HARYANA STATE POLLUTION CONTROL BOARD
SCO No.55, SECTOR-25, HUDA, PANIPAT
Ph. – (0180) 2672037, Telefax – 2664951, E-mail: hspcbropr@gmail.com

No. HSPCB/PR/2023/1413 Dated:16.01.2023

To

The Registrar,
National Green Tribunal,
New Delhi.

Subject: **Interim Report in the matter of Original Application No. 612/2022: Subhender Applicant Versus State of Haryana Respondent, in compliance of Hon'ble National Green Tribunal Order dated 22/09/2022.**

Ref: Hon'ble NGT vide order dated 22/09/2022.

Please find enclosed herewith the Interim Report in the matter of Original Application No. 612/2022: Subhender Applicant Versus State of Haryana Respondent, in compliance of Hon'ble National Green Tribunal Order dated 22/09/2022 for kind consideration of the Hon'ble Tribunal.

KAMALJIT SINGH
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Date: 2023.01.16 18:05:25 +05'30'

Regional Officer
HSPCB, Panipat

Interim Report in the matter of Original Application No. 612/2022: Subhender Applicant Versus State of Haryana Respondent, in compliance of Hon'ble National Green Tribunal Order dated 22/09/2022.

1. Background and Directions of Hon'ble NGT:

The matter in OA No. 612 /2019; Subhender Applicant Versus State of Haryana Respondent, is related to pollution caused in the nearby villages Sutana, Jatal, Khukhrana, Untla, Aasan etc., during management of fly ash by Panipat Thermal Power Plant.

In the above matter, Hon'ble NGT vide order dated 22/09/2022 (copy attached as **Annexure-1**) directed as under:

"3. Prima facie, the averments made in the application raise questions relating to environment arising out of the implementation of the enactments specified in Schedule I to the National Green Tribunal Act, 2010. In view of the averments made in the application, we consider it appropriate that a Joint Committee be constituted to verify the factual position. Accordingly, we constitute a Joint Committee comprising of CPCB, State PCB and Deputy Commissioner, Panipat and direct the same to meet within two weeks, undertake visits to the sites, look into the grievances of the applicant, associate the applicant and representatives of the concerned project proponent, verify the factual position and submit its report within one month by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Supported PDF and not in the form of Image PDF. The State PCB will be the nodal agency for coordination and compliance.

List for further consideration on 20.01.2023"

2. Compliance of the Orders of Hon'ble NGT:

In compliance of the Orders of Hon'ble NGT, a Joint Committee comprising of the following members was constituted:

i) Dr. Suneel Dave , Director, Central Pollution Control Board (CPCB), Regional Directorate, Chandigarh
ii) Er. Kamaljit Singh, EE,Regional Officer, Haryana State Pollution Control Board (HSPCB),Panipat.
iii) Sh. Balwan Singh, Naib Tehsildar, Panipat (Representing District Magistrate Panipat)

It was directed by Hon'ble NGT to undertake visits to the sites, look into the grievances of the applicant, associate the applicant and representatives of the concerned project proponent, verify the factual position and submit its report.

The Joint Committee visited the site on 16.01.2023. Applicant was also called to associate the site visit in compliance of the directions of the Hon'ble Tribunal but it was informed by the son of the applicant that the applicant Sh. Subhender is bed ridden now and his son has been requested to accompany the site visit but he informed that he is not aware of the application submitted before the Hon'ble NGT .

The observations of the committee are as follows:

1. That Panipat Thermal Power Station comprised of 8 units i.e. 4 no of units of 110 MW, 2 no of units of 210 MW and 2 no of units of 250 MW , out of which 4 no of 110 MW units

have already been dismantled in year 2015 and 1 no of unit of 210 MW has been phased out and yet to be dismantled.

2. That Presently 3 no. of units (1 no of units of 210 MW and 2 no of units of 250 MW) are available for generation of electricity.
3. That Fly ash generated from the plant is been stored in to Fly Ash Silos and loaded in to Bilkers/Tankers with the help of closed telescopic chutes to prevent the fugitive emissions and directly transported to the cement industries.
4. That the Bottom ash generated from the plants is been mixed with water and transferred to the Ash pond area with the help of pumps after making slurry (Bottom ash mixed with water).
5. That Thermal Power plant is having three no. of Ash Ponds also called as Ash Dykes namely **A, B & C** in which bottom ash is being transferred from the different units of the Power plant as per the details submitted by PTPS is as under :

Ash Dyke	Area in Acres	Ash Storage Capacity (in Lakhs Metric Tonnes)	Ash Stored (in Lakhs Metric Tonnes) in 2018	Ash Stored (in Lakhs Metric Tonnes) as on 01.01.2023
A	575	283	246	112
B	160	45	41	22
C	172	58	45	15
		386	**332**	**149**

6. For the transportation of the Ash approx 700 no of heavy earth movers (carrying capacity 20 – 35 Tonnes) are plying in the ash dyke and its connected roads. The traffic movement of heavy earth movers causing the dust resuspension need to be handles precisely to control the emissions in the environment.
7. Presently the ash is being lifted from Dyke **A and C** only.

The following details were sought by the Joint Committee from the Panipat TPS, M/S HPGCL so as toassess the impact of pollution due to ash handling from ASH Dykes on the environment and public health in the nearby villages, as alleged by the applicant in the Original Application No. 612/2022:

i. The drawings of the Ash Dykes of Panipat Thermal Power Plant (PTPP)
ii. Layout of the Ash Dykes w.r.t Poer Plant and near by villages .
iii. Last EIA report of the project of the year 2004
iv. Power generation data since the year 2018.
v. Coal Consumption data since the year 2018.
vi. Ash generation data since the year 2018.
vii. Ash utilization data since the year 2018.
viii. Ambient air quality monitoring data for the last twelve months
ix. Water consumption data for the water used, for sprinkling in Ash Dykes.
x. The details of the Medical Check Up Camps organized by PTPP in the nearby villages and the outcome of the same w.r.t diseases identified during medical check-up.
xi. The Time Bound Action plan of PTPP for lifting of the complete ash from Ash Dykes.
xii. Analysis report of the Coal used PTPP including ash content and heavy metals.

Further a similar matter has already been taken up by Hon'ble NGT in the matter of OA No. 581 /2019; Residents of Gram Panchayat Jatal, District Panipat , Applicant Versus State of Haryana Respondent and Joint Committee of CPCB, HSPCB and representative of District Magistrate Panipat has already examined the facts of the site in question and its impact on the Environment and Public Health of the near by villages. Joint committee had already submitted the progress report in OA no. 581 of 2019 on

dated 14.01.2022 (Report attached as **Annexure-2**).

It was informed by Regional Officer, HSPCB Panipat that Panipat Thermal Power Station, HPGCL is undertaking the monitoring of the study area by engaging ***Shri Ram Institute of Industrial Research, Delhi*** on the direction of HSPCB from 28.12.2022 to 05.01.2023 w.r.t followings:

- **Ambient Air quality monitoring** in the study area from 8 locations, for the parameters relevant to thermal power plant ash against the control sample, to establish the impact on the air quality.
- **Ground water sampling**, various bore-wells from 5 locations, up-stream and down-stream of the Panipat Thermal Power Plant Ash Dyke. The water quality parameters alongwith other parameters relevant to thermal power plant ash to be analysed in EPA/NABL approved Laboratory.
- **Sampling of agriculture Soil** of the study area from 5 locations to determine the accumulation of contaminants in the soil over a period of time, by irrigation with contaminatedwater and deposition of ash over a period of time.

The analysis of results of the various samples collected by the Joint Committee in the matter of OA no 581/2019 is expected from the Shri Ram Institute of Industrial Research, Delhi by Jan 31, 2021. This Committee desired to make use of the analysis data of the above mentioned samples to find out the factual position of the Environmental and Public Health damage caused in the nearby villages as mentioned by the applicant in this OA no 612/2022. Committee also desired to obtain the data from concerned authorities on number of accidents occurred, cause of accident and location of accident near to ash dykes of PTPS to establish the facts as mentioned in the application.

3.0. Submission:

The above interim report is being submitted for the consideration of Hon'ble National Green Tribunal with a request to allow two months time to the Joint Committee for examination of facts on ground and submission of the final report before the Hon'ble Tribunal.

KamalJit Singh
HSPCB, RO, Panipat

Balwan Singh
Naib Tehsildar

Suneel Dave
Director , CPCB, RD,
Chandigarh

Dated: January 16, 2023

Item No.08 (Court No. 2)

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH

(By Video Conferencing)
Original Application No. 612/2022

Subhender ...Applicant

Versus

State of Haryana & others ...Respondents

Date of hearing: 22.09.2022

CORAM: HON'BLE MR. JUSTICE ARUN KUMAR TYAGI, JUDICIAL MEMBER
HON'BLE DR. AFROZ AHMAD, EXPERT MEMBER

Application is registered based on a Letter Petition received by email.

ORDER

1. The grievances of Subhender s/o Ram Pal r/o village Sutana, District Panipat in this letter petition sent by email , which has been treated and registered as Original Application, are that Tau Devi Lal Panipat Thermal Power station (Now Panipat Thermal Power Station) is situated at Village Khukhrana, District Panipat. The plant, which is based on coal, dumps fly-ash residue in nearby area. In these days of peak of summer season, fly ash particles are flying in the nearby villages Sutana, Jatal, Khukhrana, Untla, Aasan etc. and all the residents of above villages and the passengers passing through the road passing by the side of the plant face great trouble due to the fly-ash. On 20.05.2022 a wind occurred due to which the fly ash entered in the houses of the residents of above villages. Apart from the above there are chances of accidents on the road due to fly-ash particles in the air of nearby areas. Animals like cows„ buffaloes, bulls, goats, dogs etc. are also suffering from the impact of flying of ash. Despite several complaints to the concerned Chief /Executive Engineers, no action has been taken so far.

2. This Tribunal is empowered to ***suo moto*** take cognizance of the cases involving questions relating to environment arising out of the implementation of enactments specified in Schedule I of the National Green Tribunal Act, 2010 as held by Hon'ble Supreme Court in ***Municipal Corporation of Greater Mumbai V/s. Ankita Sinha and others 2021 SSC Online SC 897*.** This Tribunal can also take cognizance of such cases on the basis of letter petitions in accordance with settled principles of law governing Public Interest Litigation.

3. *Prima facie*, the averments made in the application raise questions relating to environment arising out of the implementation of the enactments specified in Schedule I to the National Green Tribunal Act, 2010. In view of the averments made in the application, we consider it appropriate that a Joint Committee be constituted to verify the factual position. Accordingly, we constitute a Joint Committee comprising of **CPCB, State PCB and Deputy Commissioner, Panipat** and direct the same to meet **within two weeks**, undertake visits to the sites, look into the grievances of the applicant, associate the applicant and representatives of the concerned project proponent, verify the factual position and submit its report **within one month** by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Supported PDF and not in the form of Image PDF. The State PCB will be the nodal agency for coordination and compliance.

4. In case the Joint Committee observes any violation of consent conditions/environmental norms, then it shall forward a copy of its report to:-

(i) The concerned Project Proponent to enable the same to comply with the recommendations in the report of the Joint Committee or file objections against the observations/recommendations contained in the same and file its response before this Tribunal as desired, **within**

one month from the date of receipt of a copy of the report of the Joint Committee, by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Supported PDF and not in the form of Image PDF; and

(ii) the concerned Authorities including State PCB and Deputy Commissioner, Panipat to enable them to take appropriate remedial action, in accordance with Statutory provisions mandating them to take remedial action for prevention, control and abatement of environmental pollution/degradation and for protection and improvement of environment, by giving notice to/hearing the concerned project proponent and following due process of law and they shall submit their action taken reports separately, **within one month from the date of receipt of a copy of the report of the Joint Committee**, by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Supported PDF and not in the form of Image PDF.

5. List for further consideration on 20.01.2023.

6. A copy of this order, along with a copy of the application and documents attached with the same, be forwarded to the CPCB, State PCB and Deputy Commissioner, Panipat by e-mail for compliance.

Arun Kumar Tyagi, JM

Dr. Afroz Ahmad, EM

September 22, 2022
AG

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
Principal Bench, New Delhi

Original Application No. 581/2019

Residents of Gram Panchayat Jatal,
District Sonipat — Applicant

Vs.

State of Haryana — Respondent

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1.	**2nd Progress Report** in compliance to the Hon'ble NGT order dated 04.11.2020 in OA No. 581/2019, Residents of Gram Panchayat Jatal, District Sonipat Vs. State of Haryana.	
2.	**Annexure-1**: A copy of Hon'ble NGT order dated 04.11.2020.	
3.	**Annexure-2**: A copy of directions issued by Haryana State Pollution Control Board to Panipat Thermal Power Plant vide letter dated 18.08.2021 to engage an institute of repute for assessment of damage caused to the environment.	
4.	**Annexure-3**: A copy of proposal of CSIR-NEERI regarding Damage Assessment due to PTPS Ash Dyke Pond on the surrounding Environment (Air, Agriculture, Ground Water and Public Health) and suggestions on Mitigation Measures.	
5.	**Annexure-4**: A copy of email dated 06.10.2021 by Panipat Thermal Power Plant to the joint committee requesting to examine the proposal CSIR-NEERI.	
6.	**Annexure-5:** A copy of data of public health of primary health centres as received from Civil Surgeon, Panipat.	

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

Date: 17.01.2022
Place: Delhi

2nd Progress Report in the matter of Original Application No. 581/2019: Residents of Gram Panchayat Jatal, District Sonipat Applicant Versus State of Haryana Respondent, in compliance of Hon'ble National Green Tribunal Order dated 04/11/2020.

1. Background and Directions of Hon'ble NGT:

The matter in OA No. 581 /2019; Residents of Gram Panchayat Jatal, District Sonipat Applicant Versus State of Haryana Respondent, is related to pollution caused in the nearby villages, during management of fly ash by Panipat Thermal Power Plant.

In the above matter, Hon'ble NGT vide order dated 04/11/2020 (copy attached as **Annexure-1**) directed as under:

"In view of separate order passed today in O.A. No. 117/2014, Shantanu Sharma v. UOI, further action may be taken with regard to the Thermal Power Plant, Panipat on same pattern by a joint Committee of CPCB and the Haryana State Pollution Control Board. The CPCB will be the nodal agency for coordination and compliance."

2. Compliance of the Orders of Hon'ble NGT:

In compliance of the Orders of Hon'ble NGT, a Joint Committee comprising of the following members was constituted:

i) Dr. Narender Sharma, Additional Director, Central Pollution Control Board(CPCB), Regional Directorate, Chandigarh
ii) Er. Sanjeev Kumar, SEE, Haryana State Pollution Control Board (HSPCB),Panchkula

It was directed by Hon'ble NGT to take action with regard to Thermal Power Plant, Panipat (OA No. 581/2019) on the same pattern, as per order passed in the matter of O.A. No. 117/2014; Shantanu Sharma Vs. UOI on 04/11/2020.

Therefore, joint committee studied the order passed in the matter of O.A. No. 117/2014 and the compliance submitted by CPCB and the following two points were found to be applicable in the matter of O.A. No. 581/2019, by the Joint Committee:

i. Environmental Compensation on account of non-utilization of 100% ash for theyears 2018 (2018-19) and 2019 (2019-20).
ii. Assessment of the Damage caused to environment and public health.

The Joint Committee visited the site on 1/7/2021 and 5/8/2021. The following details were sought by the Joint Committee from the Thermal Power Plant, Panipat, so as to compute the environmental compensation and also to assess the damage caused to the environment and public health in the nearby villages, as alleged by the applicant in the Original Application No. 581/2019:

i. The drawings of the Ash Dykes of Panipat Thermal Power Plant (PTPP)
ii. Mapping of the sprinklers provided in the as dyke area
iii. Last EIA report of the project of the year 2004
iv. Peizometer data for the ground water level and quality in the premises ofPTPS and Ash Dykes

v. Power generation data since the year 2015
vi. Coal Consumption data since the year 2015
vii. Ash generation data since the year 2015
viii. Ash utilization data since the year 2015
ix. Permission of CGWA for the bore-wells installed in the premises of PTPP andin ash dykes along with ground water analysis reports.
x. Ambient air quality monitoring data for the last six months
xi. Water consumption data for the water used, for sprinkling in ash dykes.
xii. The details of the Medical Check up Camps organized by PTPP in the nearby villages and the outcome of the same w.r.t diseases identified during medical check-up.

The details w.r.t (i) to (xi) were provided by Panipat Thermal Power Plant on August5, 2021 and the details w.r.t. (xii) were provided by the PTPS on August 10, 2021.

2.1. Progress Report of the Joint Committee:

2.1.1. Environmental Compensation on account of non-utilization of 100% ash for the years 2018 (2018-19) and 2019 (2019-20).

The Joint Committee obtained and examined the ash generation & utilization data from Thermal Power Plant, Panipat, for the financial years 2018-19, 2019-20 and 2020-21, to compute the Environmental Compensation (EC) for non-utilization of 100% ash for years 2018 (2018-19) and 2019 (2019-20).

The following formulae were used to compute the environmental compensation as revised and approved by Hon'ble NGT vide order dated 27/1/2020 (Uploaded on 12/2/2020) in the matter of O.A. No. 117/2014, Shantanu Sharma Vs. UOI:

EC = PI X R X X F X LF = Rs. 30000 per day (80 x 250 x 1.5) x N x LF

EC= Environmental compensation/penalty (Rs)
PI = Pollution Index of industrial sector (80 for red category of industries)R = Rs in per day (Rs 250)
N = Number of days of violations.
F = Scale of operation of industrial sector, small 0.5, medium 1.0 and large 1.5
LF= Location factor, 1.5 for all situations as the principal contributor to environmentaldegradation in area is TPP.

Therefore, for 330 days per year, the said figure would come to Rs. 9900000 or say Rs. 1 crore per annum.

In addition to above, the EC may be imposed on the basis of compliance of Fly Ash Notification after 31.12.2017 as below:

EC for 2018 & 2019:

EC = Rs. 1 crore / year x C x P x LF

C : Capacity factor 1 for 350 MW and MW/ 350 for other capacity instead of taking 500 MWas a base.
P : Non-compliance during the year i.e. (100-% utilization during the year/ 100)
LF = Location factor, 1.5 for all situations as the principal contributor to environmental degradation in area is TPP.

The environmental compensation as computed by using the above formulae for thePanipat Thermal Power Plant, by the Joint Committee, is as follows:

S. No.	Financial Year	Power Generation(MU)	Total Ash generation,MT	Total Ash Utilized, MT	% Ash Utilization	Environmental Compensation (EC), Rs.
1	2018-19	3378.90	824442	1238214	150.18	Nil
2	2019-20	1972.79	494595	1191254	240.85	Nil

Note: 1. The ash in excess of generation is taken from Ash Dykes (Legacy ash) 2. The ash utilization in 2020-21 has been 999.29% of annual generation.

2.1.2. Assessment of the Damage caused to environment and public health.

The available data obtained from PTPS, was examined against the baseline data of EIA report of the year 2001, to assess the damage caused to the environment and public health. It was observed that:

No ambient air quality monitoring station (CAAQMS or manual station) is available in the nearby villages in the vicinity of PTPP and no data w.r.t. PM_{10} and $PM_{2.5}$ of the ambient air environment is available with HSPCB. The data provided by PTPP is showing PM_{10} and $PM_{2.5}$ concentration on the much lower side in comparison to base line data and hence was not considered as relevant and representative data, by the Joint Committee.

Being monsoon season, Joint Committee could not collect the data of PM_{10} and $PM_{2.5}$ during the inspection and decided to generate and consider the post monsoon period data, for assessment of the damage. The HSPCB Regional Office was requested by the Joint Committee to generate PM_{10} and $PM_{2.5}$ data during management/handling/lifting of Ash from the ash dykes, for the post monsoon period, for comparison with the base line data available in the EIA report of PTPP for the year 2001.

It was informed by PTPP that the bore-wells have been installed by the agencies involved in lifting of the ash from as dykes only two months back and hence no data w.r.t. analysis of ground water is available.

As per information provided, PTPP has organized 09 medical Check-up Camps in the nearby villages. PTPP has been asked by the Joint Committee to provide the outcome of the Medical Check-up Camps.

The joint Committee could not assess the damage caused to the environment and public health due to non-availability of adequate data. The current data w.r.t. PM_{10} and $PM_{2.5}$ during lifting of ash from the ash dykes and ground water analysis is required for the post monsoon period (Sept. to Nov., 2021) for assessing the damage caused to the environment by PTPP, in nearby villages.

The Joint Committee also requested HSPCB to issue letter to PTPP to engage an institute of repute such as NEERI, National Institute of Occupational Health, Ahmadabad, IIT or such other institutions, for assessment of damage caused to the Environment, Agriculture, ground water and public health, so that assessment of damage in monetary terms could be finalized by the Joint Committee. The Directions in this regard have been issued by HSPCB to Panipat Thermal Power Plant vide letter No. HSPCB/PR/2020/2320 dated 18/8/2021 (Copy attached as **Annexure-2**).

In response to the above letter of HSPCB, Panipat Thermal Power plant obtained the offer of CSIR-NEERI for conducting the Assessment of Damage on the surrounding Environment (Air, Agriculture, Ground Water and Public Health) and Suggestions on Mitigation Measures. **As per offer submitted by CSIR-NEERI, the time required for conducting damage assessment was indicated as 12 months involving cost of Rs. 72 Lacs plus GST** (Copy attached as **Annexure-3**). Panipat Thermal Power Plant vide email dated October 6, 2021 requesting the Joint Committee to examine the proposal of CSIR-NEERI (**Annexure-4**).

The Joint Committee examined the proposal of CSIR-NEERI and observed that the **time-line indicated for carrying out damage assessment was too long to comply with the directions of Hon'ble National Green Tribunal within the time line granted to the Joint Committee in this matter**. In view of this, it was decided by the Joint Committee, to carry out the assessment of damage in two stages:

Stage 1: **Qualitative Assessment** of the damage as per following approach:

- **Site visit and interaction** with the local farmers to finalize the study area.
- **Ambient Air quality monitoring** in the study area, for the parameters relevant to thermal power plant ash against the control sample, to establish the impact on the air quality.
- **Ground water sampling** from various bore-wells up-stream and down-stream of the Panipat Thermal Power Plant Ash Dyke. The water quality parameters alongwith other parameters relevant to thermal power plant ash to be analyzed in EPA/NABL approved Laboratory.
- **Sampling of agriculture Soil** of the study area to determine the accumulation of contaminants in the soil over a period of time, by irrigation with contaminated water and deposition of ash over a period of time.
- **Sampling of agriculture crops and the produce (grains),** to estimate the bio-magnification of contaminants in plant (fodder) and produce (seeds).
- **Calculation of Transfer Factor (TF)**, for determining the bio-accumulation of metals/contaminants in plants from soil and **Health Risk Index (HRI)** by considering daily intake and reference oral dose.
- **Damage to Public Health, b**y obtaining data of cases reported w.r.t respiratory and other diseases/illness related to thermal power plant ash, from the nearby health centers followed by calculation of the damage to public health in monetary terms by using the following formula: Damage H (Rs): No. of cases Reported (X) x COI Affected area.

Stage 2: **Quantitative Damage Assessment by the methodology/Proposal as obtained by Panipat Thermal Power Plant from CSIR-NEERI** along with preparation of short term and long term remediation plan.

In the last progress report filed by the Joint Committee on 1/12/2021, request for the extension of time line was sought to assess the qualitative damage caused by PTPP.

The progress made by the Joint Committee w.r.t Assessment of damage as on 14/01/2022, is as follows:

Interaction with the Farmers:

Interaction of the farmers with the members of the Joint Committee was held on October 26, 2021. The following points were raised by the farmers:

- It was informed by the farmers that **visible impact of fly ash of PTPP can be observed as black cloud in this area, during the period from March-July** and it is very difficult to even breathe during this period. They requested Joint Committee **to conduct the ambient air quality monitoring during March-July to know the real status of the problem.**

- It was also informed by the farmers that **the most of the people in the area are suffering from skin, eye and respiratory problems.** However, all the villagers suffering from these problems do not visit local primary health centres for treatment due to lack of proper facilities.

Impact on Ambient Air quality:

The parameters relevant to thermal power plant ash were monitored in the ambient air environment of the study area on 22/11/2021-23/11/2021, to establish the impact on the ambient air quality. The result of analysis of the samples alongwith details of the monitoring locations is summarized in **Table 1**:

Table 1: **Analysis results of ambient air quality monitoring.**

S.No.	Parameter	Unit	MoEF &CC NAAQ Standard	GD Goenka School, Jattal (Panipat) at rear lawn	Maharishi Kashyap Govt. Polytechnic, Jattal (Panipat) near Parking Area	Govt. Model Sankriti Primary School, Jattal (Panipat) infront of classrooms	PTPS Guest House at rear side	Rajkiya Prathmic Pathshala, Sutana (Panipat) at near main gate
1	Sulphur dioxide (SO_2)	ug/m3	Max. 80 ug/m^3 (24-hr.)	8	6	6	6	6
2	Nitrogen Oxides (as NO_2)	ug/m3	Max. 80 ug/m3 (24-hr.)	59	49	55	40	56
3	Respirable Particulate Matter (PM10)	ug/m3	Max. 100 ug/m3 (24-hr.)	**356**	**330**	**347**	**339**	**397**
4	Fine Particulate Matter (PM $_{2.5}$)	ug/m3	Max. 60 ug/m3 (24-hr.)	**130**	**124**	**177**	**109**	**167**
5	Ozone (O3), avg [8 hr.]	ug/m3	Max. 100 ug/m3 (8-hr.)	49	43	51	38	47
6	Lead (Pb)	ug/m3	Max. 1 ug/m3 (24-hr.)	0.05	0.13	0.06	0.06	0.07

7	Carbon Monoxide (CO) avg [8 hr.]	mg/m3	Max. 2 mg/m3 (8-hr.)	1.7	1.7	1.6	1.8	1.8
8	Ammonia (NH3)	ug/m3	Max. 400 ug/m^3 (24-hr.)	37	94	65	52	57
9	Benzene (C_6H_6)	ug/m3	5 ug/m^3 (Annual Avg.)	2.6	5.6	BQL	0.95	1.46
10	Benzo (a) Pyrene (BaP)	ng/m3	1 ng/m3 (Annual Avg.)	BDL	**2**	**3.3**	**1.7**	**1.53**
11	Arsenic (As)	ng/m3	6 ng/m3 (Annual Avg.)	0.3	0.83	0.58	0.45	0.85
12	Nickel (Ni)	ng/m3	20 ng/m3 (Annual Avg.)	**29**	19	12	**43**	**25**

The results of the parameters PM_{10} and $PM_{2.5}$ were found to be exceeding the NAAQ Standards, at all the locations, with **PM_{10} concentration** ranging between **330-396 ug/m^3 (against the standard of 100 ug/m^3)** and **$PM_{2.5}$ concentration** ranging between 1**09 -167 ug/m^3 (against the standards of 60 ug/m3).** A comparison of PM_{10} and $PM_{2.5}$ conc. in the ambient air at the locations in the vicinity of Panipat Thermal Power Plant monitored by Joint Committee, was also made with the Continuous Ambient Air Quality Monitoring Station located at HSVP Office, Sector 18, Panipat. **It was observed that PM10 conc. in the villages located at the vicinity of PTPP is much higher (142-237 ug/m^3 vs. 330-396 ug/m^3) in comparison to CAQMS data located at Sector 18, Panipat. Similarly, PM2.5 conc. was also higher (67-94 ug/m^3 vs. 09 - 167 ug/m^3) at the locations in the vicinity of PTPP in comparison to CAAQMS located at Sector 18, Panipat.**

Out of 5 locations monitored by the Joint Committee, **Nickel concentration in the ambient air was found to be exceeding at 03 locations ranging between 25-43 ng/m^3 (24 hr) against the standard of annual average 20 ng/m^3.**

B**enzene concentration in the ambient air was found to be exceeding at one location with conc. of 5.6 ug/m^3 (24 hr) against the standard of annual average 5 ug/m^3.**

Benzo (a) Pyrene (BaP) concentration in the ambient air, was also **found to be exceeding at 04 locations out of 05 locations** monitored by the Joint Committee with concentration ranging **between 1.53-3.3 ng/m^3 (24 hr) against the standard of annual average 1 ng/m3.**

As per MoEF&CC NAAQ Standards "Whenever and wherever monitoring results on two consecutive days of monitoring exceeds the limits specified above for the respective category, it shall be considered adequate to institute regular or continuous monitoring and further investigation"

Impact on Ground water quality:

The ground water sampling was conducted at 07 locations from various bore-wells up-stream and down-stream of the Panipat Thermal Power Plant Ash Dyke. The water quality parameters alongwith other parameters relevant to thermal power plant ash were analyzed and the results are

summarized in **Table 2. T**he parameters specific to thermal power plant/fly ash was found to be within the prescribed parameters. **However, the microbiological parameters (Total Coliform) were found to be exceeding (52-72 cfu/100 ml > 20 cfu/100 ml)** in the 6 borewells, out of 7 bore-wells monitored by the Joint Committee. **This needs further investigation to find the root case and remedial action.**

Table 2: Ground water analysis.

Ground Water Analysis										
S. No.	**Characteristic**	**Requirement (Acceptable Limit)**	**Permissible Limit in the Absence of Alternate Source**	**1. Hand Pump 100 Ft, Rampal S/o Sh. Harphool, Sutana; Geo Cordinates: N29 22'7.33674 E 76 53'37.1112**	**2. Borewell 220 Ft, Rajkumar S/o Sh.Krisna Lal, Geo-coordinates: N 29 23'13.35588, E 76 54'18.3114**	**3. Borewell 200 Ft, Ramphal S/o Sh. Harphool, Sutana; Geo-coordinates: N 29 22'7.33764, E 76 53'37.1112**	**4. Borewell 180 Ft, Geo-coordinates: N 29 22'30.35244, E76 54'6.8088**	**5. Borewell 180 Ft, Anand S/o Dhoop Singh, Geo-coordinates: N 29 22'39.94248, E 76 54'4.554**	**6. Borewell 220 Ft, Ramesh Kumar S/o Karam Singh, Geo-coordinates N 29 23'18.86496, E76 54'12.98736**	**7. Borewell 200 Ft, GD Goenka School,Geo-coordinates: N 29 22'45.31548, E 76 54'48.5216**
(1)	**(2)**	**(3)**	**(4)**							
Organoleptic & Physical Parameters										
1	Colour, Hazen units, *Max*	5	15	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Turbidity, NTU, *Max*	1	5	26	5	4	5	5	2	2
4	*p*H value	6.5-8.5	No relaxation	7.3	7.5	8	7.5	7.5	7.7	7.8
5	Total dissolved solids, mg/l, max	500	2,000	954	630	630	393	397	480	456
General Parameters Concerning Substances Undesirable in Excessive Amounts										
1	Aluminium (as Al), mg/l, *Max*	0.03	0.2	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2	Ammonia (as total ammonia-N), mg/l, Max	0.5	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
3	Anionic detergents (as MBAS), mg/l, Max	0.2	1.0	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
4	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	0.1	0.2	0.3	0.2	0.2	0.2	0.1
5	Boron (as B), mg/l, *Max*	0.5	1.0	0.4	0.3	0.3	0.5	0.2	0.2	0.1
6	Calcium (as Ca), mg/l, *Max*	75	200	19	20	9	34	26	27	23
7	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
8	Chloride (as Cl), mg/l, *Max*	250	1,000	29	19	42	13	13	10	29

9	Copper (as Cu), mg/l, *Max*	0.05	1.5	0.02	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
10	Fluoride (as F) mg/l, *Max*	1.0	1.5	0.7	**1.3**	0.7	0.7	0.7	**1.1**	**1.3**
11	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	**5.3**	**0.6**	**0.8**	**0.9**	**1.7**	0.02	0.02
12	Magnesium (as Mg), mg/l, *Max*	30	100	**67**	**54**	9	**49**	**31**	**39**	**32**
13	Manganese (as Mn), mg/l, *Max*	0.1	0.3	0.04	0.01	0.04	0.01	0.02	Not Detected	Not Detected
14	Mineral oil, mg/l, Max	0.5	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
15	Nitrate (as NO3), mg/l, Max	45	No relaxation	3	12	39	4	Not Detected	4	10
16	Phenolic compounds (as C6H5OH), mg/l, max	0.001	0.002	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
17	Selenium (as Se), mg/l, Max	0.01	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
18	Silver (as Ag), mg/l, Max	0.1	No relaxation	0.02	0.04	0.02	Not Detected	0.07	0.03	Not Detected
19	Sulphate (as SO4) mg/l, Max	200	400	107	112	81	78	55	78	77
20	Sulphide (as H2S), mg/l, Max	0.05	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
21	Total alkalinity as calcium carbonate, mg/l, Max	200	600	657	360	331	251	257	297	238
22	Total hardness (as CaCO3), mg/l, Max	200	600	328	277	59	288	196	230	192
23	Zinc (as Zn), mg/l, Max	5	15	3.6	0.2	0.06	0.02	0.04	0.04	0.01
Parameters Concerning Toxic Substances										
1	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
2	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
3	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	**0.08**	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
4	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
5	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
6	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

7	Total arsenic (as As), mg/l, *Max*	0.01	0.05	BQL	BQL	BQL	BQL	BQL	0.001	0.001
8	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Bacteriological Tests										
1	Total Coliform Bacteria, cfu/100 ml	20		68cfu	72cfu	58cfu	67cfu	61cfu	52cfu	Not Detected
2	E.coli, cfu/100 ml	2		11cfu	12cfu	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Impact on agriculture Soil:

To determine the **accumulation of contaminants in the soil over a period of time**, by irrigation with contaminated water and deposition of ash over a period of time, **soil samples from the five locations of the study area were drawn and analysed for various parameters including the parameters specific to thermal power plant/fly ash.** The results of analysis of soil samples are summarized in **Table 3**:

Table 3: Analysis of soil samples

S.No.	Parameters	Results of analysis					
		Soil-1	**Soil-2**	**Soil-3**	**Soil-4**	**Soil-5**	**Target value of Soil, mg/Kg (WHO)**
		Panchayat Land; Geo-coordinates: N 29 22'6.81492, E 76 53'34.72584	Mr. Raj kumar Land; Geo-coordintes: N 29 23'13.35588, E 76 54'18.3114	Mr. Ramesh Kumar Land; Geo-coordinates: N 29 23'18.86496, E 76 54'12.98736	Geo-coordinates; N 29 22'30.35244, E 76 54'6.8088	Mr. Anand Land; Geo-coordinates: N 29 22'39.94248, E 76 54'4.5544	
1	pH (30g in 75 ml. water) (on Received basis)	8.5	7.7	7.4	8.5	7.7	
2	Arsenic (as As), mg/Kg (on received basis)	0.32	0.17	0.15	0.48	0.5	
3	Mercury (as Hg), mg/Kg (on received basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	
4	Cadmium (as Cd), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	**0.8**
5	Cobalt (as Co), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	
6	Chromiun (as Cr), mg/Kg (on dry basis)	**175**	**139**	**151**	**140**	**155**	**100**
7	Copper (as Cu), mg/Kg (on dry basis)	**49**	**36**	**30**	**35**	**24**	**36**
8	Manganese (as Mn), mg/Kg (on dry basis)	435	290	298	337	317	

9	Nickel (as Ni), mg/Kg (on dry basis)	**49**	**31**	**37**	34	**37**	**35**
10	Lead (as Pb), mg/Kg (on dry basis)	24	24	20	20	17	**85**
11	Zinc (as Zn), mg/Kg (on dry basis)	**67**	**58**	**67**	**59**	**73**	**50**
12	Phosphate (as P2O5), % by mass (on dry basis)	0.11	0.11	0.13	0.11	0.12	
13	Iron (as Fe2O3), % by mass (on dry basis)	3.48	2.6	3.18	2.83	3.28	
14	Potassium (as K2O), % by mass (on dry basis)	1.54	1.34	1.26	1.37	1.46	
15	Nitrogen (as N), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	
16	Cation Exchange Capacity, meq/100 g (on dry basis)	10	7.4	7.6	7.4	9.7	

It was observed from the analysis of soil samples that the concentration of chromium, copper, nickel and zinc is on much higher side in comparison of target values of these heavy metal in soil specified by WHO.

Impact on Plant and Seed:

The samples of the paddy plant and seed grown on the soils (**Table 3**) were also collected by the Joint Committee for analysis of various parameters including the parameters specific to thermal power plant/fly ash, **to study the bio-magnification of contaminants in plants and grains. The results of analysis are summarized in Table 4 (i) and Table 4 (ii):**

Table 4 (i): Analysis of crop (Plant) samples:

S.No.	**Parameters**	**Results of analysis**					
		Plant-1	**Plant-2**	**Plant-3**	**Plant-4**	**Plant-5**	**Target value of Plant, mg/Kg (WHO)**
		Panchayat Land; Geo-coordinates: N 29 22'6.81492, E 76 53'34.72584	Mr. Raj kumar Land; Geo-coordintes: N 29 23'13.35588, E 76 54'18.3114	Mr. Ramesh Kumar Land; Geo-coordinates: N 29 23'18.86496, E 76 54'12.98736	Geo-coordinates; N 29 22'30.35244, E 76 54'6.8088	Mr. Anand Land; Geo-coordinates: N 29 22'39.94248, E 76 54'4.5544	
1	pH (30 g in 75 ml. water) (on Received basis)	8	7.3	6.8	7.2	7.6	
2	Arsenic (as As), mg/Kg (on received basis)	0.1	0.09	Below Detection Limit	0.12	Below Detection Limit	

3	Mercury (as Hg), mg/Kg (on received basis)	0.04	0.02	0.03	0.06	0.04	
4	Cadmium (as Cd), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	**0.02**
5	Cobalt (as Co), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	
6	Chromiun (as Cr), mg/Kg (on dry basis)	134	78	91	111	58	**1.3**
7	Copper (as Cu), mg/Kg (on dry basis)	37	17	13	40	10	**10**
8	Manganese (as Mn), mg/Kg (on dry basis)	407	288	184	236	345	
9	Nickel (as Ni), mg/Kg (on dry basis)	18	11	10	16	Below Detection Limit	**10**
10	Lead (as Pb), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	**2**
11	Zinc (as Zn), mg/Kg (on dry basis)	47	28	39	41	19	**0.6**
12	Phosphate (as P2O5), % by mass (on dry basis)	0.14	0.13	0.43	0.17	0.1	
13	Iron (as Fe2O3), % by mass (on dry basis)	0.81	0.63	0.29	1.06	0.26	
14	Potassium (as K2O), % by mass (on dry basis)	1.73	1.5	1.59	0.75	1.19	
15	Nitrogen (as N), mg/Kg (on dry basis)	0.2	0.49	0.17	0.06	0.27	
16	Cation Exchange Capacity, meq/100 g (on dry basis)	186	112	245	34	274	

Table 4 (ii): Analysis of Crop (Grain) samples:

S. No.	Parameters	Results of analysis					
		Seed-1	**Seed-2**	**Seed-3**	**Seed-4**	**Seed-5**	**Target value of Plant, mg/Kg (WHO)**
		Panchayat Land; Geo-coordinates: N 29 22'6.81492, E 76 53'34.72584	Mr. Raj kumar Land; Geo-coordintes: N 29 23'13.35588, E 76 54'18.3114	Mr. Ramesh Kumar Land; Geo-coordinates: N 29 23'18.86496, E 76 54'12.98736	Geo-coordinates; N 29 22'30.35244, E 76 54'6.8088	Mr. Anand Land; Geo-coordinates: N 29 22'39.94248, E 76 54'4.5544	
1	pH (30g in 75 ml. water) (on Received basis)	7	6.9	6.7	7	6.9	
2	Arsenic (as As), mg/Kg (on received basis)	Below Detection Limit	0.09	Below Detection Limit	Below Detection Limit	Below Detection Limit	
3	Mercury (as Hg), mg/Kg (on received basis)	0.03	0.03	0.04	0.03	0.02	
4	Cadmium (as Cd), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	**0.02**
5	Cobalt (as Co), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	
6	Chromiun (as Cr), mg/Kg (on dry basis)	35	36	24	41	118	**1.3**
7	Copper (as Cu), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	12	Below Detection Limit	11	**10**
8	Manganese (as Mn), mg/Kg (on dry basis)	21	16	12	49	73	
9	Nickel (as Ni), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	11	**10**
10	Lead (as Pb), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	Below Detection Limit	**2**
11	Zinc (as Zn), mg/Kg (on dry basis)	Below Detection Limit	Below Detection Limit	Below Detection Limit	12	26	**0.6**
12	Phosphate (as P2O5), % by mass (on dry basis)	0.24	0.23	0.2	0.37	0.69	
13	Iron (as Fe2O3), % by mass (on dry basis)	0.02	0.02	0.02	0.08	0.06	
14	Potassium (as K2O), % by mass	0.04	0.04	0.04	0.06	0.12	

	(on dry basis)						
15	Nitrogen (as N), mg/Kg (on dry basis)	1.09	1.08	1.22	1	1.05	
16	Cation Exchange Capacity, meq/100 g (on dry basis)	9.2	20	11	40	49	

The results of analysis of contaminants in the Crop (Plant and grain) samples indicate very high concentration for heavy metals specific to thermal power plant/fly ash viz, chromium, copper, nickel and zinc when compared with the target values of these heavy metals for plant specified by WHO.

Public Health:

The data of public health of primary health centres as received from Civil Surgeon, Panipat is attached as **Annexure-5**. However, **looking into the presence of contaminants in ambient air, soil, plant and grain and the feedback of the farmers during interaction with the Joint Committee, the data provided by primary health centre does not seem to be representative.**

3. Conclusion:

As per Orders of Hon'ble National Green Tribunal in the matter of O.A. No. 581/2019, the Joint Committee was directed to comply with the following two points

i. Environmental Compensation on account of non-utilization of 100% ash for theyears 2018 (2018-19) and 2019 (2019-20).

ii. Assessment of the Damage caused to environment and public health.

I. The environmental compensation as computed by using the prescribed formulae for the Panipat Thermal Power Plant, by the Joint Committee, is as follows:

S. No.	Financial Year	Power Generation (MU)	Total Ash generation, MT	Total Ash Utilized, MT	% Ash Utilization	Environmental Compensation (EC), Rs.
1	2018-19	3378.90	824442	1238214	150.18	Nil
2	2019-20	1972.79	494595	1191254	240.85	Nil

II. The Joint Committee has made an assessment of the qualitative damage caused by Panipat Thermal Power Plant and the outcome is as follows:

a. **The PM_{10} and $PM_{2.5}$ concentration in the ambient air were between 330-396 ug/m^3 (against the standard of 100 ug/m^3) and $PM_{2.5}$ concentration ranging between 109 - 167 ug/m^3 (against the standards of 60 ug/m3)** at all the locations in the vicinity of PTPP. The above concentration of PM_{10} and $PM_{2.5}$ is **also much higher (142-237 ug/m^3 vs. 330-396 ug/m^3) in comparison to CAQMS data located at Sector 18, Panipat. Similarly, $PM_{2.5}$ conc. was also higher (67-94 ug/m^3 Vs. 09 -167 ug/m^3)** at the locations

in the vicinity of PTPP in comparison to CAAQMS located at Sector 18, Panipat, t**hus clearly indicating the impact of PTPP, on the ambient air quality of the area.** Further, as per feedback given by farmers/ villagers of the area, **the maximum impact is observed during the period from March to July, thereby indicating need for further investigation.**

b. Out of 5 locations monitored by the Joint Committee, **Nickel concentration in the ambient air was found to be exceeding at 03 locations ranging between 25-43 ng/m^3 (24 hr) against the standard of annual average 20 ng/m^3. Benzene concentration in the ambient air was found to be exceeding at one location with conc. of 5.6 ug/m^3 (24 hr) against the standard of annual average 5 ug/m^3. Benzo (a) Pyrene (BaP) concentration in the ambient air, was also found to be exceeding at 04 locations out of 05 locations monitored by the Joint Committee with concentration ranging between 1.53-3.3 ng/m^3 (24 hr) against the standard of annual average 1 ng/m3.** However, as per MoEF&CC NAAQ Standards "Whenever and wherever monitoring results on two consecutive days of monitoring exceeds the limits specified above for the respective category, it shall be considered adequate to institute regular or continuous monitoring and further investigation".

c. The parameters specific to thermal power plant/fly ash was found to be within the prescribed parameters, in the 7 bore-wells monitored by the. **However, the microbiological parameters (Total Coliform) were found to be exceeding (52-72 cfu/100 ml > 20 cfu/100 ml) in the 6 borewells,** out of 7 bore-wells monitored by the Joint Committee. **This needs further investigation to find the root case and remedial action.**

d. The concentration of various **heavy metal specific to thermal power plant viz. chromium, copper, nickel and zinc is on much higher side in comparison of target values of these heavy metal in soil specified by WHO.**

e. **Very high concentration** for heavy metals specific to thermal power plant/fly ash viz, **chromium, copper, nickel and zinc, in paddy plant and grains in the study area establish transfer of these contaminants from soil to plant and the biomagnification of these contaminants**

f. The Joint Committee **didn't find the data of public health received from the primary health centres, as representative**, in view of the feedback of villagers during interaction and also based on the qualitative impact observed on ambient air, soil and crop. Further investigation including conducting medical camps to establish the impact on public health is required to arrive at conclusion.

Based on the above findings, it is established that qualitative damage has been caused to the environment and public health by the Panipat Thermal Power Plant (PTPP).

However, **it is submitted that further detailed investigation to generate extensive data is required for quantification of the affected area and the quantitative damage caused to the environment and Public health by involving subject experts, so as to prepare the remediation plan.**

The Joint Committee will abide by the further directions of Hon'ble NGT in this matter.

SANJEEV KUMAR

Digitally signed by SANJEEV KUMAR
DN: c=IN, o=Haryana State Pollution Control Board, ou=Engineering Department, postalCode=122052, st=Haryana, 2.5.4.20=ad23ad98bdd5bb279ec1168f3180c7d97281cf8d62f6e0b03c543082fa96e38f, serialNumber=63ecf071bdb0410d223fdf06670 1554faa32896b48013bba295708c07a986fb8, cn=SANJEEV KUMAR
Date: 2022.01.17 12:37:06 +05'30'

Er. Sanjeev Kumar
HSPCB, Panchkula

17/1/22

Dr. Narender Sharma
CPCB, RD, Chandigarh

Dated: January 14, 2022

Item No. 04 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 581/2019

Residents of Gram Panchayat Jatal, District Sonipat Applicant

Versus

State of Haryana Respondent

Date of hearing: 04.11.2020

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. SATYAWAN SINGH GARBYAL, EXPERT MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Respondent: Mr. Rahul Khurana, Advocate for HSPCB
Mr. Raj Kumar, Advocate for CPCB

ORDER

In view of separate order passed today in O.A. No. 117/2014, Shantanu Sharma v. UOI, further action may be taken with regard to the Thermal Power Plant, Panipat on same pattern by a joint Committee of CPCB and the Haryana State Pollution Control Board. The CPCB will be the nodal agency for coordination and compliance.

A status report may be filed before the next date 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 19.05.2021.

A copy of this order be sent to the CPCB and the HSPCB by e-mail for compliance.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. S.S. Garbyal, EM

Dr. Nagin Nanda, EM

November 04, 2020
Original Application No. 581/2019
SN

HARYANA STATE POLLUTION CONTROL BOARD
SCO No.55, SECTOR-25, HUDA, PANIPAT
Ph. – (0180) 2672037, Telefax – 2664951, E-mail: hspcbropr@gmail.com

No. HSPCB/PR/2020/2320 Dated : 18/08/2021

To

The Chief Engineer,
Panipat Thermal Power Station, Panipat.

Sub: **O.A. No.581/2019 titled as Residents of Gram Panchayat Jatal, District Panipat Versus State of Haryana before Hon'ble National Green Tribunal, New Delhi.**

Kindly refer to the subject noted above, O.A. No.581/2019 titled as Residents of Gram Panchayat Jatal, District Panipat Versus State of Haryana is pending before by the Hon'ble National Green Tribunal, New Delhi and Hon'ble tribunal has passed the following orders on dated 04/11/2020 . imperative part of the order is as mentioned below:

"In view of separate order passed today in O.A. No.117/2014, Shantanu Sharma v. UOI, further action may be taken with regard to the Thermal Power Plant, Panipat on same pattern by a joint committee of CPCB and the Haryana State Pollution Control Board. The CPCB will be the nodal agency for coordination and compliance.

In compliance of the above said order of Hon'ble Tribunal, Joint committee of CPCB and HSPCB has visited the site of disposal of fly ash generated from Panipat Thermal Power Plant on 05.08.2021. After detailed deliberation and observations, Committee has requested undersigned to direct Panipat Thermal Power Plant to engage an institute of repute such as NEERI, National Institute of Occupational Health, Ahmedabad, IIT or such other institutions, for assessment of damage caused to Environment, Agriculture, Ground Water and public Health on the similar pattern as recommended by the Joint committee in O.A. No.117/2014, Shantanu Sharma v. UOI for other thermal power plants.

In the above, you are hereby directed to engage an institute of repute such as NEERI, National Institute of Occupational Health, Ahmadabad, IIT or such other institutions, for assessment of damage caused to Environment, Agriculture, Ground Water and public Health by the Panipat Thermal Power Plant and submit report within 15 days so that same can be sent to the joint committee constituted by the Hon'ble NGT in the said matter.

Regional Officer
HSPCB, Panipat

Endst.No.HSPCB/PR/2020/ Dated

A copy of the above is forwarded to the followings for information and further necessary action, please:

1. Dr. Narender Sharma, Additional Director, CPCB, Regional Office, Chandigarh.
2. Senior Environmental Engineer (Coord.Cell) (HQ), HSPCB, Panchkula.

Regional Officer
HSPCB, Panipat

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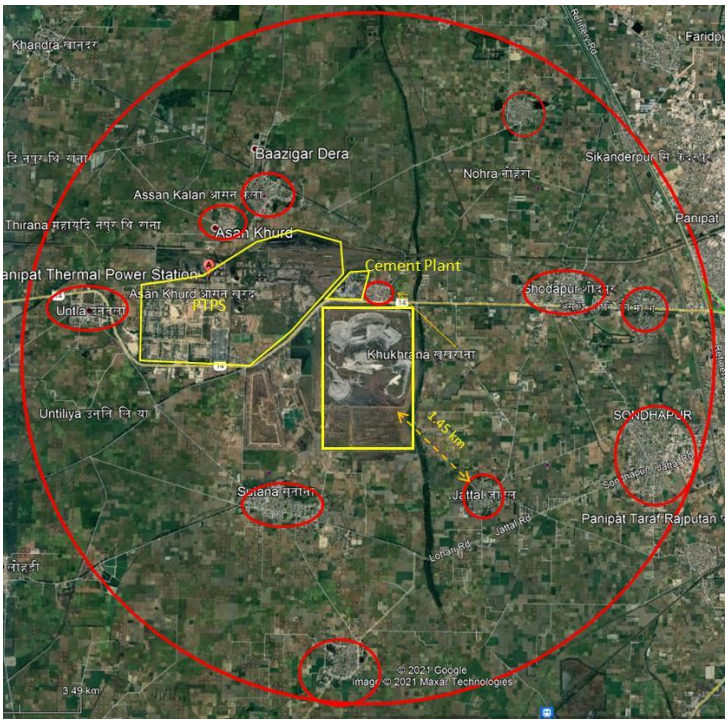
Project Proposal

Damage Assessment due to PTPS Ash Dyke Pond on the surrounding Environment (Air, Agriculture, Ground Water and Public Health) and Suggestions on Mitigation Measures

(in context to the Hon'ble NGT Case O.A. 581/519)



Submitted to

Panipat Thermal Power Station, Panipat

CSIR-National Environmental Engineering Research Institute (NEERI),
Delhi Zonal Centre, Naraina, New Delhi – 110028

September 27, 2021

Damage Assessment due to PTPS Ash Dyke Pond on the surrounding Environment (Air, Agriculture, Ground Water and Public Health) and Suggestions on Mitigation Measures

1.0 Background

Air pollution problem becomes complex due to multiplicity and complexity of air polluting sources. The revolution in industrial sectors leads to consumption of fossil energy and release of pollutants in the atmosphere. Air pollution from coal based thermal power plant is well known problem throughout the country including fugitive dust emission from transport of raw material and bottom ash, natural erosion from ash from ash dyke pond. The present proposal is focused on the assessment of damage caused by Panipat Thermal Power Station's Ash Dyke Pond on the surrounding environment including Air, Agriculture, Ground Water and Public Health). Pond ash is being lifted for utilization by NHAI and Cement plants and is being transported through trucks. This activity has further added to the air pollution problem in the area.

Residents of Gram Panchayat Jatal, a village located in south east direction of PTPS ash dyke (at ~1.5 km) filed a case with the Hon'ble NGT (NGT Order: Original Application No. 581 of 2019). It is against the unscientific disposal of the fly ash by Thermal Power Plant at Panipat, Haryana which is adversely affecting the inhabitants of village Jatal, District Panipat. The complaint states that 30-40 people have died due to cancer, 70% people are suffering from Asthma, 90% people have suffered eye diseases, 70%-80% people are suffering from skin diseases, even the animals are affected by way of several diseases.

The NGT directed the HSPCB to take appropriate action in accordance with law and furnish a factual and action taken report to the Tribunal. In response to this, HSPCB submitted the report on 29.11.19 which is summarized as the ash dykes are covered and water sprinkling was being done. There was no health issue in the area. In later hearing, referring another case (O.A. No. 117/2014, Shantanu Sharma v. UOI,) NGT suggested that further action may be taken with regard to the Thermal Power Plant, Panipat on same pattern by a joint Committee of CPCB and the Haryana State Pollution Control Board. In continuation of that committee has visited the study area and suggested to conduct a study to assess the damage caused on the environment including Air, ground water, agriculture and public health due to disposal of power plant ash (HSPCB/PR/2020/2320) dt 18.08.2021).

In response to this, Panipat Thermal Power Station (PTPS) has requested CSIR-NEERI Delhi Zonal Centre to submit the proposal on the pre-defined scope of work as per committee suggestions. In view of above, CSIR-NEERI Team visited the study area including ash dyke, plant area, observed road conditions and discussed the problem with officials of PTPS and the residents of Jatal Village on September 17, 2021. Considering their views, inspection of the study area and committee's suggestions, the following scope of work and objectives have been formulated to resolve the issue.

	
Ash Dyke Pond Area	Road Condition near Ash Dyke
	
Re-suspension of dust near Cement Plant	Discussions with Residents of Jatal Village

Plate 1: Photographs taken during Field visit by NEERI Team (September 17, 2021)

2.0 Objectives, Study Domain and Scope of Work

2.1 Objectives

i) Assessment of damage caused to ambient air environment
ii) Assessment of damage caused to agriculture
iii) Assessment of damage caused to ground water
iv) Assessment of damage caused to public health
v) Suggestions for short-term and long-term mitigation measures to improve the situation/resolve the issue.

2.2 Study Domain

Fig. 1 shows the study area covering ash dyke pond as Centre and 5 km radius surrounding areas where cement plant, Thermal power plant and villages are marked. Further, **Fig. 2** shows the close view of ash dyke pond and its distance from Jatal village. **Fig.3** shows the monitoring locations on the study area map.

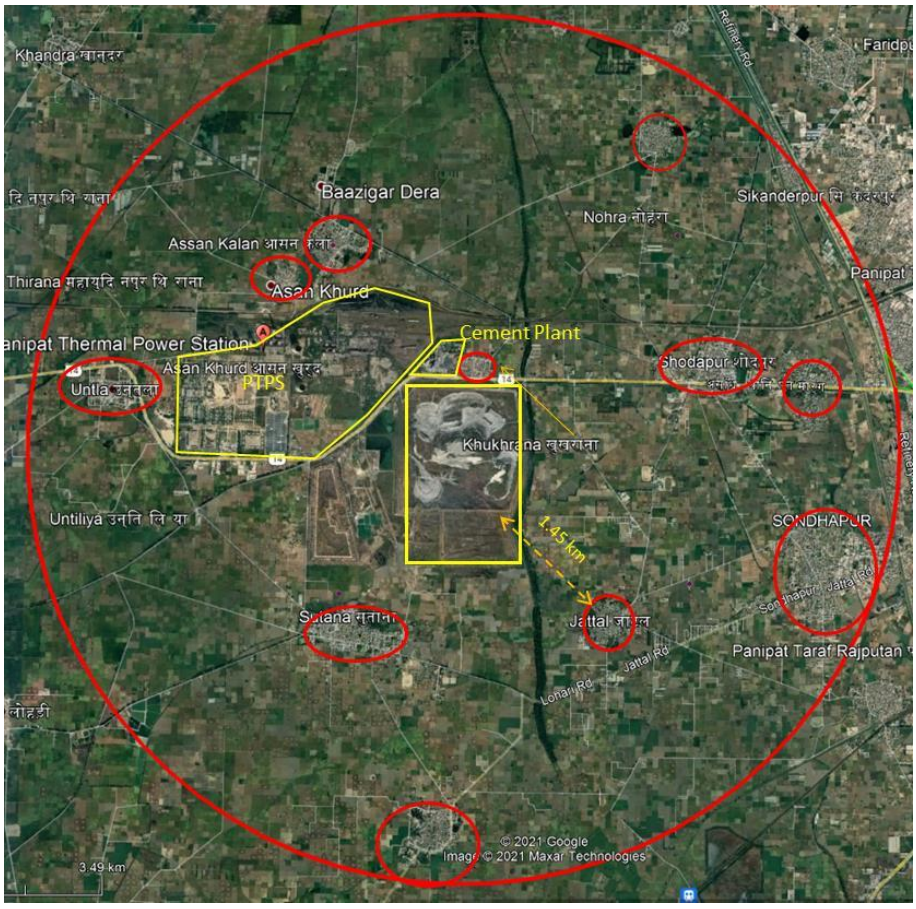


Fig. 1: Study Area around 5 km radius from Ash Dyke Pond, PTPS

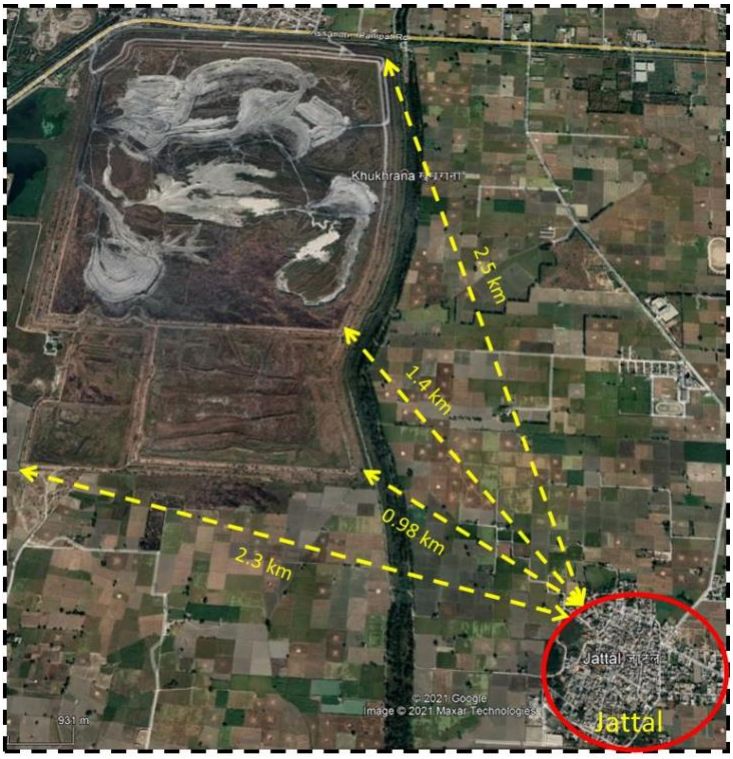


Fig. 2: Close view of Ash Dyke Pond and its distance from Jattal Village

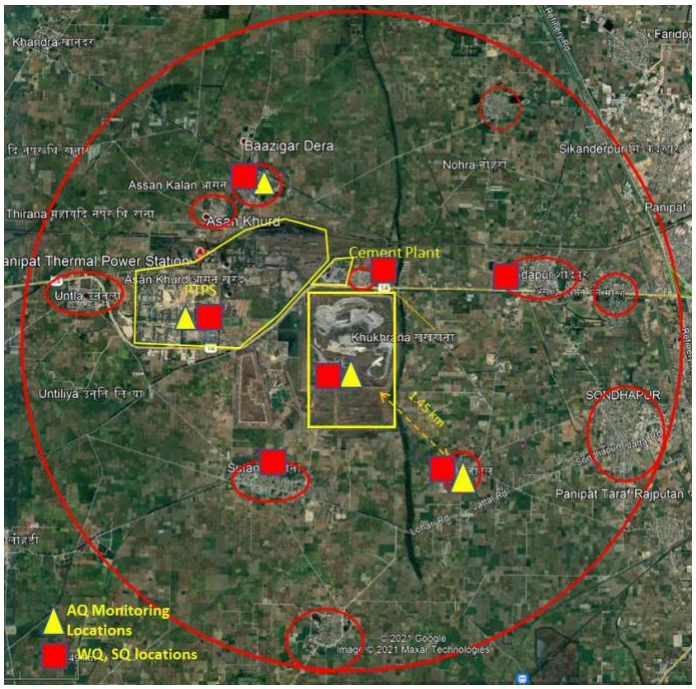
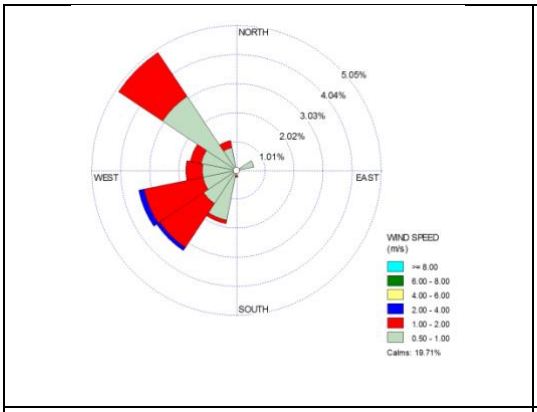


Fig. 3: Study area with proposed Monitoring Locations of Air, Water, Soil/Crop

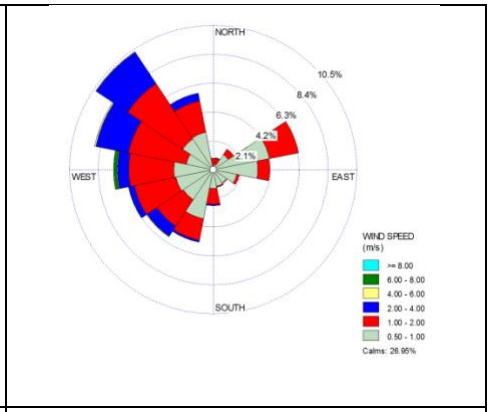
2.3 Detailed Scope of Work

2.3.1 Meteorological Profile of the Panipat Region

The site-specific meteorological parameter will be monitored at the Ash Dyke Pond to study the wind pattern of the study area. Preliminary meteorology in form of wind speed and wind direction are evaluated through secondary data from CAAQMS, located at Sector 18, Panipat city which is approx. 9 Km from the ash dyke in Northeast direction. The wind patterns indicate the dominant wind blows from Northwest side in both season with second dominant from southwest and west side. The local urban structure around station may impact the wind direction. These are only considered for selection of monitoring locations of ambient air monitoring in the study region.



Windrose Plot for Winter Season (December 2020 to February 2021)



Windrose Plot for Summer Season (March 2021 to May 2021)

2.3.2 Air Quality Monitoring

- Particulate matter monitoring at selected sites in the study areas considering upwind and down wide side of the ash dyke. The PM_{10} and $PM_{2.5}$ concentration will be monitored on day and night hour's basis. The monitoring will be done in villages including Jatal village. The monitoring will be done at 3-4 four locations for a period of 4-5 days.

- The chemical characterization of collected particulate matter will be done to quantify the metal concentration in the ambient air sample.

- Collection of surface meteorological data during the sampling period.

2.3.2 Ground Water Monitoring

- Water samples will be collected from the area near ash dyke pond, and also from the surrounding villages. About 8-10 water samples shall be collected depending upon their significance.

- Apart from physico-chemical and biological parameters, metal analysis will also be done in the collected ground water samples.

2.3.3 Metal Analysis in Soil/Crop Samples

- 5-6 Representative samples of soils shall be collected from the agricultural fields along with the crop/plant samples, and metal content linked with power plant ash shall be analysed.

2.3.4 Data Collection on Public Health

- Secondary data will be collected from the hospital in the study area/nearby Health care centres/ hospitals. The major cancer related hospitals will be visited in the Panipat city to check the hospital admissions for the cancer patients coming from study area. The public perception about the issue will also be assessed through pre-defined questionnaire to get the view of other villages in the study area.

2.3.5 Primary data Collection from Road dust re-suspension

- Truck movement route will be studied and mapped on the study area

- Traffic counting will be done at major road during the monitoring period to assess the impact of traffic movement in the study area

- Silt content on the major road will be assessed to quantify the re-suspension of road dust, which further contribute to air pollution.

Note: The sampling locations shall be finalized in consultation with affected villagers/ farmers and PTPS.

The data collected by other industries in the region on air, water and soil quality and meteorology shall be taken into consideration/analysis (if made available by PTPS).

2.3.6 Damage Assessment

The monitoring data as mentioned in detailed scope of work will be further analyzed statistically to quantify the damage in respective environment such as Air, ground water, agriculture and public health. The damage will be assessed by comparing monitored values with standard values and calculate the exceedance factor. The air quality modeling will be carried out to see the impact of emission from ash dyke pond and traffic movement in the study area. Other sources will also be considered if found during the study.

2.2.7 Suggestion on Mitigation Measures and Its Implementation

Based on the magnitude of damage occurred immediate, short term and long-term mitigation measures shall be suggested to address the problem caused due to ash pond/ ash dyke, and cost of its restoration shall be worked out.

PTPS shall be expected to adopt the mitigation measures in time bound manner, and effectiveness of implementation of mitigation measures shall be further assessed to resolve the issue.

2.2.8 Field Data Collection (during Winter & Summer)

Looking into the complexity of the problem/issue with to change in seasons, i.e. different meteorological conditions, cropping pattern and level of ash handling activities and other activities in the region, it is necessary to capture the real information/ representative primary data during the Winter (December – February) and Summer (April-May) months.

3.0 Inputs required from PTPS

- Identify a nodal person from PTPS to coordinate with the NEERI study team and provide relevant information related to study
- Relevant data, maps/ reports etc.
- Past data on environmental compliance reports and EIA report of the PTPS
- Details of Industries located in the study area, and their EC Compliance data for past one year.
- For smooth conduct of study, arrange for lodging & boarding facility for the study team and local transport during the study period.

4.0 Timeline and Deliverables

Study Duration: 12 months (after receipt of work order with Ist installment)

Interim report based on one season data analysis will be submitted within 6 months and Final Study Report in 12 months.

5.0 Budget Estimate

Total Study Cost: **Rs. 72.0 Lakhs** plus GST (as applicable)

Schedule of Payment

- First installment: 70% of the Total project cost along with work order to initiate the study
- Second & final installment: 30% of the project cost on submission of final report.

GST shall be payable with each of the instalments.

Bank Details

All the payments to be made through RTGS, the details are given in the below table:

Name of the Account holder	DIRECTOR NEERI, NAGPUR
Bank Account No.	30266513766
Account type	Saving Bank Account
Bank Name	STATE BANK OF INDIA
Branch	NEERI Branch
11 digit IFS Code	SBIN0004224
11 digit NEFT Code	SBIN0004224
Tax Registration Numbers	
Income Tax PAN*	AAATC2716R
GST No.	27AAATC 27162ZE
Service Tax Category	Scientific & Technical Consultancy Services

6.0 Contact

Dr. S.K. Goyal Chief Scientist & Head Email: sk_goyal@neeri.res.in Mob: 09423400470	**Dr. Sunil Gulia** Sr. Scientist Email: s_gulia@neeri.res.in Mob: 08447505460
CSIR-NEERI Delhi Zonal Centre **A 93-94, Naraina Industrial Area, Phase I, New Delhi 110028**	

----- Forwarded Message -----
From: "JIT SINGH" <xencmdp2.ptps@hpgcl.org.in>
To: "Narender Sharma" <narendersharma.cpcb@gov.in>
Cc: hspcbropr@gmail.com, "S K mittal" <secivil.ptps@hpgcl.org.in>
Sent: Wednesday, October 6, 2021 12:19:31 PM
Subject: Re: OA no. 581/2019 titled as Residents of Gram Panchayat Jatal, District Panipat Versus State of Haryana before Hon'ble NGT, New Delhi

Respected Sir,

Please refer to the trailing mails, as directed vide HSPCB letter no. HSPCB/PR/2020/2320 dated 18.08.2021 the matter was pursued with the institutions mentioned by you. An offer has been received from NEERI,New Delhi for carrying out the assessment of damage caused to Environment, Agriculture, Ground Water and public health. It is requested to kindly examine the offer of NEERI, New Delhi, so that further action can be taken by PTPS in the matter.

Thanks & Regards
Jit singh
Executive Engineer/CMDP-II
Panipat Thermal Power Station, HPGCL
(A Govt. of Haryana Undertaking)
Panipat, Haryana, 132105 India
M: +91822023777.

----- Original Message -----
From: "Narender Sharma" <narendersharma.cpcb@gov.in>
To: "JIT SINGH" <xencmdp2.ptps@hpgcl.org.in>
Cc: hspcbropr@gmail.com, "S K mittal" <secivil.ptps@hpgcl.org.in>
Sent: Friday, September 10, 2021 5:27:02 PM
Subject: Re: OA no. 581/2019 titled as Residents of Gram Panchayat Jatal, District Panipat Versus State of Haryana before Hon'ble NGT, New Delhi

The scope is clearly defined in the letter issued by HSPCB. Reproducing below for reference:

i) Assessment of damage caused to ambient air environment

ii) Assessment of damage caused to agriculture

iii) Assessment of damage caused to ground water.

iv) Assessment of damage caused to public health.

Thanks.

Narender

----- Original Message -----
From: JIT SINGH <xencmdp2.ptps@hpgcl.org.in>
To: Narender Sharma <narendersharma.cpcb@gov.in>
Cc: hspcbropr@gmail.com, S K mittal <secivil.ptps@hpgcl.org.in>
Sent: Fri, 10 Sep 2021 16:36:04 +0530 (IST)
Subject: Re: OA no. 581/2019 titled as Residents of Gram Panchayat Jatal, District Panipat Versus State of Haryana before Hon'ble NGT, New Delhi

Gentle Reminder

Respected Sir,

Please refer to the trailing mail, you are again requested to kindly provide us the scope of work or a copy of any other similar assessment for reference.

Thanks & Regards
Jit singh
Executive Engineer/CMDP-II
Panipat Thermal Power Station, HPGCL
(A Govt. of Haryana Undertaking)
Panipat, Haryana, 132105 India
M: +91822023777.

From: "JIT SINGH" <xencmdp2.ptps@hpgcl.org.in>
To: "Narender Sharma" <narendersharma.cpcb@gov.in>
Cc: "hspcbropr" <hspcbropr@gmail.com>, "S K mittal" <secivil.ptps@hpgcl.org.in>
Sent: Friday, September 3, 2021 5:39:24 PM
Subject: OA no. 581/2019 titled as Residents of Gram Panchayat Jatal, District Panipat Versus State of Haryana before Hon'ble NGT, New Delhi

Respected Sir,

Please refer to HSPCB letter no. HSPCB/PR/2020/2320 dated 18.08.2021 on the subject cited matter. You have directed us to engage an institute of repute such as NEERI, National Institute Of Occupational Health, Ahmedabad, IIT or such other institutions for assessment of damage caused to Environment, Agriculture, Ground Water and public health and submit the report within 15 days.

It is submitted that PTPS pursued this matter with the institutions mentioned by you. IIT Roorke has asked to define the scope of study as 'Environment' is a broad term. So, you are requested to provide us the scope of work or a copy of any other similar assessment for reference. NEERI has scheduled a meeting on 06.09.2021 for discussion on scope of work

Further, the case for carrying out this assessment needs to be finalized through e-NIT process which needs 1-2 months time. Time required to carry out this assessment will be 3-4 months. So, the total time required to submit the report is 4-6 months.

Thanks & Regards
Jit singh
Executive Engineer/CMDP-II
Panipat Thermal Power Station, HPGCL
(A Govt. of Haryana Undertaking)
Panipat, Haryana, 132105 India
M: +91822023777.

Annexure-5

प्रेषक

सिविल सर्जन
पानीपत।

प्रेषित

क्षेत्रिय अधिकारी,
हरियाणा राज्य प्रदुषण नियंत्रण बोर्ड, पानीपत।

क्रमांकः-/PNP/Health/2021/551 दिनांकः- 30-11-2021

विषयः- Regarding Health Data from Primary Health Centres around panipat thermal power station.

Village Assan Kalan, Khukhrana, Jattal,Untla, Sutana, Panipat.

उपरोक्त विषय के संदर्भ में।

आपके कार्यालय के पत्र क्रमांक HSPCB/BR/4278 दिनांक 10.11.2021 के अनुसार मांगी गई रिपोर्ट निर्धारित प्रोफॉर्मा अनुसार आगामी आवश्यक कार्यवाही हेतु प्रेषित है।

Sr. no.	Name fo village	Year	Skin Disease	Eye Disease	Respiratory Tract infection	Cancer Disease	GIT Disease	Hyper tension	Cardiace Disease	Death due to cancer
1	Khukhrana	2016-17	3	4	10	1	3	8	2	0
		2017-18	4	2	7	1	2	6	2	1
		2018-19	8	9	8	1	3	9	3	1
		2019-20	5	2	10	1	1	4	2	1
		2020-21	2	3	7	2	0	10	3	2
	Total		22	20	42	6	9	37	12	5
2	Sutana	2016-17	2	2	0	0	0	3	2	0
		2017-18	3	3	0	2	0	1	4	0
		2018-19	3	3	0	0	0	3	6	0
		2019-20	2	2	0	1	0	1	0	1
		2020-21	1	1	0	0	0	0	0	0
	Total		11	11	0	3	0	8	12	1
3	Untla	2016-17	2	3	11	0	0	7	0	0
		2017-18	0	0	4	0	0	5	0	0
		2018-19	3	5	3	0	0	4	0	0
		2019-20	0	2	4	0	0	5	0	0
		2020-21	1	1	4	0	0	4	0	1
	Total		6	11	26	0	0	25	0	1
4	Assan kalan	2016-17	0	0	1	3	0	2	1	0
		2017-18	1	0	2	4	0	3	0	0
		2018-19	0	0	3	4	0	3	0	0
		2019-20	3	0	4	3	0	4	2	0
		2020-21	1	0	1	1	0	5	0	0
	Total		5	0	11	15	0	17	3	0
5	Jattal	2016-17	0	0	0	2	0	0	0	0
		2017-18	0	0	0	1	0	0	1	0
		2018-19	0	0	1	1	0	0	1	0
		2019-20	0	0	0	1	0	0	1	0
		2020-21	0	0	11	3	0	0	5	0
	Total		0	0	12	8	0	0	8	0
	Grand Total		44	42	91	32	9	87	35	7

सलंग्नः- बैक्ट्रीयोलॉजिक्ल व वाटर सैम्पल रिपोर्ट

30/11/2021

उप सिविल सर्जन (हैल्थ)
पानीपत।