयुक्त समिति गठित कर अंतिम रिपोर्ट प्रस्तुत किये जाने का निर्देश दिया गया है। जिसके परिपालन मे पर्यावरण संवर्धित मापदण्ड, के अनुपालन मे कोटरा कोल फील्ड से एस.ई.सी.एल. सीपत तक आने वाले मालगाड़ियो के बंद एवं पूर्णतः ढंके होने की जांच प्रतिवेदन प्रस्तुत करने हेतु अनुविभागीय अधिकारी रा. मस्तुरी श्री संजय डाहिरे की अध्यक्षता मे गठित समिति श्रीमती कुलेश्वरी सोनवानी तहसीलदार सीपत, श्री मनीष जायसवाल सहा. अभियंता यंत्रमान निरीक्षक बोर्ड बिलासपुर, श्री अनिल कुमार साहू सहा. अभियंता उपखण्ड अधिकारी द्वारा मौके मे उपस्थित लोगो के समक्ष समय 1:30 PM को ट्रेन SAP no 61926 D, LOCO NO 5012, Rake 2 कुल 44 वैगन्स के बंद एवं ढंके होने का जांच किया गया। जिसमे सभी वैगनो तारपोलीन से ढंके हुए थे परंतु खुद वैगनों के ताड़पोलीन फटे हुए थे

सुनील राज

परमेश्वर साहू

लक्ष्मीनारायण राज

नरेन्द्र कुमार यादव

हरीराम यादव

राजकुमार यादव

Adl. Tehsildar
Addl Tehsildar
Amo Bilaspur

AE., R.O.CE(B)
Bilaspur

पंचनामा

दिनांक 13/02/2021 को एस.टी.सी.सी सीपट जिला बिलासपुर में कार्यालय सेक्टर बिलासपुर द्वा.ज्ञ. के जीईई क्रमांक /672/सेक्ट-2/अति.रूके./2021 बिलासपुर दिनांक 11/02/2021 के अनुसार माननीय एम.जी.टी. के प्रकरण क्र. ओ ए 453/2017 के दिनांक 27/2/2020 को चार्टर्ड एकाउन्ट समिति द्वारा अंतिम रिपोर्ट प्रस्तुत किये जाने का निर्देश दिया गया है जिसके परिपालन में पवीकरण संबंधित मदपत्रों के अनुपालन में खोटना-डोंगरगढ़ सीपट तक आने वाले मालगाड़ियों के बंद एवं दूर्णित: ढंके होने की जांच प्रतिवेदन प्रस्तुत करने हेतु अन्वेषणागीम अधिकारी का. मस्तुरी श्री पंकज डाटिरे की अध्यक्षता में गठित समिति श्रीमती तुलसी राठौर एसीएम/इंजर सीपट, श्री मनीष जमलदास स्टा. अभियंता, प्रदूषण नियंत्रण बोर्ड बिलासपुर, श्री अनिल कुमार साहू सहा. खनिज अधिकारी तथा मौके में उपस्थित लोगों के समक्ष समय 5:00 PM को ट्रेन SAP NO 51340D, LOCO NO 5010, Rake B कुल 44 वैगन्स के बंद एवं ढंके होने का जांच किया गया जिसमे सभी वैगन्स तादपोलीन से ढंके हुए थे परंतु कुछ वैगन्स के तारपोलीन फटे हुए थे।

मनोज कुमार यादव

प्रमोद कुमार धीवर

चेतन्य यादव — Chinmyadav

सुनील राज

नाज हपेन्द्र

राजेन्द्र कुमार यादव

नरपतलाल

Vinod Patel

ADD Bilaspur

A.E, A.O.CELB Bilaspur

पंचनामा

दिनांक 15/02/2021 को एन.टी.पी.सी सीपत जिला बिलासपुर में कार्यालय कलेक्टर बिलासपुर द्वारा के आदेश क्र./672/से.-2/अति.कले./2021 बिलासपुर दिनांक 11/2/2021 के अनुसार माननीय एस.डी.एम. के न्या.दृष्ट के ए. 453/2019 दिनांक 27/2/2020 को पारित आदेश के संयुक्त समिति गठित कर अंतिम रिपोर्ट प्रस्तुत किये जाने का निर्देश दिया गया है। जिसके परिपालन में प्रभावित संबंधित मापदण्डों के अनुपालन में डोरना कोल फील्ड से सतीबीमी तक जाने वाले माल गाड़ियों के बंद एवं घूर्णित पहिये होने की जांच प्रतिवेदन प्रस्तुत करने हेतु अनुविभागीय अधिकारी श्री मस्तुरी श्री पंकज डहिरे की अध्यक्षता में गठित समिति श्रीमती तुलसी गौर तहसीलदार सीपत, श्री मनीष जामलदास अवर अभियंता पहुचमा नियंत्रण कोई बिलासपुर, श्री अनिल कुमार साहू सहा. खनिज अधिकारी उपस्थित होगी के समक्ष समय 4:30 pm को ट्रेन SAP NO 51566D, LOCO NO 5012 Loco D कुल 44 वैगन्स के बंद एवं घूमे होने का जांच किया गया जिसमें सभी वैगन्स ताड़पोलीन से ढंके हुए थे परंतु कुछ वैगन्स के ताड़पोलीन फटे हुए थे।

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[illegible] धीवर

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वर्मा

कार्तिक

कार्तिकराम

राजकुमार यादव

राजकुमार यादव

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रावण कुमार

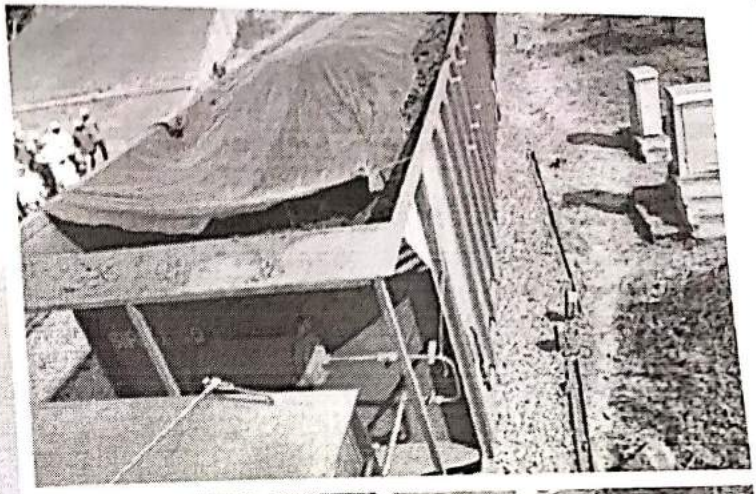
राकेश यादव

राकेश यादव

[illegible]
सी.एस.ई.पी.सी.

[illegible]
ASD CSEPCL

AE, RO CECL
Bilaspur



ANNEX - B.

Annex B (1)
Pg 2

AU for last five years

Fin year	Ash Generation	Utilisation	(%) Utilization	Cement	Brick/ Block Industries	NTPC Brick Plant	Area Dev	Ash Dyke raising	Road construction	Others	Total
2015-16	5511025.9	837409.87	15.20	422348	266458.73	10710.3	46460	47000	0	44432.5	837410
2016-17	5449684	1246148.76	22.87	454921	229636.84	3695.58	259721	292477	2745	2953.06	1246149
2017-18	5211382.9	970974.37	18.63	352369	277432.54	2939.55	138978	138500	26678.48	34077.2	970974
2018-19	4800059.4	2377816.57	49.54	544020	316059.88	6656.34	375533	584706	109053	441789	2377817
2019-20	4905238.2	2408428.48	49.10	506979	360075.99	11693.7	14940	1049924	310461	154355	2408429

Note:All values are in MT

P K Sharma

Digitally signed by P K Sharma
DN: cn=P K Sharma, o=NTPC Ltd., ou=NTPC Sipat, email=pksharma03@ntpc.co.in, c=US
Date: 2021.02.19 13:03:51 +05'30'

ANNEX C(a)

(1)

To,

The Project Director,
NHAI, PIU-Bilaspur,
Tifra, Bilaspur C.G.

Dear Sir,

As per your instruction, we are furnishing the Pond Ash status from NTPC as follows:

1	Total Pond Ash scope from NTPC (To be supplied by NTPC)	19.10 Lakh cum
2	Pond Ash received from NTPC till 16.02.2021	10.53 Lakh cum
3	Balance Pond Ash to be received from NTPC	8.57 Lakh cum

This is based on the information received from concessionaire M/s BPRPL.

L. N. Malviya Infra Project Pvt. Ltd. Bilaspur (C.G.)

ANNEXC(5)

(2)

DETAILS OF ASH TRANSPORTATION TO NHAI PROJECTS					
Sr. No	PO Number	Agency Name	Chainage of road	Total awarded Qty of ash transportation (cum)	Total Qty of ash transportation billed (cum) till 10.02.2021
Bilaspur-Pathrapali Road Project					
1	4000221763	M/s AW Xcacaon	0.00 KM to 9.600 km	316000	282,786
2	4000234001	M/s DC Construction	9.5 km to 17 km	386500	161,738
3	4000231072	M/s JH Transport	17.50 km to 19.50 km	515703	156,874
4	4000230930	M/s JH Transport	20.00 km to 27.00 km	309586	133,794
5	4000237450	M/s DC Construction	27.00 km to 41.50 km	352740	61,097
6	4000238846	M/s JP Associates	41.50 km to 47.00 km	209135	74,995
SUBTOTAL				**2089664**	**871,284**
Raipur-Dhamtari Road Project					
1	4000242397	M/s JH Transport	11+950 Km to 12+450 Km	34500	29,021
2	4000253118	M/s JP Associates	11+000 to 18+000 km	265000	7,593
SUBTOTAL				**299500**	**36,614**
GRAND TOTAL				**2389164**	**907,898**

P K Sharma

Digitally signed by P K Sharma
DN: cn=P K Sharma, o=NTPC Ltd., ou=NTPC Sipat, email=pksharma03@ntpc.co.in, c=US
Date: 2021.02.19 13:04:32 +05'30'

ANNEX-D
Pg 1.

कार्यालय, मुख्य महाप्रबंधक
जिला व्यापार एवं उद्योग केन्द्र,
प्रथम तल, न्यू कम्पोजिट बिल्डिंग, बिलासपुर छ0ग0

दूरभाष नं0– 07752-250082-83 Email : dtic-bilaspur.cg@gov.in

क्रमांक / जिव्याउके–बिला / समन्वय / 2020 / 340 / बिलासपुर, दिनांक 17.02.2021

प्रति,

अपर कलेक्टर
जिला–बिलासपुर (छ0ग0)

विषयः– माननीय एन0जी0टी0 के प्रकरण क0 ओ ए 459 / 2019 दिनांक 27.02.2020 के संबंध में निरीक्षण प्रतिवेदन।

संदर्भः– कार्यालय कलेक्टर बिलासपुर का आदेश कमांक 672 / स्टेनो–2 / अति0कले0 / 2021 बिलासपुर दिनांक 11.02.2021

—

उपरोक्त विषयांकित आदेश के निर्देशानुसार एन.टी.पी.सी. सीपत द्वारा फ्लाई एश ब्रिक्स उद्योगो को प्राप्त फ्लाई एश की जांच एवं फ्लाई एश के रोड से परिवहन के संबंध में इस कार्यालय एवं छ0ग0 पर्यावरण संरक्षण मंडल के द्वारा निरीक्षण किया जाकर निरीक्षण प्रतिवेदन पत्र के साथ संलग्न प्रेषित है।

संलग्नः– उपरोक्तानुसार।

मुख्य महाप्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

Annexure-D
Pg 2

निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 16/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स गंगाश्री ब्रिक्स, ग्राम–पिरईया विल्हा, जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	286.10 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	287.80 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	10.00 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	1.93 लाख नग ईट
6. उक्त अवधि में विक्रय की मात्रा	–	0.56 लाख नग ईट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 120 लाख नग है। इकाई द्वारा स्वयं के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

16/2/2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.02.21
(विनय टेंगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 16/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स के.जी.एन.फ्लाई एश प्रोडक्ट सिलपहरी, जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	189.36 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	179.36 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	10.00 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	1.21 लाख नग ईंट
6. उक्त अवधि में विक्रय की मात्रा	–	0.92 लाख नग ईंट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 48 लाख नग है। इकाई द्वारा स्वयं के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

16/2/2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 16/02/2021

1. [illegible] नाम एवं पता	–	मेसर्स तुषार इंटरप्राइजेस, ग्राम–परसदा बिल्हा, जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	137.81 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	86.81 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	51.00 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	1.34 लाख नग ईंट
6. उक्त अवधि में विकय की मात्रा	–	0.57 लाख नग ईंट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 51 लाख नग है। इकाई द्वारा स्वयं के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटाग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

16/2/2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

Pg 5

निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 16/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स क्वालिटी ब्रिक्स, ग्राम–धौराभाठा, बिल्हा, जिला–बिलासपुर
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	316.68 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	232.68 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	84.00 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	2.41 लाख नग ईंट
6. उक्त अवधि में विक्रय की मात्रा	–	1.92 लाख नग ईंट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 100.40 लाख नग है। इकाई द्वारा किराये के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

16/2/2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

Pg 6

निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 16/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स शांति इण्डस्ट्रीज, औ.क्षेत्र सिरगिट्टी, जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	20.10 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	10.10 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	10.00 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	0.54 लाख नग ईंट
6. उक्त अवधि में विक्रय की मात्रा	–	0.49 लाख नग ईंट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 30 लाख नग है। इकाई द्वारा किराये के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

16/2/2021
(एस0के0ध्रुवे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.02.21
(विनय टेम्भर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 16/02/2021

1. इकाई का नाम एवं पता – मेसर्स एस.के.फ्लाई एश ब्रिक्स, ग्राम–खरकेना, तखतपुर जिला–बिलासपुर
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा – 373.59 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा – 363.59 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा – 10.00 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा – 2.11 लाख नग ईंट
6. उक्त अवधि में विक्रय की मात्रा – 1.68 लाख नग ईंट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 46 लाख नग है। इकाई द्वारा किराये के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

16/2/2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

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निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 16/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स के.जी.एन. इण्डस्ट्रीज रिलपहरी, जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	145.00 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	120.00 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	25.00 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	1.16 लाख नग ईंट
6. उक्त अवधि में विकय की मात्रा	–	1.12 लाख नग ईंट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 98 लाख नग है। इकाई द्वारा स्वयं के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

16/2/2021
(एस0के0धुर्वे)
प्रवंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

16.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

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निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 15/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स मौर्या फ्लाई इण्डस्ट्रीज सिरगिट्टी जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	18.57 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	17.57 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	01 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	1.63 लाख नग ईट
6. उक्त अवधि में विक्रय की मात्रा	–	1.34 लाख नग ईट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 36 लाख नग है। इकाई द्वारा किराये के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

15/2/2021
(एस0के0ध्रुवे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

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निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 15/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स तान्या ब्रिक्स, औ.क्षेत्र सिरगिट्टी जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	311.95 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	266.95 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	45 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	2.00 लाख नग ईट
6. उक्त अवधि में विक्रय की मात्रा	–	1.08 लाख नग ईट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 60 लाख नग है। इकाई द्वारा किराये के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

15.2.2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

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निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 15/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स नवनिर्माण एसोसियेट औ.क्षेत्र. सिरगिट्टी, जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	194.16 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	158.16 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	36.00 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	0.95 लाख नग ईंट
6. उक्त अवधि में विक्रय की मात्रा	–	0.45 लाख नग ईंट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 36 लाख नग है। इकाई द्वारा स्वयं के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

15/2/2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

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निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 15/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स श्रीराम फ्लाई एश ब्रिक्स, ग्राम–परसदा, विल्हा, जिला–बिलासपुर
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	252.11 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	192.11 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	60 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	1.55 लाख नग ईट
6. उक्त अवधि में विकय की मात्रा	–	1.45 लाख नग ईट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 29 लाख नग है। इकाई द्वारा किराये के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

15/2/2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

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निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 15/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स दीप फ्लाई एश ब्रिक्स, औ.क्षेत्र. सिरगिट्टी, जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	147.26 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	100.26 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	47.00 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	1.33 लाख नग ईट
6. उक्त अवधि में विक्रय की मात्रा	–	1.68 लाख नग ईट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 76 लाख नग है। इकाई द्वारा स्वयं के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

15/2/2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 15/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स छावड़ा इण्डस्ट्रीज औ.क्षेत्र सिरगिट्टी जिला–विलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	338.48 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	293.48 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	45 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	2.26 लाख नग ईंट
6. उक्त अवधि में विक्रय की मात्रा	–	2.25 लाख नग ईंट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 60 लाख नग है। इकाई द्वारा किराये के क्लोज बॉडी वाहन से फ्लाई एश मंगाया जाता है। इकाई के फोटोग्राफ, एनटीपीसी द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

15/2/2021
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.02.21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

15.2.21
(आशीर्वाद चाणक्य)
सहायक विधि अधिकारी
क्षेत्रीय कार्यालय
छ.ग. पर्यावरण संरक्षण मंडल
बिलासपुर (छ0ग0)

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निरीक्षण प्रतिवेदन

निरीक्षण दिनांक 12/02/2021

1. इकाई का नाम एवं पता	–	मेसर्स सोहागा ब्रिक्स, ग्राम–पंधी, सीपत, जिला–बिलासपुर (छ0ग0)
2. दिनांक 25.01.2021 से 10.02.2021 तक एन.टी.पी.सी. से प्रदाय फ्लाई एश की मात्रा	–	158.22 मे0टन
3. प्राप्त फ्लाई एश के उपयोग की मात्रा	–	138.22 मे0टन (लगभग)
4. निरीक्षण दिनांक को इकाई में उपलब्ध फ्लाई एश की मात्रा	–	20 मे0टन (लगभग)
5. दिनांक 25.01.2021 से 10.02.2021 तक उत्पादन की मात्रा	–	2.24 लाख नग ईंट
6. उक्त अवधि में विक्रय की मात्रा	–	2.27 लाख नग ईंट

निर्देशानुसार इकाई का निरीक्षण दल द्वारा निरीक्षण किया गया। निरीक्षण दिनांक को इकाई कार्यरत थी। इकाई का वार्षिक फ्लाई एश ईट उत्पादन की क्षमता 72 लाख नग है। इकाई के पास फ्लाई एश की परिवहन हेतु क्लोज बॉडी वाहन (ट्रैक्टर) उपलब्ध है। इकाई के फोटाग्राफ, एन.टी.पी.सी. द्वारा तिथिवार प्रदाय किये गये फ्लाई एश की सूची एवं डिलिवरी चालान की प्रति संलग्न प्रस्तुत है।

12/2/21
(एस0के0धुर्वे)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

12/2/21
(विनय टेगर)
प्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

12.2.21
(जे0एस0नेताम)
मुख्य महाप्रबंधक
जिला व्यापार एवं उद्योग केन्द्र
बिलासपुर (छ0ग0)

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कार्यालय अनुविभागीय अधिकारी(रा.) मस्तुरी जिला – बिलासपुर (छ0ग0)

//जॉच प्रतिवेदन//

माक/ /अविअ./स्टेनो/2021 मस्तूरी, दिनांक 17/02/2021

ति,

अतिरिक्त कलेक्टर
जिला बिलासपुर छ.ग.

विषय :– एन0टी0पी0सी0 सीपत द्वारा प्रदाय, ऐश ब्रीक्श, फ्लाई ऐश कम्पनियों का जॉच प्रतिवेदन।
संदर्भ:– कार्या. कले. का ज्ञापन कं/अति.कले./स्टेनो–2/2021, बिलासपुर दिनांक 12/02/21

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विषयान्तर्गत लेख है कि एन.टी.पी.सी. सीपत द्वारा एन.टी.पी.सी. से निकलने वाले फ्लाई ऐश को कंपनी में भेजा जाता है, की सूची जॉच कर प्रतिवेदन हेतु आपके द्वारा चाही गई है की जानकारी बिन्दुवार निम्नानुसार आपकी ओर सादर सम्प्रेषित।

1. एन.टी.पी.सी. सीपत द्वारा मॉ सरस्वती फ्लाई एस ब्रीक्स, गतौरा को कुल ऐश राबिस 266.65 मीट्रीक टन प्रदाय किया गया था, जिसमें से 259.65 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 7.00 मीट्रीक टन शेष है।
2. एन.टी.पी.सी. सीपत द्वारा मारूती फ्लाई ऐश ब्रीक्स, मल्हार को कुल ऐश राबिस 302.849 मीट्रीक टन प्रदाय किया गया था, जिसमें से 232.789 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 70.06 मीट्रीक टन शेष है।
3. एन.टी.पी.सी. सीपत द्वारा ओम फलाई ऐश ब्रीक्स, पाराघाट को कुल ऐश राबिस 115 मीट्रीक टन प्रदाय किया गया था, जिसमें से 70 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 45 मीट्रीक टन शेष है।
4. एन.टी.पी.सी. सीपत द्वारा शर्मा ब्रीक्स, खैरा को कुल ऐश राबिस 261.96 मीट्रीक टन प्रदाय किया गया था, जिसमें से 121.96 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 140 मीट्रीक टन शेष है।
5. एन.टी.पी.सी. सीपत द्वारा जय मॉ वैभव लक्ष्मी, गतौरा को कुल ऐश राबिस 194.4 मीट्रीक टन प्रदाय किया गया था, जिसमें से 184.4 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 10 मीट्रीक टन शेष है।
6. एन.टी.पी.सी. सीपत द्वारा शिवम ब्रीक्स, कोनी को कुल ऐश राबिस 255.27 मीट्रीक टन प्रदाय किया गया था, जिसमें से 191.27 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 64 मीट्रीक टन शेष है।
7. एन.टी.पी.सी. सीपत द्वरा राजकुमारी रॉय फ्लाई ऐश ब्रीक्स, टिकारी को कुल ऐश राबिस 72 मीट्रीक टन प्रदाय किया गया था, जिसमें से 50 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 22 मीट्रीक टन शेष है।

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8. एन.टी.पी.सी. सीपत द्वारा हंश फ्लाई ऐश ब्रीक्स, सीपत को कुल ऐश राबिस 552 मीट्रीक टन प्रदाय किया गया था, जिसमें से 492 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 60 मीट्रीक टन शेष है।
9. एन.टी.पी.सी. सीपत द्वारा शिवम ब्रीक्स, कोनी में ऐश राबिस प्रदाय नही किया गया है।
10. एन.टी.पी.सी. सीपत द्वारा शिवम ब्रीक्स, कोनी को कुल ऐश राबिस 167.94 मीट्रीक टन प्रदाय किया गया था, जिसमें से 142.94 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 25 मीट्रीक टन शेष है।
11. एन.टी.पी.सी. सीपत द्वारा परशुराम फ्लाई ऐश ब्रीक्स, मल्हार को कुल ऐश राबिस 302.849 मीट्रीक टन प्रदाय किया गया था, जिसमें से 232.899 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 70.06 मीट्रीक टन शेष है।
12. एन.टी.पी.सी. सीपत द्वारा शोहाग ब्रीक्स इण्डस्ट्रीश, पंधी को कुल ऐश राबिस 37.56 मीट्रीक टन प्रदाय किया गया था, जिसमें से 37.18 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 0.38 मीट्रीक टन शेष है।
13. एन.टी.पी.सी. सीपत द्वारा सुमन इण्डस्ट्रीश, कर्रा कोनी में ऐश राबिस प्रदाय नही किया गया है।
14. एन.टी.पी.सी. सीपत द्वारा के0 आर0 फ्लाइ ऐश ब्रीक्स वेदपुरसदा, को कुल ऐश राबिस 340.37 मीट्रीक टन प्रदाय किया गया था, जिसमें से 60 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 90 मीट्रीक टन शेष है।
15. एन.टी.पी.सी. सीपत द्वारा श्री बालाजी फ्लाइ ऐश खम्हरिया मेन रोड, को कुल ऐश राबिस 125.35 मीट्रीक टन प्रदाय किया गया था, जिसमें से 118 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 7.35 मीट्रीक टन शेष है।
16. एन.टी.पी.सी. सीपत द्वारा वर्षा इण्टरप्राईजेश, झलमला को कुल ऐश राबिस 268.61 मीट्रीक टन प्रदाय किया गया था, जिसमें से 250.60 मीट्रीक टन दिनांक 25.01.2021 से 10.02.2021 तक उपयोग में लाया जा चुका है एवं 6 मीट्रीक टन शेष है।

संलग्न :–(1) पटवारियों द्वारा प्राप्त पंचनामा।
(2) उपरोक्तानुसार संलग्न सूचि।

अनुविभागीय अधिकारी(रा.)
मस्तुरी, जिला–बिलासपुर(छ.ग.)

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	Name of theBrick Industries	Proprietor name	Address	NTPC SIPAT से प्राप्त ऐश शविस (मीट्रिक टन)	संबंधित संस्था द्वारा किया गया उपयोग (मीट्रिक टन)	शेष (मीट्रिक टन)	किस कार्य हेतु उपयोग में लाया गया	रिमार्क
1	M/s Maa Saraswati Fly Ash Brick	RISHIKESH SINGH	GATOURA	266.65	259.65	7.00	ईट निर्माण हेतु	
2	M/s Maruti Fly Ash Bricks	SANAT Kr. VERMA	MALHAR	302.849	232.789	70.06	ईट निर्माण हेतु	
3	M/s OM Fly Ash Bricks	PUSHPLATA RATHORE	PARAGHAT	115	70	45.00	ईट निर्माण हेतु	
4	M/s Sharma Bricks khairn	Vinod Sharma	KHAIRAJAIRAMNAGAR	261.96	121.96	140.00	ईट निर्माण हेतु	
5	M/s Jai Maa Vaibhav Laxmi	NARAYAN PRASADRATH	GATORA	194.4	184.4	10.00	ईट निर्माण हेतु	
6	M/s Shivam Bricks	VINAY Kr. AGRAWAL	KONI	255.27	191.27	64.00	ईट निर्माण हेतु	
7	M/s Rajkumari Ray Fly Ash Bricks	RAJKUMARI RAI	TIKARI	72.00	50.00	22.00	ईट निर्माण हेतु	
8	M/s Hansa Fly Ash Bricks	MANISHA SARAF	SIPAT	552.00	492.00	60.00	ईट निर्माण हेतु	
9	M/s Shivam Bricks	VINAY Kr. AGRAWAL	KONI	0.00	0.00	0.00	ईट निर्माण हेतु	
10	M/s Shivam Bricks	SHWETA AGRAWAL	KONI	167.94	142.94	25.00	ईट निर्माण हेतु	
11	M/s Parshuram Fly Ash Brick	HEMANT Kr. TIWARI	MALHAR	302.849	232.789	70.06	ईट निर्माण हेतु	
12	M/s Sohaga brick Industries	Abhisek Diwan	PANDHI	37.56	37.18	0.38	ईट निर्माण हेतु	
13	M/s Suman industries	Sunita Kaushik	KARRA	0.00	0.00	0.00	ईट निर्माण हेतु	
14	M/s K.R.Fly Ash Bricks	PREM KUMARI SAHU	VED PARSADA	340.37	60.00	90.00	ईट निर्माण हेतु	
15	M/s Shree Balaji Fly Ash Khamhriya	SEEMA AGRAWAL	Main Road Khamhriya	125.35	118.00	7.35	ईट निर्माण हेतु	
16	M/s Varsha Enterprises	Prabha Sahu	Jhalmala	268.61	250.60	6.000	ईट निर्माण हेतु	

अनुविभागीय अधिकारी(रा.)
मस्तुरी,जिला–बिलासपुर(छ.ग.)

Annex D(a)
Pg 1

Area of Ash ponds

Ash Pond	Area in Hectare
Ash pond No. 1	143.57
Ash pond No. 2	146.56
Ash pond No. 3	97.94
Total	**388.07 ha or 958.94 acres**

P K Sharma

Digitally signed by P K Sharma
DN: cn=P K Sharma, o=NTPC Ltd., ou=NTPC Sipat, email=pksharma03@ntpc.co.in, c=US
Date: 2021.02.23 16:44:43 +05'30'

ANNEX (E)
Pg 1

प्रस्तावित नवीन औद्योगिक क्षेत्र सेलर के संबंध में संक्षिप्त टीप

ग्राम–सीमरा जिला बिलासपुर विशेष क्षेत्र के मुख्य कार्य औद्योगिक एवं उद्यानों से जुड़े है। तथा अनुषांगिक विकास एनटीपीसी ताप विद्युत उद्योग की स्थापना के पश्चात क्षेत्र में अनुषंगिक विकास उद्योगो के विकास संभव होने से विकास योजना प्रस्तावित औद्योगिक क्षेत्र के अतिरिक्त औद्योगिक भूमि उपयोग की आवश्यकता प्रतिपादित होती है। सीएसआईडीसी लिमि. द्वारा इसे दृष्टिगत रखते हुए शासकीय भूमि पर औद्योगिक क्षेत्र की स्थापना का प्रस्ताव दिया गया है।

कृपया अवगत होना चाहेंगे कि वर्तमान में जिला बिलासपुर में स्थापित औद्योगिक क्षेत्र सिरगिट्टी, तिफरा, सिलपहरी,अंजनी में रिक्त भूखण्ड नही होने तथा नवीन उद्योगों की मांग होने एवं छ.ग. शासन के उद्योग नीति के अन्तर्गत राज्य के विभिन्न जिलो में नवीन औद्योगिक क्षेत्र की स्थापना के अंतर्गत ग्राम सेलर जिला बिलासपुर में शासकीय भूमि खसरा नं. 1297 रकबा 95.02 एकड का आधिपत्य न्यायालय कलेक्टर बिलासपुर (छ.ग.) के आदेष क्रमांक 39/अ–19/15–16 दिनांक 15.12.2016 के तहत दिनांक 17.03.2016 को प्राप्त हुआ है। उपरोक्त प्रस्तावित नवीन औद्योगिक क्षेत्र के संबंध में संक्षिप्त जानकारी निम्नानुसार है :–

- प्रस्तावित नवीन औद्योगिक क्षेत्र सेलर की स्थापना भारत सरकार की सूक्ष्म एवं लघु उद्योगों/उद्यमों की विकास योजना (Micro Small Enterprises Cluster Development Programme) के अंतर्गत किया जाना प्रावधानित है।
- उपरोक्त परियोजना की प्रथम स्तरीय लागत 28.60 करोड है, जिसमें छत्तीसगढ शासन से प्रशासकीय/वित्तीय एवं नगर तथा ग्राम निवेश विभाग बिलासपुर से अभिन्यास की स्वीकृति/अनुमोदन के पश्चात ग्राम सेलर में नवीन औद्योगिक क्षेत्र की स्थापना के अंतर्गत अधोसंरचना निर्माण कार्य प्रारंभ किया जावेगा।
- उक्त प्रस्तावित नवीन औद्योगिक क्षेत्र सेलर में 1000 वर्ग मीटर, 2000 वर्ग मीटर एवं 4000 वर्ग मीटर, क्षेत्रफल के लगभग 100 भूखण्ड सूक्ष्म एवं लघु उद्योगों की स्थापना के लिये प्रावधानित है।
- प्रस्तावित नवीन औद्योगिक क्षेत्र सेलर के स्थापना होने से प्रत्यक्ष रुप से लगभग 2000 स्थानीय नागरिको/ बेरोजगारो एवं अप्रत्यक्ष रुप से लगभग 2500 स्थानीय नागरिको/ बेरोजगारो को रोजगार प्राप्त होगा।
- प्रस्तावित नवीन औद्योगिक क्षेत्र सेलर की स्थापना होने से प्रावधानित भूखण्डो को आंबटन करने से राज्य शासन को लगभग 1800 लाख का राजस्व उद्यमियो से प्राप्त होगा।
- प्रस्तावित नवीन औद्योगिक क्षेत्र सेलर में अधोसंरचना विकास कार्य के अंतर्गत 4.65 कि.मी. लम्बाई में डामरीकृत सडक, 9.30 कि.मी. लम्बाई में सडक के दोनो ओर आर.सी. सी. पक्की सतही नाली, सडक बत्ती एवं जल प्रदाय योजना के तहत 500 कि.ली. क्षमता के पानी टंकी एवं 11.00 कि.मी. लम्बाई में डी.आई. पाईप लाईन प्रदाय कर बिछाने एवं अन्य निर्माण कार्य यथा विद्युत उपकेन्द्र व्यवसायिक परिसर का निर्माण, तौल कांटा, आहाता दिवाल, प्रषासकीय भवन आदि का प्रावधान है।

अतः राज्य में उद्योगो के अनुषांगिक विकास उद्योगो के विकास की संभावना को दृष्टिगत रखते हुए बिलासपुर के समीप ग्राम सेलर में प्रस्तावित नवीन औद्योगिक क्षेत्र की स्थापना एवं औद्योगिक विकास को बढ़ावा देने के लिये प्रस्तावित नवीन औद्योगिक क्षेत्र सेलर के अभिन्यास अनुमोदन की स्वीकृति देने हेतु प्रमारी संयुक्त संचालक नगर तथा ग्राम निवेश विभाग बिलासपुर में प्रक्रियाधीन है।

Executive Engineer
CSIDC Ltd.

कार्यालय संयुक्त संचालक, नगर तथा ग्राम निवेश
क्षेत्रीय कार्यालय बिलासपुर, छत्तीसगढ़

नई कलेक्ट्रेट बिल्डिंग
कलेक्टर परिसर बिलासपुर (छ.ग.)
फोन 07752-250081
फैक्स 07752-250081
cgtownplan_bilaspur@gmail.com

Add.-New Composit Building
Collector Parisar Bilaspur (C.G.)
Tel— 07752-250081
Fax – 07752-250081
E-Mail- cgtownplan.bilaspur@gmail.com

क्रमांक/ 458 /न.ग्रा.नि/2021 बिलासपुर दिनांक 18.2.21

प्रति,

अनुविभागीय अधिकारी (रा.)
मस्तूरी,
जिला–बिलासपुर (छ0ग0)

विषय :– एनटीपीसी द्वारा अधिग्रहित ग्राम सेलर के 70 ए0 भूमि के संबंध में।
संदर्भ :– आपका पत्र क्रमांक /स्टेनों/अ0वि0अ0/2021/646–1 3मस्तुरी दिनांक 02.21

——000——

संदर्भित पत्र के तारतम्य में लेख है कि इस कार्यालय के पत्र क्र 7874/धा 23क/नग्रानि/2019 बिलासपुर दिनांक 07.09.2019 के द्वारा संचालक नगर तथा ग्राम निवेश रायपुर छ0ग0 को सीपत विकास योजना (2031) के ग्राम सेलर में उपांतरण बाबत् पत्र प्रेषित किया गया था (छायाप्रति संलग्न)।

संलग्न :– उपरोक्तानुसार।

सहायक संचालक
नगर तथा ग्राम निवेश
बिलासपुर (छ0ग0)

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कार्यालय संयुक्त संचालक, नगर तथा ग्राम निवेश
क्षेत्रीय कार्यालय बिलासपुर, छत्तीसगढ़

...लिंग
...लासपुर (छ.ग.)
...
...
...bilaspur@gmail.com

Add -New Composit Building
Collector Parisar Bilaspur (C G)
Tel- - 07752-250081
Fax 07752-250081
E-Mail- egtownplan bilaspur@gmail.com

क्रमांक /7874 /धा.23क/न.ग्रा.नि/2019 बिलासपुर दिनांक 7/9/19

प्रति,

संचालक,
नगर तथा ग्राम निवेश,
इन्द्रावती भवन, नवा रायपुर,
अटल नगर, रायपुर (छ0ग0)

विषय– सीपत विकास योजना 2031 के ग्राम सेलर में उपांतरण बाबत।
संदर्भ– आपका पत्र क्रमांक/2172/साडा–2(4)/नग्रानि./2019 अटल नगर, दि. 28.06.19.

उपरोक्त विषय के संदर्भ में लेख है कि सीपत विकास योजना 2031 के अंतर्गत ग्राम सेलर स्थित भूमि का कृषि से औद्योगिक भू–उपयोग का उपांतरण की सूचना स्थानीय समाचार पत्रों हरिभूमि एवं नईदुनिया में दिनांक 08.06.2019 को प्रकाशित किया गया था। नियत समयावधि के भीतर कार्यालय कलेक्टर बिलासपुर, कार्यालय जिला पंचायत बिलासपुर एवं नगर पालिक निगम बिलासपुर में सीपत विकास योजना 2031 के ग्राम सेलर में कृषि से औद्योगिक करने के संबंध में कोई आपत्ति/सुझाव प्राप्त नही हुए है, की जानकारी से अवगत कराया गया है। संबधित कार्यालयों से प्राप्त जानकारी एवं उक्त प्रकाशित समाचार पत्र की कतरन की छायाप्रति संलग्न कर आवश्यक कार्यवाही हेतु सादर सम्प्रेषित है।

संलग्न : उपरोक्तानुसार।

प्र.उप संचालक
नगर तथा ग्राम निवेश
बिलासपुर (छ0ग0)

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Annex – F (a)

पंचनामा

स्थान - 09 R.F.
(सोंढी पहाड़)
दिनांक - 24/02/2021
समय - 2.00 PM (लगभग)

हम पंचगण अपना सच-सच पंचनामा दर्ज कराते हैं आज दिनांक 24/02/21 को अतिरिक्त कलेक्टर बिलासपुर, श्री एस० एम० मस्कुरी तथा सीपत तहसील के अधिकारी गण NTPC द्वारा स्थापित "परिवेशी वायु गुणवत्ता अनुवीक्षण स्टेशन- भरुवाडीह, सोंढी पहाड़ के निरीक्षण हेतु आर/बिलासपुर वन परिक्षेत्र के सोंढी परिवृत्त अंतर्गत कक्ष क्रमांक-09 R.F. (शृंखला गरगज श्रेणी) में स्थित पहाड़ को बोल-चाल की भाषा में ही सोंढी पहाड़" कहा जाता है, जबकि NTPC द्वारा स्थापित अनुवीक्षण स्टेशन बिलासपुर वन परिक्षेत्र के सीपत परिवृत्त अंतर्गत भरुवाडीह परिसर के कक्ष क्रमांक-04 R.F. में स्थापित है।

उक्त वर्णित दोनों जगहों की वायु दुरी लगभग-03 KM है एवं वन मार्ग से लगभग 4.5 km दुरी पर स्थित है। सोंढी परिसर के 09 R.F. का क्षेत्रफल - 191.611 हे० है। एवं भरुवाडीह परिसर कक्ष क्र०-04 R.F. -145.579 हे० है।

यही हम पंचों का सच-सच पंचनामा है। पंचनामा पढ़कर/सुनकर, हस्ताक्षर/अंगुठा लिया।

1. अजय बेन (फ.स.सीपत)
2. रविन्द्र कुमार महिलांगे (वनरक्षक)
3. दिविक दिवाकी (प.ह.नं.-09)
4. संतोष कुमार पटेल (प. ह. नं. 04)
5. रतन दास (कोरबार-सोंढी) रतनदास मेरावी
6. सत्यनारायण सोनी (एसईसीएल) सत्य.
   गोविंदराम यादव
7. आशीर्वाद चाणक्य, सहा. विधि अधिकारी, ई. प. वनपर्यावरण मंडल

ANNEX F

-(b)

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निरीक्षण प्रतिवेदन

विषय	:–	मेसर्स सीपत सुपर थर्मल पॉवर प्रोजेक्ट (एन.टी.पी.सी.) सीपत, जिला–बिलासपुर (छ.ग.) द्वारा आस–पास के गांवों में कराई जाने वाली मैन्युअल परिवेशीय वायु गुणवत्ता के संबंध में।
संदर्भ	:–	माननीय अपर कलेक्टर महोदया द्वारा दिनांक 11.02.2021 को एनजीटी में लंबित ओ.ए. 459/2018 (रश्मि सिंह विरूद्ध एन.टी.पी.सी.) के परिप्रेक्ष्य में पारित आदेश कमांक 672 के संबंध में निरीक्षण किया गया।
निरीक्षण दिनांक	:–	12.02.2021
उत्पाद एवं उत्पादन क्षमता		1. थर्मल पॉवर प्लांट (स्टेज–1 यूनिट नम्बर 1,2 व 3)–3X660 मेगावाट 2. थर्मल पॉवर प्लांट (स्टेज–2 यूनिट नम्बर 4 व 5)–2X500 मेगावाट
उपस्थित प्रतिनिधि	:–	1. श्री पंकज शर्मा, इन्वायरमेंट मैनेजर 2. श्री दिलीप मिश्रा, सीनियर मैनेजर
निरीक्षणकर्ता	:–	1. डॉ. सुरेश चंद्र, क्षेत्रीय अधिकारी 2. आर्शीवाद चाणक्य, सहायक विधि अधिकारी

पायी गई वस्तुस्थिति :– दिनांक 12.02.2021 को उद्योग के समीप स्थित कुल 05 गांवों में मैन्युअल परिवेशीय वायु गुणवत्ता जांच प्रति तीन माह की अवधि तक कराई जाती है। उपस्थित उद्योग प्रतिनिधि द्वारा बताया गया कि निरीक्षण दिनांक तक ग्राम कर्रा एवं ग्राम– कौड़िया में वायु गुणवत्ता जांच पूर्ण हो गयी है तथा यह भी बताया गया कि केवल ग्राम–सीपत में अन्य गांवों के विपरित प्रतिदिन वायु गुणवत्ता यंत्र संचालित किया जाता है। शेष 03 गांवों (जांजी, सीपत एवं दर्राभाठा) में निरीक्षण दौरान परिवेशीय वायु गुणवत्ता जांच यंत्र संचालित पाया गया।

उपस्थित उद्योग प्रतिनिधि द्वारा बताया गया कि उक्त 03 गांवों के किसी एक रहवासी के मकान में परिवेशीय वायु गुणवत्ता यंत्र संचालित किया जाता है, जिसके लिये मकान मालिक को 500 रू. प्रतिमाह की राशि का भी भुगतान किया जाता है।

सहायक विधि अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,
बिलासपुर (छ.ग.)

क्षेत्रीय अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,
बिलासपुर (छ.ग.)

pg 2

2

निरीक्षण प्रतिवेदन

विषय :– मेसर्स सीपत सुपर थर्मल पॉवर प्रोजेक्ट (एन.टी.पी.सी.) सीपत, जिला–बिलासपुर (छ.ग.) टाउनशीप बी–टाइप CAAQMS स्टेशन का निरीक्षण प्रतिवेदन।

संदर्भ :– माननीय अपर कलेक्टर महोदया द्वारा दिनांक 11.02.2021 को एनजीटी में लंबित ओ.ए. 459/2018 (रश्मि सिंह विरूद्ध एन.टी.पी.सी.) के परिप्रेक्ष्य में पारित आदेश कमांक 672 के संबंध में निरीक्षण किया गया।

निरीक्षण दिनांक :– 12.02.2021

उत्पाद एवं उत्पादन क्षमता :– 1. थर्मल पॉवर प्लांट (स्टेज–1 यूनिट नम्बर 1,2 व 3) – 3X660 मेगावाट
2. थर्मल पॉवर प्लांट (स्टेज–2 यूनिट नम्बर 4 व 5) – 2X500 मेगावाट

उपस्थित प्रतिनिधि :– श्री पंकज शर्मा, इन्वायरमेंट मैनेजर।

निरीक्षणकर्ता :– डॉ. सुरेश चंद्र, क्षेत्रीय अधिकारी एवं
आर्शीवाद चाणक्य, सहायक विधि अधिकारी

पायी गई वस्तुस्थिति :– दिनांक 12.02.2021 को उद्योग के टाउनशीप बी–टाइप CAAQMS स्टेशन का संयुक्त निरीक्षण किया गया। निरीक्षण के दौरान पायी गयी वस्तु स्थिति निम्नानुसार है:–

1. निरीक्षण के दौरान टाउनशीप बी–टाइप CAAQMS स्टेशन संचालित पाया गया। CAAQMS स्टेशन में प्रातः 11:15 बजे परिवेशीय वायु गुणवत्ता का रिडिंग निम्नानुसार पाया गया है :– NOx – 11.58 $\mu g/m^3$, PM_{10} – 50.40 $\mu g/m^3$, $PM_{2.5}$ – 24.56 $\mu g/m^3$ एवं SO_2 – 13.85 $\mu g/m^3$ स्थापित CAAQMS स्टेशन को दिनांक 29.01.2021 को कैलीब्रेट किया गया था।
2. निरीक्षण के दौरान पायी परिवेशीय वायु गुणवत्ता की रिडिंग निर्धारित गुणवत्ता मानकों के अनुरूप पायी गयी। केन्द्रीय प्रदूषण नियंत्रण मंडल, नई दिल्ली द्वारा 18.11.2009 को जारी परिवेशीय वायु गुणवत्ता मानक निम्नानुसार है:–

कमांक	वायु प्रदूषक प्रकार	वायु गुणवत्ता मानक
1.	NOx	$< 80\ \mu g/m^3$
2.	PM_{10}	$< 100\ \mu g/m^3$
3.	$PM_{2.5}$	$< 60\ \mu g/m^3$
4.	SO_2	$< 80\ \mu g/m^3$

सुलभ संदर्भ हेतु टाउनशीप बी–टाइप CAAQMS स्टेशन की दिनांक 01.02.2021 रात्रि 12:00 बजे से दिनांक 15.02.2021 रात्रि 11:00 बजे तक की परिवेशीय वायु गुणवत्ता रिपोर्ट संलग्न है।

सहायक विधि अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,
बिलासपुर (छ.ग.)

क्षेत्रीय अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,
बिलासपुर (छ.ग.)

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निरीक्षण प्रतिवेदन

विषय :– मेसर्स सीपत सुपर थर्मल पॉवर प्रोजेक्ट (एन.टी.पी.सी.) सीपत, जिला–बिलासपुर (छ.ग.) ट्रैक हॉपर CAAQMS स्टेशन का निरीक्षण प्रतिवेदन।

संदर्भ :– माननीय अपर कलेक्टर महोदया द्वारा दिनांक 11.02.2021 को एनजीटी में लंबित ओ.ए. 459/2018 (रश्मि सिंह विरूद्ध एन.टी.पी.सी.) के परिप्रेक्ष्य में पारित आदेश कमांक 672 के संबंध में निरीक्षण किया गया।

निरीक्षण दिनांक :– 12.02.2021

उत्पाद एवं उत्पादन क्षमता
1. थर्मल पॉवर प्लांट (स्टेज–1 यूनिट नम्बर 1,2 व 3)–3X660 मेगावाट
2. थर्मल पॉवर प्लांट (स्टेज–2 यूनिट नम्बर 4 व 5)–2X500 मेगावाट

उपस्थित प्रतिनिधि :– श्री पंकज शर्मा, इन्वायरमेंट मैनेजर।

निरीक्षणकर्ता :– डॉ. सुरेश चंद्र, क्षेत्रीय अधिकारी एवं
आर्शीवाद चाणक्य, सहायक विधि अधिकारी

पायी गई वस्तुस्थिति :– दिनांक 12.02.2021 को उद्योग के ट्रैक हॉपर CAAQMS स्टेशन का संयुक्त निरीक्षण किया गया। निरीक्षण के दौरान पायी गयी वस्तु स्थिति निम्नानुसार हैः–

1. निरीक्षण के दौरान ट्रैक हॉपर CAAQMS स्टेशन संचालित पाया गया। CAAQMS स्टेशन में प्रातः 11:30 बजे परिवेशीय वायु गुणवत्ता का रिडिंग निम्नानुसार पाया गया है :– NOx – 24.43 $\mu g/m^3$, PM_{10} – 55.80 $\mu g/m^3$, $PM_{2.5}$ – 28.90 $\mu g/m^3$ एवं SO_2 – 11.62 $\mu g/m^3$ स्थापित CAAQMS स्टेशन को दिनांक 28.01.2021 को कैलीब्रेट किया गया था।
2. निरीक्षण के दौरान पायी परिवेशीय वायु गुणवत्ता की रिडिंग निर्धारित गुणवत्ता मानकों के अनुरूप पायी गयी। केन्द्रीय प्रदूषण नियंत्रण मंडल, नई दिल्ली द्वारा 18.11.2009 को जारी परिवेशीय वायु गुणवत्ता मानक निम्नानुसार हैः–

कमांक	वायु प्रदूषक प्रकार	वायु गुणवत्ता मानक
1.	NOx	< 80 $\mu g/m^3$
2.	PM_{10}	< 100 $\mu g/m^3$
3.	$PM_{2.5}$	< 60 $\mu g/m^3$
4.	SO_2	< 80 $\mu g/m^3$

सुलभ संदर्भ हेतु ट्रैक हॉपर CAAQMS स्टेशन की दिनांक 01.02.2021 रात्रि 12:00 बजे से दिनांक 15.02.2021 रात्रि 11:00 बजे तक की परिवेशीय वायु गुणवत्ता रिपोर्ट संलग्न है।

सहायक विधि अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,
बिलासपुर (छ.ग.)

क्षेत्रीय अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,
बिलासपुर (छ.ग.)

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निरीक्षण प्रतिवेदन

विषय :– मेसर्स सीपत सुपर थर्मल पॉवर प्रोजेक्ट (एन.टी.पी.सी.) सीपत, जिला–बिलासपुर (छ.ग.) स्वीच यार्ड CAAQMS स्टेशन का निरीक्षण प्रतिवेदन।

संदर्भ :– माननीय अपर कलेक्टर महोदया द्वारा दिनांक 11.02.2021 को एनजीटी में लंबित ओ.ए. 459/2018 (रश्मि सिंह विरूद्ध एन.टी.पी.सी.) के परिप्रेक्ष्य में पारित आदेश कमांक 672 के संबंध में निरीक्षण किया गया।

निरीक्षण दिनांक :– 12.02.2021

उत्पाद एवं उत्पादन क्षमता
1. थर्मल पॉवर प्लांट (स्टेज–1 यूनिट नम्बर 1,2 व 3)–3X660 मेगावाट
2. थर्मल पॉवर प्लांट (स्टेज–2 यूनिट नम्बर 4 व 5)–2X500 मेगावाट

उपस्थित प्रतिनिधि :– श्री पंकज शर्मा, इन्वायरमेंट मैनेजर।

निरीक्षणकर्ता :– डॉ. सुरेश चंद्र, क्षेत्रीय अधिकारी एवं
आर्शीवाद चाणक्य, सहायक विधि अधिकारी

पायी गई वस्तुस्थिति :– दिनांक 12.02.2021 को उद्योग के स्वीच यार्ड CAAQMS स्टेशन का संयुक्त निरीक्षण किया गया। निरीक्षण के दौरान पायी गयी वस्तु स्थिति निम्नानुसार हैः–

1. निरीक्षण के दौरान स्वीच यार्ड CAAQMS स्टेशन संचालित पाया गया। CAAQMS स्टेशन में प्रातः 12:00 बजे परिवेशीय वायु गुणवत्ता का रिडिंग निम्नानुसार पाया गया है :– NOx – 11.77 $\mu g/m^3$, PM_{10} – 37.64 $\mu g/m^3$, $PM_{2.5}$ – 28.05 $\mu g/m^3$ एवं SO_2 – 14.87 $\mu g/m^3$ स्थापित CAAQMS स्टेशन को दिनांक 30.01.2021 को कैलीब्रेट किया गया था।
2. निरीक्षण के दौरान पायी परिवेशीय वायु गुणवत्ता की रिडिंग निर्धारित गुणवत्ता मानकों के अनुरूप पायी गयी। केन्द्रीय प्रदूषण नियंत्रण मंडल, नई दिल्ली द्वारा 18.11.2009 को जारी परिवेशीय वायु गुणवत्ता मानक निम्नानुसार हैः–

कमांक	वायु प्रदूषक प्रकार	वायु गुणवत्ता मानक
1.	NOx	$< 80\ \mu g/m^3$
2.	PM_{10}	$< 100\ \mu g/m^3$
3.	$PM_{2.5}$	$< 60\ \mu g/m^3$
4.	SO_2	$< 80\ \mu g/m^3$

सुलभ संदर्भ हेतु स्वीच यार्ड CAAQMS स्टेशन की दिनांक 01.02.2021 रात्रि 12:00 बजे से दिनांक 15.02.2021 रात्रि 11:00 बजे तक की परिवेशीय वायु गुणवत्ता रिपोर्ट संलग्न है।

सहायक विधि अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,
बिलासपुर (छ.ग.)

क्षेत्रीय अधिकारी
छत्तीसगढ़ पर्यावरण संरक्षण मंडल,
बिलासपुर (छ.ग.)

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प्रति,

अपर कलेक्टर महोदय,
जिला–बिलासपुर (छ0ग0)

विषयः– जांच प्रतिवेदन बिन्दु 6(अ) एवं 6(ब) के संबंध में।

संदर्भः– कार्यालय कलेक्टर बिलासपुर का आदेश क्र / 672 / स्था.पु. प्रो.नि. / 2021 बिलासपुर दिनांक 11.02.2021

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सदर्भित आदेश के पालन में वायु प्रभावित परिक्षेत्र में वायु गुणवत्ता की [illegible] एवं यांत्रिकी की उपलब्धता के संबंध में दिनांक 12.02.2021 को एनटीपीसी के प्रतिनिधि [illegible] गौरव सेउवाल (CAAQMS/C&I dept.)के द्वारा 03 ऑटोमेटिक स्टेशन एवं 4 मेनुअल [illegible] का अवलोकन कराया गया।

तीन ऑटोमेटिक स्टेशन एनटीपीसी परिसर में दिखाये गये जिसमें 1- [illegible] सीपत, टाउनशिप स्टेशन– so2-12.6ug/m3, no-3.8ug/m3, no2-8.2ug/m3, nox-12.1ug/m3, co2-392ppm (time app.-12.05pm) 2- एएक्युएमएस ट्रेकर [illegible] so2-48.2ug/m3, no-16.8ug/m3, no2-2.2ug/m3, nox-18.9ug/m3 co2-343ppm (time app.-12.29pm) एवं 3–एएक्युएमएस स्वीच यार्ड स्टेशन so2-14.4 ug/m3, no-1.9ug/m3, no2-11.0ug/m3, nox-12.9ug/m3, co2-303ppm (time app.-12.40pm) दिखाया गया।

4 मेनुअल स्टेशन का अवलोकन एनटीपीसी के प्रतिनिधि दिलीप मिश्रा (C&I monitary in near by villagers chemistry.) के द्वारा कराया गया। [illegible] 1–एनटीपीसी परिसर के स्वीच यार्ड स्टेशन के समीप लगा हुआ था। (rotometer- 16.7 lpm minomieter-1.4lpm) तीन ग्रामों में निम्नानुसार मेनुअल स्टेशन स्थापित थे।

1– ग्राम जांजी (अरूण यादव के मकान में।) rotometer- 16.7 lpm/ minomieter-1.3lpm

2– ग्राम सीपत बस स्टेण्ड (हलधर लाल पिता शोभालाल यादव) rotometer- 16.5 lpm/ minomieter-1.4lpm

3– ग्राम दर्राभाठा (अनिल साहू पिता रितराम साहू के मकान में) rotometer- 16.6 lpm/ minomieter-1.4lpm

मेनुअल संयत्र जिनके घर में लगे थे उनमें रहने वाले लोगों ने बताया कि [illegible] के लगाने से किसी प्रकार स्वास्थ्य समस्या नहीं है। तीन माह पूर्व यंत्र को उनके घर [illegible] स्थापित किया गया था एवं सप्ताह में 2–3 बार एनटीपीसी कर्मी द्वारा इसका निरीक्षण किया जाता है।

उक्त संबंध में लेख है कि उक्त मेजरमेंट का विश्लेषण एवं वायु गुणवत्ता संबंध में इसके माप का अभिमत एवं यंत्रों के परिचालन एवं कालातीत अवधि के होने के [illegible] में अभिमत डॉ. सुरेश चंद्र क्षेत्रीय अधिकारी प्रदुषण नियंत्रक बोर्ड द्वारा लिया जाना उचित [illegible] अतः प्रतिवेदन सादर प्रेषित है।

श्री अजीत पुजारी डिप्टी कलेक्टर जिला–बिलासपुर (छ0ग0)	श्रीमती मोनिका वर्मा डिप्टी कलेक्टर जिला–बिलासपुर (छ0ग0)	12/02/2021 सुश्री दिव्या अग्रवाल संयुक्त कलेक्टर जिला–बिलासपुर (छ0ग0)	12/2/21 श्री [illegible] डाहिरे अनुविभागीय अधिकारी (रा) मस्तूरी जिला–बिलासपुर (छ0ग0)

Annex 6
Pg 1
ANNE

कार्यालय,कार्यपालन अभियंता,
लोक स्वास्थ्य यांत्रिकीय खंड बिलासपुर (छ.ग.)

पत्र.कं. 611 /त.शा./का.अ./लो.स्या.यां/2020 बिलासपुर, दिनांक 17/02/21

प्रति,

कलेक्टर,
जिला बिलासपुर (छ.ग.)

विषयः– एन.टी.पी.सी. के अंतर्गत ग्रामों के पेयजल की जांच बाबत्।

संदर्भः– आपका कार्यालयीन आदेश कं 672/स्टेनो–2 /अति.कले./2021 दिनांक 11.02.2021

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उपरोक्त विषयांतर्गत संदर्भित आदेश के परिपालन में एन.टी.पी.सी. के अंतर्गत ग्रामों के पेयजल स्त्रोतो का जल परीक्षण किया गया है जिसमें पानी पीने योग्य पाया गया है।

सादर सूचनार्थ प्रेषित।

सहपत्रः– उपरोक्तानुसार।

o/c

कार्यपालन अभियंता,
लोक स्वा.यांत्रिकी खंड बिलासपुर

District Water Testing Laboratory

PUBLIC HEALTH ENGINEERING DEPARTMENT BILASPUR (C.G.)

District ..... Bilaspur (Code No.) Block ..... Masturi... (Code No.) Village A.c.Under.....

Particulars of Sample :

(i) Date of collection ..... 12.02.2021 .....
(ii) Date of Sample receive in Lab..... 12.02.2021 .....
(iii) Date of analysis ..... 12.02.2021 .....
(iv) Reference (if any) ..... Sample Collected by lab .....
(v) ..... Start .....

Details of Source & Location

(i) Kaudiya - Near school
(ii) Haradih - Near Kaushal House
(iii) Sukhripali - Near Provision store
(iv) Raliya - Near Panchayat Bhawan
(v) Rank - Near Nirjubaba Mandir

S. No.	CHARACTRISTIC	UNIT	ACCEPTABLE	CAUSE FOR REJECTION	RESULTS i	ii	iii	iv	v
A	**Physical Test**								
1.	Temperature	°C	-	-	3.96	3.34	2.18	1.82	1.96
2.	Turbidity	N.T.U.	1.0	5.0					
3.	Colour	Pt. Cobalt Scale	5.0	25					
4.	Test & Odour ✓	-	Unobjectionable	Objectionable	- Unobjectionable -				
B.	**Chemical Test**								
5.	pH	pH Scale	7.0 to 8.5	<6.5 or >9.2	7.10	7.15	7.26	7.10	7.09
6.	Conductivity	Micromhos/cm	-	-	1.35	0.88	0.76	0.72	0.74
7.	Total (M.O.) Alkalinity	mg/l	200	600	382	248	206	172	195
8.	Chlorides	mg/l	250	1000	182	58	71	46	48
9.	Nitrates	mg/l	10	45					
10.	Sulphate	mg/l	200	400					
11.	Total Hardness as $CaCo_3$	mg/l	200	600	568	392	314	274	361
12.	Calcium (as ca)	mg/l	75	200					
13.	Magnesium (as mg)	mg/l	30	150					
14.	Total Dissolved Solids	mg/l	500	1500	810	528	456	432	444
15.	Iron (Fe)	mg/l	0.3	1.0	0.4	0.2	0.2	0.3	0.3
16.	Fluorides (F)	mg/l	1.0	1.5	0.5	0.5	0.5	0.5	0.5
17.	Residual Chlorine	ppm	-	-	NIL	NIL	NIL	NIL	NIL
18.	Cogulant Dose Jar Tests	mg/l	-	-					
C.	**Bacteriological Test**								
19.	Coliform Organisms at 37°C	MPN 100ml	24 Hr.	-	NIL	NIL	NIL	NIL	NIL
20.	Faecal Coliform	per 100ml	48Hr.	-	NIL	NIL	NIL	NIL	NIL
D.	**Other Test**								
	(i)								
	(ii)								

Remarks Tested Parameters are with in permissible limit.

Tested By

Assistant Engineer
P.H.E.Sub.Division
Bilaspur (C.G.)

Mahabal Enviro Engineers Pvt. Ltd.

Pollution monitoring, Engineers & Contractors in Environmental Management
13/14, OPP. Patel Pump, Chhindwara Road, Koradi, Dist – Nagpur – 441111
Phone: 91-0712-3240365, Tele Fax: 2612212, Email: Nagpur@mahabal.com

Client : NTPC Ltd. SipatUjjwalNagar,DistBilaspur (C.G)	Test Report No & Issue Date : MEEPL/ SIPAT-NTPC/2020/SW-525 DATE-29-11-2020
Sample Particulars : Surface Water (Pond)	
Test Method : IS 3025 & APHA 23rd Edition	
Packing : plastic bottle	
Date of Sampling : 05.11.2020	
Test Required : As given below	Page No :1 of 4

SAMPLE LOCATION

S No.	Parameters	UOM	Desirable/ Permissible Limit	Hardadih	Sukhripali	Raliya	Bhilai	Gatura	Raank
01	pH Value	-	6.5-8.5	7.4	7.5	7.3	7.6	7.2	7.7
02	Temperature	°C	-	25.1	26.3	26.2	26.0	25.8	26.4
03	Conductivity	µs/cm	-	402	420	436	416	546	610
04	T.D.S.	mg/l	500	268	280	290	227	364	406
05	T.S.S.	mg/l	100	14	15	18	12	17	19
06	B.O.D.(at 27°C for 3 days)	mg/l	30	09	10	08	10	11	12
07	C.O.D.	mg/l	250	30	36	40	38	48	46
08	Chloride	mg/l		38	48	43	53	46	54
09	Fluoride (as F)	mg/l	1.5	0.3	0.2	0.4	0.5	0.2	0.3
10	Calcium Hardness as CaCo3	mg/l	-	108	122	116	108	118	130
11	Magnesium Hardness as CaCo3	mg/l	-	76	86	90	82	92	94
12	Boron (as B)	mg/l	0.5	0.03	0.05	0.04	0.05	0.05	0.06
13	Aluminium	mg/l	0.2	0.022	0.024	0.023	0.026	0.025	0.025
14	Fecal coliform	MPN/ 100 ml	230	14	13	20	17	21	14
15	E-coli	MPN/ 100 ml	100	1.6	2.0	2.2	2.3	1.9	2.6

COMPANY NAME : MAHABAL ENVIRO ENGINEERS PVT.LTD.

SIGN
NAME Abhishek Bhargava
POST

पंकज शर्मा
PANKAJ SHARMA
उपमहाप्रबंधक (डू एम जी)
DGM (EMG)
एनटीपीसी लि. सीपत, बिलासपुर (छ.ग.)
NTPC Ltd. SIPAT, BILASPUR (C.G.)

Plot No. F-7, Road No. 21, Wagle Estate, Thane West - 400604, Maharashtra, India
(600 m from Hotel Rukhmini Palace Turn Opp Toyota Show Room. Near J B Sawant Bus Stop)
Phone: 2582 0658/ 3139/ 1663/ 3154 Fax: 91-22-25823543 thane@mahabal.com

Mahabal Enviro Engineers Pvt. Ltd.

Pollution monitoring, Engineers & Contractors in Environmental Management
13/14, OPP. Patel Pump, Chhindwara Road, Koradi, Dist – Nagpur – 441111
Phone: 91-0712-3240365, Tele Fax: 2612212, Email: Nagpur@mahabal.com

Client : NTPC Ltd, SipatUjwalNagar,DistBilaspur (C.G)	Test Report No & Issue Date : MEEPL/ SIPAT-NTPC/2020/SW-526 DATE-29-11-2020
Sample Particulars : Surface Water (Pond)	
Test Method : IS 3025 & APHA 23rd Edition	
Packing : plastic bottle	
Date of Sampling : 05.11.2020	
Test Required : As given below	Page No :2 of 4

SAMPLE LOCATION

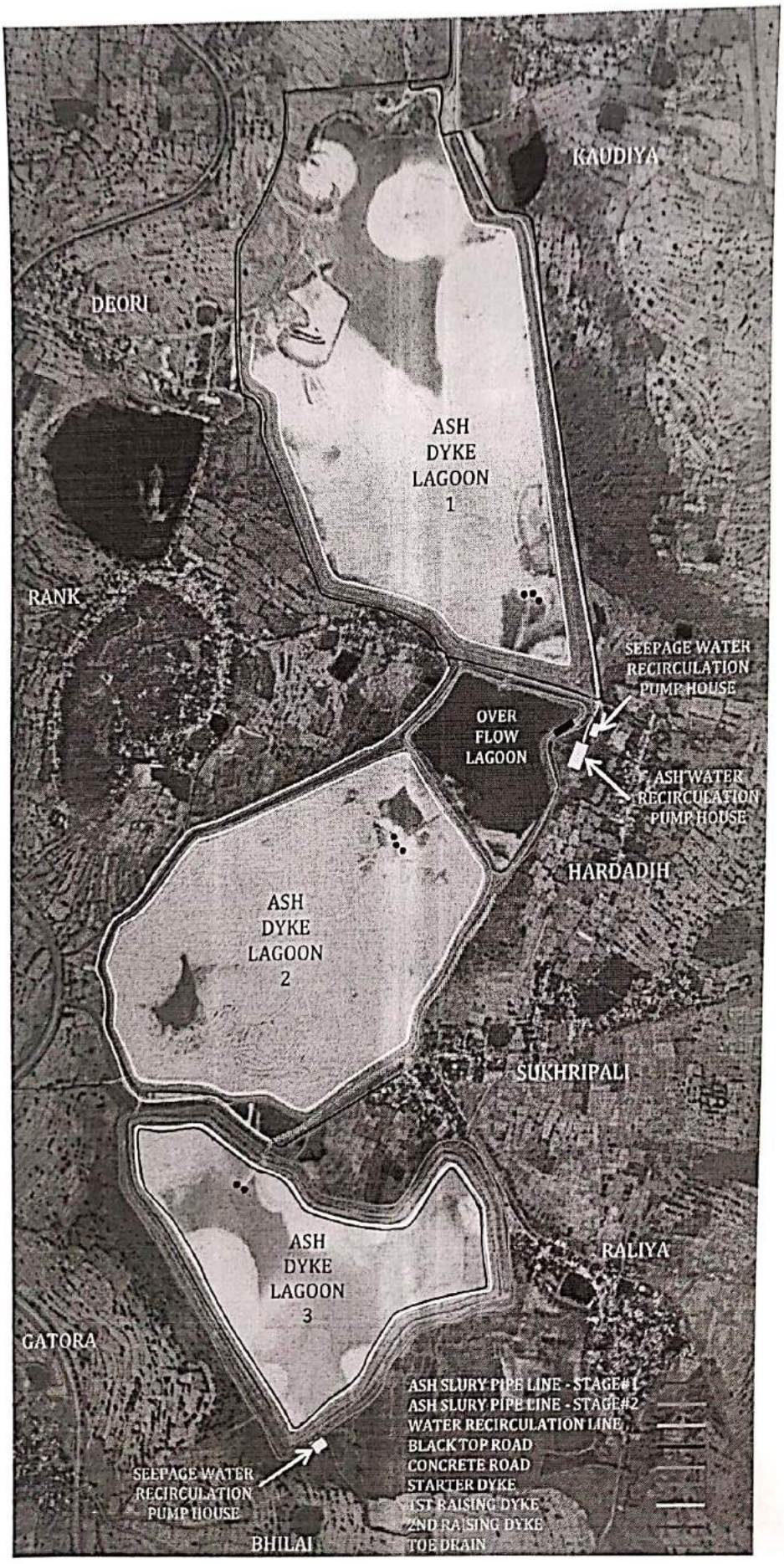
S No.	Parameters	UOM	Desirable/ Permissible Limit	Janji	Kaudia	Darrabhata	Deori	Navadih
01	pH Value	-	6.5-8.5	7.4	7.2	7.5	7.3	7.5
02	Temperature	°C	-	26.2	26.0	26.1	26.3	25.8
03	Conductivity	µs/cm	-	446	534	486	578	462
04	T.D.S.	mg/l	500	297	356	324	385	308
05	T.S.S.	mg/l	100	14	18	17	15	13
06	B.O.D.(at 27°C for 3 days)	mg/l	30	08	14	12	12	10
07	C.O.D.	mg/l	250	30	40	34	36	32
08	Chloride	mg/l	-	43	47	40	52	47
09	Fluoride (as F)	mg/l	1.5	0.4	0.5	0.6	0.3	0.4
10	Calcium Hardness as CaCo3	mg/l	-	108	120	110	98	104
11	Magnesium Hardness as CaCo3	mg/l	-	66	76	68	56	58
12	Boron (as B)	mg/l	0.5	0.02	0.03	0.04	0.04	0.06
13	Aluminium	mg/l	0.2	0.021	0.024	0.026	0.026	0.025
14	Fecal coliform	MPN/ 100 ml	230	17	21	20	26	22
15	E-coli	MPN/ 100 ml	100	1.8	2.6	2.4	2.1	2.6

COMPANY NAME : MAHABAL ENVIRO ENGINEERS PVT.LTD.
SIGN
NAME Abhishek Bhargava
POST

Plot No. F-7, Road No. 21, Wagle Estate, Thane West - 400604, Maharashtra, India
(600 m from Hotel Rukhmini Palace Turn Opp Toyota Show Room. Near J B Sawant Bus Stop)
Phone: 2582 0658/ 3139/ 1663/ 3154 Fax: 91-22-25823543 thane@mahabal.com

पंकज शर्मा
PANKAJ SHARMA
उपमहाप्रबंधक (ई एम जी)
DGM (EMG)
एनटीपीसी लि. सीपत, बिलासपुर (छ.ग.)
NTPC Ltd. SIPAT, BILASPUR (C.G.)

Annex I-a.
Pg. 1



प्रति,

Annex I-(b)

Pg 1

अतिरिक्त तहसीलदार
उप० तह० सीपत
जिला- बिलासपुर (छ०ग०)

विषय:- NTPC राखड़ डेम में रिसाव के कारण प्रभावित कृषको के संबंध में रिपोर्ट।

महोदय,

सन्दर्भित विषयान्तर्गत लेख है कि ग्राम सांठ पं०ह०नं०-19 रा०नि०मं०-जयरामनगर तह० मस्तुरी जिला बिलासपुर स्थित राखड़ डेम से पानी रिसाव सम्बन्धित प्रभावित कृषको का मौका स्थल निरीक्षण किया गया, जिसमें 60 कृषको का भूमि राखड़ डेम से प्रभावित होना पाया गया जिन्हे NTPC सीपत द्वारा प्रतिवर्ष मुआवजा ~~राशी~~ राशी प्रदान किया जाता है तथा 21 कृषको के भूमि में राखड़ डेम पानी रिसाव के कारण पानी भर जाता है, जिससे फसल के पैदावार में कमी हो जाता है। जिनका सर्वे सूची के नाम नही जुड़ पाया था जिनका मौके पर सूची तैयार किया गया। जिसका वर्तमान में 21 कृषको के NTPC सीपत द्वारा मुआवजा राशी नही दिया जाना है।

संलग्न (1) पंचनामा.
(2) प्रभावित कृषको की सूची।

मनमोहन सिंह सिदार
प.ह.नं.-19, रा.नि.मं.-जयरामनगर
तह.-मस्तूरी, जि.-बिलासपुर (छ.ग.)

पंचनामा

पेज 2

आज दिनांक 13/02/2021 को ग्राम रांक प.ह.नं. 19 रा.नि.मं. जयरामनगर तह० मस्तूरी जिला बिलासपुर स्थित सारवड़ डेम से पानी रिसाव संबंधित प्रभावित कृषकों का मौका स्थल निरीक्षण किया गया। लगभग 60 कृषकों का भूमि सारवड़ डेम से दलदल हो जाता है। जिन्हें NTPC सीपत द्वारा प्रति वर्ष मुआवजा राशि दिया जाता है। पंचनामा पढ़कर सुनकर हस्ताक्षर किया।

संतोष प्रजापति

हरीशकुमार

विक्रमाम प्रसाद

गोवर्धनपुरी

[illegible]

विनोदकुमार

सोहन पांडेय

श्रीमनदास कोटवार

मनमोहन सिंह सिदार
प.ह.नं.-19, रा.नि.मं.-जयरामनगर
मु.-मस्तूरी, जि.-बिलासपुर (छ.ग.)

पंचनामा

आज दिनांक 24/02/2021 को ग्राम खोंड पं.ह.नं.19 रा.नि.मं. जयरामनगर तह. मस्तुरी जिला बिलासपुर स्थित राखड़ डेम से पानी रिसाव सम्बन्धित प्रभावित कृषकों का मौका स्थल निरीक्षण किया गया। 21 कृषकों का भूमि राखड़ डेम से पानी रिसाव के कारण पानी भर जाता है। जिनका उचौ मौके पर तैयार किया गया। उक्त भूमिस्वामीयो के ख.न. की जी.पी. तापन द्वारा सुमापना बाकी नहीं किया जाता है। मौके पर कृषकों के समीपस्थ भूमि से ख.न. 1636/1 में नया तालाब व ख.न. 1573 में पुरी तालाब स्थित है। जिसके पानी की गात्रा बहुत कम है। राखड़ डेम से पानी रिसाव का पानी तालाब में भरा है। उपस्थित ग्रामवासियों व कृषकोंकी उपस्थिति में पंचनामा तैयार किया गया।

बदराम

ज्यारेलाल

धनसाय

सुशील कुमार

रामप्रसाद

जवाहर प्रसाद

मनमोहन सिंह सिदार
प.ह.नं.-19, रा.नि.मं.-जयरामनगर
तह.-मस्तूरी, जि.-बिलासपुर (छ.ग.)

...णी राजड़ डेम से प्रभावित कृषकों की सूची

क्रम	खसरा नं.	रकबा	फसल पैदावार
(1)	गोवर्धन पि० रामाधार जाति-सतनामी	1666/1	0.26 एक्ड	1.20 कि
(2)	धनराम पि० रामाधार जाति-सतनामी	1667/1	0.22 एक	90 कि
(3)	सुशील कुमार पि० रामाधार सतनामी	1667/3	0.22 एक	90 कि.ग्रा
(4)	प्यारेलाल पि० भैयाराम सतनामी	1668/1	0.40 एक	2 क्विंटल
(5)	त्रिवेणी, गंगाबाई पु० भैयाराम सतनामी	1668/2	0.69 एक	3 क्विंटल
(6)	लेदराम पिता भोंदला सतनामी	1670	0.19 एक	80 कि.ग्राम
(7)	जनकराम पिता महेत्तर सतनामी	1671/1	0.63 एक	2.50 क्विंटल
(8)	सिरिथराम पिता दुखारी पुर्मवंशी	1671/2	0.10 एक	45 कि० ग्रा.
(9)	मनहरण लाल पिता भेलकु पुर्यवंशी	1673	0.38 एक	1.50 क्विंटल
(10)	पुनीलाल पि० हिरिया सुर्यवंशी	1674/1	0.17 एक	80 कि० ग्राम
(11)	गोवर्धन पि० रामाधार सतनामी	1675/1	0.14 एक	70 कि० ग्राम
(12)	सुशील कुमार पि० रामाधार	1677/1	0.10 एक	45 कि० ग्राम
(13)	गोवर्धन पि० रामाधार सतनामी	1678/1	0.06 एक	20 कि० ग्राम
(14)	रामकुमार पि० जनकी सतनामी	1686/2	0.10 एक	45 कि० ग्राम
(15)	कुलदीप पि० सुरेन्द्र शर्मा	1700/1	0.85 एक	3.50 क्विंटल
(16)	बिन्दा यदु पि० भोंदला सतनामी	1672	0.17 एक	80 कि० ग्राम
(17)	शत्रुहन पि० भैयाराम सतनामी	1669	0.11 एक	45 कि० ग्राम
(18)	ज्वाला प्रसाद पि० गोधीराम सतनामी	1512/1	0.16 एक	75 कि० ग्राम
(19)	कुशील पि० रामाधार सतनामी	1676/1	0.16 एक	75 कि० ग्राम
(20)	जनकराम पि० महेत्तर सतनामी	1511	0.57 एक	2.10 क्विंटल
(1)	गंगाप्रसाद पिता रामलाल	2063/1	0.03 एक	पड़त

मनमोहन सिंह सिदार

..... पटवारा हल्का नंबर 19 ..... राजस्व निरीक्षक मंडल सीपत तहसील मस्तूरी वर्ष 20
जिला बिलासपुर(छ.ग.)

क्र.	कृषक/पिता का नाम	प्रभावित ख.न.	कुल रकबा	प्रभावित रकबा	~~कैफियत~~ रा.प.
01	मोहित / बाबूलाल सूर्यवंशी	1328/2	0.10	0.10	5000=00
02	विजय कुमार / भुनेश्वर पटेल	1329/1	0.63	0.63	31500=00
03	अशिला कुमार / बाबूलाल	1527/3, 1525/1	0.18	0.18	9000=00
04	गीता देवी / सोहन बाह्मण	1389/2	0.32	0.32	16000=00
05	कुलदीप उर्फ अमीत / सुरेन्द्रकुमार	2030/1	0.04	0.40	20,000=00
		2042, 2073/2	0.10, 0.26		
06	जगदीश / नेत राम	2073/1	0.03	0.03	1500=00
07	गोविंद / देवी प्रसाद	2016/1, 2045/1	0.02, 0.02	0.07	3500=00
		2096/1	0.03		
08	संतोष कुमार / नंदोरन	2078/6	0.02	0.02	1000=00
09	राम कुमार / रामगोपाल	2059, 2058	0.04, 0.06	0.10	5000=00
10	गोवर्धन पुरी / बुद्धेश्वर पुरी	2000/3, 2000/3	0.05, 0.05	0.10	5000=00
11	नन्दे राम / दास राम	1975/1, 1980 2007, 2022 2034, 2040/1 2056, 2068, 2068/1	0.38	0.46	23000=00
		2056, 2068	0.04, 0.04		

..... पटवारी हल्का नंबर 19.... राजस्व निरीक्षक मंडल सीपत तहसील मस्तूरी वर्ष 201
जिला बिलासपुर(छ.ग.)

क्र.	कृषक/पिता का नाम	प्रभावित ख.न.	कुल रकबा	प्रभावित रकबा	कैफियत
12	श्याम लाल / ननकीराम अहिरवार	2090/2, 1962/2, 1187	0.01, 0.01, 0.57	0.53	2950000
13	गोर्धन / रामाधार	1813/1, 2052/2	0.09, 0.01	0.10	5000=00
14	नंद कुमार / श्रीचन्द	1995/2	0.03	0.03	1500=00
15	कांतिबाई / भवदत्त	1986	0.05	0.05	2500=00
16	लता / भवदत्त	2049	0.05	0.05	2500=00
17	धनसाय / रामाधार	2052/2, 1813/2	0.01, 0.09	0.10	5000=00
18	सुशील कुमार / रामाधार	1813/3, 2052/3	0.01, 0.09	0.10	5000=00
19	रामेश्वर / पंचराम	2062/3	0.01	0.01	500=00
20	शंभजी / बरातु	1971/2	0.02	0.02	1000=00
21	गोंदराम / सरवन्हर	2288/2	0.11	0.11	5500=00
22	मितेन्द्र / ननकी	1977/2	0.03	0.03	1500=00
23	बिसराम / मथुरा प्रसाद	2016/4	0.02	0.06	3000=00
		2096/2	0.04		
24	रामसहाय / महेन्तर	1961/3	0.01	0.01	500=00

ग्राम का नाम राऊ..... पटवारी हल्का नंबर 19..... राजस्व निरीक्षक मंडल सीपत तहसील मस्तूरी वर्ष
जिला बिलासपुर(छ.ग.)

क्र.	कृषक/पिता का नाम	प्रभावित ख.न.	कुल रकबा	प्रभावित रकबा	कैफियत
25	✓ गेंदराम / भगऊ	2025	0.04	0.04	2000=00
26	✓ कुलो कुमारे / बुधराम	2000/1, 2028/4	0.05, 0.01	0.06	3000=00
(27)	✓ रमेश पुरी / लखन पुरी	2063/2, 802/2	0.05, 0.07	0.12	6000=00
(28)	✓ मेघराम / मेघनाथ	1435	0.15	0.15	7500=00
(29)	✓ भरतलाल / भैयालाल	1597, 1597	0.16, 0.11	0.27	13500=00
(30)	✓ साधमती / सहसराम	1809/2	0.18	0.18	9000=00
(31)	✓ हेमन्त / सालिकराम ब्राह्मण	826, 837 838, 839 840, 842 843, 844 857, 859/1 860, 863/1 864/1, 893 834, 1957 1958, 1959 1964	0.16, 0.37 0.36, 0.39 0.26, 0.36 0.88, 0.33 0.19, 0.42 0.30, 0.23 0.15, 0.24 0.10, 0.04 0.03, 0.15 0.06	5.03	251500=00
(32)	✓ आनंद कुमार / रमाशंकर	1687	1.17	1.17	58500=00
(33)	✓ हरकुवर / लाखन चन्द्र	1805, 1821/2 1823/2, 1925 1926, 1930	0.35, 0.19 0.13, 0.20 0.25, 0.62	1.74 3.76	87000=00

..... राजस्व निरीक्षक मंडल सीपत तहसील मस्तूरी वर्ष 2
जिला बिलासपुर(छ.ग.)

क्र.	कृषक/पिता का नाम	प्रभावित ख.न.	कुल रकबा	प्रभावित रकबा	कैफियत
34	सहस राम / मुला राम	1823/2, 1776/2	0.10, 0.28	0.68	34000=00
		1783	0.30		
35	प्रीतम / मनी राम	1803/2	0.14	0.14	7000=00
36	मसत राम, शालिक राम एवं अन्य 3	1820, 1841	0.32, 0.17	0.49	24500=00
37	अनिल कुमार, संजय कुमार / सहदेव लाल	1803/3, 1789/3	0.21, 0.14	0.35	17500=00
38	दशरथ / घासी राम	1803/1, 1804/2	0.35, 0.28	0.85	42500=00
		1785	0.22		
39	धनेश्वर / शिव लाल	1768/3	0.91	0.91	45500=00
40	नर सिंह / हंशराम	1762, 1763	0.24, 0.27		
		1765/1, 1769/1	0.01, 0.21	1.52	76000=00
		1761/3, 1759/2	0.22, 0.37		
		1761/2	0.40		
41	नरसिंह / हंशराम वगैरह	1761/1	0.48	0.48	24000=00
42	सेलू / अच्छे राम	1803/1, 1803/6	1.01, 0.12	1.38	69000=00
		1804/1, 1824/2	0.15, 0.10		

0.30=

ग्राम का नाम रोंठ ..... पटवारी हल्का नंबर 19 ..... राजस्व निरीक्षक मंडल सीपत तहसील मस्तूरी वर्ष 2019
जिला बिलासपुर(छ.ग.)

क्र.	कृषक/पिता का नाम	प्रभावित ख.न.	कुल रकबा	प्रभावित रकबा	कैफियत
42	धिसलन / तिहारू	845/1	0.32	0.32	16000=00
43	मोहन / भवदल	714, 777/1	0.78	0.78	39000=00
44	मोहन / ~~रामरतन~~	856, 855/1			
45	मोहन / रामरतन	858/1	0.31	0.31	15500=00
46	धरम लाल / भगतराम	2074/1	0.07	0.07	3500=00
47	गोपाल / भवदल	836	0.28	0.28	14000=00
48	रामफल / तिहारू	2083/1, 2084/1, 2086/2, 2087/2	0.14	0.14	7000=00
49	शत्रुहन / भैयाराम	1821/1, 1825/1	0.47	0.47	23500=00
50	प्यारे लाल / भैयाराम	1927, 1928	0.36	0.36	18000=00
51	संतोष कुमार / भैयाराम	1817	0.12	0.12	6000=00
52	घनश्याम / निसाहू	1979, 2077/1	0.04	0.04	2000=00
53	छोटे लाल / हीरालाल	1971/1	0.02	0.02	1000=00
54	कोतेदास / अलखराम अन्य 3	2035/2	0.01	0.01	500=00

..... पटवारी हल्का नंबर 19 ..... राजस्व निरीक्षक मंडल सीपत तहसील मस्तूरी वर्ष .....
जिला बिलासपुर(छ.ग.)

क्र.	कृषक/पिता का नाम	प्रभावित ख.न.	कुल रकबा	प्रभावित रकबा	कैफियत
55	रामटहल / शंकराम एवं अन्य 4	1824/4	0.10	0.10	5000 = 00
56	महेश्वर / महेशराम	1829/1	0.05	0.05	2500 = 00
57	शंकराम / मयारख	1824/4	0.10	0.10	5000 = 00
58	संतोष / मालू कंवर	2047	0.07	0.07	3500 = 00
59	रामगोपाल / शोभाराम	2058, 2059	0.10	0.10	5000 = 00
60	सुमित्रा / भूनेश्वर	1341/3	0.52	0.52	26000 = 00

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Annexure-VII to Directors' Report

ANNUAL REPORT ON CSR ACTIVITIES

1. **A brief outline of your Company's CSR policy, including overview of projects or programs proposed to be undertaken and a reference to the web-link to the CSR policy and projects or programs.**

CSR has been synonymous with your Company's core business of power generation. Your Company's spirit of caring and sharing is embedded in its mission statement. Your Company has a comprehensive Resettlement & Rehabilitation (R&R) policy covering community development (CD) activities, which has been revised and updated from time to time. CD activities in green field area are initiated as soon as project is conceived and thereafter-extensive community / peripheral area development activities are taken up along with the project development. CSR Policy formulated in July 2004 and revised in 2010, 2016 and 2019 covers a wide range of activities including provision for implementation of a few key Programs through NTPC Foundation.

CSR programs undertaken by your Company include activities specified in Schedule VII of the Companies Act 2013 & Rules made thereafter for benefit of community at large. Focus areas of your Company's CSR activities are Health, Sanitation, Safe Drinking Water and Education. However, your Company also takes up activities in the areas of capacity building of the youth, women empowerment, social infrastructure, livelihood creation through support for implementation of innovative agriculture & livestock development, support to Physically Challenged Person (PCPs), and for the activities contributing towards Environment Sustainability.

Preference for CSR activities is being given to local areas where your Company's operations are situated, ensuring that majority CSR funds are spent for activities in local areas. However, considering inclusive growth & environment sustainability, some of the activities are also taken up in different parts of the country to supplement governmental efforts. During the year, about 500 villages and more than 450 schools have been benefitted by your Company's various CSR initiatives at different locations. Your Company's CSR initiatives have touched the lives of around 18 lakhs people generally residing at remote locations in various parts of the country in one or the other way.

Apart from the regular CSR activities undertaken around your Company's operations, support has also been provided for some of the major CSR initiatives all across the country:

Education

- 4 weeks residential summer workshops for more than 1800 girl children in the age group of 10-12 years studying in Govt. schools in the vicinity of 23 NTPC Locations through its flagship program "Girl Empowerment Mission" (GEM) wherein interventions were undertaken to make the girls self-reliant and confident in all walks of life.
- Implementation of project for improvement of learning levels in about 130 Government Schools.
- Construction of school & hostel for tribal children near NTPC Rihand, in UP.
- Construction of school buildings at Varanasi UP, Hoshangabad MP & Sambalpur Odisha.
- Smart Tab labs in Government schools in vicinity of 03 NTPC Stations.
- Quality education primarily to rural community children through 34 schools located in NTPC townships.

Health & Sanitation

- Creating infrastructure & support for equipment at National Cancer Institute Nagpur for cancer treatment.
- Setting up Burn Units at AIIMS Patna, AIIMS Bhubaneswar & King George Medical University Lucknow.
- Construction of Eye Hospital at Dadri, UP and of operating room complex at Eye hospital in Bhubaneswar.
- Your Company operates Mobile Health Clinics at 10 locations benefitting about 80,000 persons per year
- Revival and continuous operation of Mechanized Solid Waste Management plant at Karsada, UP.
- 50 Nos of Sanitary Napkin Mini Manufacturing units (MMU) installed in the state of Odisha.
- Installation of sanitary napkin vending machine and incinerators in more than 40 Govt. schools and colleges benefitting substantial no. of girl children.
- Proactive relief measures like regular sanitization of villages, distribution of PPE kits to health professionals face masks to villagers and supply of groceries to the community.
- Your Company is supporting the developmental & beautification works at Charminar Hyderabad, under 'Swachh Iconic places Project' of Govt. of India.

Livelihood Generation & Vocational Training

- To enhance income generation opportunities within the villages, your Company has provided vocational training to the village youth and had undertaken livestock development and crop management projects.
- To enhance employability through vocational training, skill upgradation and income generation programs, Your Company has adopted 18 Industrial Training Institutes (ITIs) and is setting up 8 new ones.
- Your Company has signed Memorandum of Understanding (MoU) with National Skill Development Corporation (NSDC) to develop the skills of 30000 youth over a period of 05 years spread in 12 states including 8,000 youth of J&K in order to make all of them self-employable.

Disaster Relief

- Substantial support in the relief activities during FANI Cyclone in Odisha.
- Support committed for Redevelopment of Kedarnath town, Uttrakhand and its surrounding areas devastated during natural calamity of 2013.

Promotion of Sports

- Promotion of Archery Sports by funding National Ranking Archery Tournaments and National Archery championships.
- Adoption & Promotion of football in the state of Chhattisgarh.

Others

- Installation of Energy Efficient Pump System in the fields of farmers residing near Your Company stations located in identified five districts of Uttar Pradesh.

Your Company, being a member of Global Compact Network, India, confirms its contribution in various CSR activities in line with 10 principles of UN Global Compact.

Web Link to the CSR Policy & Projects or programs

https://www.ntpc.co.in/en/corporate-citizenship/corporate-social-responsibility

2. **The Composition of the CSR Committee**

As on date, the Board Level Corporate Social Responsibility & Sustainability Committee comprises

One functional Director	:	Shri Dillip Kumar Patel, Director (HR)
Two Independent Directors	:	Shri Vinod Kumar (Chairman), Independent Director
	:	Shri Pradeep Kumar Deb, Independent Director

The committee recommends to the Board for approval, the amount of expenditure anticipated on the CSR activities and monitors from time to time the Policy for CSR and the proposals approved by the Board.

3. Average net profit of your Company for the previous 3 financial years - ₹ 12,633.85 Crore
4. Prescribed CSR Expenditure (2% of the amount as in item 3 above) - ₹ 252.68 Crore

Previous Year Shortfall	NIL
Total Prescribed CSR Expenditure	- ₹ 252.68 Crore

5. Details of CSR spent during the financial year

(a) Total amount to be spent for the financial year	- ₹ 252.68 Crore
Amount spent	- ₹ 304.92 Crore (2.41%)
Amount exceeding prescribed CSR Exp	- ₹ 52.24 Crore
(b) Amount unspent, if any	- NIL
(c) Manner in which the amount spent during the financial year is detailed below:	(Table enclosed)

Amount (₹ Crore)

5(c) Manner in which the amount spent during the financial year 2019-20 is detailed below :							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
S. No	CSR project or activity identified	Sector in which the Project is covered./ Relevant Section of Schedule VII in which the project is covered (Note)	Project or programs (1) Local area or other (2) Specify the State and district where projects or programs was undertaken	Amount outlay (budget) project or programs wise	Amount spent on the projects or programs Sub-heads*: (1) Direct expenditure on projects or programs (2) Overheads	Cumulative expenditure upto to the reporting period*	Amount spent: Direct or through implementing agency
1	Eradicating Hunger and Poverty, Health Care and Sanitation	(i)	CSR initiatives during the Financial Year 2019-20 have been taken up on PAN India basis around NTPC operations primarily in 19 states mentioned below: Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, J&K, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Telangana, Uttar Pradesh, Uttarakhand, West Bengal	82.26	47.83	47.83	Through Implementing / Contracting Agency/NTPC Foundation/ Trusts/ societies
2	Education and Skill Development	(ii)		88.46	124.57	124.57	
3	Empowerment of Women and other Economically Backward Sections	(iii)		0.78	1.53	1.53	
4	Environmental Sustainability	(iv)		83.38	73.20	73.20	
5	Art & Culture	(v)		1.13	2.36	2.36	
6	Sports	(vii)		6.41	2.51	2.51	
7	Rural Development	(x)		45.37	40.02	40.02	
8	Disaster management, including relief, rehabilitation and reconstruction activities	(xii)		0.00	12.90	12.90	
	Total			307.79	304.92	304.92	

Note * Including expenditure on activities carried forward from previous years , which have been completed during 2019-20

6. In case the company has failed to spend the two percent of the average net profit of the last three financial years or any part thereof, the company shall provide the reasons for not spending the amount in its Director Report.

   By spending ₹ 304.92 Crore during the financial year, the company has surpassed the prescribed two percent amount of ₹ 252.68 Crore by ₹ 52.24 Crore, thus achieving a CSR spend of 2.41%.

7. A responsibility statement of the CSR Committee that the implementation and monitoring of CSR policy, is in compliance with CSR objectives and policy of the company.

For and on behalf of the Board of Directors

(Gurdeep Singh)
Chairman & Managing Director

Place: New Delhi
Date: 21st August, 2020

Approved CSR Budget for Sipat - RE 2018-19		
	Activity	**Approved Amount (₹ Lac)**
	Regular Activities	
Education		
11	Gyan Shakti Program (GSP) across 10 Government Schools around Sipat Station.	30.00
12	Augmenting and strengthening school infrastructure in Govt. Schools of nearby villages	25.00
13	Coaching students from class 11th & 12th from nearby villages to prepare them to appear in Competitive Exams	15.00
14	Assistance to Baiga Tribe community under the scheme UDAN by state govt. Under the scheme, Baiga tribal children in classes 8th to 12th are provided full residential education.	10.00
Sub-total		80.00
Health		
15	Making primary health care accessible, affordable and inclusive - Outreach Services through Mobile Medical Unit	35.00
16	Making primary health care accessible, affordable and inclusive - Conducting health camps in nearby villages	10.00
17	Promotive healthcare by undertaking the following activities in nearby villages:(1) Yoga Camp in villages (2) Awareness Creation on Health/ Nutrition/ Adolsecent Health for Women	3.00
Sub-total		48.00
Sanitation		
18	Construction of Public Toilet at Navadih and Sipat Gaon Bus Stand including their maintenance for a period of 3 years	30.00
19	Construction of community toilets	25.00
20	Promotive healthcare by undertaking the following activities in nearby villages:- Awareness creation on sanitation - "Swachh Gaon - Swasth Gaon" and installation of dustbins	5.00
21	Preventive healthcare by (1) Fogging, anti-larval spraying and supply of bleaching powder (2) Constructing village drains	2.00
Sub-total		62.00
Water		
22	Additional Integrated water supply with overhead tank and water points (Three Villages)	120.00
Sub-total		120.00
Infrastructure (Other than roads & renewable)		
23	Repair and maintenance of assets created under CSR	10.00

Approved CSR Budget for Sipat - RE 2018-19		
#	Activity	Approved Amount (₹ Lac)
		10.00
Sub-total		
Renewable Energy		
24	Installation of Centralized Solar Power Plant along with Street Lights and high mast lights in villages	50.00
		50.00
Sub-total		
Art and Culture		
25	Promoting rural art and culture - rural cultural programmes, performing arts, festivals & melas	50.00
		50.00
Sub-total		
Sports		
26	Promotion of state level foot ball training programs	20.00
27	Support for rural and national sports - talent scouting, training, sports infrastructure, sports equipment, leagues and tournaments	15.00
		35.00
Sub-total		
Vocational Training		
28	Imparting vocational skills to 500 youth under Chief Ministers Skill Development Program through registered Vocational Training Providers.	125.00
		125.00
Sub-total		
Physically Challenged Persons		
29	Mainstreaming of physically challenged persons by providing them with aids and appliances	5.00
		5.00
Sub-total		
Animal Health		
30	Integrated Livestock Management: Improving the breed of existing livestock by artificial insemination, improved feed and fodder practices, scheduled vaccinations, regular veterinary treatment etc. to enhance milk productivity in rural households	35.00
		35.00
Sub-total		
Environment Conservation		
31	Augment water resources - Water Harvesting Project in Villages and Schools.	20.00
		20.00
Sub-total		
Communication		
32	Capacity Building / Communication	3.00
		3.00
Sub-total		

Gridhar

(b)

Approved CSR Budget for Sipat - RE 2018-19		
#	Activity	Approved Amount (₹ Lac)
Miscellaneous		15.00
33	Miscellaneous CSR activities	15.00
Sub-total		658.00
Total Regular Activities		
Strategic Activities		0.00
Total Strategic Activities		658.00
Grand Total Station Activities		

(9)

NTPC Limited
(Corporate CSR Group)

Ref.: 01/CSR/5.03

Date: 12/04/2019

Sub.: **Allocation of Annual CSR Budget to Stations/ Regions for RE 2019-20 & BE 2020-21.**

1.0 The CSR and Sustainability Committe, in its 88th Meeting held on 09.04.2019 has approved a CSR budget (RE 2019-20) of ₹ 1135.94 Lakh for Sipat subject to the following:

(i) Any sanction/ expenditure on this account is to be made only after model code of conduct is revoked i.e. on or after 24.05.2019. However, expenses on Girls Empowerment Mission (GEM) shall not come under the purview of the rider clause as the same was envisaged and acted upon much before the model code of conduct came into force.

(ii) The budget should be recast to ensure that atleast 60% of the amount sanctioned should be spent on Education/ Health as per Government of India directives and as approved by NTPC Management. However Sanitation and Drinking Water can also be considered as a part of initiative for health improvement.

2.0 The approved Budget RE 2019-20 and BE 2020-21 for Sipat is enclosed for further action by station.

(D K Patankar)
GM (CSR & R&R)

Encl: a/a

To:

BUH: Sipat

CC: For kind Information

1. **RED:** West-II
2. **ED:** CSR/ R&R

(8)

एनटीपीसी NTPC

NTPC

(Corporate CSR Group)

Ref. 01/CSR/5.03

Date: 22.06.2020

Sub.: Approved CSR Budget for Sipat for COVID-19 related activities and NAS/ SIE

Consequent upon the broad approvals for CSR Budget 2020-21 w.r.t. COVID-19 related expenses and re-appropriation approved by Competent Authorty, the following is communicated as Budget Approval for FY 2020-21 for **Sipat:**

#	Activity Description	Approved Amount (₹ Lac)
1	Financial Support to Local Administration towards fight against COVID-19	25.21
2	Providing Grocery items to Community	19.00
3	Providing Masks, Hand Gloves, etc to Community to prevent COVID-19	17.97
4	Support for providing Sanitizers, Soaps, disinfecting materials, etc to Community.	17.83
5	Support For Establishing Covid-19 Hospitals	8.00
6	Providing Personal Protective Equipment (PPE) to Corona Warriors	7.00
Total		**95.01**

Sridhar

(G Sridhar)
Additional General Manager (CC-CSR)

To:

BuH (Sipat)

CC: For kind information

1. RED (West-II)
2. ED (CSR/ R&R/ LA)

(9)

एनटीपीसी सीपत सीएसआर अंतर्गत वित्तीय वर्ष 2018-19 से 2020-21(11 फरवरी 2021 तक) हुये खर्च का विवरण

क्र.	वित्तीय वर्ष	मद	खर्च राशि (लाख ₹)	कार्य विवरण
1	2020-21 (01 अप्रेल 2020 से 11 फरवरी तक)	शिक्षा	136.74	आसपास के विद्यालयों के लिए आपूर्ति किए गए डेस्क बेंच हेतु भुगतान, बालिका सशक्तिकरण अभियान के अंतर्गत खर्च एवं अन्य
2		पशु स्वास्थ्य	23.69	एकीकृत पशुधन विकास केंद्र और चारा विकास केंद्र की स्थापना के माध्यम से कृत्रिम गर्भाधान और पशु चिकित्सा सेवाएं ग्रामवासियों को प्रदान करते हुये मवेशी नस्ल सुधार कार्यक्रम
3		कला एवं संस्कृति	1.82	उर्स के दौरान किए गए डोम व्यवस्था हेतु भुगतान इंतेजामिया समिति को
4		स्वास्थ्य एवं सेनीटेशन	60.24	कोरोना वायरस (COVID-19) के संक्रमण के रोकथाम हेतु सेनेटाइजर इत्यादि, कोरोना वायरस (COVID-19) के संक्रमण के रोकथाम हेतु सहयोग राशि, लॉकडाउन के दौरान जरूरतमंद को भोजन व्यवस्था हेतु राशि, कोरोना वायरस (COVID-19) के संक्रमण के रोकथाम हेतु छिड़काव इत्यादि
5		अधोसंरचना	55.23	ग्राम करी के अधूरे सामुदायिक भवन निर्माण कार्य को पूर्ण करने एवं अन्य
6		विविध	2.47	संचार इत्यादि
7		आईटीआई	28.22	आईटीआई महदा-बलौदा, जिला-जांजगीर चाम्पा डीजल मेकेनिक टूल्स हेतु भुगतान
8		व्यावसायिक प्रशिक्षण	2.53	वैल्डिंग प्रशिक्षण
9		पानी	18.63	ग्राम जांजी, रांक, एवं गतौरा में स्थापित आरओ वॉटर संयंत्र एवं आसपास के ग्रामों में स्थापित वॉटर एटीएम के माध्यम से पेयजल उपलब्ध कराना एवं अन्य
कुल			329.57	

(10)

एनटीपीसी सीपत सीएसआर अंतर्गत वित्तीय वर्ष 2018-19 से 2020-21(11 फरवरी 2021 तक) हुये खर्च का विवरण

क्र.	वित्तीय वर्ष	मद	खर्च राशि (लाख ₹)	कार्य विवरण
1	2019-20	शिक्षा	181.31	बालिका सशक्तिकरण अभियान के अंतर्गत 120 बालिकाओं हेतु 4 साप्ताहिक आवासीय कार्यशाला का आयोजन एवं बालिका सशक्तिकरण अभियान के अंतर्गत प्रवेशित बालिकाओं का स्कूल खर्च, हरदाडीह एवं रलिया के स्कूल में शौचालय निर्माण हेतु, गतौरा उच्चतर माध्यमिक विद्यालय परिसर में स्कूल भवन, लैब एवं शौचालय निर्माण, सीपत में 50 बिस्तर बालिका छात्रावास भवन निर्माण हेतु प्रथम किश्त, शासकीय हाई स्कूल परिसर सोंठी में अतिरिक्त कक्ष निर्माण हेतु प्रथम किश्त, उड़ान योजना के अंतर्गत विशेष पिछड़ी जनजाति "बैगा" परिवार के बच्चों की शिक्षा हेतु सहयोग, शा. हाई स्कूल गतौरा में पार्किंग शेड एवं शा. मिडिल स्कूल गतौरा में अतिरिक्त कक्ष निर्माण की अंतिम किश्त, शा. हाई स्कूल बिटकुला में अहाता निर्माण हेतु अंतिम किश्त एवं अन्य
2		पशु स्वास्थ्य	123.86	एकीकृत पशुधन विकास केंद्र और चारा विकास केंद्र की स्थापना के माध्यम से कृत्रिम गर्भाधान और पशु चिकित्सा सेवाएं ग्रामवासियों को प्रदान करते हुये मवेशी नस्ल सुधार कार्यक्रम, पैरा प्रबंधन के लिए सहकारी समितियों को बेलर मशीन हेतु
3		कला एवं संस्कृति	100	नेशनल ट्रायबल डांस फेस्टिवल 2019 के आयोजन हेतु सहयोग राशि एवं अन्य
4		स्वास्थ्य एतं सेनीटेशन	108.95	कोरोना वायरस (COVID-19) के संक्रमण के रोकथाम हेतु सहयोग राशि,साबुन वितरण, हरदाडीह एवं रलिया के स्कूल में शौचालय निर्माण हेतु, योग दिवस 2019 हेतु टी-शर्ट, स्वास्थ्य शिविर का आयोजन, धनगवां में ड्रेन कार्य एवं अन्य
5		अधोसंरंचना	212.35	ग्राम धनिया में सामुदायिक भवन निर्माण कार्य, ग्राम देवरी में सामुदायिक भवन निर्माण कार्य, ग्राम दर्राभाठा में सामुदायिक भवन निर्माण का बचा हुआ कार्य , ग्राम सीपत में सामुदायिक भवन मरम्मत कार्य, ग्राम कुकदा में सीसी रोड निर्माण कार्य, ग्राम महुदा-बलौदा, जिला-जांजगीर चाम्पा में सोलर हाइ मास्ट हेतु राशि (5.3524 लाख)*, ग्राम कौड़िया सामुदायिक भवन परिसर में आहाता निर्माण कार्य, ग्राम रलिया में 06 नग बाजार शेड एवं 02 नग पचरी निर्माण कार्य, शासकीय मदन लाल शुक्ल महाविद्यालय में सोलर पावर संयंत्र तथा सोलर हाई मास्ट- 05 नग रांक (02 नग), सुखरीपाली (01 नग), भिलाई (01 नग) एवं लुतरा (01) , देवरी में सीसी रोड निर्माण
6		विविध	5.04	वृक्षारोपण हेतु ट्री गार्ड
7		आईटीआई	102.74	आईटीआई महुदा-बलौदा, जिला-जांजगीर चाम्पा* में विभिन्न ट्रेडों (डीजल मेकेनिक, वेल्डर, टर्नर) के लिए उपकरण एवं अन्य अधोसंरचना कार्य

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एनटीपीसी सीपत सीएसआर अंतर्गत वित्तीय वर्ष 2018-19 से 2020-21(11 फरवरी 2021 तक) हुये खर्च का विवरण

क्र.	वित्तीय वर्ष	मद	खर्च राशि (लाख ₹)	कार्य विवरण
8		खेल	31.17	9वीं सब-जूनियर बालक राष्ट्रीय हॉकी प्रतियोगिता बिलासपुर 2019 हेतु सहयोग,राज्य स्तरीय शालेय खेल प्रतियोगिता, वरिष्ठ महिला वर्ग फुटबाल प्रतियोगिता एवं कोचिंग कैंप एवं अन्य
9		व्यावसायिक प्रशिक्षण	71.63	विभिन्न व्यावसायिक प्रशिक्षण (डाटा एंट्री ऑपरेटर, मोबाइल मरम्मत, ब्यूटि थेरेपिस्ट, लेदर बैग, सिलाई कढ़ाई, डीसीए / पीजीडीसीए इत्यादि) मल्टीयूटीलिटी सेन्टर गनियारी में फ्लाई एश ब्रिक्स उत्पादन हेतु मशीन स्थापना हेतु
10		पानी	140.25	आसपास के ग्रामों में रेन वॉटर हार्वेस्टिंग कार्य, जिला कलेक्टर परिसर एवं जिला न्यायालय परिसर में पेयजल व्यवस्था, ग्राम दर्राभाठा, सीपत में पेयजल वितरण, ग्राम महुदा-बलौदा, जिला-जांजगीर चाम्पा में हैंड पम्प (1.2396 लाख)*, ग्राम रलिया में 02 नग हैंड पंप, ग्राम जांजी, रांक, एवं गतौरा में स्थापित आरओ वॉटर संयंत्र एवं आसपास के ग्रामों में स्थापित वॉटर एटीएम की लायबिलिटी बूकिंग, उर्स में पेयजल व्यवस्था
		कुल	1077.3	

क्र.	वित्तीय वर्ष	मद	खर्च राशि (लाख ₹)	कार्य विवरण
1	2018-19	शिक्षा	55.77	सहयोगी ग्रामों के स्कूलों में अध्ययन सामग्री, ग्रीन बोर्ड, शासकीय महाविद्यालय मदनलाल शुक्ल में कैंटीन, 11वीं एवं 12वीं के बच्चों के लिए ऊ.मा.वि. जांजी में कोचिंग एवं क्रैश कोर्स,उड़ान योजना के अंतर्गत विशेष पिछड़ी जनजाति "बैगा" परिवार के बच्चों की शिक्षा हेतु सहयोग एवं अन्य कार्य
2		पशु स्वास्थ्य	27.37	एकीकृत पशुधन विकास केंद्र और चारा विकास केंद्र की स्थापना के माध्यम से कृत्रिम गर्भाधान और पशु चिकित्सा सेवाएं ग्रामवासियों को प्रदान करते हुये मवेशी नस्ल सुधार कार्यक्रम
3		कला एवं संस्कृति	35.86	बिलासपुर कार्निवाल, स्वीप कार्यक्रम एवं अन्य कार्य
4		स्वास्थ्य एवं सेनीटेशन	19.55	आसपास के ग्रामों में स्वास्थ्य शिविर,योग कैंप एवं अन्य
5		अधोसंरंचना	175.01	ग्राम जांजी में सामुदायिक भवन, तहसील कार्यालय मस्तूरी में आहाता निर्माण,सीसी रोड-कुकदा, दर्राभाठा, उतरदा, सीपत सामुदायिक भवन, जांजी विद्यालय में शौचालय मरम्मत एवं नवाडीह के पानी टंकी में पाइप कनैक्शन इत्यादि
6		विविध	17.99	मिशन ग्रीन बिलासपुर" अंतर्गत 'रन फॉर ग्रीन' व 'वृक्षारोपण महाअभियान' एवं अन्य
7		आईटीआई	318.38	आईटीआई महुदा (बलौदा) में विभिन्न ट्रेडों (डीजल मेकेनिक, वेल्डर, टर्नर) के लिए उपकरण, विद्युतिकरण, हॉस्टल अवाम अन्य अधोसंरचना कार्य

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एनटीपीसी सीपत सीएसआर अंतर्गत वित्तीय वर्ष 2018-19 से 2020-21(11 फरवरी 2021 तक) हुये खर्च का विवरण

क्र.	वित्तीय वर्ष	मद	खर्च राशि (लाख ₹)	कार्य विवरण
8		खेल	40.38	विभिन्न वर्गों में राज्य स्तरीय बालिका फुटबाल प्रतियोगिताओं एवं प्रशिक्षण कार्यक्रमों का आयोजन, दर्राभाठा में खेल मैदान का विकास, विद्यालयों में खेल सामग्री, राष्ट्रीय शालेय क्रीड़ा प्रतियोगिता वर्ष-2018 में पुरस्कार व्यवस्था इत्यादि
9		व्यावसायिक प्रशिक्षण	70.43	विभिन्न व्यावसायिक प्रशिक्षण (डाटा एंट्री ऑपरेटर, मोबाइल मरम्मत, ब्युटि थेरेपिस्ट, लेदर बैग, सिलाई कढ़ाई, डीसीए/पीजीडीसीए इत्यादि)
10		पानी	137.74	ग्राम दर्राभाठा में पाइप के माध्यम से पेयजल वितरण व्यवस्था, आसपास के ग्रामों में हैंड पंप, ग्रीष्म ऋतु में वॉटर टैंकर के माध्यम से पेयजल व्यवस्था, विद्यालय में क्रेडा के माध्यम से सोलर वॉटर सिस्टम एवं अन्य
कुल			898.48	

प्रति,

अतिरिक्त कलेक्टर
बिलासपुर (छ0ग0)

विषय :– **NTPC सीपत बिलासपुर द्वारा सीएसआर मद मे दी गई राशि की उपयोगिता एवं व्यय का परीक्षण।**
दिनांक :–12-02-2021, समय :–12:00 PM

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विषयांतर्गत NTPC सीपत बिलासपुर द्वारा सीएसआर मद मे दी गई राशि की उपयोगिता एवं व्यय का परीक्षण आज दिनांक 12.02.2021 को किया गया। एनटीपीसी सीपत परियोजना के लिए भूमि अधिग्रहित/व्यपवर्तित एवं आबंटित हेतु उप तहसील सीपत क्षेत्रांतर्गत कुल 26 ग्राम शामिल है एवं एनटीपीसी सीपत के राखड़ बांध के पास स्थित/प्रभावित कुल 8 ग्राम शामिल है।

एनटीपीसी सीपत द्वारा सीएसआर मद अंतर्गत वर्ष 2018–19 से 2020–21 तक निम्नानुसार कार्य विभिन्न मद अंतर्गत किया गया है :–

वर्ष 2018–19, 2019–20 एवं 2020–21 मे विभिन्न मदों मे व्यय किए गए राशि की जानकारी

क्र0	क्षेत्र	राशि (लाख में)	किए गए कार्यो का विवरण
01	शिक्षा	373.82	आसपास के विद्यालयों के लिए आपूर्ति किए गए डेस्क बेंच हेतु भुगतान, ग्रामों मे अध्ययन सामाग्री, ग्रीन बोर्ड, महाविद्यालय मे केंटीन, शा0हाईस्कूल जांजी मे कोंचिग एवं क्रैश कोर्स, उड़ान योजना के तहत **विशेष पिछड़ी जनजाति बैगा परिवार के बच्चो की शिक्षा हेतु सहयोग** व अन्य कार्य, बालिका शसक्तिकरण अभियान हेतु शौचालय निर्माण, बालिकाओं का स्कूल खर्च, गतौरा मे स्कूल भवन, लैब व शौचालय, सीपत मे **50 बिस्तर बालिका छात्रावास**, सोठी मे अति0कक्ष निर्माण व अन्य कार्य।
02	पशु स्वास्थ्य	174.92	एकीकृत पशुधन विकास केन्द्र व चारा विकास केन्द्र की स्थापना के माध्यम से कृत्रिम गर्भाधान व पशु चिकित्सा सेवाए ग्रामवासियों को प्रदाय करते हुए मवेशी नस्ल सुधार कार्यक्रम, पैरा प्रबंधन हेतु सह0 समितियों को बेलर मशीन प्रदाय।
03	कला एवं संस्कृति	137.78	उर्स के दौरान डोन व्यवस्था हेतु भुगतान, बिलासपुर कार्निवाल, स्वीप कार्यक्रम एवं **नेशनल ट्रायबल डांस फस्टिवल 2019 के सफल आयोजन हेतु सहयोग राशि** एवं अन्य ।
04	स्वास्थ्य एवं सेनेटाईजेशन	188.74	कोरोना वायरस (Covid-19) के संक्रमण के रोकथाम हेतु मास्क, सेनेटाईजर, साबुन वितरण एवं छिड़काव, हरदाडीह व रलिया ग्राम मे शौचालयों का निर्माण, स्वास्थ्य शिविर का आयोजन, आसपास के ग्रामों मे

			स्वास्थ्य शिविर योग कैंप, लाकडाउन के दौरान जरूरतमंद को भोजन व्यवस्था हेतु राशि प्रदाय।
05	अधोसंरचना	442.59	ग्राम कर्रा के अधूरे सामुदायिक भवन निर्माण कार्य को पूर्ण करने हेतु राशि प्रदाय, जांजी व सीपत मे सामुदायिक भवन, तह0 कार्यालय मस्तूरी मे आहाता निर्माण, कुकदा, दर्राभाठा, उतरदा मे सीसीरोड, जांजी विद्यालय मे शौचालय मरम्मत कार्य व नवाडीह मे पानी टंकी के पाईप कनेक्शन कार्य।
06	पेयजल व्यवस्था	296.62	आसपास के ग्रामों मे रेन वाटर हार्वेस्टिंग, जिला कलेक्टर एवं जिला न्यायालय परिसर मे पेयजल व्यवस्था, ग्राम दर्राभाठा/सीपत मे पेयजल व्यवस्था, ग्राम रलिया मे 2 नग हैंडपंप, ग्राम जांजी, रांक एवं गतौरा मे स्थापित आर ओ वाटर संयंत्र एवं आसपास के ग्रामो में स्थापित वाटर एटीएम की लायबिलिटी बुकिंग एवं उर्स मे पेयजल व्यवस्था।
07	खेल	71.55	9 वी सब–जूनियर बालक राष्ट्रीय हॉकी प्रतियोगिता बिलासपुर 2019 हेतु सहयोग, राज्य स्तरीय शालेय खेल प्रतियोगिता, वरिष्ठ महिला वर्ग फूटबाल प्रतियोगिता , कोचिंग कैम्प व अन्य कार्य। राज्य स्तरीय बालिका फुटबाल प्रति0 एवं प्रशिक्षण कार्यक्रमों को आयोजन, दरौभाठा मे खेल मैदान का विकास, विद्यालयों मे खेल सामाग्री, राष्ट्रीय शालेय क्रीडा प्रतियोगिता वर्ष 2018 मे पुरस्कार व्यवस्था आदि।
08	विविध	25.50	वृक्षारोपण हेतु ट्री–गार्ड, मिशन ग्रीन बिलासपुर अंतर्गत **"रन फार ग्रीन व वृक्षारोपण महाअभियान व अन्य।"** एवं संचार के क्षेत्र में कार्य आदि।
कुल राशि		**1711.42**	

उक्त 1711.42 लाख रू0 की राशि मे से एनटीपीसी सीपत परियोजना से प्रभावित ग्रामों
शिक्षा हेतु 373.82 लाख, स्वास्थ्य एवं सेनेटाईजेशन हेतु 188.74 लाख, अधोसंरचना हेतु 442.5
लाख एवं पेयजल व्यवस्था हेतु 296.62 लाख **कुल राशि 1301.77 लाख रू0 परियोजना**
प्रभावित प्रत्यक्ष ग्रामों मे व्यय किया गया है, शेष राशि को जिले के अन्य क्षेत्रों हेतु व्यय किय
गया है। इसके अतिरिक्त मोबाईल मरम्मत, सिलाई–कढ़ाई, डीसीए/पीजीडीसीए, वेल्डिंग आ
व्यवसायों का प्रशिक्षण प्रदाय किया गया । मल्टीयूटीलिटी सेंटर गनियारी मे फ्लाई एश ब्रिक
उत्पादन हेतु मशीन स्थापना किया गया है।

उक्तानुसार जानकारी आवश्यक कार्यवाही हेतु आपकी ओर सादर प्रेषित है।

प्रभारी अधिकारी
सी.एस.आर
जिला बिलासपुर (छ0ग0)

ANNEX K

Pg 1.

प्रति,

अपर कलेक्टर
बिलासपुर (छ.ग.)

विषय :– जॉच प्रतिवेदन बिन्दू क्रमांक 5 के संबंध में।

संदर्भ :– कार्यालय कलेक्टर बिलासपुर के आदेश क्र./672/स्टेनों –2 /अति0 कले0/2021 बिलासपुर दिनांक 11.02.2021

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संदर्भित आदेश के पालन में दिनांक 12.02.2021 को वन विभाग की टीम एन.टी.पी.सी. सीपत क्षेत्र में छ.ग. राज्य वन विकास निगम बिलासपुर द्वारा एन.टी.पी.सी. प्रभावित क्षेत्रों में सघन वृक्षारोपण क्षेत्रों हेतु राशि उपलब्ध कराई गई थी जिसमें छ.ग. राज्य वन विकास निगम द्वारा रोपण किया गया था।

जिसमें दिनांक 12.02.2021 को निरीक्षण किया गया जिसकी स्थिति निम्नानुसार है :–

1. एन.टी.पी.सी. डिपॉजिट ब्लाक रोपण वर्ष 2018 एवं 2019 रोपण 17.00 हे. क्षेत्र जिसमें 38769 पौधें रोपित किये गये थे। रोपित पौधों का अंतराल 2×2 मी. है रोपित प्रजाति करंज, शिशु, सागौन, स्पोथोडिया, पेल्टाफार्म, गुलमोहर, गंगाईमली, कनेर पीपल, सीमारोमा, सिंदूरी आदि का रोपण किया गया जिसमें वर्तमान में पौधों का जीवित प्रतिशत लगभग 89 है एवं पौधों की औसत उंचाई 4.5 मी. है, तथा छाती गोलाई 25 से 35 से.मी. है, जिसका मौका पंचनामा संलग्न है।(पदकी - 1)

2. बनियाडीह गेट एम.जी.आर. रोपण वर्ष 2019 एन.टी.पी.सी. रेल लाईन के दोनों ओर 02 कि.मी. लंबाई में पौधों की अंतराल 2×2 मी. पौधों की संख्या 25000 नग पौधों का रोपण किया गया है। रोपण क्षेत्र में रोपित प्रजाति कहुआ, करंज, पेल्टाफार्म शिशु, गंगाईमली, नीम, झारूल, बकायन, कचनार आदि रोपित किया गया है। वर्तमान में पौधों का जीवित प्रतिशत लगभग 92 है पौधों की औसत उंचाई लगभग 2.25 मी. है, जिसका मौका पंचनामा संलग्न है।(पदकी - 2)

3. धनिया ओवरब्रीज एन.टी.पी.सी के पास एम.जी.आर. रोपण वर्ष 2018 रेल लाईन के दोनों ओर 500 मी. लम्बाई में 2×2 मी. अंतराल में 22975 पौधों का रोपण किया गया, रोपण क्षेत्र में कहुआ, करंज, शिशु, पेल्टाफार्म, गंगाईमली, नीम, कचनार आदि प्रजातियों का रोपण कराया

गया है। उक्त रोपण क्षेत्र की स्थिति अच्छी है वर्तमान में पौधों की औसत उंचाई 3 मी. है तथा जीवित पौधों का प्रतिशत लगभग 82 है जिसका मौका पंचनामा संलग्न है। (पृष्ठ - 3)

4. एन.टी.पी.सी. सीपत एस. डाईक एरिया वृक्षारोपण वर्ष 2019 कौड़िया में 5000 नग पौधें रोपित किये गये जिसमें 2800 नग रोड साईड जिसमें लोहे की ट्रीगार्ड (एक साईड) लगी हुई है रोपण तथा 2200 नग पौधें ब्लाक में लगाये गये है। रोपण क्षेत्र में शिशु, करंज, पेल्टाफार्म, गुलमोहर, कर्रा प्रजाति के पौधें का रोपण किया गया, वर्तमान में पौधों की औसत उंचाई 1.5 मी. जीवित प्रतिशत लगभग 91 पाया गया जिसका मौका पंचनामा संलग्न है। (पृष्ठ - 4)

5. एन.टी.पी.सी. सीपत एस. डाईक (राक) रोपण वर्ष 2018 रोपण क्षेत्र में 2000 नग पौधों लंबाई 2 कि.मी. मार्ग के एकतरफ रोपण कराया पाया गया रोपण क्षेत्र में शिशु, करंज, गंगाईमली, नीम झारूल, सतवन आदि पौधों का रोपण किया गया। रोपण क्षेत्र में पौधों की स्थिति अच्छी पाई गयी वर्तमान में जिसकी औसत उंचाई 6.5 मी. एवं जीवित प्रतिशत लगभग 90 है, जिसका मौका पंचनामा संलग्न है। (पृष्ठ - 5)

6. एन.टी.पी.सी. सीपत ग्रीन बेल्ट रोपण वर्ष 2016 इस क्षेत्र में 60000 नग पौधों का रोपण 26.32 हे. में 2×2 मी. अंतराल में किया गया, जिसमें केसियासेमिया, करंज, शिशु, रीठा, आंवला, नीम, गंगाईमली, सतवन, गुलमोहर आदि प्रजाति रोपित किये गये वर्तमान में पौधों की स्थिति अच्छी पाई गई जिसकी औसत उंचाई 6 मी. एवं जीवित प्रतिशत लगभग 82 है जिसका मौका पंचनामा संलग्न है। (पृष्ठ - 6)

उक्त संबंध में एन.टी.पी.सी. सीपत में वन विकास निगम बिलासपुर द्वारा वर्ष 2016 से 2019 तक कराये गये वृक्षारोपणों का जांच कर जांच प्रतिवेदन एवं मौका पंचनामा सहित आपकी ओर अवलोकनार्थ सादर संप्रेषित है।

अभिनंदन गोस्वामी
परियोजना परिक्षेत्र अधि.
वन विकास निगम
बिलासपुर (छ.ग.)

सुरेश कुमार विश्वकर्मा
वन विस्तार अधिकारी
अनुसंधान एवं विस्तार
झगराई-पाथरिया

अमिता गुप्ता
सहायक वन संरक्षक
अनुसंधान एवं विस्तार
वनमंडल बिलासपुर
(छ.ग.)

सुनिल कुमार [illegible]
उपवनमंडलाधिकारी
बिलासपुर वनमंडल
बिलासपुर (छ.ग.)

(3)

कार्यालय उप वनमण्डलाधिकारी बिलासपुर उप वनमण्डल बिलासपुर (छ.ग.)

e-mail–sdfobsp@rediffmail.com

क्रमांक/ 366 /2021/ बिलासपुर, दिनांक 25/02/2021

प्रति,

अपर कलेक्टर
बिलासपुर (छ.ग.)

विषय :– जांच प्रतिवेदन बिन्दु क्रमांक 05 के संबंध में।
संदर्भ :– आपका पत्र क्र. 672/स्टेनो–2/अति.कले./2021 बिलासपुर दिनांक 11.02.2021 एवं इस कार्यालय का पत्र क्रमांक 270 दिनांक 17.02.2021

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निवेदन है कि उपरोक्त विषय में संदर्भित क्रमांक द्वारा दिये गये निर्देशानुसार माननीय एन.जी.टी. के प्रकरण क्रमांक ओ ए 459/2019 में दिनांक 27.02.2020 को पारित आदेश में संयुक्त समिति गठित कर अंतिम रिपोर्ट प्रस्तुत करने बाबत् निर्देशित किया गया है।

संदर्भित आदेश के पालन में दिनांक 12.02.2021 एवं 23.02.2021 को वन विभाग की टीम एन.टी.पी.सी.सीपत क्षेत्र में छत्तीसगढ़ राज्य वन विकास निगम मण्डल प्रबंधक, कोटा परियोजना मण्डल बिलासपुर द्वारा एन.टी.पी.सी.प्रभावित क्षेत्र में सघन वृक्षारोपण वर्ष 2016, वर्ष 2018, 2019 में ग्रीन बेल्ट में पौधारोपण किया गया है जिसका संयुक्त निरीक्षण कर मौका पंचनामा लिया गया जिसकी स्थिति निम्नानुसार है :–

(1) एन.टी.पी.सी. ग्रीन बेल्ट रोपण वर्ष 2016 इस क्षेत्र में 60000 नग पौधों का रोपण 26.32 हे. में अंतराल 2×2 मीटर में किया गया है जिसमें रोपित प्रजाति केशियासेमिया, करंज, शीशू, रीठा, आवंला, नीम, गंगा इमली सतवन गुलमोहर आदि का रोपण किया गया है वर्तमान मे पौधों की स्थिति अच्छी पायी गयी है जीवित प्रतिशत लगभग 82 है एवं पौधों की औसत ऊंचाई 6 मीटर है। जिसका मौका पंचनामा संलग्न है। **(प्रदर्श–1)**

(2) एन.टी.पी.सी. डिपॉजिट ब्लाक रोपण वर्ष 2018 एवं 2019 रोपण 17.00 हे. क्षेत्र जिसमें 38769 पौधे रोपण किये गये थे रोपित पौधों का अंतराल 2×2 मीटर है रोपित प्रजाति करंज शीशू, सागौन, स्पोथोडिया, पेल्टाफार्म, गुलमोहर गंगा इमली कनेर पीपल, सीमा रोम सिंदुरी आदि का रोपण किया गया है वर्तमान में पौधों का जीवित प्रतिशत लगभग 89 है ए पौधों की औसत ऊंचाई 4.5 मीटर है तथा छाती गोलाई 25–35 से.मी. है जिसका मौका पंचनाम संलग्न है। **(प्रदर्श–2)**

उक्त संबंध में एन.टी.पी.सी. सीपत में छत्तीसगढ़ राज्य वन विकास निग बिलासपुर द्वारा वर्ष 2016 से 2019 तक कराये वृक्षारोपण का जांच कर जांच प्रतिवेदन एवं मौव पंचनामा सहित पुनः आपकी ओर अवलोकनार्थ एवं आवश्यक कार्यवाही हेतु सादर संप्रेषित है।

संलग्न :– उपरोक्तानुसार।

(अभिनंदन गोस्वामी)
परियोजना परिक्षेत्र अधिकारी
कोटा परियोजना मण्डल बिलासपुर
वन विकास निगम बिलासपुर (छ.ग.)

(सुरेश कुमार विश्वकर्मा)
वन विस्तार अधिकारी
अनुसंधान एवं विस्तार
इकाई–पथरिया

(अमिता गुप्ता)
सहायक वन संरक्षक
अनुसंधान एवं विस्तार वनमण्डल
बिलासपुर (छ.ग.)

(सुनिल कुमार)
उप वनमण्डलाधिकारी
बिलासपुर उप वनमण्डल
बिलासपुर (छ.ग.)

परिशिष्ट-01

स्थान - NTPC ग्रीन बेल्ट रोपण-2016
नवाडीह
दिनांक - 12/02/2021
समय - 4.40 PM (लगभग)

हम पंचगण अपना सच-सच पंचनामा दर्ज कराते हैं कि आज दिनांक 12/02/21 को NTPC Green Belt रोपण-2016 नवाडीह की जांच हेतु उपवनमण्डलाधिकारी श्री-सुनिल बच्चन, बिलासपुर वन मण्डल एवं सुश्री अमिता गुप्ता (ACF) अनु० विस्तार वन मण्डल बिलासपुर अपने अधीनस्थ वनाधिकारियों को साथ लेकर उक्त रोपण क्षेत्र की जांच हेतु पहुंचे। उक्त रोपण-NTPC-Green Belt-नवाडीह वर्ष-2016 में कराया गया। उक्त क्षेत्र में कुल - 60000 नग पौधे 3मी०×2मी० के अंतराल में रोपित किए गए, चारों तरफ चैन लिंक जाली से घेराबंदी की गई। उक्त क्षेत्र में केसिया सामिया, शीशु, करंज, रौंहा, आंवला, नीम, गंगा ईमली, सलवन, गुलमोहर आदि प्रजाति के पौधे रोपित किए गए थे।

उक्त अधिकारियों की उपस्थिति में श्री सुरेश कुमार विश्वकर्मा (वन विस्तार अधिकारी-पथरिया इकाई) की अभिनंदन गोस्वामी (परियोजना परिक्षेत्र अधिकारी, वन विकास निगम बिलासपुर) मय स्टाफ द्वारा सेम्पल प्लाट 50मी०×50मी० चैंयर पर रोपण क्षेत्र में जीवित पौधों के प्रतिशत की गणना की गई। उक्त रोपण क्षेत्र में पौधे (वृक्ष) अच्छी स्थिति में पाए गए, औसत ऊंचाई - 6मी०(लगभग) एवं जीवित प्रतिशत 82% पाया गया।

यही हम पंचों का सही-सही पंचनामा है। पंचनामा पढ़कर, सुनकर हस्ताक्षर / अंगुठा किया गया।

① श्री - परमानंद सुर्यवंशी S/o मालिकराम, उम्र-22Y (लगभग) परमानंद
साकिन - किरारी, थाना - मस्तुरी

② श्री - खुधराम पटेल S/o जेढूराम, उम्र-25Y (लगभग) खुधराम
साकिन - कौड़िया, थाना - सीपत

③ श्री - श्रेलेश कुमार सोनी (वन०) पथरिया इकाई
अनुसंधान / विस्तार वन मण्डल बिलासपुर (छ.ग.)

④ श्री - घनश्याम देवांगन S/o सीताराम, उम्र-36Y (लगभग)
साकिन - लिंगियाडीह, बिलासपुर (छ.ग.)

⑤ श्री - किर्ती कुमार साहु (वन०) पथरिया इकाई
अनुसंधान / विस्तार वन मण्डल बिलासपुर (छ.ग.)

पंचनामा मेरे समक्ष लेख किया गया।

वन विस्तार अधिकारी
अनुसंधान एवं विस्तार
इकाई - पथरिया

पंचनामा मेरे समक्ष लेख किया गया।

सहायक वन संरक्षक
अनुसंधान एवं विस्तार वन मंडल

(5)

प्रदर्श-02

स्थान - NTPC डिपॉजिट
Block रोपण क्षेत्र-2018
दिनांक - 12/02/2021
समय - 12.45 PM (लगभग)

हम पंचगण अपना सच-सच पंचनामा दर्ज कराते हैं कि आज दिनांक 12/02/21 को NTPC डिपॉजिट ब्लॉक रोपण-2018 की जांच हेतु उप वन-मण्डल अधिकारी, बिलासपुर उप वनमण्डल श्री सुनिल बच्चन एंव अनुसंधान वन मण्डल से सहा० वन संरक्षक सुश्री अमिता गुप्ता अपने अधीनस्थ वनाधिकारियों के साथ पहुंचे। उक्त NTPC डिपॉजिट ब्लॉक रोपण वर्ष-2018 एंव 2017 में कराया गया, क्रमशः 31737 नग एंव 7032 नग, कुल योग-38769 नग पौधे रोपित किए गए। उक्त रोपण क्षेत्र में करंज, शीशु, सागौन, हल्दूधोडिया, पेल्टाफार्म, गुलमोहर, गंगा इमली, कनेर, पीपल, सीमारोबा, सिंदूरी आदि प्रजाति के पौधे रोपित किए गए हैं। मौके पर वरिष्ठ अधिकारियों की उपस्थिति में वन क्षेत्रपाल श्री सुरेश कुमार विश्वकर्मा (वन विस्तार अधिकारी-पथरिया इकाई, अनु० विस्तार वन मण्डल बिलासपुर), अभिनंदन गोस्वामी (परियोजना परिक्षेत्र अधिकारी, वन विकास निगम बिलासपुर) एंव अन्य वनाधिकारियों द्वारा 50×50 मी० का सेम्पल प्लाट निकालकर जीवित प्रतिशत की गणना की गई। उक्त रोपण क्षेत्र में पौधों की स्थिति अच्छी है, जिनित प्रतिशत 89% (लगभग) है एंव औसत उंचाई - 4.5 मी० (लगभग), छाती गोलाई - 25 - 35 से०मी० (लगभग) है।

यही हम पंचों का सच-सच पंचनामा है। पंचनामा पढ़कर/सुनकर हस्ताक्षर अंगुठा किया।

① श्री भोज लाल निर्मलकर S/o हीरालाल, उम्र - 54 y (लगभग) भोज लाल
सा० - हाल मुकाम - कौड़िया, थाना - सीपत

② श्री राजेन्द्र प्रसाद धुर्वे S/o विश्वम्भर सिंह, उम्र - 40y (लगभग) राजेन्द्र
सा० - हाल मुकाम - कौड़िया, थाना - सीपत

③ श्री किर्ती कुमार साहू (क०अ) पथरिया इकाई, अनु० विस्तार वन मण्डल बिलासपुर (छ०ग०) (व.ए)

④ श्री शैलेष कुमार सोनी (क०अ) पथरिया इकाई, अनु० विस्तार वन मण्डल बिलासपुर (छ०ग०) (क०अ)

⑤ श्री रविशंकर दादोरिया (क०अ) परिसर-बरगुर, वन परिक्षेत्र-बिलासपुर -

पंचनामा मेरे द्वारा लेख किया गया।

पंचनामा मेरे समक्ष दर्ज किया गया।

वन विस्तार अधिकारी
अनुसंधान एवं विस्तार वन मंडल
इकाई - पथरिया

सहायक वन संरक्षक
अनुसंधान एवं विस्तार वन मंडल
बिलासपुर (छ.ग.)

उप वनमण्डल अधिकारी
बिलासपुर (छ.ग.)

एनटीपीसी NTPC
A Maharatna Company

NTPC Limited
(A Government of India Enterprise)
Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4000206020-185-1019 **Date** : 29.06.2018 **(version : 0)**

To **Vendor Code :** 1035822

MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Subject:	: Tree Plantation in NTPC Land along the MGR Track. [LOA REF.NO.SIPAT/CS/2018-19/18062/1839128 DATED:26.06.2018]
NIT NO.	: Dated
Your Offer No.	:
Your Reference	: 1. Your letter No.VVN/KP/Expenditure/2018/955 dated: 19.06.2018
Our Reference	: LOA REF.NO.SIPAT/CS/2018-19/18062/1839128 DATED:26.06.2018

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Tree Plantation in NTPC Land along the MGR Track. [LOA REF.NO.SIPAT/CS/2018-19/18062/1839128 DATED:26.06.2018] of total value INR 25,258,668.76 (Rupee TWO CRORE FIFTY-TWO LAKH FIFTY-EIGHT THOUSAND SIX HUNDRED SIXTY-EIGHT POINT SEVENTY-SIX ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 27.06.2018 to 31.03.2023. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. SHRI A.K. RAI, DGM(MGR) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

[R.K. JAIN]
SR.MANAGER(CS)

Enclosures :
BILL OF QUANTITIES, SCOPE OF WORK, TERMS AND CONDITIONS

(Bill of Quantity)

Name of Work: Tree Plantation in NTPC Land along the MGR Track.
[LOA REF.NO.SIPAT/CS/2018-19/18062/1839128
DATED:26.06.2018]

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:
1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507
Invoicing to be done on
GST No. : 22AAACN0255D4Z5

10		Tree Plantation along MGR Track (Part-A)	AU	1.000	18,517,850.00	18,517,850.00	

Tax: NIL **Extra**

10 .10		First year plantation & its maintenance	NO	22,975	365.0000	8,385,875.00	
10 .20		Second Year Maintenance	NO	22,975	140.0000	3,216,500.00	
10 .30		Third Year Maintenance	NO	22,975	131.0000	3,009,725.00	
10 .40		Fourth Year Maintenance	NO	22,975	127.0000	2,917,825.00	
10 .50		Fifth Year Maintenance	NO	22,975	43.0000	987,925.00	

TOTAL OF BOQ PART : 00010 INR 18517850.00

Amount **18517850.00**
Other Charges 0.00

Net Amount on BOQ PART : 00010 INR 18517850.00

20		Fencing RCC Pole with Barbed Wire(Part-B	AU	1.000	6,740,818.76	6,740,818.76	

Tax: NIL **Extra**

20 .10		Fencing RCC Pole with barbed wire (3x3M	RMT	14,956	450.7100	6,740,818.76	

TOTAL OF BOQ PART : 00020 INR 6740818.76

Amount **6740818.76**
Other Charges 0.00

Net Amount on BOQ PART : 00020 INR 6740818.76

Net Total Amount INR 25,258,668.76
Less Rebate/Amount INR 0.00
Grand Total INR 25,258,668.76

INR TWO CRORE FIFTY-TWO LAKH FIFTY-EIGHT THOUSAND SIX HUNDRED SIXTY-EIGHT AND SEVENTY-SIX PAISA ONLY

[R.K. JAIN]
SR.MANAGER(CS)

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एनटीपीसी NTPC
A Maharatna Company

NTPC Limited

(A Government of India Enterprise)
Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4600057825-185-1019 **Date :** 21.09.2019 **(version : 0)**

Vendor Code : 1035822

To
MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Subject: : Tree Plantation (25000 nos), Fencing and its Maintenance for 5 Years along the MGR Track in NTPC Land on Deposit basis.
[LOA REF.NO.SIPAT/CS/2019-20/19048/P-258440/1939070 DATED:19.09.2019]

NIT NO. : 800043231 Dated
Your Offer No. :
Your Reference : 1. Your letter Ref. #/#####/######/####/2019/1996 ######## ###### 04.09.2019
Our Reference : LOA REF.NO.SIPAT/CS/2019-20/19048/P-258440/1939070 DATED:19.09.2019

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Tree Plantation (25000 nos), Fencing and its Maintenance for 5 Years along the MGR Track in NTPC Land on Deposit basis. [LOA REF.NO.SIPAT/CS/2019-20/19048/P-258440/1939070 DATED:19.09.2019] of total value INR 42,653,263.00 (Rupee FOUR CRORE TWENTY-SIX LAKH FIFTY-THREE THOUSAND TWO HUNDRED SIXTY-THREE ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 23.09.2019 to 22.09.2024. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. SHRI A.K. RAI, DGM(MGR) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

[G.P. PATLEY]
MANAGER(CS)

Enclosures :
BILL OF QUANTITIES, TERMS AND CONDITIONS

Name of Work:

(Bill of Quantity)

Tree Plantation (25000 nos), Fencing and its Maintenance for 5 Years along the MGR Track in NTPC Land on Deposit basis. [LOA REF.NO.SIPAT/CS/2019-20/19048/P-258440/1939070 DATED:19.09.2019]

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:

1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507
Invoicing to be done on
GST No. : 22AAACN0255D4Z5

10		Tree Plantation along MGR Track	AU	1.000	42,653,263.00	42,653,263.00	

Tax: NIL **Extra**

10 .10		First year plantation & its maintenance	NO	25,000	382.2500	9,556,250.00	
10 .20		Second Year Maintenance	NO	25,000	173.3800	4,334,500.00	
10 .30		Third Year Maintenance	NO	25,000	161.7900	4,044,750.00	
10 .40		Fourth Year Maintenance	NO	25,000	158.2400	3,956,000.00	
10 .50		Fifth Year Maintenance	NO	25,000	82.8700	2,071,750.00	
10 .60		fencing RCC pole with barbes wire 1st yr	RMT	38,040	491.3300	18,690,193.20	

TOTAL OF BOQ PART : 00010 INR 42653443.20
Discount (Value) 180.20-
Amount **42653263.00**
Other Charges 0.00
Net Amount on BOQ PART : 00010 INR 42653263.00

Net Total Amount INR 42,653,263.00
Less Rebate/Amount INR 0.00
Grand Total INR 42,653,263.00
INR FOUR CRORE TWENTY-SIX LAKH FIFTY-THREE THOUSAND TWO HUNDRED SIXTY-THREE ONLY

(10)

एनटीपीसी NTPC
A Maharatna Company

NTPC Limited

(A Government of India Enterprise)
Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4000209233-054-1019 **Date :** 20.08.2018 **(version : 1 Date : 22.08.2018)**

Vendor Code : 1035822

To
MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Subject: : Plantation, maintenance & watch and ward including fencing of 2000 Plants in ash Dyke area for five year at NTPC Sipat.
Version 1: Purchase Grp changed to 054.

NIT NO. : Dated
Your Offer No. :
Your Reference : Your offer letter Ref. No. VVN/KP/vyay/2017/909 dated 22.05.2017
Our Reference : Ref. No. SIPAT/CS//18192

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Plantation, maintenance & watch and ward including fencing of 2000 Plants in ash Dyke area for five year at NTPC Sipat. Version 1: Purchase Grp changed to 054. of total value INR 4,103,991.57 (Rupee FORTY-ONE LAKH THREE THOUSAND NINE HUNDRED NINETY-ONE POINT FIFTY-SEVEN ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 14.08.2018 to 13.08.2023. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. Sh. Shahid Nasim, Sr. Manager (AHP) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

Rajeev Verma
DGM (CS)

Enclosures :
Payment Details, Terms and Conditions and Drawing as per Annexure-A.

Name of Work: (Bill of Quantity)

Plantation, maintenance & watch and ward including fencing of 2000 Plants in ash Dyke area for five year at NTPC Sipat.
Version 1: Purchase Grp changed to 054.

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:

1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507
Invoicing to be done on
GST No. : 22AAACN0255D4Z5

10		Plantation in Ash Dyke area	AU	1.000	4,103,991.57	4,103,991.57	

Tax: NIL **Extra**

10 .110		1st year plantation & maintenance	NO	2,000	401.0000	802,000.00	
10 .120		Fencing RCC with Chain link 1st year	RMT	4,553	450.6900	2,051,991.57	
10 .130		Second year Plantation maintenance	NO	2,000	178.0000	356,000.00	
10 .140		Third year Plantation maintenance	NO	2,000	174.0000	348,000.00	
10 .150		Fourth year PLANTATION maintenance	NO	2,000	172.0000	344,000.00	
10 .160		Fifth year plantation maintenance	NO	2,000	101.0000	202,000.00	

TOTAL OF BOQ PART : 00010 INR 4103991.57

Amount **4103991.57**
Other Charges 0.00

Net Amount on BOQ PART : 00010 INR 4103991.57

Net Total Amount INR 4,103,991.57
Less Rebate/Amount INR 0.00
Grand Total INR 4,103,991.57

INR FORTY-ONE LAKH THREE THOUSAND NINE HUNDRED NINETY-ONE AND FIFTY-SEVEN PAISA ONLY

(12)

एनटीपीसी NTPC
A Maharatna Company

NTPC Limited

(A Government of India Enterprise)
Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4600058009-054-1019 **Date :** 05.10.2019 **(version : 0)**

Vendor Code : 1035822

To
MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Subject: : Plantation, maintenance & watch and ward including fencing of 5000 plants in Ash Dyke area for five years for the year 2019-2024.
[LOA REF.NO.SIPAT/CS/2019-20/19086/P-279066/1939077 DATED:03.10.2019]

NIT NO. : 800043350 Dated
Your Offer No. :
Your Reference : 1. Your letter Ref. #/#####/######/####/2019/4152 ######## ###### 12.02.2019
2. Your letter Ref. #/#####/######/####/2019/2235 ######## ###### 24.09.2019
3. Your letter Ref. #/#####/######/####/2019/2237 ######## ###### 24.09.2019

Our Reference : LOA REF.NO.SIPAT/CS/2019-20/19086/P-279066/1939077 DATED:03.10.2019

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Plantation, maintenance & watch and ward including fencing of 5000 plants in Ash Dyke area for five years for the year 2019-2024. [LOA REF.NO.SIPAT/CS/2019-20/19086/P-279066/1939077 DATED:03.10.2019] of total value INR 10,434,693.30 (Rupee ONE CRORE FOUR LAKH THIRTY-FOUR THOUSAND SIX HUNDRED NINETY-THREE POIN THIRTY ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 09.10.2019 to 08.10.2024. Though the duration of contrac shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. SHF SHAHID NASIM, SR.MANAGER (AHP) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signato in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchas order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that ord has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

[G. P. PATLEY]
MANAGER(CS)

13

Enclosures :

BILL OF QUANTITIES, SCOPE OF WORK, TERMS AND CONDITIONS

(14)

PO No. : 4600058009

Name of Work: (Bill of Quantity)
Plantation, maintenance & watch and ward including fencing of 5000 plants in Ash Dyke area for five years for the year 2019-2024.
[LOA REF.NO.SIPAT/CS/2019-20/19086/P-279066/1939077 DATED:03.10.2019]

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text

Delivery/Invoicing Address:
1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507
Invoicing to be done on
GST No. : 22AAACN0255D4Z5

10		Plantation of 5000Trees in Ash Dyke area	AU	1.000	10,434,693.30	10,434,693.30	

Tax: NIL Extra

10 .10		1st year plantation & maintenance	NO	5,000	405.2000	2,026,000.00	
10 .20		Fencing RCC with Chain link 1st year	RMT	5,110	829.0300	4,236,343.30	
10 .30		Second year Plantation maintenance	NO	5,000	229.1800	1,145,900.00	
10 .40		Third year Plantation maintenance	NO	5,000	220.7500	1,103,750.00	
10 .50		Fourth year PLANTATION maintenance	NO	5,000	226.3700	1,131,850.00	
10 .60		Fifth year plantation maintenance	NO	5,000	158.1700	790,850.00	

TOTAL OF BOQ PART : 00010 INR 10434693.30

Amount **10434693.30**
Other Charges 0.00

Net Amount on BOQ PART : 00010 INR 10434693.30

Net Total Amount INR 10,434,693.30
Less Rebate/Amount INR 0.00
Grand Total INR 10,434,693.30

INR ONE CRORE FOUR LAKH THIRTY-FOUR THOUSAND SIX HUNDRED NINETY-THREE AND THIRTY PAISA ONLY

[G. P. PATLEY]
MANAGER(CS)

(15)

NTPC Limited

(A Government of India Enterprise)
Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4000168564-037-1019 **Date** : 29.06.2016 **(version : 1 Date : 20.02.2018)**

To

Vendor Code : 1035822

MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Subject: : Plantation of trees in green belt area sipat

Version : 1 - Created for updation of NIL GST in India Tab as per request received from execution deptt. through IOM dated : 17.02.2018.

NIT NO. : Dated
Your Offer No. :
Your Reference : Your offer letter dated : 21.12.2015.
Our Reference : Sipat/CS/2016-17/16048/1667082

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Plantation of trees in green belt area sipat Version : 1 - Created for updation of NIL GST in India Tab as per request received from execution deptt. through IOM dated : 17.02.2018. of total value INR 22,314,000.00 (Rupee TWO CRORE TWENTY-THREE LAKH FOURTEEN THOUSAND ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 24.06.2016 to 23.06.2021. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. Sh. Pankaj Kumar Sharma DGM(EMG) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

Sh. Rajeev Verma
DGM(CS)

Enclosures :
Payment Details , Terms and Conditions and Drawing as per Annexure-A & B.

(16)

PO No. : 4000168564

Name of Work: (Bill of Quantity)
Plantation of trees in green belt area sipat

Version : 1 - Created for updation of NIL GST in India Tab as per request received from execution deptt. through IOM dated : 17.02.2018.

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Lor Te
10		Green Belt plantation	AU	1.000	22,314,000.00	22,314,000.00	

Delivery/Invoicing Address:
1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507
Invoicing to be done on
GST No. : 22AAACN0255D4Z5

Tax: NIL **Extra**

10 .10		Green belt plantation& maintenan1st year	NO	60,000	127.0000	7,620,000.00
10 .20		Maintenance for 2nd year	NO	60,000	70.0000	4,200,000.00
10 .30		Maintenance for 3rd year	NO	60,000	70.0000	4,200,000.00
10 .40		Maintenance for 4th year	NO	60,000	53.0000	3,180,000.00
10 .50		Maintenance for 5th year	NO	60,000	30.0000	1,800,000.00
10 .60		fencing barbed wire (3x3 mtr.interval)	RMT	3,000	292.0000	876,000.00
10 .70		Maintenance of fencing 2nd year	RMT	300	321.2000	96,360.00
10 .80		Maintenance of fencing 3rd year	RMT	300	350.4000	105,120.00
10 .90		Maintenance of fencing 4th year	RMT	300	379.6000	113,880.00
10 .100		Maintenance of fencing 5th year	RMT	300	408.8000	122,640.00

TOTAL OF BOQ PART : 00010 INR 22314000.0

Amount 22314000.0
Other Charges 0.0

Net Amount on BOQ PART : 00010 INR 22314000.0

Net Total Amount INR 22,314,000.0
Less Rebate/Amount INR 0.0
Grand Total INR 22,314,000.0
INR TWO CRORE TWENTY-THREE LAKH FOURTEEN THOUSAND ONLY

NTPC Limited

(A Government of India Enterprise)
Sipat Super Thermal Power Project
PO Ujwal Nagar
District Bilaspur
Chhattisgarh- 495555, India
Telephone No. : 07752-246552 Fax No. : 07752-246507

Service Purchase Order

Purchase Order No. : 4000198487-037-1019 **Date :** 09.02.2018 **CIN No.** : L40101DL1975GOI007966

(version : 1 Date : 17.01.2019)

To

MANAGING DIRECTOR CG RAJYA VAN VIKAS NIGAM LIMITED
Lokash Plaza, Shankar Nagar Road
Shankar Nagar
RAIPUR
Chhattisgarh
India - 492001

Vendor Code : 1035822

Subject: : Plantation of trees in green belt area of Sipat.
[LOA Ref. No. SIPAT/CS/2017-18/17173/1737151 DATED:09.09.2017]

Note:- Version:1 PO created to incorporate a new line item 20 for watering of 15000 Plants (which is Off season plantation) in Green Belt area for the period from Dec.2018 to Feb.2019 as per approval of C/A in Pradeep at NP-22.

NIT NO. : Dated
Your Offer No. :
Your Reference : Your offer letter Ref. No. VVN/KP/vyay/2017/909 dated 22.05.2017
Our Reference : LOA Ref. No. SIPAT/CS/2017-18/17173/1737151 DATED:09.09.2017

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Plantation of trees in green belt area of Sipat. [LOA Ref. No. SIPAT/CS/2017-18/17173/1737151 DATED:09.09.2017] Note:- Version:1 PO created to incorporate a new line item 20 for watering of 15000 Plants (which is Off season plantation) in Green Belt area for the period from Dec.2018 to Feb.2019 as per approval of C/A in Pradeep at NP-22. of total value INR 25,043,350.00 (Rupee TWO CRORE FIFTY LAKH FORTY-THREE THOUSAND THREE HUNDRED FIFTY ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 01.02.2018 to 31.01.2023. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. Shri L.K. Kaushik, Sr. Manager (EMG) shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

(R K Jain)
Sr.Manager(CS)

(18)

PO No. : 4000198487

(Bill of Quantity)

Name of Work: Plantation of trees in green belt area of Sipat.
[LOA Ref. No. SIPAT/CS/2017-18/17173/1737151
DATED:09.09.2017]

Note:- Version:1 PO created to incorporate a new line item 20 for watering of 15000 Plants (which is Off season plantation) in Green Belt area for the period from Dec.2018 to Feb.2019 as per approval of C/A in Pradeep at NP-22.

Delivery/Invoicing Address:
1019 Sipat Super Thermal Power Project
PO Ujwal Nagar District Bilaspur
Chhattisgarh
495555
India
07752-246552
07752-246507
Invoicing to be done on
GST No. : 22AAACN0255D4Z5

Sl No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text
10		Plantation in over burdan area	AU	1.000	24,293,350.00	24,293,350.00	

Tax: NIL **Extra**

10 .10		1st year plantation & maintenance	NO	42,500	199.9200	8,496,600.00	
10 .20		Second year Plantation maintenance	NO	42,500	108.6900	4,619,325.00	
10 .30		Third year Plantation maintenance	NO	42,500	97.5900	4,147,575.00	
10 .40		Fourth year PLANTATION maintenance	NO	42,500	93.6800	3,981,400.00	
10 .50		Fifth year plantation maintenance	NO	42,500	62.1000	2,639,250.00	
10 .60		1st yearFencing RCC barbed wire 3x3 mtr	RMT	880	310.0000	272,800.00	
10 .70		2nd year maintenance(10% of total lenth)	RMT	88	341.0000	30,008.00	
10 .80		3rd year maintenance(10% of total lenth)	RMT	88	372.0000	32,736.00	
10 .90		4th year maintenance(10% of total lenth)	RMT	88	403.0000	35,464.00	
10 .100		5th year maintenance(10% of total lenth)	RMT	88	434.0000	38,192.00	

TOTAL OF BOQ PART : 00010 INR 24293350.00

Amount **24293350.00**
Other Charges 0.00

Net Amount on BOQ PART : 00010 INR 24293350.00

20		Watering of 15000 Plants from Dec-18 to	AU	1.000	750,000.00	750,000.00	

Tax: NIL **Extra**

20 .10		Watering of 15000 Plants from Dec18 to F	EA	15,000	50.0000	750,000.00	

TOTAL OF BOQ PART : 00020 INR 750000.00

Amount **750000.00**
Other Charges 0.00

(R K Jain)
Sr.Manager(CS)

Page No. 4 / 9

Net Amount on BOQ PART : 00020	INR 750000.00
Net Total Amount	INR 25,043,350.00
Less Rebate/Amount	INR 0.00
Grand Total	INR 25,043,350.00

INR TWO CRORE FIFTY LAKH FORTY-THREE THOUSAND THREE HUNDRED FIFTY ONLY

(R K Jain)
Sr.Manager(CS)

ANNEX L

(1)

कार्यालय
मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी
राष्ट्रीय स्वास्थ्य मिशन, जिला स्वास्थ्य समिति, जिला–बिलासपुर (छ.ग.)

Telc-07752-266011, 417780 email: dpmnrhm[illegible]@gmail.com

कमांक / एन.एच.एम. / 2021 / 1723 बिलासपुर, दिनांक 27/[illegible] / 2021

प्रति,

कलेक्टर

जिला – बिलासपुर (छ.ग.)

विषयः– एन.टी.पी.सी. सीपत क्षेत्र में रेल्वे वैगन के माध्यम से कोयला के परिवहन के कारण ग्रामीणों के स्वास्थ्य पर पड़ने वाले प्रभाव पर सिम्स बिलासपुर द्वारा किये गये अध्ययन के संबंध में।

उपरोक्त विषयांतर्गत लेख है कि सिम्स बिलासपुर द्वारा बिलासपुर एवं कोरबा जिले के दो विकासखण्डों में एम.जी.आर. ट्रेक के साथ रहने वाले 96916 जनसंख्या के मध्य अध्ययन किया गया जिसमें से 900 व्यक्तियों का चयन रेंडम सैंपलिंग के माध्यम से किया गया। उक्त अध्ययन में निम्नानुसार रिपोर्ट प्रस्तुत किया गया है–

(अ) उत्तरदाताओं के मध्य पाई गई विभिन्न स्वास्थ्य समस्याएं

1. 21.4 प्रतिशत व्यक्तियों में सांस लेने में कठिनाई।
2. 17.2 प्रतिशत व्यक्तियों में खांसी के साथ बलगम आने की शिकायत।
3. 12.1 प्रतिशत व्यक्तियों में सीने में भारीपन की शिकायत।
4. 12.3 प्रतिशत व्यक्तियों में खांसी के कारण सीने में दर्द
5. 08 प्रतिशत व्यक्तियों में असामान्य श्वास ध्वनि।
6. 7.8 प्रतिशत व्यक्तियों में रात में नींद न आने की शिकायत।

(ब) जांच उपरांत पाई गई बीमारी की जानकारी –

1. अध्ययन में शामिल 900 व्यक्तियों के स्पायरोमेट्री के माध्यम से जांच किया गया जिसमें से 19 COPD के संभावित प्रकरण पाये गये।
2. 11 व्यक्ति एक्सरे जांच के माध्यम से COPD मरीज पाये गये एवं 04 व्यक्तियों में हृदय संबंधी विकार पाया गया। शेष 04 व्यक्तियों द्वारा फालोअप जांच नही कराया गया।

सिम्स द्वारा दिये गये सुझाव –

1. रेल्वे ट्रेक के किनारे ग्रीन बेल्ट बनाने हेतु सुझाव दिया गया।
2. स्वास्थ्य शिविर एवं स्वास्थ्य केन्द्र के माध्यम से नियमित रूप से ग्रामीणों के स्वास्थ्य परीक्षण की व्यवस्था करना।
3. श्वसन एवं हृदय रोग की जांच एवं उपचार हेतु शासकीय अस्पताल में वार्ड विकसित कर आवश्यक उपकरण जैसे स्पायरोमीटर, नेबूलाईजर, ई.सी.जी. एवं एक्स–रे मशीन की उपलब्धता सुनिश्चित करना।

F:\NHM_Rakesh.doc

4. नियमित रूप से जागरूकता हेतु सूचना, शिक्षा एवं संचार की गतिविधियां आयोजित करना।
5. नियमित अंतराल में वायु की गुणवत्ता की निगरानी के लिए रेल्वे ट्रेक के किनारे के कुछ ग्रामों में Sentinels Site स्थापित किया जाना है जिससे निर्धारित वायु गुणवत्ता मानक प्राप्त किया जा सके।
6. रेल्वे वैगन के माध्यम से कोल परिवहन में साफ एवं सुरक्षित तकनिक का उपयोग करना।

अतः उपरोक्तानुसार सिम्स बिलासपुर द्वारा किये गये अध्ययन की जानकारी आपकी ओर सादर प्रेषित।

मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी
बिलासपुर (छ.ग.)

पृ. क्र./एन.एच.एम./2021/ 1724 बिलासपुर, दिनांक 22/02/2021

प्रतिलिपिः–

1. मिशन संचालक, राष्ट्रीय स्वास्थ्य मिशन, छ.ग. की ओर सादर सूचनार्थ।
2. चिकित्सा अधीक्षक, सिम्स बिलासपुर की ओर सूचनार्थ।
3. कार्यालयीन प्रति।

मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी
बिलासपुर (छ.ग.)

ANNEXH
(1)

कार्यालय कार्यपालन अभियंता,
खारंग जल संसाधन संभाग, बिलासपुर (छ.ग.)

पत्र क्रमांक /तक./2021 /बिलासपुर दिनांक .....
प्रति,

कलेक्टर,
जिला–बिलासपुर (छ.ग.)

विषय :– जल स्त्रोतों के नियमित जल प्रवाह बाबत्।

संदर्भ :– आपका आदेश क्रमांक 672/स्टेनो–2/अति.कले./2021 दिनांक 11.02.21

.....00.....

उपरोक्त संदर्भित आदेश के परिपालन में गठित समिति की द्वारा जल स्त्रोतों से नियमित जल प्रवाह की जांच की गई। जांच की निरीक्षण प्रतिवेदन, नहर के क्षतिग्रस्त के सुधार कार्य एवं नहर में बगैर अवरोध के सुचारु रुप से जल प्रवाह हेतु प्राक्कलन तैयार कर आवश्यक कार्यवाही हेतु सादर संप्रेषित।

सहपत्र :– उपरोक्तानुसार।

कार्यपालन अभियंता,
खारंग जल संसाधन संभाग,
बिलासपुर (छ.ग.)

(For observations as noted in the Investigation Report).

R.P.S. GAHIRE

निरीक्षण प्रतिवेदन

एन.टी.पी.सी. सीपत के अन्तर्गत Drainage System का निरीक्षण

दिनांक 12.02.2021 को अतिरिक्त कलेक्टर की उपस्थिति एवं एन.टी.पी.सी. प्रबंधन के साथ संयुक्त निरीक्षण के दौरान निम्नलिखित बिन्दु पर Drainage System का उल्लेख है।

1– एन.टी.पी.सी. प्लांट से अतिरिक्त प्रवाह (Seepage & Over Flow) प्लांट के अंदर का वर्षाकाल में जलग्रहण क्षेत्र के प्रवाह की निकासी के लिए चैनल का निर्माण किया गया है जिसे स्थानीय नाले से जोड़कर लीलागर नदी में छोड़ा गया है। निरीक्षण के समय चैनल में प्रवाह लगभग 2 घन फीट/सेकेण्ड पाया गया जो कि साफ जल था। प्रबंधन द्वारा बताया गया कि चैनल से प्रदुषित जल प्रवाहित नहीं किया जाता है। केवल वर्षा जल का प्रवाह किया जाता है।

2– एन.टी.पी.सी. के अंतर्गत 3 डाईक का निर्माण किया गया है जिसमें जल सहित राख (Ash) को जलाशयों में प्रवाहित किया जाता है। वर्तमान में डाईक क्र. 2 में जल का भराव है। प्रबंधन द्वारा बताया गया कि उस जल को रिसायकिलिंग कर प्लांट में उपयोग किया जाता है। डाईक क्र. 3, ग्राम रलिया के पास स्थित है। Seepage Water एवं Water Logging के जल को व्यवस्थित रुप से प्रवाहित करने के लिए स्थानीय नाले के माध्यम से लीलागर नदी में छोड़ा जाता है। वर्तमान में एन.टी.पी.सी. द्वारा छोड़े जाने वाले जल से लीलागर नदी में कोई प्रवाह दिखाई नही देता।

3– एन.टी.पी.सी. प्लांट से खारंग नहर प्रणाली का कौड़िया शाखा नहर एवं दवन माईनर गुजरती है। दवन माईनर के आर.डी. 600 मी. से आर.डी. 765 मी. तक एन.टी.पी.सी. में नाली निर्माण करने वाली एजेंसी द्वारा क्षतिग्रस्त कर दिया गया है। क्षतिग्रस्त लायनिंग कार्य को सुधारा जाना आवश्यक है जिसकी वर्तमान लागत लगभग 8.10 लाख रुपये की होगी।

4– कौड़िया शाखा नहर आर.डी. 1500 मी. से आर.डी. 4440 मी. तक एन.टी.पी.सी. सीपत के टाउनशिप, संरक्षित जलाशय एवं अन्य प्रतिबंधित क्षेत्र से गुजरती है। कौड़िया शाखा नहर से ग्राम कर्रा, दवन, दर्राभाठा, कौड़िया, हरदाडीह, नवागांव एवं मुड़पार का 1610 हेक्टे. कृषि भूमि में सिंचाई होता है। टाउनशिप में रहने वाले एवं अन्य कारणों से शाखा नहर में कचरा एवं अन्य सामग्री जमा हो जाती है जिससे नहर के रुपांकित क्षमता के अनुरूप जल प्रवाह नही हो रहा है। बार–बार सिंचाई के समय जनप्रतिनिधियों एवं ग्रामीण कृषकों के आक्रोश का सामना करना पड़ता है। अतः सुझाव है कि आर.डी. 2850 से आर.डी. 3750 मी. तक कौड़िया शाखा नहर में R.C.C. Box Duct का निर्माण तकनीकी रुप से किये जाने से नहर के जल प्रवाह में हो रहे अवरोध को रोका जा सकता है। जिसका अनुमानित लागत रू. 162.70 लाख की होगी। जिससे सुलभ व सुचारु रुप से भविष्य में सिंचाई किया जा सकेगा। निर्माण कार्य में जो भी लागत आयेगा उसे एन.टी.पी.सी. प्रबंधन द्वारा वहन किया जाना होगा।

सहपत्रः– 1 प्राक्कलन दवन माईनर
2 कौड़िया शाखा Duct

अनुविभागीय अधिकारी,
राष्ट्रीय जल प्रबंध उपसंभाग,
बिलासपुर (छ.ग.)

कार्यपालन अभियंता,
खारंग जल संसाधन संभाग,
बिलासपुर (छ.ग.)

Annex M
Pg 1

पंचनामा

आज दिनांक 24/2/2021 को ग्राम पंचायत रलिया में एन.टी.पी.सी. के प्रभावित ग्राम का दौरे में ग्राम में उपस्थित लोगो के द्वारा बताया गया कि सन् 2009 में एन.टी.पी.सी के द्वारा उनके राखड़ डैम के प्रभावित खेतो में फसल नुकसान का मुआवजा दिया जाता है लेकिन खरिफ की फसल का ही मुआवजा दिया जाता है रबी की फसल का मुआवजा नही दिया जाता।

एन.टी.पी.सी द्वारा गांव के नजीक बने राखड़ डैम के गांव में प्रदूषण की समस्या बनी रहती है। गांव के किसी भी लोगो को दिहाड़ी मजदूर के रूप में अपने कम्पनी में काम नही दिया जाता है गांव में बहुत से छोटे किसान है जिनका लगभग 1-1.50 एकड़ भूमि था जिनको एन.टी.पी.सी द्वारा अधिग्रहण किया गया लेकिन उनको रोजी मजदूरी के रूप में भी काम नही दिया जा रहा है आज इनके पास अपनी आजीविका का कोई साधन नही है।

ग्राम में उपस्थित लोगो के द्वारा बताया गया कि लगभग 100 एकड़ जमीन दलदली हो गया

है। लेकिन सभी को मुआवजा नहीं दिया जाता है। एन.टी.पी.सी. के द्वारा सर्वे किया जाता है जिसमें दलदल से प्रभावित किसान सही दलदली क्षेत्र में फसल लगा देता है (जिसमे उसको 2-4 क्विंटल फसल उपज) तो उसको मुआवजा नहीं दिया जाता है। लेकिन दलदल के कारण ही किसान को अच्छी उपज में फसल नहीं हो पा रहा है।

एन. टी. पी. सी. द्वारा पड़ताल ① L.E.D. स्ट्रीट लाईट कार्यरत नहीं है।

② सौर ऊर्जा हाई मास्ट पुराना जाए, माता चौरा, आवास पारा, तीनो खराब है। एन.टी.पी.सी. द्वारा 5 साल पहले लगाया गया था लेकिन एक साल भर ही चला।

③ R.O. Water ~~filter~~ माता चौरा के पास लगाया गया था लेकिन वह भी खराब है।

मौके पर उपस्थित होकर पंचनामा तैयार किया गया।

ग्राम सिंघी
① [illegible]
② शिवशंकर
③ [illegible] पंच पूर्व
④ [illegible]
⑤ गंगाराम
⑥ मुखदेवप्रसाद लहरे
⑦ [illegible]
⑧ सोनूराम लहरे
⑨
⑩
⑪
⑫ (CALO, CECB)
⑬

[illegible] ग्रा.प. सीपत

S.B. [illegible]
MP SDO [illegible]
Bilaspur

Item No. 04 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

(By Video Conferencing)

Original Application No. 459/2018
(Earlier O.A. No. 196/2014 (CZ)

(With report dated24.07.2020)

Rashmi Singh Applicant(s)

Versus

National Thermal Power Corporation Ltd.& Ors. Respondent(s)

Date of hearing: 20.08.2020

CORAM:HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE S. P. WANGDI, JUDICIAL MEMBER
HON'BLE DR. SATYAWAN SINGH GARBYAL, EXPERT MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Applicant(s): Mr. Ritwick Dutta, Advocate

Respondent(s): Mr. K.M. Nataraj, ASG with Mr. Sudhanshu Prakash, Advocate for NTPC
Ms. Soni Singh, Advocate for CPCB

ORDER

1. The issue for consideration is compliance of environmental norms by National Thermal Power Corporation (NTPC). The Tribunal in order dated 05.01.2016 noted following points for consideration:

> *"(1). Discharge from the plant into the Lilagar river contrary to the EC conditions.*
>
> *(2). The quality of the coal being used, in particular reference to the conditions imposed for sulphur content.*
>
> *(3). The sulphur dioxide emissions as a result of coal of higher sulphur content than what is prescribed in the EC condition.*

(4). Ash content in the coal being beyond the prescribed standard.

(5). Fly ash disposal in terms of the MoEF Notification of 2009.

(6). Not complying with the green belt requirement.

……additional monitoring station on the Sonthi Pahad (reserved forest) be located for assessing the ambient air quality as also the requirement of FGD installation. In addition to the above, as provided in condition No. 2(ii), the requirement for having continuous monitoring facility at each of the stacks was required to be complied with."

2. Vide order dated 22.03.2017, following directions were issued:

"We direct that the MoEF while carrying out the inspection shall also in particular take specific note of the allegations made in the Original Application and submit their observations with regard to the same.

Learned Counsel for the State submitted that since remaining plantation work of compensatory afforestation is likely to be taken up in the coming monsoon season of 2017, the matter may be taken up for hearing after 15.07.2017.

In view of the same, the Learned Counsel for the parties submits that the matter may be listed on 18.07.2017. The complete figures in this behalf shall be provided along with the copies of the inspection report by the Learned Counsel for the Respondent."

3. Thereafter, a report was sought about the status of compliance from the Regional Office of MoEF&CC. The matter was considered on 27.02.2020 in light of report of the Regional Office of MoEF&CC dated 20.06.2019 and objections of the applicants thereto. The report gave status of various issues as 'complied', 'partially complied' and 'being complied'. The Tribunal directed NTPC to comply with the observations in the said report. With regard to the objections of the applicant, the Tribunal directed the Committee to look into the same. The operative part of the order of the Tribunal is as follows:

"13. We are of the view that these aspects may be considered by the Committee constituted on 14.02.2019 in O.A. No. 200/2018, Dukalu Ram & Ors. v. Union of India & Ors. mentioned above. The NTPC may give its response in respect of the above to the Committee

within one month from today. If considered necessary, the Committee will be at liberty to undertake visit to the site.

14. As regards the conditions of installing FGD plant/system, while the MoEF&CC has suggested that period of two years may be given, having regard to the impact of absence of such device on the health of the citizens, such a long time cannot be allowed being against the 'Sustainable Development' principle which is part of right to life and also mandatory under Section 20 of the National Green Tribunal Act, 2010. Such device may be positively installed within six months failing which Chief General Manager of the concerned project of NTPC will be personally accountable and coercive measures may have to be taken for non-compliance. The installation of FGD system may be overseen by the Chairman, NTPC.

15. We also find that according to NTPC, MoEF&CC has relaxed condition of covering raw material/coal by tarpaulin which is otherwise an essential safeguard to prevent air pollution. We are of the view that such essential safeguard cannot be dispensed with and must be adopted being a mandate of Article 21 of the Constitution and 'Precautionary' and 'Sustainable Development' principles under Section 20 of the NGT Act, 2010. Such safeguards may be positively adopted within one month from today which will also be the responsibility of the Chief General Manager of the concerned project of NTPC which may be overseen by the Chairman, NTPC."

4. Based on the above order, the NTPC filed Civil Appeal No. 2728/2020 which was disposed of on 21.07.2020. Order of Hon'ble Supreme Court is as follows:

"

1 *This appeal arises from a judgment of the National Green Tribunal[1] dated 27 February 2020. The NGT has issued two directions for compliance by the appellant:*

(i) The installation of an FGD Plant within six months; and

(ii) Ensuring that all railway wagons transporting coal are covered with tarpaulin.

2 Mr Tushar Mehta, learned Solicitor General, submits that the process for installing the FGD plant has already commenced. However, it has been submitted that the Central Pollution Control Board[2] had on 11 December 2017 granted time for compliance until 31 December 2022 for Units 1 and 2 and until 31 December 2021 for Units 3 to 5. It has been submitted that it is physically impossible to complete the process within a period of six months which will expire in August 2020.

[1] NGT
[2] CPCB

3 Mr Ritwick Dutta appearing on behalf of the respondents, submitted that the notification dated 7 December 2015 provided an outer time-line of two years for all thermal power plants to effect compliance. The CPCB, finding that there was non-compliance, issued a communication dated 11 December 2017 granting time until 31 December 2022 for Units 1 and 2 and 31 December 2021 for Units 3 to 5.

4 On the aspect of tarpaulin covers, the Solicitor General stated that the appellant is coordinating with the Ministry of Railways and the process will be completed in one month. Mr Ritwick Dutta on the other hand submitted that that the Environmental Clearance was granted in 1999 and it has taken an inordinately long period of twenty years to effect compliance. However, he has not opposed the suggestion of the Solicitor General that one month's time to complete all formalities and to effectuate compliance be allowed.

5 Having regard to the communication which has been issued by the CPCB on 11 December 2017 granting time for compliance in regard to the installation of the FGD plant until 31 December 2022 for Units 1 and 2 and 31 December 2021 for Units 3 to 5, respectively, we extend time for compliance as fixed by the NGT so as to be in accord with the timelines which have been indicated in the communication of the CPCB. Accordingly, time is extended until 31 December 2022 for Units 1 and 2 and 31 December 2021 for Units 3 to 5, respectively.

6 Time to complete the process of ensuring that all wagons are covered with tarpaulin sheets is extended by a period of one month from today.

7 The appellant must take all appropriate steps within the period which has been extended for installing the FGD plant to the satisfaction of the NGT. The appellant shall submit quarterly progress reports to the NGT so as to facilitate compliance being monitored. Since the proceedings are to be listed before the NGT on 28 July 2020, we direct that on that date an affidavit shall be filed by the appellant setting out the concrete steps which have been taken and which shall be taken hereafter to effect compliance."

5. Accordingly, NTPC has filed a compliance affidavit mentioning the status of steps taken and proposed to be taken. CPCB has also filed its report on 24.07.2020 expressing handicap in visiting the site on account of pandemic. However, after going into the issues and the data, following observations have been made:

"1) It is observed that all three conditions of EC regarding fly ash utilization is still as "partially complied".

2) Study of heavy metal in coal and fly ash has been completed and analysis submitted by IICT Hyderabad has been submitted by NTPC Sipat. (Annexure-09)

3) The report of study conducted by Indira Gandhi Krishi Vishwavidyalaya BTC College of agriculture and research station Sarkanda, Bilaspur has been submitted. (Annexure-07)

4) The details of treatment system reported by NTPC Sipat and further endorsement by CECB indicate that industry is capable to maintain ZLD.

5) The coal analysis reports submitted by NTPC Sipat were found in consonance with data available on public domain and reveals to be as per EC condition. Moreover NTPC Sipat is in process of FGD installation.

6) EC compliance verification report of MoEF&CC has confirmed the compliance of Green belt development.

7) Perusal of reports submitted by NTPC Sipat and it endorsement by reports published by CEA (Central Electricity Authority) at national level concludes that figures filed by NTPC Sipat about generation and utilization of fly ash are reliable, but not complying the target.

8) The soil analysis report submitted through collector, Bilaspur has not indicated any adverse effect on fertility of soil in the villages in question. The report submitted is placed at Annexure-05.

9) As per report submitted by NTPC, Sipat work order for installation of FGD in, Unit #01, 02 & 03 has been issued and pert chart for progress of work prepared. Copy of work order is attached at Annexure-11.

SUBMISSION

Given the guidelines of Ministry of Home Affairs (MHA) regarding operation during the COVID 19 pandemic, the committee could not visit the site and request for extension of time (two months) for site visit and to submit full report with recommendation as per direction issued by Hon'ble NGT in its order dated 27.02.2020."

6. In view of the above, let further action be taken by the NTPC. The Committee may complete its task within three months and give its report with a tabulated statement, verifying the submissions of NTPC. The report be furnished before the next date of hearing by e-mail at judicial-

ngt@gov.in preferably in the form of searchable PDF/ OCR Support PDF and not in the form of Image PDF.

List again on 07.01.2021.

Adarsh Kumar Goel, CP

S. P. Wangdi, JM

Dr. S.S. Garbyal, EM

Dr.Nagin Nanda, EM

August 20, 2020
Original Application No. 459/2018
(Earlier O.A. No. 196/2014 (CZ)
SN