BEFORE THE NATIONAL GREEN TRIBUNAL

AT NEW DELHI

MEMORANDUM OF APPLICATION

(Under Section 18(1) read with Section 14

the National Green Tribunal Act 2010)

ORIGINAL APPLICATION NO. _____OF 2016

IN THE MATTER OF:

1. **DEBADITYO SINHA**
   28/1, Ground Floor, Govindpuri
   Kalkaji, New Delhi-110019

2. **DR. BHARAT JHUNJHUNWALA**
   Lakshmoli, P.O. Maletha, Kirti Nagar
   Uttarakhand- 249161…. ….. …. ….. …… …… ……**Applicant**

Versus

1. **MINISTRY OF ENVIRONMENT, FORESTS AND CLIMATE CHANGE**
   Through the Secretary,
   Indira Parayavaran Bhawan,
   Jorbagh Road, Aligunj,
   New Delhi- 110003

2. **CENTRAL POLLUTION CONTROL BOARD**
   Through the Secretary,
   Indira Parayavaran Bhawan,
   Jorbagh Road, Aligunj,
   New Delhi- 110003

3. **MINISTRY OF POWER**
   Rafi Marg, Sansad Marg Area,
   New Delhi- 110001

4. **MINISTRY OF WATER RESOURCE,**
   GANGA REJUVENATION AND RIVER DEVELOPMENT
   Shram Shakti Bhavan,
   Rafi Marg, Sansad Marg Area,
   New Delhi- 110001…. ….. ….. ….. …. ….. ……**Respondents**

I. The address of the counsels for the Applicants is given for the service of notices of this Application.

II. The addresses of the Respondents are given above for the service of notices of this Application.

FACTS

It is most respectfully showeth:

1. That the present application is being filed by the applicants herein seeking appropriate directions from this Hon'ble Tribunal for prevention, control and abatement of environmental pollution caused by the thermal power plants across the country. The applicants submit that the unregulated operations of the thermal power plants have caused substantive decline in the environmental quality by severely impacting the air and water resources and has led to depletion of vegetal cover and damage to public health at large. Despite the fact that the thermal power is regarded as one of the most highly polluting industry, the existing framework adopted for regulating the operations of the thermal power projects are highly inadequate and deficient in dealing with the environmental pollution which is on the rise due to rapid increase in the number of thermal power plants as a result of the growing necessity of power generation. The grievance of the applicants is that owing to shortcomings in Environmental Impact Assessments, relaxed standards of emission, lack of stringent measures to reduce pollution and lack of regulatory framework to control abstraction of water for generation of power, severe loss to environment, ecology and public health has occurred. Thus, there is an urgent need for the kind intervention of this Hon'ble Tribunal to consider effective measures which are required to be undertaken at the present stage to control and prevent further damage and loss occurred by the thermal power plants. The applicants through this application are highlighting the major flaws in the recent notification no. S.O 3305 (E) passed by the MoEF & CC on

07.12.2015 amending the Environment (Protection) Rules, 1986 with respect to the standards of emission for thermal power plants. The applicants have critiqued the said notification and the same is being challenged on the basis of technical and scientific analysis which is substantiated by various studies documented in the instant application. Copy of the Notification No. S.O 3305 (E) passed by the MoEF & CC on 07.12.2015 received through RTI reply dated 12.01.2016 is marked and annexed herein as **Annexure A-1**.

2. That the application is filed under section 14 of the NGT Act, 2010 since it raises substantial question related to environment as defined under section 2 m (i) and (ii) of the Act. The application highlights the environmental consequences of the thermal power operations which has caused irreparable damage to environment and public health at large. The application involves the following substantial questions relating to environment.

   (1) Whether the Respondents are under an obligation to protect and improve the quality of the environment under the enactments specified under Schedule I of the NGT Act?

   (2) Whether the operations of thermal power plants has led to decline in the environmental quality?

   (3) Whether proper safeguards have been undertaken for controlling environmental pollution caused by the thermal power plants?

   (4) Whether the existing environmental laws, rules, guidelines etc. are effective in prevention, control and abatement of the environmental pollution caused by thermal power plants?

   (5) Whether the notification no. S.O 3305 (E) passed by the MoEF & CC on 07.12.2015 amending the Environment (Protection) Rules 1986 with respect to the standards for emission for thermal power plants should

be set side since the same is highly inadequate and insufficient to control the pollution emitted from the thermal power plants and hence fails to fulfill the object and purpose of protecting and improving the quality of environment as envisaged under the Environment (Protection) Act, 1986?

(6) Whether the emission standards prescribed by the MoEF vide the said Notification are weak and highly relaxed thereby allowing the thermal power projects to emit disproportionately high level of pollutants consequently impacting the air quality and are therefore violative of the fundamental right to life as guaranteed under Article 21 of the Constitution?

3. That the applicant no. 1 is an environmentalist and possess Masters in Environmental Science and Technology from Banaras Hindu University. He is founder of Vindhya Bachao Abhiyan, in Mirzapur district, Uttar Pradesh and works extensively for protection of environment and biodiversity in the region. The applicant no. 2 is a former Professor of IIM Bengaluru and is economist by education. He has worked extensively for protection of the ecology of River Ganga. The applicants have initiated various litigations before this Hon'ble Tribunal for protection of the environment and effective implementation of the environment rules and regulations.

4. That the Respondent No. 1 is the nodal agency of the Central Government for planning and execution of nation-wide programme for the prevention, control and abatement of environmental pollution and frame standards for quality of environment in its various aspects. The Respondent No. 2 is the statutory organization which provide technical services to the MoEFCC and advise the Central Government on matters pertaining to water and air pollution. It controls and regulates pollution from industries and other sources to meet the air and water quality standards under its monitoring

programmes. The Respondent No. 3 is responsible for evolving general policy in the field of energy and decide on matters relating to hydro-electric power and thermal power and transmission & distribution system network. The Respondent No. 4 is the apex body for formulation and administration of the rules and regulations and laws relating to the development and regulation of the water resources in the country.

5. That the application is based on extensive research and analysis of various studies pertaining to the environmental pollution caused by the thermal power plants. The applicants have also analyzed various rules, guidelines and manuals issued by the MoEF & CC which prescribes preventive measures including laying down standards for emission or discharge of environmental pollutants from thermal power plants. It is only after a detailed and thorough research of the existing policies and laws that the applicants have reached to the conclusion that there are major inadequacies in the existing framework which are required to be dealt with by this Hon'ble Tribunal.

6. That the applicants submits that considering the fact that thermal power is the biggest source of energy generation in India which is bound to increase in future to meet the requirements of the growing population. Therefore, the government is required to take immediate actions to bring stricter safeguard policies, advanced pollution abatement technologies and improve the existing laws for greater benefit of the public health, conservation of precious natural resources and reduction of the ecological and health costs involved in the energy generation. The applicants wish to point out the following facts to substantiate their concerns:

   Biggest source of energy generation in the country: As per the fact sheet published by the Central Electricity Authority-Govt. of India, the total power generation from coal based thermal power plant till March, 2016 is 185172.88 MW (62%), gas-based thermal

power plant is 24508.63 MW (8.2%) and oil-based thermal power plants is 993.53 MW (0.3%) out of the total power generation of 298059.97 MW installed capacity in India.

Another document published by Government of India titled as 'India Energy Security Scenario 2047, NITI AYOG, Govt. of India, August 2015 states that the thermal power production may increase as high as 723 GW in the year 2047.

Copy of the fact sheet of the Central Electricity Authority-Govt. of India dated 31.03.2016 and relevant extract from India Energy Security Scenario 2047, NITI AYOG, Govt. of India, August 2015 are annexed herewith as **Annexure A-2** and **A-3** respectively.

Biggest emitter of Green House Gases and Pollutants:

The GoI document titled 'User Guide for India's 2047 Energy Calculator, Coal and Gas Power Stations' available online at http://indiaenergy.gov.in/docs/Thermal-power-generation-documentation.pdf shows that the total GHG emission from thermal power plants in India was 811 MT CO2e emissions out of 2074 MT of energy related CO2e emissions in the year 2012 which accounts for 39% of the energy related GHG emission. The highest estimates for CO2e emission for the year 2047 is stated 11342 MT CO2e and thermal power generation CO2 emissions being 3495 MT CO2e.

Similarly as per a research paper titled 'Atmospheric emissions and pollution from the coal-fired thermal power plants in India' published by Desert Research Centre and IIT Delhi in journal 'Atmospheric Environment' in 2014, it is observed that,

> .....Of the estimated annual anthropogenic emissions in India, the thermal power plants account for ~15% for $PM_{2.5}$, ~30% for NO_x, and ~50% of SO_2.

Copy of the document titled User Guide for India's 2047 Energy Calculator, Coal and Gas Power Stations, GoI and research paper

titled as 'Atmospheric emissions and pollution from the coal-fired thermal power plants in India' published by Desert Research Centre and IIT Delhi in journal 'Atmospheric Environment' in 2014 is annexed herewith as **Annexure A-4 and Annexure A-5 respectively**.

The applicants submit that owing to the negative impacts of the Green House Gas emissions and pollutants released by the thermal power plants which would significantly rise due to the growing number of projects, there is an urgent need to put stricter regulations in place to prevent people from facing harmful consequences of the environmental pollution caused by the projects. The applicants are highlighting the severe impacts of the thermal power operations and the root cause of the same with the help of various scientific studies which deals with the issue in question.

6.1 Severe Impact on Human Health and Economic Development

That the applicants submit that due to the requirement of huge amount of water for thermal power generation, the thermal power units are located near rivers, reservoirs and coastal areas. Unfortunately, the same places are also one of the most populated regions which undergo further increase in population due to development of other industries and commercial activities around thermal power plants in lure of employment and livelihood. The applicants are concerned that without any strict regulation for emission and discharge of pollutants, these populations are greatly affected from the pollution, contamination of soil and water and suffers indirect impact via the food chain. A large number of deaths are attributed to the emissions from thermal power plants. The pollutants generated by coal combustion have profound effects on the health of local communities, especially vulnerable individuals including children, the elderly, pregnant women, and those suffering from asthma and lung disease.

The IIT Delhi paper at Annexure A-5 states:

" ...The regions 1 (Delhi, Haryana, Uttar Pradesh) and 6 (West Bengal, Jharkhand, Bihar) are the densest, with average population density above 1000 per km^2 , with peaks of more than 10,000 per km 2 in the cities of Delhi (capital of India) and Kolkata (capital of West Bengal). These regions also experience highest risk of exposure. These seven sub-regions account for 40% of the total premature deaths estimated for India.

A Discussion Paper on The Health Effects of Coal Electricity Generation in India by Cropper et.al. published in June 2012 calculated the damages per ton of pollutant for each of 89 plants and compute total damages in 2008, by pollutant, for 63 plants. The paper finds that:

"...The average number of deaths associated with current emissions levels, compared to zero emissions, is approximately 650 per plant per year: approximately 500 deaths are associated with SO_2, 120 with NO_x and 30 with PM 2.5 (for year 2008)

... Damages per ton are, on average, greater for directly emitted PM 2.5 than for SO_2 or NO_x. There are, on average, 23 deaths per 1,000 tons of PM 2.5, 10 deaths per 1,000 tons of SO_2, and 9 deaths per 1,000 tons of NO_x."

Copy of the discussion paper titled the "Health Effects of Coal Electricity Generation in India by Cropper et.al. 2012" is annexed herewith as **Annexure A-6.**

The applicants further submit that the health impacts of thermal power plants are costing our country a huge amount of cost which also affects the GDP negatively. The applicants are citing the following excerpts from some publications:

As per a research paper published by University of Illinios, Chicago titled 'Scientific Evidence of Health Effects from Coal Use in Energy Generation' dated April, 2013 it is stated that,

".....The 'external costs' of electricity generation from coal are the

burdens to society that are not included in the electricity's monetary price. Estimates of the external costs of electricity generation from coal suggest that 95% of the external cost consists of the adverse health effects on the population. Most of coal's health burden results from its combustion in power plants, with the rest of the health burden consisting of the effects caused from the other steps of coal's life cycle.

...If health and other external costs of coal-fired electricity in the U.S. are included, they triple its cost to consumers."

According to the 'Diagnostic Assessment of Select Environmental Challenges in India' published by World Bank in June, 2013:

".....The annual cost of environmental degradation in India amounts to about Rs. 3.75 trillion ($80 billion) equivalent to 5.7% of GDP. It focuses on particle pollution (PM10) from the burning of fossil fuels, which has serious health consequences amounting to up to 3% of India's GDP along with losses due to lack of access to clean water supply, sanitation and hygiene and natural resources depletion. Of this, the impacts of outdoor air pollution account for the highest share at 1.7% followed by cost of indoor air pollution at 1.3%."

Copy of the relevant excerpts from the publications by University of Illinios, Chicago titled 'Scientific Evidence of Health Effects from Coal Use in Energy Generation' dated April, 2013 and a summary of the report 'Diagnostic Assessment of Select Environmental Challenges in India' published by World Bank in June, 2013 are annexed herewith as **Annexure A-7** and **Annexure A-8** respectively.

6.2 Significant Reduction in Agricultural Production & Threat to Food Security

That the applicants submit that the high level of pollution from these thermal power plants and the secondary pollution arising out of the

emissions is a severe threat to food security and is increasing climate change impacts on agriculture. The applicants submit that aerosols are formed as secondary pollution out of Sulphur Dioxide (SO_2) and Surface level Ozone (O_3) is formed as secondary pollution from Nitrogen Oxides (NOx), Volatile Organic Compounds (VOCs) and Carbon Monoxide (CO) which are emitted in huge amount from thermal power plants.

As per a research paper published in a very high Impact Factor journal PNAS in November, 2014 by scientist of University of California titled 'Recent climate and air pollution impacts on Indian agriculture' shows:

> "…..There is substantial variation in relative impacts of climate and SLCPs across states. Some of the most dramatic impacts for both wheat and rice have occurred in Uttar Pradesh and Uttaranchal (UP). UP, India's most populous state is the largest producer of both wheat and rice in the country, providing over one-third of India's wheat and 14% of India's rice. In particular, wheat yields for UP are ∼50% lower than they otherwise would have been absent climate and pollution trends, and over two-thirds of that RYC (Relative Yield Change) is attributable to SLCP emissions trends.
>
> …..The states of the heavily polluted northern and eastern Indo Gangetic Plains (UP, Bihar and Jharkhand, West Bengal) all exhibit SLCP RYC of −15% or more.
>
> ….Our results nevertheless indicate that SLCPs have had significant impact on crop yields in India in recent decades. The main wheat-producing state (UP) has been hit especially hard; rice-producing states in the heavily polluted northern Indo-Gangetic Plains have also been significantly negatively affected. For context, the yield loss for wheat attributable to SLCPs alone in 2010 (−18.9%) corresponds to over 24 million tons of wheat: around four

> times India's wheat imports before the 2007–2008 food price crisis and a value of ~$5 billion."

The above-stated research paper compares data of wheat and rice production from the year 1960 onwards till 2010. In the comparison it is clearly evident that though annual production is increasing for wheat, but Kg/Ha yield for wheat has substantially decreased between the year 1995 and 2010, which is more in case of Uttar Pradesh-Uttaranchal. The average growing season temperature also showed an increasing trend for major wheat producing states for year 1980-2010 and average growing season precipitation in mm also showing decreasing trend. The Average Total Surface Radiation in W/m^2 for Kharif season is shown to decreasing since year 1980 and in U.P. and Uttaranchal there is a significant loss of -1.32 W/m^2/year, in Bihar it is -0.96 W/m^2/Year and West Bengal it is reduced by -1.03 W/m^2/Year. The data is supported by a trend of significant rise in SO_2, NOx, Organic Carbon, VOC for the same duration. A similar trend is observed in Rabi season. The highest Relative Yield Change (%) is observed in Uttar Pradesh and Uttarakhand which is shown as 33% and is attributed to by climate change and pollution. As the paper says:

> "Ex ante, we would expect to see larger impacts on wheat than rice for two reasons: (i) wheat's main growing season coincides with the greatest buildup of pollution over the Indian subcontinent; and (ii) wheat shows more sensitivity than rice to ozone in chamber experiments. Indeed, we found that wheat yields were over 36% lower in 2010 than they would have been absent climate and SLCP (Short lived climate pollution) emissions trends (−36.92% weighted by area; −37.91 weighted by production). For rice, our median estimates suggest that yields were over 20% lower (−20.56 weighted by area; −20.85 weighted by production), but the 5th–95th

confidence interval includes zero for rice. Our analysis indicates that 90% of the RYC in wheat can be attributed to SLCPs, as opposed to trends in average temperature and precipitation."

According to another research paper titled 'Reductions in India's crop yield due to ozone' published in Geophys. Res. Lett., 41 by Ghude et.al. published in August, 2014 shows:

"…. Agriculture in India is demographically the broadest economic sector, ranking worldwide second in farm output. It is the principal source of livelihood for more than 58% of population and hence plays an important role in the overall socioeconomic fabric of India. Recent studies have shown high surface O_3 concentration over major agriculture regions in India, particularly the Indo-Gangetic Plains (IGP), one of the world's most important fertile agricultural lands [Engardt, 2008; Roy et al., 2009]. Ozone concentrations are projected to increase further in the future [Avnery et al., 2011; Levy et al., 2008], which could worsen the vulnerability of the agricultural sector.

…. Surface ozone is produced by ozone precursor gases, notably NOx, CO, VOCs, and methane.

…. O_3 levels along the Indo-Gangetic Plains (IGP) and western Maharashtra are about 40–50 ppb during kharif season. In rabi season, modeled O3 is higher (40–50 ppb) over most of the Indian region, except IGP (<33 ppb, Figure 1b). Low O_3 over IGP is likely due to the titration of O_3 by higher NOx values during coolest winter months.

….For top 10 wheat- and rice-producing states in India (Figures 3a and 3b), O_3 -induced fractional loss of wheat is greatest in Maharashtra (~17%) followed by Madhya Pradesh (~8%), Gujarat

(~8%), West Bengal (~6%), and Uttaranchal (~5%). In terms of weight, greatest loss of wheat is noticed in Uttar Pradesh (~0.6 million tons (Mt)) and Madhya Pradesh (~0.5 Mt), which accounts for about 32% of total wheat lost in India during 2005.

….Overall, our study suggests that widespread ozone pollution under present emission scenario has considerable impact on productivity of crops important for food security in India. The present-day ozone-induced damage to wheat (3.5 ± 0.8 Mt) and rice (2.1 ± 0.8 Mt) is sufficient enough to feed roughly 35% (94 million poor people) of 270 million below poverty line population in India.

…Taking into account the variability in NOx emissions within the emission inventories considered, the uncertainty on combined economic losses can be as much as 36%."

Copy of the research publication by PNAS in November, 2014 titled 'Recent climate and air pollution impacts on Indian agriculture' and relevant extracts of Geophys. Res. Lett., 41 'Reductions in India's crop yield due to ozone' by Ghude et.al. published in in August, 2014 is annexed herewith as **Annexure A-9** and **Annexure A-10** respectively.

6.3 Biggest emitter of Heavy Metals causing Irrevocable damage to soil, water resources and biological functioning of living beings

That 87% of India's mercury emission comes from the coal based thermal power plants making it the single highest emitter of Mercury, a deadly toxic heavy metal. Apart from Mercury several other heavy metals are emitted in high concentrations from the TPPs which are responsible for heavy metal contamination in the environment and can deposit to long distances due to tall stack heights. As per the IIT Delhi paper at Annexure A-5,

> "....The PM in the flue gas also contains high concentrations of heavy metals such as arsenic, lead, cadmium, mercury, copper, and zinc, which not only contributes to potential health hazard than the bottom ash (Finkelman, 2007), but also increases the resistivity and reduces the ESPs collection efficiency to as low as 98%. Reddy et al. (2005) measured the chemical composition of the bottom ash, fly ash, and flue gas from a coal fired power plant in the western India and estimated 1-7% of zinc, 2-7% of copper, 5-8% of manganese, 7-10% of cobalt, 12-18% of cadmium, 60-70% of selenium, 70-80% of mercury, and traces of arsenic, iron, lead, and chromium contained in the coal was emitted in the flue gas."

The Centre for Science and Environment report titled 'Coal Toll' and 'Among the Least Efficient' published in Down-To-Earth (DTE) dated February 2015 states that,

> "…The thermal power sector contributes 87 per cent of total mercury emissions in the country.
>
> …During 2013-14, CSE's PML collected and analysed coal and ash samples from coal mines and thermal power plants from across the country. The study found, on an average, very high (0.61 mg/kg) mercury in domestic coal. India's coal-based power plants are estimated to be emitting around 440 g/GWh of mercury into air and water.
>
> …CSE estimates total mercury emission may grow to nearly 700 tons per annum by 2021-22, if left unchecked.

In another study conducted by CSE in October 2012 titled 'Mercury Pollution in Sonbhadra District of Uttar Pradesh and its Health Impacts' indicates,

> "The soil samples collected from Anpara, Chlilika Daad and

Obra contained 1.64, 1.75 and 0.42 ppm of mercury respectively. A soil sample earlier collected and analysed in 2011 by CSE-PML from outside Anpara thermal power plant near fly ash pond also contained 0.71 ppm of mercury (a coal sample collected from Anpara thermal power plant at the same time was found to contain 0.15 ppm of mercury). Anpara, Chilika Daad and Obra are situated very near to thermal power plants. In rest of the three samples (S05, S06 and S07) mercury concentration was found in the range of 0.50 - 0.57 ppm. These results show that the entire stretch from Obra to Chilika Daad contained mercury because the thermal power plants present in this stretch release the mercury in to the environment and also because of coal mining activity.

....Of the 19 persons sampled, 7 were males and 12 were females. All the males (100%) had mercury in their blood and were in the range of 26.23 – 113.48 ppb with average concentration of 44.66 ppb. All the males exceeded the USEPA's safe level of mercury in blood of 5.8 ppb and they are in increasing risk category of health Canada guidelines as they had more than 20 ppb of mercury in their blood.

…75% females (8 of 12) had mercury in the range of 10.31 – 78.68 ppb which is higher than USEPA's safe level of mercury in blood. The average concentration of mercury in blood of females was found to be 28.26 ppb. 100% blood samples from Dibulganj, Khairahi-Kirwani and Obra contained mercury while 62.5% blood samples from Chilika Daad contained mercury.

.....Average concentrations of mercury in human blood, hair and nail were 34.30 ppb, 7.39 ppm and 0.83 ppm respectively. More than 84% blood samples were found to contain mercury above the safe level (5.8 ppb) set by USEPA. All the male persons

examined who were showing adverse health conditions, were detected with mercury in their blood with the average concentration of 44.66 ppb.

75% females were detected with mercury in their blood and the average concentration was 28.26 ppb. All the females detected with mercury in their blood had more than 5.8 ppb of mercury which is a safe level according to USEPA.

Three persons from Obra who showed adverse health conditions were sampled for blood, hair and nail. The maximum concentration found in blood is 5.1 times higher than the safe level. All three persons had mercury in blood, two in hair and only one had it in nails. The soil had 0.42 ppm mercury."

Despite the fact that heavy metals are classified among the most dangerous groups of anthropogenic environmental pollutants due to their toxicity and persistence in the environment and the thermal power plants are one of the major cause which is responsible for presence of heavy metals in the ambient air which has serious and adverse human health effects, the Government has failed to impose stringent techniques to prevent contamination and work out effective action plans to reduce the negative effects of mercury emission. Moreover, the thermal power plants are planned without acknowledging the effects of metal contamination on the human habitations in the surroundings. It is submitted that the current pollution control techniques of the thermal power projects are required to be reconsidered at this stage taking into account the severe health conditions of the people which are constantly deteriorating due to its operations.

Copy of the CSE-DTE report titled 'Coal Toll-Among the Least Efficient' published in February, 2015 and relevant extracts of CSE study titled 'Mercury Pollution in Sonbhadra District of Uttar Pradesh and its Health

Impacts' published in October 2012 are annexed herewith as **Annexure A-11** and **Annexure A-12** respectively.

6.4 Hazardous impacts of Radioactivity from Coal Ash

That the applicant submits that apart from the hazard posed by the heavy metals from the coal based thermal power plants, the ash generated causes potential hazard due to the radioactive nature of both fly ash and bottom ash. "Natural radionuclides from coal fired thermal power plants – estimation of atmospheric release and inhalation risk", published by Environmental Assessment Division, Bhabha Atomic Research Centre in 2011 clearly states that,

> "…Coal, bottom ash and fly ash samples were collected from three different coal-fired thermal power plants in India and subjected to gamma spectrometry analysis for natural radioactivity contents. The results of present study show that fly ash and bottom ash contains two to five times more natural radionuclides than feed coal. None of the fly-ash and bottom ash samples had radium equivalent activities and external hazard index values more than 370 Bq kg– 1 and unity respectively. However the absorbed dose rate at 1 m above the ash pond was 79.19n Gy h– 1 (average of 3 plants) higher than the global average value of 55 nGy h– 1 . The corresponding annual external effective dose is estimated to be 0.68 mSv y– 1 , which is also more than that (0.46 mSv y– 1) in areas of natural background radiation. The 5th percentile, 95th percentile and mean values for total inhalation risk arising from radionuclides (Ra 226 , Th 228 , Pb 210 and Nat-U) were found to be 3.83 × 10 −9 , 6.50 × 10 −8 and 2.08 × 10 −8 respectively.
>
> …The openly dumped fly ash poses radiation hazard due to the leachability of radionuclides into the ground water stream ultimately contaminating the drinking waters. The disposal and

even the utilization in construction work also leads to exposure to radiation doses to the personals in vicinity. Therefore, it is necessary to characterize and quantify the natural radioactivity content in fly ash and bottom ash for subsequent evaluation of the associated environmental and biological risks.

…The feed coal used in power plants contains various elements, minerals and organic constituents. Upon burn up the elements tend to get enriched in the ashes. Radionuclides which are normally found in the coals get enriched into the ashes after burn up. The concentration of most radioactive elements in solid combustion wastes were approximately 5–10 times the concentration in the original coal. Although these elements are less chemically toxic than other coal constituents such as arsenic, selenium, or mercury, they possess concern because of possible risk from radiation.

…The collective doses to the population arise primarily through inhalation of radioactivity during the passage of the cloud containing fly-ash emitted from the stack. Since many of the thermal power plants in India are situated in densely populated areas, the estimation of radiological risk to the neighborhood population may be of significance.

…The calculated absorbed dose rate at 1 m above the ground was 79.19 nGy h^{-1}, which is higher than the global average value of 55 nGy h^{-1}. Also, the average external effective dose rate in the ash pond was 0.68 mSv y^{-1}, which is higher than the average annual external effective dose rate (0.46 mSv y^{-1}) from the terrestrial radionuclides."

The study further concludes,

"Ashes produced in thermal power plants may contain high levels of natural radioactivity and constitute a potential health hazard to

> the power plant personnel, and to the population living in the vicinity, due to fly-ash releases, flyash depositions and fly-ash industrial utilization. The concentration of the radioactive elements in fly ash was found to be higher than that in bottom ash and coal from the three different coal power plants across India. The results showed that the elements are more enriched in fly ash than in bottom ash. The corresponding annual external effective dose due to fly ash was observed to be more than that in areas of natural background radiation. The risk estimated by Monte Carlo technique to general population residing around thermal power plant shows that Th232 contributes maximum because of its high concentration in fly ash. The data in this study may be helpful in developing environmental pollution abatement methods or technologies for fly ash in various applications."

The applicants further wish to point out the directions passed by the Hon'ble Tribunal in its judgment dated 20th September, 2011 in the matter of Krishi Vigyan Arogya Sanstha & Ors vs MoEF & Ors wherein the Hon'ble Tribunal has dealt with radioactivity from coal based thermal power plants. For easy reference the same are reproduced herein:

> "The first respondent, Ministry of Environment and Forests is directed to look into the matter as to long term impacts caused by nuclear radiation from the thermal power projects, by instituting a scientific long term study involving Bhabha Atomic Research Agency or any such other recognized scientific institution dealing with nuclear radiation with reference to the coal ash generated by thermal power project (Respondent No. 3) particularly the cumulative effect of a number of thermal power project located in the area on human habitation and environment and ecology. The study shall also take into consideration the

> health profile of the residents within the area in which the pollutants are expected to spread from the thermal power project.
>
> ….The Ministry of Environment and Forests shall include in the Terms of Reference of all the future projects asking the proponent to furnish details of possible nuclear radioactivity levels of the coal proposed to be used for the thermal power plant.
>
> …..The Ministry of Environment and Forests shall get the national standards prescribed, if not already available, from the Department of Atomic Energy, Govt. of India within a period of one year from the date of receipt of this order, as to permissible levels of nuclear radiation in residential, industrial and ecologically sensitive areas of the country."

It is submitted that despite specific directions to the MoEF and CC were passed to analyse the long term impacts of nuclear radiation from coal ash and to frame national standards with respect to permissible levels of radiation in residential, industrial and ecologically sensitive areas of the country yet so far no such exercise has been undertaken. Moreover, the impacts of radioactivity from coal which should be a part of the EIA analysis is mostly stipulated as a post environment clearance condition merely to show compliance of the directions passed by the Hon'ble Tribunal. It is submitted that the population residing in the surroundings of the thermal power plants face severe threat to life due to constant exposure to radiation. However, no effective steps and measures to prevent exposure to harmful effects of radiation from coal ash have been undertaken by the concerned Ministry till date.

Copy of the publication tilted as "Natural radionuclides from coal fired thermal power plants –estimation of atmospheric release and inhalation risk", published by Environmental Assessment Division, Bhabha Atomic Research Centre in 2011 is annexed herewith as **Annexure A-13**.

6.5 Severe impacts of Ash disposal

The toxic dangers posed by the unregulated coal ash disposal is a serious matter of concern. Along with an increased risk of cancer from toxic heavy metal exposure, coal ash affects human development, create lung and heart problems, cause stomach ailments, and contribute to premature mortality. Despite the MoEF Notification dated 03.09.2009 which makes it mandatory for all thermal power plants to utilize 100% of fly ash by 4th year of commissioning, the projects have utterly failed to comply with the said requirement resulting into severe pollution of the water bodies. The fact that ash disposal is a serious challenge and posing high risks to health and environment has been pointed out in the CSE-DTE report of February, 2015 (Annexure A-11). The report indicates,

> "The story is almost the same for all communities surrounding power plants. The most serious complaint has been ash pond overflow, or downright discharge by the plants into rivers, reservoirs or fields. Some communities like those around WBPDCL, Bakreswar, have gone to court; some have resorted to violence, like those near Rajiv Gandhi Thermal Power Station in Hisar.
>
> …Coal-based power plants generated 173 million tonnes of ash in 2013-14—it is the second largest waste stream in the country. Its handling and disposal is a significant challenge. Only five plants—JSWEL in Toranagallu, KSK in Wardha, GIPCL in Surat, NLC in Barsingsar and CESC in Budge Budge—use the water-efficient dry ash-handling technology.
>
> …Given the grave risks ash poses, Union environment ministry has set a target of 100 per cent ash utilisation from 2014 onwards. But compliance seems impossible: 36 of the 47 plants assessed were unable to meet the 2012-13 target of utilising 90 per cent of the ash generated and average utilisation was only 54 per cent. Plants

> generating large amounts of ash, such as NTPC in Kahalga on, UPRVUNL in Anpara and GSECL in Wanakbori, managed to use little of it.
>
> …Unused ash is being dumped in large quantities in ash ponds, which are poorly maintained. The pollution control board had cited 70 per cent of the companies in sample for violation of norms. Less than a third of the plants in the study had ash pond lining, which prevents heavy metals from leaching into the groundwater; only a fifth of them had piezometers to monitor ground water quality.
>
> …WBPDCL-Bandel claimed the ash was being used in agriculture and waste land development but the community complained about illegal ash dumping on agricultural fields and wetlands.
>
> …Govind Ballabh Pant reservoir, the main source of water in Singrauli, is so polluted that the National Green Tribunal had ordered big companies in the region to set up reverse osmosis plants to supply drinking water. But the thermal power plants remain unfazed. NTPC Singrauli, UPVRUNL, Obra, and UPVRUNL, Anpara, directly discharge ash slurry into the reservoir. In all, 10 plants let their ash slurry into water bodies.

That despite several notifications and Office Memorandums, the scenario of ash disposal does not seem to get better. The accumulated ash is becoming a critical problem to ecology and economic development and has severely polluted our reservoirs, rivers and soil with toxic heavy metals which subsequently enter the food chain and have far wider impacts beyond assessment. Considering the far reaching impacts of coal ash pollutants, stricter policies for management and handling of ash by the units is required to be formulated. It is submitted that there is an urgent need to strictly deal with the current units who have failed to undertake proper management of coal. Thus, the units which are found to be guilty should be fined with heavy penalty and should ultimately be subjected to

suspension of the Environment Clearance in case mandatory norms are not adhered.

6.6 Immense Pressure on Water Resources and Hydrology

The applicants submit that India is a water-stressed country and a large number of thermal power plants are already drawing huge amount of water for power generation from river basins resulting into reduction of water flow in River. The applicants further submit that there is no regulatory mechanism for controlling abstraction of water by thermal power plants. Further none of the laws or policies provide for a cumulative impact study and carrying capacity study of the withdrawals from thermal power plants and other competitive users. The applicants also wish to submit that due to restriction of abstraction in lean seasons, the water abstraction occurs rampantly in non-lean seasons of the year. The cumulative impact of such huge abstraction apart from other industrial abstraction has affected the natural flow of the river and its tributaries. According to the CSE-DTE report of February, 2015 (Annexure A-11)-on an average a thermal power plant consumes 4 cum./MWh, considering which the figure turns out to be 1959 MCM/Year. The applicants submit that the State Governments and the Central Water Commission does not necessitate for cumulative impact assessment which should be required due to the ecological considerations of such huge withdrawal from the River Basin. As per the same CSE-DTE report, it is clearly showed that water abstraction by thermal power plants at 4 m^3/MWh in India are far above global standard at 1.6 m^3/MWh. The CEA guidelines recommend water use of 3.6 m^3/MWh (for plants in 1^{st} year of operation) and 3.0 m^3/MWh for all thermal power plants.

Copy of the relevant excerpts from CEA Report on Minimization of Water Requirement in Coal Based Thermal Power Station, January 2012 is annexed herein as **Annexure A-14**.

The applicants further submit that the demand of huge amount of water for thermal power plants is responsible for destroying the ecological well-being of our river system. The increasing demand of water for thermal power plants and other industrial uses is leading to severe reduction in water flow in the river and threatening the health of the river. Moreover, since India is already water stressed, the experts have warned that by 2025 India's water demand may surpass the water supply and in coming decade the nation may become 'water scarce'. In an article published by UNEP titled "Increased global water stress: Vital Water Graphics" in 2008 at http://www.unep.org/dewa/vitalwater/article141.html it is stated that,

> "…. Today, 31 countries, accounting for less than 8% of the world's population, faces chronic freshwater shortages. Among the countries likely to run short of water in the next 25 years are Ethiopia, India, Kenya, Nigeria and Peru. Parts of other large countries (e.g. China) already face chronic water problems."

This concern is also highlighted in a report published by Joint Program on the Science and Policy of Global Change, Massachusetts Institute of Technology, Cambridge, MA, USA in January,2014 titled 'The Future of Global Water Stress: An Integrated Assessment' which states,

> "In considering these population-under-stress projections, we find that some of the largest increases in population (Table 4) occur in areas that are already under water stress, in particular, India, the Middle East (or MES region of EPPA), and northern Africa (Figures 3 and 5). The total projected population increases within these water-stressed regions, approximately 1.8 billion, could account for a substantial portion (up to 90%) of the nearly 2 billion people increase in water-stressed populations shown in Figure 17. A closer inspection indicates that given the increasing trends in WSI over the Middle East across all scenarios (Figure 14) and that none of the decreases in WSI seen over India are enough to diminish its

water-stressed condition—all of the additional 660 million people projected to live in these regions (by 2050) will be exposed to water stress".

As acknowledged in the Twelfth Five Year Plan – 2012-2017 Report of the Working Group on Rural Domestic Water and Sanitation by Ministry of Drinking Water and Sanitation published in September, 2011 which states:

"…One of the most critical challenges that face rural villages is to secure an adequate source of water in terms of quantity and quality. With increasing growth of the population the per capita water availability has fallen from over 5,000 m^3/year to about 1,700 m^3/year.

…In terms of water resources regulation, the critical issues facing the sector concern inter-sectoral distribution, bulk water tariffs and water resource management. In particular, ensuring that drinking water receives priority especially during scarcity and drought is a challenge because irrigation demand dominates water demand. The current distribution of water resources in the country is about 86% percent for agriculture, 6 percent for industries and 8 percent for domestic uses. With increasing industrialization, the share of industry is set to rise. The comparable share of industry in rich industrialized countries is more than 50%. The share of domestic water use will also rise with increasing urbanization and demands of rural households for urban levels of amenities and services.

…As per the provisions of the National Water Policy, drinking water has the first priority in allocation, of all available water. However, it is often seen that in surface water harvesting or water impounding projects, requirements of drinking water are not given appropriate priority. States should review existing water resource allocations for irrigation, drinking water etc. in cases of new demands for improved or augmented drinking water supply in rural and urban

areas. Water policy should also provide for review and reallocation of water resources among competing user groups giving primacy to drinking water supply."

Similarly as per the report titled 'Water in India: Situation and Prospects' published by UNICEF, FAO and SaciWATERs, 2013, it is stated that,

> "…One of the major constraints often cited for India in achieving developmental goals is the pressure of an ever-increasing population. According to the provisional census data of 2011, the population of India is 1.21 billion. The per capita water availability during this period has decreased from 2,309 cu m in 1991 (Sharma and Bharat, 2009) to 1,588 cu m in 2001 (CWC, 2010). Considering the projected population growth in 2025, the per capita water availability can further decrease to 1,000 cu m, which would then be termed a 'water scarcity 'situation. Despite the National Water Policy (NWP) assigning the highest priority to drinking water, providing adequate and safe drinking water to every household in the country remains an onerous task".

It is submitted that there is significant amount of water consumption by the thermal power plants in different regions of the country. There are instances where extensive water withdrawal for power generation has led to severe problem of water scarcity in the regions leading to a substantial drop in the water supply for irrigation and drinking purposes. At the present time, there is an urgent need to have effective control over consumption of water by existing and upcoming power plants to prevent the critical situation of water scarcity in different parts of the country which is bound to happen if proper regulations will not be put in place.

Copy of the relevant extracts from the report titled Increased global water stress: Vital Water Graphics, UNEP (2008); report titled 'The Future of Global Water Stress: An Integrated Assessment' dated January, 2014

publised by Massachusetts Institute of Technology, Cambridge, MA, USA in January,2014 ; Twelfth Five Year Plan – 2012-2017 Report of the Working Group on 'Rural Domestic Water and Sanitation by Ministry of Drinking Water and Sanitation' published in September, 2011; and 'Water in India: Situation and Prospects' published by UNICEF, FAO and SaciWATERs, 2013 are attached as **Annexure A-15**, **Annexure A-16**, **Annexure A-17** and **Annexure A-18** respectively.

6.7 Massive and Unregulated emissions of Sulphur Dioxide has reduced quality of life

The applicants submit that environment deterioration is attributed to emission of large amount of SO_2 which leads to respiratory and related ailments in human beings and animals. It further affects photosynthesis process, balance of minerals and micro and major nutrients in the plants, soil strata etc. The applicants wish to point out that the major reason for unregulated emission of SO_2 directly into the atmosphere is the lack of strict emission standards and mandate for installation of FGD (Flue Gas Desulphurisation) and SCR (Selective Catalytic Reduction) units. The applicants also wish to point out that the FGD and SCR has many co-benefits which helps to reduce the emission of Mercury significantly and also maintaining the efficiency of ESP (Electrostatic Precipitator) by trapping other heavy metals which damage the ESP. However, installation of these techniques are not necessitated by the Government. Infact, the Government is under an impression that tall height of stacks can effectively disperse the SO_2. This assumption may be valid in absolute term but it fails in relative term considering the present situation. In a PIB Press Release dated 21st May, 2012, the Ministry of Power has stated,

> "… FGD technology is normally not being used in the Indian thermal power stations as the Indian coal used in the thermal power stations has low sulphur content of the order of 0.3% to 0.5% and SOx control is being achieved through dispersion

from tall stacks provided as per the Regulations prescribed by Ministry of Environment and Forests (MoE&F).

In coal based units of 500 MW and above and also at stations with capacity of 1500 to 2000 MW, space provisions are required to be kept for installation of FGD if required in future. In sensitive areas, the installation of FGD Plants may be insisted upon by MoE&F."

The applicants submit that the assumption made by the Ministry of Power is highly shortsighted and without any scientific assessment and ignores the cumulative impacts of all the thermal power plants. It also ignores the projects with capacity of more than 500 MW but containing several smaller units where the cumulative power capacity is more than 500 MW. Apart from that, the units with production capacity of less than 500 MW are more problematic in terms of pollution due to lower efficiency, short stack heights and relaxed standards which emits more pollution near to surface. It is also ignored that due to high ash-content of Indian coal, indigenous coal is blended with imported coal. It is pertinent to point out that given the domestic coal availability scenario in past few years, it is more likely that the upcoming thermal power plants are completely imported coal based. Further, with the increase in the number of thermal power plants, the efficiency of tall stacks for dispersion of pollution from low sulphur coal reduces irrespective of the fact as to whether the coal used is indigenous or imported. More number of thermal power plants even with tall stacks can only help dispersal of pollutants to long distances, but cumulatively the SOx emission will be much higher and is bound to cause the environmental deterioration. The increasing level of SOx in last decades is scientifically well documented and is a proven fact which cannot be ignored.

As per the Discussion Paper by Cropper et.al. 2012 (Annexure A-6),

> "Tall stacks cause pollution to be dispersed but do not eliminate exposure, especially in a densely populated country. Although Indian coal has lower sulfur content than coal mined in the eastern United States, more coal is used to produce a kWh hour of electricity in India due to the low heating value of Indian coal. This, combined with the magnitude of SO_2 emissions from coal-fired power plants, makes SO_2 the main pollutant of concern from a health standpoint".

The IIT Delhi research paper (Annexure A-5) suggests few measures which are as follows,

> "… With no FGD systems to control SO_2 emissions at most of the power plants, the secondary contributions are significant. SO_2, once airborne, further interacts with the hydroxyl radicals to form aerosol sulfates. The formation of aerosol nitrates is more complicated due to the involvement of the multiple nitrogen species and numerous chemical reactions with hydroxyl radicals and volatile organic compounds.
>
> … The highest secondary contributions were estimated for the summer months. This is partly due to the higher photochemical activities and presence of oxidizing agents, which increase the oxidation of SO_2 and NO_x gases and their conversion rate to sulfates and nitrates.
>
> ….From the coal-fired power plants, we estimate 30-40% of the PM pollution is secondary in nature, with the most coming from chemical conversion of gaseous SO_2 to aerosol sulfate. Since a majority of the power plants do not operate a dedicated FGD system, most of the SO_2 from coal combustion is emitted and ends up in respirable PM fraction, resulting in more health impacts. In the environmental impact assessment studies, which is required before commissioning

any power plant, a provision for a FGD is discussed, but the power plants are not required to operate a FGD. The combined benefits of a FGD in conjunction with the already operational ESPs will have a significant effect on overall health impacts. We believe that FGD technology should become mandatory for all new power plants and a provision should be introduced to implement the same for the larger and older power plants to control SO2 emissions and to reduce the overall PM 2.5 concentrations by at least 30-40%.

….Going forward, coal-fired power plants should be subjected to tighter emission standards, similar to those found in emerging economies (like China) and developed economies (like EU, Australia, and USA). For example, a mandate for installation of FGD systems for the existing 111 coal-fired power plants could reduce the PM 2.5 concentrations by 30-40%, by eliminating the formation of secondary sulfates and nitrates, and some additional benefits to the primary particulates

…. The efficiency improvement of existing older power plants, irrespective of the boiler size, should become a starting point for reducing overall coal consumption and associated atmospheric emissions

…. Unlike pollution from the transport or domestic sector, pollution from stacks is a point source meaning a finite and known number of units releasing emissions. Moreover, with a majority of the power plants operated by the public sector, mandating technologies that reduce pollution would seem to represent a simple solution.

…. The stack emissions can be monitored relatively easily as compared to non-point sources (such as vehicles, garbage burning, domestic burning, and fugitive dust). While, the larger power plants are now equipped with continuous stack monitors, this information is not open to public, either for analysis or for scrutiny of the emission

loads. This adds to the uncertainty of similar studies. Besides strengthening standards, newer policies are required for dissemination of information from the coal-fired power plants".

The applicant submits that installation of FGD should be made mandatory since it not only reduce the SOx emissions also helps in controlling the PM emission as discussed in the above research paper. In addition to this, the FGD is also useful in controlling mercury emission especially Hg2+ which escapes the conventional ESPs. The fact is substantiated by a research paper published by scientists of Mahanadi Coalfields Limited in International Journal of Engineering Research & Technology in November, 2013 titled 'Mercury emissions control from coal fired thermal power plants in India: Critical review & suggested Policy measures' which points out the following,

"...Mercury abatement as co-benefit of reduction of NOx, SO_2 and dust: For a coal fired power plant the APCD (air pollution control device) normally consists of several abatement techniques. In most cases an ESP is used as a first step in reduction of dust emissions. More and more installations also apply a fabric filter to further reduce emissions of dust. Most installations in the EU and part of the installations in the USA and Canada reduce emissions of SO_2 by applying flue gas desulphurization (FGD) based on wet or semi-dry scrubbers with lime stone slurry. In many modern power plants also selective catalytic reduction (SCR) is used to reduce emissions of NOx.

The Hg(P) fraction is typically removed by a particulate control device such as an electrostatic precipitator (ESP) or fabric filter (FF). The Hg (2+) portion is water-soluble and therefore a relatively high percentage can be captured by the wet flue gas desulphurization (FGD) systems. The Hg (0) fraction is generally not captured by existing APCD. However, when an SCR is applied this will promote

oxidation of Hg (0) to Hg (2+) and enhance Hg capture in a downstream FGD.

…. Regulation of sulphur dioxide & NOx by installing FGD & SCR will not only significantly reduce the emissions of conventional pollutants but also benefit the mercury emission from coal fired power plants and hence should be done immediately as new power plants are coming up at a faster rate than ever in the country.

...Phasing out small units (below 200 MW) and the application of supercritical & ultra-supercritical coal fired power plants to improve energy efficiency and ultimately reducing atmospheric mercury emissions.

…. In clean coal technology, reduction of non-GHG pollutant emissions (SO2, NOx, PM) is indispensable and deployment of best available flue gas treatment technologies should be intensively promoted.

...India is the 2nd largest emitter of mercury from coal fired thermal power plants. Mercury reduction as a co-benefit offered by SOx & NO_X control units as obtained in other countries is not available In India as for SOx reduction, only stack height criteria is prescribed by regulation and for NO_X no specific emission limit from CFTPP & meeting the ambient air quality norms is enough as per present regulation. The ESP provided in most of the thermal power plants in India is also not very effective to offer co benefit of reduction of mercury due to fly ash characteristics".

The applicants submit that there are a few thermal power plants where FGD is installed and the successful implementation of the same proves that installation of FGD is economically viable. The additional investment made to control the SO_2 and NOx emissions using SCR have much more economic benefit which will help significant reduction on pollution which will in turn help in reducing the cost accrued to the agricultural productivity,

human health and climate change impact.

Copy of the Press Release dated 21st May, 2012 by Ministry of Power is annexed herein as **Annexure A-19** and relevant extracts from the research paper titled “Mercury emissions control from coal fired thermal power plants in India: Critical review & suggested Policy measures, Mahanadi Coalfields, November, 2013” is annexed herein as **Annexure A-20.**

6.8Uncontrollable and Unregulated Pollution by older units which are less efficient and more polluting

The applicants submit that the pollution from older thermal power plants are much more because they have very low efficiency and higher fuel consumption. Their impact on environment and human health is significantly higher because the older units are smaller in capacity and therefore they are more in number, emits more pollution and have much more relaxed norms for emission like lower standards, lower stack heights etc. It is also submitted that several of these older units have completed their lifetime but are still under operation. When resources like coal is a scarce natural resource, the huge cost these units are imposing on environment, ecology and human health cannot be overlooked and they need immediate closure. The fact is substantiated in the IIT Delhi paper (Annexure A-5) which states,

> “.....Approximately 70% of the operational units in the country are of the sizes less than or equal to 210 MW and these units tend to have the worst net efficiency and plant load factor”.

It is submitted that the older units consume more fuel, generate less power and emit more poisonous gases. Such units are required to be scrapped immediately and replaced with newer units which are technologically advanced and equipped with effective pollution control techniques. The MoEF is required to take appropriate action against the old and inefficient units and suspend their EC’s expeditiously. However, all

such units are still operating since there is no monitoring mechanism to check the power generation efficiency of these units.

6.9 Inadequacies in the present EIA Process has led to increase in the environmental Pollution

That the Environment Impact Assessment Report for the thermal power projects is prepared based on Rapid EIA for speedier appraisal process. Since the rapid EIA is undertaken through collection of one season data (other than monsoon data), most of the EIA consultants conduct the baseline data in the pre-monsoon period. Apart from this, the EIA is restricted to only 10 to 15 kilometers of radius of the project site which in some cases has been restricted to a mere distance of 5 Km also. The applicants submit that this usual process of EIA followed in TPPs is highly inadequate in estimating the overall impacts of the project. Owing to the dangerous and severe impacts of thermal power plants and the likelihood of the pollutants to travel far off distances as much as 400 kilometers and other climatic factors like wind behavior, the EIA is required to account for a complete year. This is necessary for bringing reliability and quality in the EIA process since the rapid EIA's as has been noted in number of present instances are merely undertaken to get over with the appraisal process in a short time impairing the quality of decision making. A thermal power plant is also categorized as red-category industry by CPCB which means it is critically polluting industry with severe impact on environment and health. Therefore, the appraisal must be based on comprehensive EIA with baseline monitoring of atleast one year. One complete year is also necessary as the dispersal of pollution depends on the wind speed and temperature which varies seasonally. This fact is also highlighted by the paper published by IIT Delhi (Annexure A-5) which states:

> "…..While the impact of the emissions is felt within 200 km of the power plants, under windy conditions the influence can be tracked to distances as far as 400 km from the source region.

> ….The environmental impact assessment procedures need to be revised, in order to include the health and environment damages due to long-range transport of pollution from the stacks, as high as 275 m, and travelling the distances of more than 300 km in less than 24 h. Currently, the procedure require assessment for an area of 50 km radius from the plant."

The above-stated research paper also shows a modeling exercise with Dispersion modeling results by season (Dec-Jan-Feb for winter; Mar-Apr-May for spring; Jun-Jul-Aug for summer; and Sep-Oct-Nov for fall) due to the emissions from coal fired thermal power plants in India for average PM 2.5 concentrations and percentage contribution of secondary (sulfates and nitrates) aerosols to average PM 2.5 concentrations by season. The results depicted through dispersion maps clearly shows that the pollution dispersion is highest in the period March-May and tend to concentrate in periods December-February, June-August and much larger spread accumulation in September-November. The paper describes this phenomenon as follows:

> "……The meteorological conditions have a large variation in the subcontinent between the monsoonal and non-monsoonal months. This variation also affects the dry and wet deposition and the ambient concentrations of various pollutants. In Fig. 4, we present the seasonal average concentrations -Dec-Jan-Feb for winter, Mar-Apr-May for spring, Jun-Jul-Aug for summer, and Sep-Oct-Nov for fall season. The south-west monsoons from the Arabian Sea during the months of April to August tend to push and disperse the emissions upwards and north, while the north-east monsoons from the Bay of Bengal Sea during the months of October to November tend to push and disperse the emissions inland and south resulting in a wider spread of pollution. For the spring season, beginning of the south-west monsoon, strong winds and higher mixing heights

were observed (Supplementary Material), which tend to lift the pollution higher into the troposphere, resulting in lower ground concentrations. In the later months, the cloud cover is higher, reducing the mixing heights, and increasing the ground level concentrations. There is much uncertainty in the monsoons and weather patterns that could not only influence the pollution patterns, but also there is growing evidence that the pollution from transport and industrial processes can affect the monsoonal pattern".

It is very clear from the above that the pollution dispersal varies for all seasons and a rapid EIA can never assess the overall impacts from thermal power plants. Moreover, the air pollution dispersal modeling is not specific to stack emission and needs to consider the cumulative impacts of all the projects and activities falling within the vicinity of the plant. Depending upon the nature and scale of the thermal power project and its adverse impact on public health, agriculture and water resources, the MoEFCC is required to frame stringent guidelines and procedures for undertaking Comprehensive EIA which should include Cumulative Impact Assessment of several projects (Including all industrial projects and activities) which are under either development or operation or proposed in much wider distance, more than 15 km.

6.10 Weak and Highly Relaxed emission standards for thermal power plants

That with the rapid industrialization and specifically increasing trend of thermal power generation in the country, the Government is required to adopt stringent emission standards to prevent increase in environmental pollution. Weak emission standards allow the power projects to emit disproportionately high level of pollutants which subsequently impact local air quality and exert regional and global climate effects. The applicants are concerned with the recent notification no. S.O 3305 (E) passed by the

MoEFCC on 07.12.2015 amending the Environment (Protection) Rules, 1986 with respect to the standards of emission for thermal power plants. The applicants submit that the said standards have been leniently framed by the Ministry and in no manner would be beneficial in curbing and preventing the increasing environmental pollution caused by the thermal power projects. It is pertinent to mention that the applicant No. 1 had sent representation to the draft of the said notification. The representation included wide suggestions and comments which were completely based on technical analysis and proper reasoning. However, none of the suggestions/comments were considered and the notification was finalized keeping aside the concerns of the applicant. The perusal of the said emission standards from technical and scientific perspective shows that the same have been highly relaxed in order to facilitate the thermal power industry. The concerns which were also part of the representation sent to the Ministry on 01.06.2015 have been provided herein in order to establish that the emission standards formulated by the Ministry by way of the current Notification are weak and highly relaxed and inadequate in dealing with the present situation of environmental pollution. The applicants are providing a brief of the comments and objections to the standards in the following paras which were part of the representation sent to the MoEF. The applicants crave leave of this Hon'ble Tribunal to refer upon the complete representation at the time of the arguments.

1. *Standards are loosely framed and would be ineffective in preventing environment pollution*-

    i. *Standards for Particulate matter*- The notification prescribes for 100 mg/ Nm3 and 50 mg/ Nm^3 for older units and older new units respectively. The said standards prescribed for emission control for PM are unreasonable in view of the fact that for PM control, the technology used like coal beneficiation, ESP, Bag Filter and Cyclone is the same in all thermal power plants irrespective of

their capacity. Thus, if the pollution control technology is the same, the standards for all plants whether new or old must be kept at the same level. The standard of 30 mg/Nm^3 is a welcome step as compared to previous emission standard of 150 mg/Nm^3 but still it is inadequate. 30 mg/Nm^3 as the emission standard seems to be in line with emission standards in countries like China. But it is also important to know that in China no new smaller units are allowed and most of their existing small plants have been decommissioned. The PM emission standard for thermal power plants in key regions is 20 mg/ Nm^3. Also, China has a robust plan to switch from Coal to Natural Gas for power generation which means their emission from coal even if not reduced in coming future, but the rate of increase in emissions will be significantly reduced. Similarly, the dust emission standards in EU is 30 mg/Nm^3 for units less than 100 MW, 25 mg/ Nm^3 for units 100-300 MW and 20 mg/Nm^3 for units above 300 MW. Additionally, given the high ash content of coal and the fact that number of indigenous coal based thermal power plants are located sequentially in concentrated pockets like Singrauli-Sonbhadra, Raigarh-Korba and many other such places, the standards of 30 mg/Nm^3 will not serve any purpose. Also, the population size and density of our nation makes its people more vulnerable to exposure. The efforts must be made to reach zero PM emission. However, in practice, 20 mg/ Nm^3 are followed in some countries, and India must adopt such strictest standard possible.

ii. *Standards for Sulphur Dioxide*- The notification proposes 600 mg/Nm^3 for units of less than 500 MW and 200 mg/ Nm^3 for larger units of 500 MW and more. For newer plants established between 2003-2006, 200 mg/Nm^3 has been prescribed. There are no

standards prescribed for plants (2003-2006) which with capacity lower than 500 MW. The applicant submits that the emission of SO_2 is one of the major environmental pollution from thermal power plants and a major concern not only for health but its significant impact on agriculture. Thus, relaxation of older and smaller units to continue emit 6 times more (600 mg/ Nm^3) than newer plants (100 mg/ Nm^3) will not solve the problem as most of the older and smaller units have less efficiency and are the biggest emitter of SO_2. Therefore, the limits which have been prescribed for the older units are not reasonable. The applicants submit that all existing thermal power plants must comply with 200 mg/Nm^3 with a mandate to reach the target of 100 mg/ Nm^3 within 2 to 3 years and the 100 mg/Nm^3 emission standard for newer plants shall be extended to all existing thermal power plants in key areas which may be classified based on number of thermal power plants or other polluting industries in vicinity and ecologically sensitive areas like places of regular gathering, large population, forests etc. It is also a matter of fact that until FGD (Flue Gas Desulphurization) units are installed, the emission reduction of thermal power plants may not be achieved. Very few thermal power plants are recommended for installation of FGD and it is yet to be made mandatory by law for all TPPs. It is a high time now, to make installation of FGD mandatory pollution control equipment. There are several thermal power plants which are operating with FGD which itself shows its feasibility and economic viability. The FGD not only helps in significantly reducing SO2 but also toxic heavy metals like Hg (Mercury) which are usually not trapped by ESP and reduce the efficiency of filters. Therefore, the installation of FGD must be made mandatory. The units which are commissioned in recent years have provisional space for

installation of FGD and therefore installing it will not be time consuming for such units. Further, the 'older new' units which do not have space allocations for FGDs must be mandated to go for 'desulphurization of coal' before combustion and adopt other methods of reduction of sulphur dioxide emission through other in-combustion methods. The older units where it is impossible to bring down the emission levels of SO_2 must be decommissioned and upgraded to latest technology units.

iii. *Standards of Mercury*- The emission standard proposed for Mercury is without any scientific assessment and will not serve the purpose of reduction of mercury emitted by the thermal power plants, and will also prove to be ineffective in reducing the mercury emissions. The proposed emission standards are far more than what the thermal power plants are emitting. Furthermore, no standards for older units less than 500 MW (2003-2006) have been prescribed despite the fact that the older and smaller units emit higher mercury content in comparison to the new. CIMFR 2014 study on thermal power plants in India revealed that the mercury content in FLUE GAS to be 14.84 µg/Nm^3 (0.01484 mg/ Nm^3) in Talcher STPP of NTPC and 4.24 ug/NM^3 (0.00424 mg/ Nm^3) in Budge Budge CESC which is itself quiet high than the proposed standards. The proposed standard of 0.03 mg/ Nm^3 is approx. 73 times more relaxed than the U.S. EPA standard of 0.003 lb/GWh which comes out 0.00041 mg/Nm^3 for Indian Thermal Power Plants. The proposed standard is also several times more than the amount of Mercury presently emitted by the thermal power plants through flue gas. The standard emission of mercury at 0.00041 mg/Nm^3 (as followed by US EPA) must be implemented for the fact that toxicity of Mercury even in minute concentrations is hazardous.

iv. *Standards for Nitrogen Oxide*- The MoEFCC has prescribed 600 mg/ Nm3 for older units which is very high. The European Union standards which is widely criticized for its relaxed attitude towards emission standards of thermal power plant prescribes 200 mg/ Nm3 for all units more than 100 MW and for older units, the standards are relaxed but with the condition stated in the EUROPEAN UNION (LARGE COMBUSTION PLANTS) REGULATIONS 2012, Schedule I, para 2 which is as follows,

> "Combustion plants using solid or liquid fuels with a total rated thermal input not exceeding 500 MW which were granted a licence before 27 November 2002 or the operators of which had submitted a complete application for a licence before that date, provided that the plant was put into operation no later than 27 November 2003, and which do not operate more than 1,500 operating hours per year as a rolling average over a period of 5 years, shall be subject to an emission limit value for NOx of 450 mg/ Nm3 . Combustion plants using solid fuels with a total rated thermal input greater than 500 MW, which were granted a licence before 1 July 1987 and which do not operate more than 1,500 operating hours per year as a rolling average over a period of 5 years, shall be subject to an emission limit value for NOx of 450 mg/ Nm3"

China has stricter rules and it mandates 100 mg/ Nm3 for all thermal power plants except those units which are built before January, 2004 as 200 mg/Nm3. The Chinese standard seems to be most sustainable approach towards reduction of NOx and may be applied in Indian standards.

v. *Standards on Water Consumption*- The MoEF has proposed for installation of cooling towers in the thermal power plants with once through cooling and the consumption to be achieved 4m3/MWH within 2 years. For existing cooling tower based plants, the standard for specific water consumption is proposed to be 3.5m3/MWH which has to be achieved within 2 years. For new plants to be installed the specific water consumption is proposed to be 2.5 m3/MWh and achieve zero liquid discharge. The water consumption standards are also very relaxed and lower than existing CEA (Central Electricity Authority) guidelines, 2012 which suggested 3.6 m^3/MWh in first year and 3.0 m^3/MWh in subsequent years.

Further, in the CSE report of 2015, it has been claimed that global best specific water consumption in thermal power plants is 1.6 m^3/MWh (USA – 2 m^3/MWh and China 2.5 m^3/MWh) and the India best is JSWEL, Toranagallu at 2 m^3/MWh. Therefore, it is submitted that 2 m^3/MWh can be the uniform standard for maximum specific water consumption in all thermal power plants.

Secondly, the water consumption in thermal power plants does not depend only on cooling tower but also on the type of cooling tower such as wet cooling, dry cooling, Cycles of Concentration (COC) and also on the ash disposal mode among several other factors which needs to be considered. Further, the zero liquid discharge has been mandated only for new plants whereas the same should be prescribed for all power plants (old and new). As the notification directs for installation of the cooling towers for all the power plants, zero discharge should also be mandated for all since the thermal power plants with cooling towers can achieve zero discharge by recycling of the water.

2. *Lack of Standards for Other Pollutants in the Notification*:

i. The notification does not prescribe any emission standards for several important air emissions like Lead, Selenium, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Lead, Manganese, Acid Gases (Hydrogen Chloride and Hydrogen Fluoride), PAHs (Polycyclic Aromatic Hydrocarbons) and VOCs (Volatile Organic Compounds), Dioxins and Furans which are hazardous air pollutants emitted from coal based power plants and are known for serious health impacts and affecting our ecology. There are scientific evidences that the impacts of these emissions are harmful. However, the notification is completely silent on emission standards for these air pollutants which are equally harmful and hazardous.

ii. There is no specific standard for Liquid Effluents. The previous CPCB standards for discharge of liquid effluents were limited to only suspended solids, oil and grease, copper, iron, free available chlorine, zinc, chromium, phosphate and pH and is categorized separately based on source such as boiler blow down, cooling tower blow down, condenser cooling water and ash pond effluent. There are ample evidences which indicate that there are many more toxics and chemicals which are affecting the environment and public health which demands for update of standards which should include relevant wastewater stream: e.g., from FGD system, wet ash transport, washing boiler / air preheater and precipitator, boiler acid washing, regeneration of demineralizers and condensate polishers, oil-separated water, site drainage, coal pile runoff, cooling water etc. However, the notification is completely silent on such standards.

iii. The notification does not emphasize on the toxic metals like Mercury, Cadmium, Hexavalent Chromium, Nickel, Selenium, and

other chemicals like Ammonia, Fluoride, Phenols, Phosphorus, Sulfide, Coliform bacteria (important as thermal power plants are established along with colonies) for all thermal power plant effluents. The standard for all these toxic chemicals is very much important for thermal power plants with cooling towers as well, as the achievement of 'Zero-Discharge' will take some time and till then we would not be able to prevent the hazardous impacts of the discharge.

iv. No standards for Radioactivity in thermal power plants has been prescribed in the notification despite the judgment passed by the Hon'ble Tribunal in the matter of Krishi Vigyan Arogya Sanstha & Ors vs MoEF & Ors wherein specific direction to the Ministry were given for prescribing permissible levels of nuclear radiation from coal ash generated by thermal power projects.

v. The notification does not mention about any standards for temperature of the effluents. At present, the temperature rise in thermal power plant effluents is still quite higher than international standards. The present standard for new coastal thermal power plants allows up to 7°c rise (of the ambient temperature of the receiving water bodies) in temperature of condenser cooling water from inlet to the outlet of condenser; and which is relaxed up to 10° c for existing thermal power plants. Considering the same, the temperature rise must be maximum of 3°c as suggested by World Bank. However, the notification is completely silent on the same.

vi. The notification does not prescribe emission standards for CO_2. There are enough scientific evidences that coal based thermal power plants are biggest emitter of GHGs (Green House Gases) and is now widely accepted fact that there is an urgent need to control it. As per the CSE report of 2015,

> "Low efficiency is directly related to high CO2 emissions. The average emission rate of plants was 1.08 tonne CO2/MWh, which is seven per cent higher than the global average and 14 per cent higher than China's. In 2012, coal-based power generation accounted for half of India's total CO2 emissions from fuel combustions. During 2011-12, India's total CO2 emissions grew by six per cent which was mostly on account of coal in energy production. There were just 13 plants in the study whose average emissions were lower than the global average. No plant conformed to the global best values. Even super critical plants in the study had emissions 35 per cent higher than the global best. It is estimated that a one percentage point improvement in efficiency can reduce CO2 emissions by 2-3 per cent. Apart from improving efficiency of existing plants, adopting state-of-the-art technologies can help achieve big cuts in emission rates."

A research paper by National Physical Laboratory, Council of Scientific and Industrial Research on 86 thermal power plants in India published in 2012 states,

> "CO_2 emissions per unit of electricity from power plants are given in Table 3B, which shows that CO_2 emissions per unit of electricity range between 0.82 and 1.0 kg/kWh. These are regional average and change year to year. CO_2 emissions depend upon the carbon content in the coal used and the specific coal usage (plant efficiency). Some plants are more efficient than others and the plant efficiency also varies from year to year due to maintenance. In 2009 -10, plant wise emissions of CO_2 (kg/kWh) varied from 0.58 at DCR-Yamunanagar to 1.59 at Faridabad, which is an old power

plant. 48 power plants emit CO_2 in the range of 0.58 -1.0 kg/kWh. Three plants have CO_2 emissions more than 1.4 kg/kWh. This number reflects operational inefficiency due to poor coal quality, operating conditions, maintenance, and/or plant design."

As CO_2 emission is now a global threat due to its impact on climate which is linked to our growth and development as well, therefore there is very much need to cap the CO_2 emissions from thermal power plants which are the highest emitter of CO_2. Good news is the amount of CO_2 emitted by thermal power plants can be reduced significantly by adopting newer technologies with better efficiencies and for that public policies must be developed. As per the report "The Future of Coal, Massachusetts Institute of Technology, 2007" available online (http://web.mit.edu/coal/The_Future_of_Coal.pdf), most of the existing thermal power plants are sub-critical type which perform at efficiencies below 33%. The thermal efficiencies of power plants with supercritical technology can be achieved around 38.5% and ultra-supercritical technology can be achieved more than 43%. Therefore, it is requested to kindly propose an emission standard for Indian Thermal Power Plants based on the lowest maximum CO_2 emission achieved in recent past. A good recommendation will be around 0.58 kg/KWh as observed in National Physical Laboratory study which shows it is achievable.

Similar to the mandate of installing cooling towers, the new thermal power plants must be mandated with installation of 'Ultra-Super Critical Technology' in new thermal power plants to maximise the thermal efficiencies and minimise coal consumption. It is submitted that the emission standards for CO_2 is not a common phenomenon yet, however if it is implemented, it will put our country in leading position in battle against climate change.

vii. The emission standards are not clear on the measurement criteria which will be followed like 24-hour average, yearly average and other criteria like temperature, pressure, correction of water vapour content of waste gases and O_2 content. These criteria conditions of measurements must be included for clarity.

viii. The emission standards prescribed for general conditions may not be of help in overall reduction of pollution in power generation hubs like Singrauli region, Korba region etc. where a large amount of coal is burnt for power generation in number of thermal power plants. Similarly, places like that of Delhi which has already several times higher pollution levels owing to heavy traffic and high density of population must be factored in. The cumulative impacts must be kept in mind for prescribing the emission standards. For eg. One thermal power of 660 MW if emits 100 mg/ Nm^3, that may sound very good but what if there are number of thermal power plants with cumulative capacity of thousands of MW production? In such cases, these standards may need to be revised as final exposure to population will remain high. One of the solutions may be emission standards based on total power generation over a certain radius say 100 km and also keeping in mind the regional industrial developments. Hence, critical/key areas need to be defined and classified and special standards need to be prescribed for the power plants located in those areas.

ix. The emission standards alone can only do the lip service, with compliance completely lying on how much responsible the company is and commitments of the monitoring agencies. For some emissions, to achieve the desired reduction, the implementation of technologies must be given the first priority. Until, there is a clear mandate for installation of Flue Gas

Desulphurization Units, significant reduction in SO_2 and heavy metals cannot be achieved.

x. The standards should be in terms of mg/MWh. Measurement of pollutants per unit of power generation per unit time may be more realistic and practical measurement of pollutants given the different capacities of units operational in India. This will also help in implementing equal standards for all units irrespective of their size. Though, many countries follow mg/ Nm^3 and it is more common, but U.S. EPA which has one of the strictest emission standards follow measurements in lb/GWh.

Copy of the representation sent by the Applicant No. 1 to MOEFCC dated 01.06.2015 is annexed herewith as **Annexure A-21.**

7. That the applicants submits that till the time stricter emission standards and necessary measures such as installation of FGD and SCR, comprehensive EIA, suspension of older units having lower efficiency, adoption of new technology like ultra-supercritical, complete utilization of ash, Cumulative Impact Assessment considering the impacts on agriculture, biodiversity, livelihood and health of people, Study on Carrying capacity, Restriction of withdrawal of water from reservoirs and dams proposed for agriculture and drinking water purposes, are made mandatory for all thermal power projects existing and proposed in the country, the environmental pollution caused by the thermal projects cannot be prevented.

8. That the application states the following among other grounds which the applicants may take at the time of hearing of the matter:

A. Because there is a substantive decline in the quality of environment due to the hazardous emissions of the thermal power projects which is constantly on the rise due to the growing needs of power supply. The failure to frame stringent measures to control environment pollution from

thermal power plants has led to severe degradation of the quality of air, water and land and other resources which are directly and indirectly affected by the harmful operations of the projects. The environment, ecology and public health are facing severe threat from the harmful consequences of the thermal power projects and the same would continue to degrade and lead to irreversible damage if immediate measures for preventing further pollution are not adopted by the concerned government authorities.

B. Because due to lack of comprehensive Environmental Impact Assessments, relaxed standards of emission, lack of stringent measures to reduce pollution and lack of regulatory framework to control abstraction of water for generation of power, severe loss to environment, ecology and public health has occurred. Despite various scientific researches which have proved the harmful consequences of the thermal power projects, no substantial change in the existing policies have been brought by the Government. With the rapid increase in the trend of thermal power generation, the Government was required to revise the existing framework and introduce strict regulations and monitoring mechanism as a preventive and precautionary measure. However, the failure on the part of the Government has caused immense damage, the repercussions of which are being faced by the public at large. Thus, there is an urgent need for the Government to revise the existing rules and regulations and reframe strict policies which are effective in controlling the hazardous impacts of the thermal power operations.

C. Because the Central Government has failed to take effective measures to protect and improve the quality of environment. Under section 3 (2) (ii) and (iii) of the Environment (Protection) Act, 1986, the Central Government is empowered to take measures with respect to planning and execution of a nationwide programme for the prevention, control and

abatement of environmental pollution and laying down standards for the quality of environment in its various aspects. As per the provisions laid down under the Act, the Central Government has wide powers to formulate policies which strictly govern the operations and activities of industries which are hazardous in nature. Furthermore, it is tasked with the responsibility to examine if the policies framed by it would be effective in controlling the adverse impacts of such industries or type of industries which in all likelihood over time lead to increase in environment pollution. Thus, it is not only the formulation of rules, regulations and standards but a careful analysis of the ground situation which is expected by the Ministry and other concerned authorities to examine as to whether the rules or standards prescribed by them are sufficient and effective enough to prevent or curb high rise in pollution caused by the operations and activities of such industries. It is submitted that while framing the standards, the Central Government has to also consider the future implications since the level of environment pollution by the thermal power projects is bound to increase with planning of more number of projects to suffice the need of power supply. Nonetheless, the Central Government has failed to take effective measures to prevent, abate and control rising environmental pollution caused by the thermal power projects under the provisions of the Environment (Protection) Act, 1986, which has resultantly deteriorated the quality of air, water and land and violated the very fundamental right of the people in the country to live in a healthy and clean environment.

D. Because the Hon'ble Tribunal has wide jurisdiction and ample powers under the NGT Act, 2010 to deal with causes of environmental damage and pass necessary action for prevention and control of environmental pollution applying the principle of precaution and intergenerational equity. In Goa Foundation versus Union of India, judgment dated 18 July 2013, this Hon'ble Tribunal has observed,

"On the cogent reading of Section 14 with Section 2(m) and Section 20 of the NGT Act, likely damage to environment would be covered under the precautionary principle, and therefore, provide jurisdiction to the Tribunal to entertain such a question. The applicability of precautionary principle is a statutory command to the Tribunal while deciding or settling disputes arising out of substantial questions relating to environment. Thus, any violation or even an apprehended violation of this principle would be actionable by any person before the Tribunal. Inaction in the facts and circumstances of a given case could itself be a violation of the precautionary principle, and therefore, bring it within the ambit of jurisdiction of the Tribunal, as defined under the NGT Act. By inaction, naturally, there will be violation of the precautionary principle and therefore, the Tribunal will have jurisdiction to entertain all civil cases raising such questions of environment. Such approach is further substantiated by the fact that Section 2(c), while defining environment, covers everything. Section 2(m) brings into play a direct violation of a specific statutory environmental obligation as contemplated under Section 5 of the Environment Act as being substantial question relating to environment These provisions, read with Section 3(1) and Section 5 of the Environment Act, which place statutory obligation and require the Government to issue appropriate directions to prevent and control pollution, clearly show that the legislature intended to provide wide jurisdiction to the Tribunal to deal with and cover all civil cases relating to environment, as stated by the Supreme Court in the case of S.A.L. Narayan Row & Anr. v. Ishwarlal Bhagwandas &

Anr. (AIR 1965 SCC 1818). The character of the proceedings is normally not with reference to the relief that the Tribunal can grant but upon the nature of the right violated and the appropriate relief which can be claimed".

E. Because Hon'ble Supreme Court has held that enjoyment of pollution free water and air is fundamental right under Article 21 of the Constitution. The increasing environmental pollution of the thermal power plant operations has infringed upon the rights of the people to clean environment, livelihood and has done damage to the environment, ecology and aquatic life. In Subhash Kumar vs. State of Bihar & Ors. (1991) 1 SCC598 Hon'ble Supreme Court has held that:

> "Right to live is a fundamental right under Article 21 of Constitution and it includes the right of enjoyment of pollution-free water and air for full enjoyment of life."

F. Because the Hon'ble Supreme Court in the matter of **M.C.Mehta vs. Union of India & Ors. [(2004) 12 SCC 118]** held that: *"…..by 42nd Constitutional Amendment. Article 48A was inserted in the Constitution in Part IV stipulating that the State shall endeavour to protect and improve the environment and to safeguard the forest and wildlife of the country. Article 51A, inter alia, provides that it shall be the duty of every citizen of India to protect and improve the natural environment including forest, lakes, rivers and wildlife and to have compassion for living creatures. Article 47 which provides that it shall be the duty of the State to raise the level of nutrition and the standard of living and to improve public health is also relevant in this connection. The most vital necessities, namely, air, water and soil, having regard to right of life under Article 21 cannot be permitted to be misused and polluted so as to reduce the quality of life of others."*

G. Because in Dr**. B.L. Wadehra vs. Union of India, (1996) 2 SCC 594**, the Hon'ble Apex Court held that :

> *"It is no doubt correct that rapid industrial development urbanisation and regular flow of persons from rural to urban areas have made major contribution towards environmental degradation but at the same time the Authorities -entrusted with the work of pollution control - cannot be permitted to sit back with folded hands on the pretext that they have no financial or other means to control pollution and protect the environment. Apart from Article 21 of the Constitution of India, which guarantees 'right to life', Articles 48A and 51A(g) of the Constitution are as under :*
>
> *48A. Protection and improvement of environment and safeguarding of forests and wild life. The State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country.*
>
> *51(g)-to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures.*

H. Because considering the fact that there is constant deterioration in the air, water and soil quality, it is the statutory obligation of the concerned authorities including the Ministry of Environment and Forests, Central and State Pollution Control Board to formulate stringent emission standards which could plausibly meet the object and purpose of the Act of protecting and improving the quality of the ecology and environment. The authorities considering the fact that the impacts of the hazardous emissions of the thermal power plants has adversely affected the community at large and has resulted into severe deterioration of human health which is broadly measurable, were required to frame strictest

standards and raise parameters of the permissible limits of emission. The failure to do the same by the concerned authorities has instead of abating, preventing and controlling the environment pollution has actually encouraged the thermal power plants to emit more hazardous gases into the atmosphere. Considering the high risk of exposure to harmful gases and irreversible damage to public health, ecology and environment, the emission standards prescribed vide notification dated 07.12.2015 which are loosely framed and are highly inadequate to deal with the increasing environment pollution caused by the thermal power plants are required to be set aside.

I. Because this Hon'ble Tribunal has wide powers to examine the correctness and constitutional validity of the Notification issued under the Scheduled Acts of the NGT Act, 2010. This Hon'ble Tribunal in the matter of Wilfred J. Anr vs MoEF & Ors, judgment dated 17 July, 2014 while hearing an application challenging the provisions of CRZ Notification, 2011 has observed that,

> "58. In fact, the jurisdiction of the Tribunal, as stated under Sections 14, 15 and 16 of the Act, not only vests a very wide jurisdiction in the Tribunal, but by necessary implication gives the power of judicial review to the Tribunal. It will be travesty of justice if it was to be held that the Tribunal does not have the power to examine the correctness or otherwise or constitutional validity of a Notification issued under one of the Scheduled Acts to the NGT Act. In the absence of such power, there cannot be an effective and complete decision on the substantial environmental issues that may be raised before the Tribunal, in exercise of the jurisdiction vested in the Tribunal under the provisions of the Act. Besides all this, the Tribunal has the

complete trappings of a Court.

The Hon'ble Tribunal has further held,

> "At the cost of repetition, we may record here that the language of the various provisions of the NGT Act by necessary implication gives power of judicial review to the Tribunal. There is no specific or even by necessary implication exclusion of such power indicated in any of the provisions. Furthermore, in the scheme of various environmental acts and if the object and purpose of such acts are to be achieved then the power of judicial review would have to be read into the provisions of the NGT Act. If the notifications issued under any of the Scheduled Acts, by virtue of the powers vested by subordinate or delegated legislation, are ultra vires the Act itself or are unconstitutional as they violate Articles 14 or 19 of the Constitution of India, then it has to be construed that the Tribunal is vested with the power of examining such notifications so as to completely and comprehensively decide the disputes, applications, appeals before it."

It is submitted that as a specialized court with explicit powers of judicial review, this Hon'ble Tribunal can examine the executive or legislative act issued under the Schedule I and invalidate that act if it is found to be contrary to constitutional principles. Considering the observations made in the aforesaid judgment, this Hon'ble Tribunal has wide powers to examine the correctness or constitutional validity of the Notification dated 7.12.2015 issued under the Environment (Protection) Act, 1986 and hold the same as invalid for violating the very principle of right to clean and healthy environment as guaranteed under Article 21 of the Constitution.

J. Because the Notification dated 7.12.2015 contravenes the Principle of Intergenerational equity, sustainable development and Precautionary

principle which are the necessary components and the basis of all the acts mentioned under Schedule I of the NGT Act, 2010. The legislations under the said acts have to serve the cause of the said principles and therefore while enacting such legislations, the MoEF has to keep in mind the risk of harm to environment and human health. However, none of the principles of environment protection have been considered by the Ministry while prescribing the emission standards for thermal power plants which is one of the most critically polluting industry. The Notification clearly violates the constitutional provisions and the aforestated principles which ensure protection of the health of the present and future generations and should therefore be set aside since it fails to undertake adequate measures to control pollution thereby leading to severe loss to ecology, environment and public health at large.

9. That based on the aforementioned facts and grounds, the applicants wish to propose the following measures which may be considered by this Hon'ble Tribunal for prevention and control of the increasing environmental pollution caused by the thermal power projects. After a detailed analysis of the facts aforementioned, the Hon'ble Tribunal may direct the Ministry of Environment and Forests to consider the following measures:

a) Installation of FGD and SCR to be made mandatory in all new thermal power plants and also in the existing thermal power plants which have allocation of space for the same.

b) Comprehensive EIA including cumulative EIA may be made mandatory for all the thermal power projects which shall be based on baseline data for a complete year.

c) Closure of the older units with lower efficiency and lower power output. A maximum lifetime of 25 years be proposed for units to be shut down completely. The units should operate for a specific lifetime which should

be specifically prescribed in the EC and subsequent to the same there should be post-facto EIA of such units to analyse as to whether the units are efficient and sustainable enough to operate.

d) New thermal power generating units may be based on ultra-supercritical technology and no more clearances shall be given to outdated technologies like sub-critical or critical technology.

e) Closure of all such projects which fails to utilize the ash generated as per the deadline mentioned in the MOEF and CC Notification dated 3rd November, 2009 and 25th May, 2015. No further expansion of the thermal power plants be allowed until they achieve the fly ash utilization as prescribed under law.

f) To set up an Expert Committee which shall conduct a Cumulative Impact Assessment and Carrying capacity of all River Basins where the thermal projects are existing or proposed to establish and their impact on agriculture, biodiversity, livelihood and health of the river ecosystem and health of people is comprehensively assessed.

g) A minimum distance may be decided for siting of thermal power plants from dams, reservoirs, wetlands, agricultural lands, forests and rivers. The same may be made part of the Siting Guidelines for Thermal Power Plants dated 1987.

h) The diversion of water for thermal power plants may be restricted from reservoirs and dams which are originally proposed for agriculture and drinking water purposes. Legal policies should be prepared for regulation of abstraction of water for use in thermal power plants.

LIMITATION

As per section 14(3) of National Green Tribunal Act of 2010, the application for adjudication of dispute under this section has to be filed

within a period of six months from the date on which the cause of action for such dispute first arose:

In this case the cause of action has arisen on 07.12.2015 when the notification no. S.O 3305 (E) amending the Environment (Protection) Rules, 1986 with respect to the standards of emission for thermal power plants has been issued by the MoEF & CC.

It is further submitted that the cause of action in the instant matter is continuing as the operations of the thermal power projects are responsible for causing serious environmental damages which are ongoing. Hence the present Application is within the period of limitation as prescribed under section 14 of the Act.

PRAYER

In view of the above facts and circumstances it is most respectfully prayed that this Hon'ble Tribunal may be pleased to:

a) Quash/Suspend the Notification No. S.O 3305 (E) dated 7th December, 2015 passed by the Ministry of Environment, Forests and Climate Change amending the Environment (Protection) Rules, 1986 with respect to the standards of emission for thermal power plants.

b) Direct the Ministry of Environment, Forests and Climate Change to revise the Notification No. S.O 3305 (E) dated 7th December, 2015 in view of the facts stated in the application.

c) Direct the Ministry of Environment, Forests and Climate Change and the Central Pollution Control Board to consider the measures proposed by the applicants and implement the same for prevention, control and abatement of environmental pollution from thermal power plants in view of the facts stated in the application.

d) Pass such order/s as this Hon'ble Tribunal may feel fit and proper in the facts and circumstance of the case.