BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH AT NEW DELHI

O.A. No. 327 of 2022

IN THE MATTER OF:

AMARAVATI FLY ASH BRICKS MANUFACTURERS ASSOCIATION ...APPLICANT(S)

VERSUS

UNION OF INDIA & ORS. ...RESPONDENT(S)

INDEX

Dated: 07.12.2022
Place- New Delhi

Received in Court
7/12/22

Filed by:-

KUMAR RAJESH SINGH
Advocate for MoEF&CC
(Respondent no.1)
53, Lawyers Chamber
Supreme Court of India
New Delhi-110001
Tel-9811013515
Email: av.kumarrajeshsingh@gmail.com

BEFORE THE NATIONAL GREEN TRIBUNAL
AT NEW DELHI
ORIGINAL APPLICATION No. 327 of 2022

IN THE MATTER OF:

AMARAVATI FLY ASH BRICKS MANUFACTURERS ASSOCIATION **...PETITIONER(S)**

VERSUS

UNION OF INDIA & ORS. **...RESPONDENT(S)**

AFFIDAVIT ON BEHALF OF THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, RESPONDENT NO. 1

I, Satyendra Kumar of aged about 44 years, S/o Shri Baliram Prasad Gupta, working as Director at Ministry of Environment, Forest and Climate Change having office at Jor bagh, New Delhi- 110003 do hereby solemnly affirm and state as under:

1. That I, in the capacity of Director at Ministry of Environment, Forest and Climate Change, am fully conversant with the facts of the case and competent to swear this affidavit on behalf of Respondent No 1.

That the contents of the application under reply, unless specifically admitted, are denied to the extent that they are inconsistent with the

NOTARY PUBLIC ★ GOVT. OF INDIA ★ NEERENDRA KUMAR Advocate NOTARY PUBLIC R. No-15708 NCT DELHI

(सत्येन्द्र कुमार)
(SATYENDRA KUMAR)
निदेशक/Director
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
M/o Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

submissions made hereinafter. The annexure accompanying this affidavit is true copy of its original.

3. That, without prejudice to the above and as an alternative submission, the deponent craves liberty to raise further required contentions during the course of the proceedings.

4. That the present affidavit is being filed in continuation to the affidavit filed on 14.11.2022 in compliance with the Hon'ble Tribunal vide Order dated 25.08.2022 in the matter 'Amaravati Fly Ash Bricks Manufacturers Association vs Union of India & Ors' directed the MoEF&CC regarding compliance with the directions given by the Hon'ble Tribunal vide Order dated 18.01.2022 in the matter "Ashwani Kumar Dubey vs Union of India & Ors".

5. That the meeting of Fly Ash Management and Utilization Mission was held on 24.11.2022. The proceedings of the meeting of the Mission dated 24.11.2022 are annexed at **Annexure-R1**.

6. That the status of action plans submitted by various industries in Singrauli and Sonbhadra Districts for implementing the recommendations made by Joint Committee has been reviewed. All the industries and coal mines except M/s Lanco Anpara Power Ltd. (Anpara C Power Station) have

NOTARY PUBLIC SATYENDRA KUMAR Advocate NOTARY PUBLIC R. No-19708 NCT DELHI GOVT. OF INDIA

(सत्येन्द्र कुमार)
(SATYENDRA KUMAR)
निदेशक/Director
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
M/o Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

submitted the action plans. Action plans submitted by the stakeholders is annexed as **Annexure-R2.**

7. That a Secretariat in CPCB is being established for coordination, monitoring and supervision of the actions emanating from the deliberations and decisions of the Fly Ash Supervision and Utilization Mission.

8. That all the industries and mines have been mandated to scrupulously implement the action plans and recommendations of the Joint Committee. State Governments have been mandated to monitor the action plans as per the specific recommendations contained in the action plan.

9. That M/s Lanco Anpara Power Ltd. has been mandated to submit the action plan based on the recommendations in the Para 15 of Hon'ble NGT's Order dated 18.01.2022 immediately.

10. That the CPCB and CEA have been mandated to scrutinize the action plans submitted by the respective stakeholders to ensure that the action plans have been as per the recommendations of the Joint Committee.

11. That the Respondent Ministry has published the Notification on Utilization of ash from coal and lignite based thermal power plants vide S.O. 5481(E) dated 31.12.2021. This notification supersedes the Fly ash

NOTARY PUBLIC GOVT. OF INDIA

(सत्येन्द्र कुमार)
(SATYENDRA KUMAR)
निदेशक/Director
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
M/o Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

notification, 1999 S.O. 5481(E) dated 31.12.2021 and the subsequent amendments thereof. Copy of the Notification is annexed herewith and marked as **Annexure R3**.

12. That the in order to ensure 100% utilization ash by lignite and coal based thermal power plants, effective monitoring and supervision of provisions of Ash Utilization Notification dated 31.12.2021, the respective stakeholders have been mandated to comply with the various activities under the notification in a time bound manner. CPCB has been mandated to coordinate with various regulatory/ statutory agencies in this regard.

13. That the concerned District Magistrates of Singrauli and Sonbhadra have been mandated to submit action plans immediately for effective prevention, control and abatement of pollution from stone crushers located at their respective districts. The respective District Magistrates have been mandated to scrupulously implement the action plans in a time bound manner.

14. That the Secretariat at CPCB has been mandated to upload the action plans and the progress of the action plans on the web portal of CPCB by 5th of next month, the link of which may be placed on MoEFCC as well as the concerned State Government's websites. CPCB has been mandated to

(सत्येन्द्र कुमार)
(SATYENDRA KUMAR)
निदेशक/Director
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
M/o Environment, Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

put in place an IT based tool for updating the progress in regard to the implementation of action plans by respective stakeholders as well as mapping of stakeholders for implementation of Ash Utilisation Notification, 2021.

15. That the concerned State Governments have been mandated to take all measures for the prevention, control and abatement of the industrial pollution in Sonbhadra and Singrauli districts to bring down the pollution levels in respective districts.

16. That all the industrial, coal and other mining activities as well as the stone quarrying and crushing in the districts of Sonbhadra and Singrauli have been mandated to be carried out in compliance with the Air (Prevention and Control of Pollution) Act, 1981, Water (Prevention and Control of Pollution) Act, 1974, and Environment (Protection) Act, 1986.

17. That the respective State Governments have been mandated to carry out regular inspections and audits as mandated under the Air (Prevention and Control of Pollution) Act, 1981, Water (Prevention and Control of Pollution) Act, 1974, and Environment (Protection) Act, 1986.

18. That the respective State Government have been mandated to receive Voluntary Fund Contribution out of the CSR funds from companies in

(सत्येन्द्र कुमार)
(SATYENDRA KUMAR)
निदेशक/Director
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
M/o Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

respective districts. The concerned State Governments have been mandated to create a separate account to receive voluntary contributions and funds for environment restoration and relief. The concerned State Governments have been mandated to take measures for restoration of environment and provide relief to victims of damage in a manner as may be found appropriate from these funds.

19. That the concerned State Governments have been given the mandate to arrange for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries.

20. That the CPCB in consultation with Central Electricity Authority has prepared the Draft Guidelines on Design, Construction, O&M and Annual Certification of Coal Ash Ponds in line with the provisions of Para A(6) of Ash Utilisation Notification, 2021. A copy of the draft guidelines is annexed herewith and marked as **Annexure R4.**

21. That it is humbly submitted that the concerned State Governments, Central Pollution Control Board, State Pollution Control Boards, District Magistrates, industries and stakeholders have been mandated to implement the directions passed by the Hon'ble Tribunal vide dated 18.01.2022 and provisions of Ash Utilisation Notification, 2021 for

NOTARY PUBLIC GOVT. OF INDIA NOTARY PUBLIC R. No-19/08 NCT DELHI

(सत्येन्द्र कुमार)
(SATYENDRA KUMAR)
निदेशक/Director
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
M/o Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

control of industrial pollution in general as well as Singrauli and Sonbhadra Districts.

22. It is respectfully submitted that in view of the above mentioned facts and circumstances, the Hon'ble Tribunal may pass such order as may deem fit and proper in the facts and circumstances of the case.

DEPONENT
(SATYENDRA KUMAR)
निदेशक/Director
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
M/o Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

VERIFICATON

7 DEC 2022

Verified at _____on this day of ___December, 2022 that the contents of the above affidavit are true and correct to my knowledge and as per official records maintained in the routine course of business. No part of the above affidavit is false and nothing material has been concealed there from.

I Identified the deponent who has signed in my presence

NOTARY PUBLIC
GOVT. OF INDIA

CERTIFIED THAT DEPONENT
Sh./Ms.................. Age.............
S/o, W/o, D/o ....
R/o..................
Identified by .... Delhi
has solemnly .... the
On.........
contents of .... correct to
& explained ....
his/her knowledge
NITENDRA KUMAR, NOTARY PUBLIC
Govt. of India, DELHI

DEPONENT
(SATYENDRA KUMAR)
निदेशक/Director
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
M/o Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

8 Annexure-R1

Minute of the meeting of Fly Ash Management and Utilization Mission held on 24.11.2022 at 15:00 hrs on

A virtual meeting on 'Ash Management and Utilization Mission', in respect to Hon'ble NGT's Order dated 18.01.2022 in the matter related to the issues of industrial pollution in Singrauli and Sonbhdara region of M.P. and U.P. respectively, was convened on 24th November, 2022 at 15:00 hrs. The list of participants is annexed at **Annexure I**.

During the meeting, following deliberations took place:

1. It was informed that the issues of pollution caused by TPPs and other industries, stone crushers, transportation and coal mining located in Singrauli district of M.P. and Sonbhadra district of U.P. have been raised under various cases to Hon'ble NGT on several instances.
2. It was shared that a team of MoEF&CC officials, Chairman, CPCB and representatives of NTPC visited Singrauli region of M.P.
3. Thereafter, MoEF&CC in its brief presentation **(Annexure II)**, summarised the pollution related issues in both the regions, compliance directions given by the Hon'ble NGT and term of references of the Mission. It also reflected the present status of implementation of given directions based on the available compliance report from various stakeholders. The salient points of the presentation are as under:

a. The Hon'ble NGT order vide dated 18.01.2022 has emphasized 18 stakeholders from of both the regions to implement the recommendations of Joint Committee and prepare the action plan and implement it in a time bound manner.

b. In compliance with one of the direction of Hon'ble NGT in respect to formulation of general road map regarding utilization and management of ash generated by thermal power plants in these two regions as well as across the country, MoEF&CC has already issued a notification on ash utilization that mandates 100% utilization of ash and various other provisions that may lead to effective management of ash in scientific manner.

c. The action points that emanates from the ash utilization notification dated 31.12.2021 are being taken into consideration and would be by expedited by concerned enforcement agency/ departments.

4. It was shared that the formulation of guidelines for technical specifications of ash ponds or dykes and procedure for annual certification of the ash pond or dyke has been initiated by Central Pollution Control Board as mandated under Para A (6) of ash utilization notification dated 31.12.2021.

5. CMD, NCL informed that for the purpose of mixing at least 25 per cent of ash on weight to weight basis of the materials used for external dump of overburden, backfilling or stowing of mine, low stripping ratio mines may be put on trial as there is possibility of mixing of ash with overburden in mine voids.

After deliberations, following decisions were made:

1. Secretariat to be established in CPCB for coordination, monitoring and supervision of the actions emanating from the deliberations and decisions of the Fly Ash Supervision and Utilization Mission. **(Action: CPCB)**

2. For effective prevention, control and abatement of industrial pollution in Singrauli and Sonbhadra districts, the actions plans prepared based on the recommendations of the Joint Committee, mentioned out in Para 15 of the Hon'ble NGT's Order dated 18.01.2022, to be scrupulously implemented in a time-bound manner as per the action plans at **Annexure III (Action: CPCB, State Govts of UP and MP, M/s NTPC Limited (Singrauli) Shakti Nagar Sonbhadra, M/s NTPC Rihand Super Thermal Power, M/s NTPC Limited Vindhyachal Super Thermal Power Plant, M/s Anpara Thermal Power Plant, M/s Obra Thermal Power Station, M/s NCL Bina Project, Bina, Sonbhadra, M/s NCL Dudhichuwa Project, Sonbhadra, M/s NCL Kakri Project, Sonbhadra, M/s NCL Khadia Project, Sonbhadra, M/s NCL Krishna Shila Project, M/s Renusagar Thermal Power Plant, Aluminum Smelter: M/s HINDALCO Industries Ltd, Renukoot, M/s Grasim Industries Limited Chemical Division, Renukoot, M/s M.P. Power Generating Co. Ltd. (MPPGCL), M/s Birla Carbon India Pvt. Ltd., Sonbhadra)**

3. CPCB and CEA to scrutinize the action plans submitted by the respective stakeholders as per Point No. 2 above to ensure that the action points have been prepared as per the recommendations of the Joint Committee as mentioned out in Para 15 of the Hon'ble NGT's Order dated 18.01.2022. CPCB to ensure that all the activities are covered and must have specific timelines **(Action: CPCB, CEA)**

4. In order to ensure 100% utilization of ash by lignite and coal based thermal power plants, effective monitoring and supervision of provisions of Ash Utilization Notification dated 31.12.2021 **(Annexure IV)** have to be scrupulously complied with. Respective stakeholders have been mapped in respect of the various activities mandated under the notification. CPCB to coordinate with all the regulatory/enforcing agencies and ensure the compliance of all the activities in a time bound and on a regular basis **(Action: CPCB, CEA, All State Govts, All stakeholders as per Annexure IV)**

5. Concerned District Magistrates of Singrauli and Sonbhadra to submit action plans immediately for effective prevention, control and abatement of pollution from stone crushers located at their respective districts. Further, the action plans submitted must be scrupulously implemented in a time bound manner. **(Action: State Govts of U.P. and M.P., District Magistrates – Sonbhara and Singrauli)**

6. M/s Anpara 'C' Lanco to submit action plans based on the recommendations in para 15 of the Hon'ble NGT's Order dated 18.01.2022 immediately. **(Action: M/s Anpara 'C' Lanco, State Govt of UP)**

7. Secretariat at CPCB to upload the action plans and the progress of the action plans on the web portal of CPCB by 5th of next month, the link of which may be placed on MoEFCC as well as the concerned State Government's and other stakeholders' websites. CPCB to put in place an IT based tool for updating the progress in regard to the implementation of action plans by respective stakeholders as well as in regard to the activities as per Point 4 above. **(Action: CPCB, State Govts of UP and MP, All stakeholders)**

8. Concerned State Governments, the State Environment Departments and concerned SPCBs to take all measures for the prevention, control and

abatement of the industrial pollution in Sonbhadra and Singrauli districts to bring down the pollution levels in these districts. The compliance of the conditions of CTOs as well as ECs in respect of all the industries, including the installation and functioning of all pollution control as well as monitoring devices, must be strictly complied with by all industrial/mining/ quarrying units. These compliances to be reported to CPCB on a monthly basis through a web portal that reflects the obligations and compliances as per CTO as well as EC in respect of all units **(Action: State Governments of U.P. and M.P.)**

9. All the industrial, coal and other mining activities as well as the stone quarrying and crushing in the districts of Sonbhadra and Singrauli must be carried out in compliance with the Air Act, Water Act and EP Act. Regular inspections and audits to be carried out by the concerned SPCBs **(Action: State Governments of U.P. and M.P.)**

10. The respective State Government to receive voluntary fund contributions out of the CSR funds from companies in respective districts. Concerned State Government to create a separate account to receive voluntary contributions and funds for environment restoration and relief. Concerned State Government to take measures for restoration of environment and provide relief to victims of damage in a manner as may be found appropriate from these funds. **(Action: State Governments of U.P. and M.P.)**

11. Concerned State Governments to arrange for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries. **(Action: State Governments of U.P. and M.P.)**

Annexure I

List of Participants

1) Ms. Leena Nandan, Secretary, EFCC
2) Shri. Alok Kumar, Secretary, Power
3) Shri Anandji Prasad, Advisor, MoC
4) Shri. Naresh Pal Gangwar, Additional Secretary, MoEFCC
5) Dr. Satyendra Kumar, Director, MoEFCC
6) Shri N. Subrahmanyam, Scientist D, MoEFCC
7) Shri. Nazimuddin, Scientist F, CPCB
8) Shri MVR Reddy, ED, SSEA, NTPC
9) Managing Director, UPRVUNL
10) Shri Ajay Kumar Sharma, MS, UPPCB
11) Dr. Hemant Kumar Sharma, MPPCB, Jabalpur
12) Shri S C Naik, DGM Operations, NTPC
13) Shri Bhola Singh, CMD, NCL - SINGRAULI
14) Shri R N Shukla, Adani
15) Shri Basuraj Goswami, Executive Director, NTPC
16) Shri Sitesh Barche, NTPC
17) Shri R D Patil, CPCB Lucknow
18) Shri A K Chattopadhyay, NTPC
19) Shri M. Devaraj, Chairman, UPPCL
20) Shri Ravindra Raghuvanshi, Birla Carbon
21) Dr. Bhola Kushwaha, Head, Environment, HPPL
22) Shri V R Shankar, M/s Hindalco
23) Shri Vivek Gupta, Aditya Birla
24) Shri V R Shankar, Aditya Birla
25) Shri. Harish Duhan, GM (Nigahi), NCL
26) M/s Sasan Ultra Mega Power Plant
27) Shri BG Setty, Addl. GM, NTPC
28) General Manager, Jhingurda Project, NCL
29) Chief General Manager, M/s Obra Thermal Power Station
30) Shri Utpal Sarkar, Aditya Birla
31) Regional Officer, Sonbhadra, UPPCB
32) Shri M Devaraj, Chairman, UPPCL
33) Regional Officer, Bhopal, MoEFCC
34) Regional Officer, Singrauli, MPPCB
35) Nodal Officer, Environment, Amhohri Project, NCL
36) Additional Chief Secretary, UP
37) Shri Dinesh Kumar Meena, NTPC
38) Shri V Santosh, NTPC
39) Shri Munish Jain, NTPC
40) Shri S C Naik, NTPC
41) Shri Sanjay Singh, Grasim Corporate
42) Shri Ramesh Babu, NTPC
43) Shri Anshul Chilbule, MPPCB Bhopal

44) Dushichua Project, NCL
45) Shri Alan Antony, Deputy Manager, Environment, Bina Project, NCL
46) Regional Director, CPCB, Bhopal
47) Shri R B Sindhur, SOM, Nigahi
48) Shri Gurdeep Singh, NTPC
49) ATP, Anpara
50) Shri Ravindra Nath Singh, Director (Thermal)
51) Shri Jitendra Yadav
52) Shri Rajiv Kumar, General Manager, NCL Khadia
53) Shri Manohar Kumar, Rosa Power
54) Shri Sunil Kumar Meena, Sc-D, CPCB
55) Additional Chief Secretary, Energy, UP

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Annexure II

Presentation
on
Industrial Pollution in Singrauli and Sonbhadra Districts
&
Effective Utilisation and Management of Fly Ash

HSM Division

Government of India

Ministry of Environment, Forest & Climate Change

24th November, 2022

Industries and Coal Mines in Singrauli and Sonbhadra

Singrauli District:

i. TPPs- 5 (NTPC Vindhyachal, Sasan UMPP, Jaypee Nigrie, Adani Power (MP) Ltd., and Hindalco Industries Ltd.)

ii. Coal Mines- 8 (NCL - Jhingurda, Khadia, Block-B, Jayant, Amlohri, Nigahi, Dudhichua, and Bina)

iii. Stone Crushers

Sonbhadra District:

i. TPPs– 9 (NTPC Singrauli, NTPC Rihand, UPRVUNL Anpara A, B & D TPS, Lanco Anpara C TPS, UPRVUNL Obra TPS, Hindalco Industries Ltd. (Renukoot CPP), Hindalco Industries Ltd. (Renusagar CPP), UltraTech Cement Ltd. (Dalla Cement CPP),Grasim Industries Ltd. (CPP)

ii. Coal Mines – 5 (NCL - Kakri, Krishnashila, Bina Extn., Dudhichua, Khadia)

iii. Aluminium Smelter (Hindalco)

iv. Stone Crushers

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Industrial Pollution in Singrauli and Sonbhadra Districts- Background

- Major issues of industrial pollution-
  - Industrial pollution and ash management related issues
  - Installation of pollution control as well as monitoring devices
  - Discharge of wastewater and ash in Rihand reservoir/water bodies
  - Pollution by stone crushers, coal mining and transportation.
- Joint Committee constituted -2018, report submitted-2019.
- Committee gave recommendations in respect of all industries
- Oversight Committee formed to review implementation
- Further, committees comprising of respective DMs constituted for compliance
- Hon'ble NGT vide Order dated 18.01.2022 directed to constitute Fly Ash Management and Utilization Mission.
- MoEF&CC vide OM dated 09.03.2022 constituted Fly Ash Management and Utilization Mission

Mission -Mandate

- NGT directed the Mission to :-
  - Coordinate and monitor of ash utilization matters as well as all associated industrial pollution issues in Singrauli and Sonbhadra region
  - To take stock of the situation and to prepare action plan in the light of recommendations of Joint Committee in respect of Singrauli and Sonbhadra
  - To prepare general road map and monitoring of scientific ash utilisation and management including legacy ash
  - May review the progress on a monthly basis and may place the quarterly progress on website
  - May require voluntary financial contributions out of CSR funds from companies
  - May get separate account for restoration of environment and relief to victims of damage in a manner as may be found necessary
  - May consider the safeguards in ash utilisation notification dated 21.12.2021
  - May interact with stakeholders, including brick manufacturers for fly ash utilisation
  - May conduct public health and risk impact assessment in areas of operation of TPPs and other generators of ash
  - May consider use of beneficiated coal
  - May consider onsite and offsite crisis management plans with regard to ash ponds and dykes

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Status of Action Plans

Action plans have been submitted by 15 stakeholders:

- M/s NTPC Limited (Singrauli) Shakti Nagar Sonbhadra,
- M/s NTPC Rihand Super Thermal Power,
- M/s NTPC Limited Vindhyachal Super Thermal Power Plant,
- M/s Anpara Thermal Power Plant
- M/s Obra Thermal Power Station
- M/s NCL Bina Project, Bina, Sonbhadra,
- M/s NCL Dudhichuwa Project, Sonbhadra,
- M/s NCL Kakri Project, Sonbhadra,
- M/s NCL Khadia Project, Sonbhadra,
- M/s NCL Krishna Shila Project,
- M/s Renusagar Thermal Power Plant, Aluminum Smelter:
- M/s HINDALCO Industries Ltd, Renukoot,
- M/s Grasim Industries Limited Chemical Division, Renukoot,
- M/s M.P. Power Generating Co. Ltd. (MPPGCL),
- M/s Birla Carbon India Pvt. Ltd., Sonbhadra.

Action plans from namely, M/s Anpara 'C' Lanco Thermal Power Station, and

Action plans w.r.t. Stone Crushers yet to be submitted by concerned DMs.

Terms of Reference - Recommendations

Sl No.	Action	Recommendation
1	Coordinate and monitor ash utilization matters as well as all associated industrial pollution issues in Singrauli and Sonbhadra region	• MPPCB in respect of Singrauli, UPPCB in respect of Sonbhadra to enforce the action plans of industries as well as relating to stone crushers (submitted by DMs) • CPCB to coordinate overall enforcement of all related matters

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Terms of Reference - Recommendations

Sl No.	Action	Recommendation
2	To take stock of the situation and to prepare action plan in the light of recommendations of Joint Committee in respect of Singrauli and Sonbhadra	i.Action plans from the industries specified at Para 15 of NGT w.r.t Joint Committee recommendations received from 15 industries (TPPs, mines, Aluminium Smelters). Action plans yet to be received from:- • M/s Anpara C Lanco Thermal Power Station; • Stone crushers in Singrauli and Sonbhadra region. ii.UP State Pollution Control Board (with respect to M/s Anpara C Lanco Thermal Power Station) and concerned District Magistrates (with respect to stone crushers) have been requested to obtain action plans.

Terms of Reference - Recommendations

SlNo	Action	Recommendation
3	(a) To prepare general road map and monitoring of scientific ash utilisation and management including legacy ash (b) May consider the safeguards in ash utilisation notification dated 21.12.2021 (c) May interact with stakeholders, including brick manufacturers for fly ash utilisation	i. Ash Utilisation notification mandates 100% utilisation of ash ii.Different stakeholders/regulators have been given specific mandate as well as timelines iii.Detailed status is presented later slides iv.Technical specifications of ash ponds shall be as per the guidelines of CPCB made in consultation with CEA v.Guidelines shall lay down a procedure for annual certification of ash pond/dyke on its safety, environmental pollution, mode of disposal, water consumption/conservation in disposal, ash waster recycling and greenbelt, etc. vi.CPCB to prepare guidelines immediately. vii. Implementation Committee has been constituted under Ash Utilisation notification with concerned stakeholders. Fly ash brick manufacturers may be interacted.

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Terms of Reference - Recommendations

Sl No.	Action	Recommendation
4	May review the progress on a monthly basis and may place the quarterly progress on website	CPCB, State Governments of UP and MP, MPPCB and UPPCB to upload the monthly status on website by getting the progress of action plans submitted by industries

Terms of Reference - Recommendations

Sl No.	Action	Recommendation
5	(a) May require voluntary financial contributions out of CSR funds from companies (b) May get separate account for restoration of environment and relief to victims of damage in a manner as may be found necessary (d) May conduct public health and risk impact assessment in areas of operation of TPPs and other generators of ash	i.Respective State Governments may be requested to receive voluntary financial contributions from CSR funds of the companies ii.Concerned State Government may get a separate account created to receive voluntary contributions and funds for environment restoration and relief. iii.Concerned State Governments to arrange for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries

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Terms of Reference - Recommendations

Sl No.	Action	Recommendation
6	May consider use of beneficiated coal	MoEFCC vide notification dated 21.5.2020 removed the mandatory use of beneficiated coal for power plants and mandated to meet the emission norms and 100% ash utilisation as per prescribed timelines.

Terms of Reference - Recommendations

Sl No.	Action	Recommendation
6	May consider onsite and offsite crisis management plans with regard to ash ponds and dykes	i.Concerned DMs to ensure onsite and offsite crisis management plans are in place for ash dykes in respective Districts.

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Provisions of Ash Utilisation Notification and responsibilities of stakeholders

Sl No.	Action	Status	Timeline	Enforcement Agency/Dept.
1	Constitution of Committee for to examine and review and recommend the eco-friendly ways of utilisation of ash, Para A(3)	Completed	-	CPCB
2	100% Utilisation of current ash by TPPs as per timelines, *Para A(4)*	Ongoing	As prescribed	SPCB/PCC
3	Guidelines for procedure for annual certification of the ash pond or dyke on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and greenbelt etc., *Para A(6)*	Ongoing	Immediate	CPCB and CEA
4	Loading, unloading, transport, storage and disposal of ash to be done in an environmentally sound manner by TPPs and all precautions to prevent air and water pollution to be taken, *Para A(7)*	Ongoing	Immediate	CPCB and SPCB/PCC
5	Installation of dedicated silos by TPPs for storage of dry fly ash for at least sixteen hours of ash, *Para A(8)*	Ongoing	Immediate	CPCB and SPCB/PCC
6	TPPs to provide real time data daily regarding the availability of ash by providing the link to CPCB's web portal or mobile phone app, *Para A(9)*	To be started	Immediate	CPCB and SPC/PCC

Sl No.	Action	Status	Timeline	Enforcement Agency/Dept.
7	Mandatory utilisation of ash by government, semi-government and private agencies for construction activities within 300 kms of the TPPs, *Para B(1)*	Ongoing	Immediate	CPCB and SPCB/PCC
8	Backfilling of ash in mine voids or mixing of ash with external overburden dumps under EPR by mines located within 300 km radius of TPPs, *Para B(3)*	Ongoing	Immediate	CPCB, SPCB/PCC, DGMS, IBM
9	Constitution of Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, *Para B(5)*	Completed	-	CPCB
10	Committee to get the updated quarterly reports for identified mines, *Para B(5)*	Ongoing	Immediate	CPCB
11	Filling of low lying areas with ash for approved projects in accordance to the guidelines by CPCB, *Para B(6)*	Ongoing	Immediate	CPCB and SPCB/PCC
12	SPCB to publish the approved low lying sites, location, area and permitted quantity annually on its website, *Para B(6)*	Ongoing	Annual	SPCB/PCC

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Sl No.	Action	Status	Timeline	Enforcement Agency/Dept.
13	CPCB to put the guidelines in place for all types of activities envisaged under the notification, *Para B(7)*	Ongoing	Within one year of publication of notification	CPCB
14	Usage of ash bricks, tiles, sintered ash aggregate or other ash based products by all building construction projects located within a radius of 300 km from the TPP , provided these are made available at prices not higher than the price of alternative products, Para B(8)	Ongoing	Immediate	CPCB and SPCB/PCC
15	Issuance of notice to agencies for mandatory utilization of ash & ash-based products, *Para D(1)*	Ongoing	On-need basis	Owners of TPPs, manufacturers of ash based products
16	Enforcement and monitoring of utilization of ash by TPPs, *Para E(1)*	Ongoing	Quarterly	CPCB, SPCB/PCC and District Magistrate
17	Development of web portal by CPCB for provisions under the notification, *Para E(1)*	Ongoing	Immediate	CPCB
18	TPPs to upload monthly information regarding ash generation and utilization, *Para E(2)(i)*	Ongoing	By 5th of next month	CPCB
19	TPPs to upload annual implementation report providing information about compliance of provisions in the notification, *Para E(2)(i)*	Yet to start	By 30th of April	SPCB/PCC
20	Compilation of annual reports submitted by TPPs by CPCB and CEA, *Para E(2)(i)*	Yet to start	By 31st of May	CPCB, CEA

Sl No.	Action	Status	Timeline	Enforcement Agency/Dept.
21	Constitution of a Committee for monitoring the implementation of the provisions of the notification, Para E(3)	Completed	-	CPCB
22	Meeting of the Committee to review annual implementation reports, Para E(3)	Ongoing	Once in six months	CPCB
23	Committee to hold stakeholder consultation for monitoring of ash utilization , Para E(3)	Ongoing	Once in six months	CPCB
24	Committee to submit six monthly report to MoEFCC, Para E(3)	Ongoing	Once in six months	CPCB
25	Constitution of State Level Committee to resolve disputes between TPPs and users of ash or manufacture of ash based products, Para E(4)	Ongoing	Immediate	CPCB
26	Compliance audit for ash disposal by TPPs and user agencies by auditors authorised by CPCB, Para E(5)	Ongoing	Annual	CPCB, SPCB/PCC
27	Audit report to be submitted to CPCB and concerned SPCB, Para E(5)	Yet to start	By 30th November every year	CPCB and SPCB/PCC
28	Initiation of action against non-compliant TPPs, Para E(5)	Yet to start	Within fifteen days of receipt of audit report	CPCB, SPCB/PCC

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Action Plan based on the recommendation of Joint Committee

Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
1.	M/s NTPC Limited (Singrauli) Shakti Nagar Sonbhadra	Take measures to stop the discharge of ash pond overflow into the Rihand reservoir	Discharge of ash pond overflow has been stopped	. Augmentation of AWRS capacity by installing another pump (2000 m3/hr. capacity).	-	July, 23	MPPCB
		Relocation of the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter	OCEMS is working in NTPC Singrauli	OCEMS at Chimney will be installed along with FGD installation	-	Dec, 26(As per FGD Timeline)	MPPCB
		Installation of third CAAQMS	Installed	-	-	-	MPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Connected	-	-	-	MPPCB
		Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan submitted	-	-	MPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Work of absorber and associated work is in progress. All three Chimneys construction have been completed. Efforts are being made to complete FGD installation.	-	Commissioning by Dec'26(As per FGD Timeline)	MPPCB
		Treatment of the MSW generated from their residential colony	-	Bio-methanation plant has been commissioned. Composting pits with covered shed are being constructed. Non-biodegradable waste (plastic waste) is being sent to registered recycler.	-	October, 23	MPPCB
		Undertake immediate measures to control fugitive emission in ash dyke area	-	Measures for regular water sprinkling have been taken and fugitive emission is under control in the dyke area.	-	-	MPPCB

Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
2.	M/s NTPC Rihand Super Thermal Power (Power Plant)	Connection of CAAQMS to the CPCB/SPCB server	Connected to CPCB/UPPCB server	-	-	-	CPCB/UPPCB
		Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan Submitted	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Civil and mechanical works for installation of FGD are in progress in full swing	-	Dec'26(As per FGD Timeline)	CPCB/UPPCB
3.	M/s NTPC Limited Vindhyachal Super Thermal Power Plant	Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan submitted	-	-	CPCB/UPPCB
		Explore possibilities for the construction of Ash mounds and submission of progress from time to time	NA	NA	NA	NA	CPCB/UPPCB

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Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
4.	M/s Renusagar Thermal Power Plant	Installation of sludge drying beds in the existing ETP	Installation of 02 No. Filter Press (of modern technology sludge drying beds) has been completed (Commissioning started)	Commissioning of the filter expected to be completed by end of November 2022	-	Nov, 2022	CPCB/UPPCB
		Relocation of the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter	For isokinetic sampling, installed new analyzers for Boiler#6 to #10	Connectivity with CPCB server to be provided	-	Connectivity by January, 2023	CPCB/UPPCB
		Submission of time bound action plan to relocate the existing CAAQMS	Relocated the existing 01 No. CAAQMS at lower altitude near Civil Office in March 2022. Data is linked with CPCB/SPCB server.	-	-	-	CPCB/UPPCB
		Completion of installation of another 02 CAAQMS	Installed	-			CPCB/UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Connected	-	-	-	CPCB/UPPCB
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan submitted	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Installation is expected to be completed by December 2023	-	Dec-23	CPCB/UPPCB
		Adoption of scientific approach for disposal of MSW	-	Non-biodegradable waste is being sent to vendors and Biodegradable waste is being converted to compost for in-house utilization	-	-	CPCB/UPPCB
		Undertake corrective measures to control the fugitive emissions from raw material storage and fly ash transportation areas	-	Weste sprinkling arrangements and rain guns are installed. Additional water sprinkinlig system installed	-	-	CPCB/UPPCB
		Submission of explanation for dumping the fly ash in haphazard manner	Ash disposed in haphazard manner has been reclaimed and area has been further cleaned	-	-	-	CPCB/UPPCB
		Undertake immediate action for proper disposal of fly ash					

Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
5.	M/s Northern Coalfields Limited (NCL) (NCL Bina Project, Bina, Sonbhadra)	Submission of time bound action plan for controlling the fire in the coal stock yard	-	Action Plan submitted	-	-	CPCB/UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities	-	A log book is being kept in CCTV Control Room and record fugitive emissions visible in CCTV cameras and corrective action taken on the report.	-	-	CPCB/UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	-	Compliance of fully tarapualin covered trucks is being ensured	-	-	CPCB/UPPCB
		Effective tyre washing facility for transport vehicles		Tendering process for tyre washing facility has been completed and LOA has been issued		Mar-23	CPCB/UPPCB
		Treatment and disposal of MSW generated in the residential colony	-	Proper treatment and disposal of MSW generated in residential colony is ensured.	-	-	CPCB/UPPCB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	-	-	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study	Dec, 23	CPCB/UPPCB
		Take corrective measures so that the site of CAAQMS is open from all directions	-	This being complied. Trees within the close vicinity of CAAQMS have been trimmed to minimize hindrance at the site	-	-	UPPCB

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Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
6.	M/s Northern Coalfields Limited (NCL) (NCL Dudhichuwa Project, Sonbhadra)	Regular operations of ETP	-	Continuous operation of ETP is ensured	-	-	CPCB/UPPCB
		Utilization of the treated effluent to achieve zero discharge	-	Treated Effluent from ETP is used in Water sprinkling, Fire fighting and wahsing of HEMM and zero discharge is maintained.	-	-	CPCB/UPPCB
		Ensure that no treated/untreated effluent will be discharged into the Balia Nalla which finally meets the Rihand reservoir	-	Water from various sources is pumped to ETP. Treated Effluent from ETP is being used in water sprinkling, fire fighting and wahsing of HEMM.	-	-	CPCB/UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities	-	CCTV network is utilized for monitoring of fugitive emissions. In case of appearance of fugitive emissions on CCTV, immediate action is taken.	-	-	CPCB/UPPCB
		Strengthen the vigilance mechanism to identify the default transporters and take stringent action against them	-	Only tarapauline covered trucks are allowed . CCTV has been installed at the exit check post. Security Guards at the check post has been posted at exit point to ensure the strict compliance.	-	-	CPCB/UPPCB
		Effective tire washing facility for transport vehicles	-	Proposal of tyre washing facility at Dudhichua Project is in final stage of completion.	-	May, 2023	CPCB/UPPCB
		Treatment and disposal of MSW generated in the residential colony	-	Wet waste is converted to compost and Dry waste is handled by Singrauli Municipal Corporation.	-	-	CPCB/UPPCB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in an operational mine related to mine backfilling through fly ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec, 2023	CPCB/UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be Started		
7.	M/s Northern Coalfields Limited (NCL) (NCL Kakri Project, Sonbhadra)	Ensure that no treated or untreated effluent will be discharged into the Rihand reservoir through the drain	-	Compliance is being ensured. Nos fixed fog cannon is also in process of being hired.	-	May-23	CPCB/ UPPCB
		Entrapment of seepage in the drain at mine water collection sump	Complied	-	-	-	CPCB/ UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	Complied				CPCB/ UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	-	-	-Monitoring of fugitve emissions inside the mines is being done through CMPDIL each fortnightly, and report is being communicated to UPPCB quarterly. CCTV have been installed only at strategic positions in mines. Monitoring of fugitive emissions throughout the mines through CCTV is not possible.	-	CPCB/ UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May, 2023	UPPCB
		Treatment and disposal of MSW generated in the residential colony	-	The work has been commenced.	-	-	UPPCB
		Submission of time-bound action plan for compliance with theprovision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.		Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.		Dec, 2023	CPCB/ UPPCB
		Open the site of CAAQMS from all the direction	Complied	-	-	-	-

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Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be Started		
8.	M/s Northern Coalfields Limited (NCL) (NCL Khadia Project, Sonbhadra)	Continuous operations of the ETP	Yes	Compliance being ensured	-	-	-
		Ensure that no treated/untreated effluent will be discharged in to the environment	Complied	-	-	-	CPCB/ UPPCB
		Regular operation of the water spraying system for effective control of fugitive dust emissions	-	Complied. Installation of 3 nos. of additional fixed fog cannon in progress	-	May'2023	CPCB/ UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	CCTV cameras installed. Truck without tarpaulin covering not allowed. One register has also been put at the Exit Gates for documenting any such violation and to take action against the security personnel manning the exit gates as well as against the defaulter trucks, if any.	-	-	-	CPCB/ UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May'2023	CPCB/ UPPCB
		Proper treatment and disposal of MSW generated in the residential colony	-	In progress	-	April'2023	CPCB/ UPPCB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec'2023	CPCB/ UPPCB
		Ensure that the site of CAAQMS is open from all the direction	Complied	-	-	-	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be Started		
8.	M/s Northern Coalfields Limited (NCL) (NCL Khadia Project, Sonbhadra)	Continuous operations of the ETP	Yes	Compliance being ensured	-	-	-
		Ensure that no treated/untreated effluent will be discharged in to the environment	Complied	-	-	-	CPCB/ UPPCB
		Regular operation of the water spraying system for effective control of fugitive dust emissions	-	Complied. Installation of 3 nos. of additional fixed fog cannon in progress	-	May'2023	CPCB/ UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	CCTV cameras installed. Truck without tarpaulin covering not allowed. One register has also been put at the Exit Gates for documenting any such violation and to take action against the security personnel manning the exit gates as well as against the defaulter trucks, if any.	-	-	-	CPCB/ UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May'2023	CPCB/ UPPCB
		Proper treatment and disposal of MSW generated in the residential colony	-	In progress	-	April'2023	CPCB/ UPPCB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec'2023	CPCB/ UPPCB
		Ensure that the site of CAAQMS is open from all the direction	Complied	-	-	-	CPCB/ UPPCB

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Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
9.	**M/s Northern Coalfields Limited (NCL) (NCL Krishna Shila Project)**	Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	62 CCTVs installed at different points in the mine. Monitoring of fugitive emissions is being done regularly from field and GM office.	-	-	-	CPCB/ UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	The Transportation agencies have been instructed. Strict action are being taken against the uncovered trucks if found.	-	-	-	CPCB/ UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress. Tyre washing facility to be jointly developed for Bina and Krishnashila projects.	-	31.03. 2023	CPCB/ UPPCB
		Proper treatment and disposal of MSW generated in their residential colony	-	The proposal for proper treatment and disposal of MSW generated in the residential colony is under tendering process.	-	30.06. 2023	CPCB/ UPPCB
		Submission of the time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	-		For utilization of fly ash, NCL had provided one pit of abandoned/closed Gorbi Mine to NTPC-Vindhyachal (VSTPP). MoU between NCL and NTPC-VSTPS has been done on 3rd Jan, 2019. Approx. 30 to 40 Million tons of fly ash will be accommodated in to this mine void. Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.	Dec-23	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
10.	**Aluminum Smelter: M/s HINDALCO Industries Ltd, Renukoot, Sonbhadra**	Take corrective measures to achieve the ZLD	ZLD status achieved. Process Water Recycling Plant (PWRP) has been installed.	-	-	-	UPPCB
		Ensure environment friendly disposal for the huge quantity of bottom ash stored in open inside the plant premises	ZLD status achieved. Process Water Recycling Plant (PWRP) has been installed.	-	-	-	CPCB/ UPPCB
		Proper treatment and disposal of the MSW	-	Collected non-biodegradable waste is segregated for further disposal through re-processors/recyclers. Biodegradable waste is converted into vermicompost for inhouse utilization in our horticultural activities. Procurement of equipment's for segregation of collected waste category wise is in progress. Installation of new machines requisite civil and electrical job is in progress	-	-	CPCB/ UPPCB
		Undertake corrective measures to control the fugitive emission effectively	Dust Extraction & Dust Suppression System is installed at coal discharge point and conveyors. Rain guns in yard periphery used for controlling dust in coal storage area. Stacker mouths discharge are mounted with water sprinklers in all the crushers in coal handling plant area.	-	-	-	CPCB/ UPPCB

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Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
11.	M/s Grasim Industries Limited Chemical Division, Renukoot, Sonbhadra	Submission of the clarification regarding the discharge of chemically contaminated effluent into the drain	Action plan not required. Unit is ZLD. Already installed ETP, RO, MEE and STP and achieved Zero Liquid Discharge since 2017. Intimation to the Board about installation and commissioning of ZLD is done vide our letter No. GIL/ENV/17-18/204 dated 17.11.2017.	-	-	NA	CPCB/ UPPCB
		Ensure environment friendly disposal of all the brine sludge stored in open pit	Fully complied. At present no legacy brine sludge is stored inside the plant premises.	-	-	-	CPCB/ UPPCB
		Completion of the remediation activities in the time bound manner of the area wherein the ash has been dumped	Complied. Process of reclamation has already been successfully completed.	-	-	-	CPCB/ UPPCB
		Preparation and execution of an action plan to shift the mercury bearing brine sludge and the muck contaminated with chlorinated chemicals from the factory premises to the TSDF in consultation with the UPPCB	•Matter sub-judiced before Hon'ble Apex Court. •On the basis of the Report of NEERI, Hon'ble Supreme Court has pleased to grant a stay against the NGT proceeding vide order dated 04.11.2019. In the interest of justice, it would be advisable to keep this issue in abeyance, till issue is disposed of by the Hon'ble Apex Court. Intimation through e-mail dated 14.11.2022 along with and Hard Copy, has been sent to MoEFCC.	-	-	-	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
12.	M.P. Power Generating Co. Ltd. (MPPGCL)	To check the strength of the bunds created around the dykes/low lying areas quarterly and one time especially before the on-set of the monsoon through expert agencies of repute and to submit Action Taken Reports to regional offices of MPPCB, CPCB & MoEF&CC periodically.	Ash dykes are proper & scientifically designed and present status is good for technical soundness, structural strength, stability, safely and is structurally sustainable and safe for adequacy for handling of fly ash generated from TPSs. Advised to monitor the performance of the dyke using geotechnical instrumentation. Report submitted to MPPCB vide no. 2235 dated: 10/12/2019. To comply with NGT order dated: 18/01/2022.	-	-	-	CPCB/ MPPCB
		To obtain prior permission from MPPCB before any disposal of fly ash / bottom ash in the low lying areas and ensure disposal as per the CPCB guideline.	The condition is regularly prescribed by MPPCB during the renewal of Consent to Operate (CTO) every year and same is being complied by the thermal power stations of MPPGCL as and when required. Action plan for fly ash utilization has been submitted	-	—	Timeline for ash utilization 31.03.2023	CPCB/ MPPCB
13.	M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra	Strict vigilance on the area from where the effluent was earlier reaching outside the plant boundary	-	The company has installed ETP & STP for treating effluent and sewage and achieved Zero liquid discharge since 2011.	-	-	CPCB/ UPPCB

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Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
14.	M/s Obra Thermal Power Station (Power Plant)	Undertake action to trap the continuous flow of ash slurry from powerhouse and ash pond overflow water carrying ash into the river Renu	Ash dyke has been raised and there is no overflow of water carrying ash into river Renu. AWRS has been made functional for recycling of ash water.	-	-	-	CPCB/UPPCB
		Restoration of the river bed areas on which a huge deposition of ash is visible in time-bound manner	-	Restoration of river bed area is under progress and 7800 Cum ash has been removed. Remaining quantity shall be done by June-2023.	-	Jun-23	
		Treatment of the industrial effluent, untreated effluent not to be discharged into the river Renu	-	ETP & STP are operational. No effluent is being discharged into river Renu.	-	-	CPCB/UPPCB
		Installation of an effluent collection and conveyance system for ETP & STP	A dedicated sump and sump pump house for all effluent collection has been completed and functional since April-2022.	-	-	-	CPCB/UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Already connected. Data is available on CPCB/SPCB server.	-	-	-	
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan submitted.	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	-	Due to space constraint for installation of wet FGD system, Dry Sorbent injection FGD was approved. Further tendering is under progress.	-	CPCB/UPPCB
		Adoption of scientific approach for treatment and disposal of MSW	-	Door to Door collection of waste is being done and segregated as Dry and Wet waste. Tender for treatment and disposal of MSW will be floated by 5.12.2022.	-	April, 23	CPCB/UPPCB
		Installation of flow meters for measuring amount of ash slurry discharged and water recycled through AWRS	-	Flow meter supplied and installation shall be done by 20.12.2022.	-	Dec., 22	CPCB/UPPCB
		Installation of flow meters for measuring the amount of wastewater treated through the ETP and STP	-	Flow meter supplied and installation shall be done by 20.12.2022.	-	Dec., 22	CPCB/UPPCB
		Fixing the personal responsibility of the officers seating at management level for causing environmental damage.	Responsibility of three officers of Chief Engineer level been fixed and disciplinary proceedings have been initiated.	-	-		CPCB/UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
15.	M/s Anpara Thermal Power Plant (Power Plant)	Installation of flow meters to measure the amount of ash slurry discharged into the ash pond and the amount of water recovered and recycled	-	Flow meter has been installed in Units B & D and their commissioning will be completed by 15.12.2022. Commissioning in Unit A shall be completed by January-2023.	-	Jan-23	UPPCB
		Entrapment of wastewater discharge containing ash into the Rihand reservoir through the drain at power house area	-	Installation of ETP for Anpara A & B is in progress and is likely to be completed by July-2023. Entrapment of waste water discharge is included in the scope of ETP contract.	-	Jul-23	UPPCB/CPCB
		Submission of explanation for not achieving ZLD in ETP & STP		Anpara A & B are more than 25 years old and there was no provision of ETP & STP. STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.	-	-	UPPCB/CPCB
		Submission of a time-bound action plan for achieving ZLD	-	STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.	-	Jul-23	UPPCB/CPCB
		Removal of deposited fly ash on the surface of the Rihand reservoir in time-bound manner	33000 Cum of fly ash deposited on the surface of the reservoir has been removed.	-	-	-	UPPCB/CPCB
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan has been submitted.	-	-	UPPCB/CPCB
		Provision to prevent the surface runoff water from the surrounding area reaching the ash dyke	Raising of the ash dyke done. There is no surface runoff water coming inside the ash dyke (except rain water of Morcha Nala).	-	-	-	
		Installation and commissioning of the FGD system in realization of the revised timeline	-	-	Installation of FGD in Unit D under progress and is likely to be completed by Dec 2023. Retendering was done and the latest bid was rejected as it was 106% higher than the estimate. Next bid will be floated by 30.11.2022.	Dec, 2023	UPPCB

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Thanks

Annexure II

Action Plans based on the recommendations of the Joint Committee

Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
1.	**M/s NTPC Limited (Singrauli) Shakti Nagar Sonbhadra**	Take measures to stop the discharge of ash pond overflow into the Rihand reservoir	Discharge of ash pond overflow has been stopped.	Augmentation of AWRS capacity by installing another pump (2000 m3/hr. capacity).	-	July, 23	MPPCB
		Relocation of the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter	OCEMS is working in NTPC Singrauli.	OCEMS at Chimney will be installed along with FGD installation.	-	Dec, 26(As per FGD Timeline)	MPPCB
		Installation of third CAAQMS	Installed	-	-	-	MPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Connected	-	-	-	MPPCB
		Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan submitted	-	-	MPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Work of absorber and associated work is in progress. All three Chimneys construction have been completed. Efforts are being made to complete FGD installation.	-	Commissioning by Dec'26(As per FGD Timeline)	MPPCB
		Treatment of the MSW generated from their residential colony	-	Bio-methanation plant has been commissioned. Composting pits with covered shed are being constructed. Non-biodegradable waste (plastic waste) is being sent to registered recycler.	-	October, 23	MPPCB
		Undertake immediate measures to control fugitive emission in ash dyke area	-	Measures for regular water sprinkling have been taken and fugitive emission is under control in the dyke area.	-	-	MPPCB

Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
2.	**M/s NTPC Rihand Super Thermal Power (Power Plant)**	Connection of CAAQMS to the CPCB/SPCB server	Connected to CPCB/UPPCB server	-	-	-	CPCB/UPPCB
		Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan Submitted	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Civil and mechanical works for installation of FGD are in progress in full swing	-	Dec'26(As per FGD Timeline)	CPCB/UPPCB
3.	**M/s NTPC Limited Vindhyachal Super Thermal Power Plant**	Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan submitted	-	-	CPCB/UPPCB
		Explore possibilities for the construction of Ash mounds and submission of progress from time to time	NA	NA	NA	NA	CPCB/UPPCB

Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
4.	**M/s Renusagar Thermal Power Plant**	Installation of sludge drying beds in the existing ETP	Installation of 02 No. Filter Press (of modern technology sludge drying beds) has been completed (Commissioning started)	Commissioning of the filter expected to be completed by end of November 2022	-	Nov, 2022	CPCB/UPPCB
		Relocation of the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter	For isokinetic sampling, installed new analyzers for Boiler#6 to #10	Connectivity with CPCB server to be provided	-	Connectivity by January, 2023	CPCB/UPPCB
		Submission of time bound action plan to relocate the existing CAAQMS	Relocated the existing 01 No. CAAQMS at lower altitude near Civil Office in March 2022. Data is linked with CPCB/SPCB server.	-	-	-	CPCB/UPPCB
		Completion of installation of another 02 CAAQMS	Installed	-			CPCB/UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Connected	-	-	-	CPCB/UPPCB
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan submitted	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Installation is expected to be completed by December 2023	-	Dec-23	CPCB/UPPCB
		Adoption of scientific approach for disposal of MSW	-	Non-biodegradable waste is being sent to vendors and Biodegradable waste is being converted to compost for in-house utilization	-	-	CPCB/UPPCB

		Undertake corrective measures to control the fugitive emissions from raw material storage and fly ash transportation areas	-	Waste sprinkling arrangements and rain guns are installed. Additional water sprinkinlig system installed	-	-	CPCB/UPPCB
		Submission of explanation for dumping the fly ash in haphazard manner	Ash disposed in haphazard manner has been reclaimed and area has been further cleaned	-	-	-	CPCB/UPPCB
		Undertake immediate action for proper disposal of fly ash					

Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dep
			Completed	Ongoing	Yet to be started		
5.	M/s Northern Coalfields Limited (NCL) (NCL Bina Project, Bina, Sonbhadra)	Submission of time bound action plan for controlling the fire in the coal stock yard	-	Action Plan submitted	-	-	CPCB/UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities	-	A log book is being kept in CCTV Control Room and record fugitive emissions visible in CCTV cameras and corrective action taken on the report.	-	-	CPCB/UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	-	Compliance of fully tarapualin covered trucks is being ensured	-	-	CPCB/UPPCB
		Effective tyre washing facility for transport vehicles		Tendering process for tyre washing facility has been completed and LOA has been issued		Mar-23	CPCB/UPPCB
		Treatment and disposal of MSW generated in the residential colony	-	Proper treatment and disposal of MSW generated in residential colony is ensured.	-	-	CPCB/UPPCB

		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	-	-	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study	Dec, 23	CPCB/UPPCB
		Take corrective measures so that the site of CAAQMS is open from all directions	-	This being complied. Trees within the close vicinity of CAAQMS have been trimmed to minimize hindrance at the site.	-	-	UPPCB

Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
6.	M/s Northern Coalfields Limited (NCL) (NCL Dudhichuwa Project, Sonbhadra)	Regular operations of ETP	-	Continuous operation of ETP is ensured	-	-	CPCB/ UPPCB
		Utilization of the treated effluent to achieve zero discharge	-	Treated Effluent from ETP is used in Water sprinkling, Fire fighting and wahsing of HEMM and zero discharge is maintained.	-	-	CPCB/ UPPCB
		Ensure that no treated/untreated effluent will be discharged into the Balia Nalla which finally meets the Rihand reservoir	-	Water from various sources is pumped to ETP. Treated Effluent from ETP is being used in water sprinkling, fire fighting and wahsing of HEMM.	-	-	CPCB/ UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities	-	CCTV network is utilized for monitoring of fugitive emissions. In case of appearance of fugitive emissions on CCTV, immediate action is taken.	-	-	CPCB/ UPPCB
		Strengthen the vigilance mechanism to identify the default transporters and take stringent action against them	-	Only tarapauline covered trucks are allowed. CCTV has been installed at the exit check post. Security Guards at the check post has been posted at exit point to ensure the strict compliance.	-	-	CPCB/ UPPCB
		Effective tire washing facility for transport vehicles	-	Proposal of tyre washing facility at Dudhichua Project is in final stage of completion.	-	May, 2023	CPCB/ UPPCB
		Treatment and disposal of MSW generated in the residential colony	-	Wet waste is converted to compost and Dry waste is handled by Singrauli Municipal Corporation.	-	-	CPCB/ UPPCB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in an operational mine related to mine backfilling through fly ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec, 2023	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be Started		
7.	M/s Northern Coalfields Limited (NCL) (NCL Kakri Project, Sonbhadra)	Ensure that no treated or untreated effluent will be discharged into the Rihand reservoir through the drain	-	Compliance is being ensured. Nos fixed fog cannon is also in process of being hired.	-	May-23	CPCB/ UPPCB
		Entrapment of seepage in the drain at mine water collection sump	Complied	-	-	-	CPCB/ UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	Complied				CPCB/ UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	-	-	-Monitoring of fugitive emissions inside the mines is being done through CMPDIL each fortnightly, and report is being communicated to UPPCB quarterly. CCTV have been installed only at strategic positions in mines. Monitoring of fugitive emissions throughout the mines through CCTV is not possible.	-	CPCB/ UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May, 2023	UPPCB
		Treatment and disposal of MSW generated in the residential colony	-	The work has been commenced.	-	-	UPPCB

		Submission of time-bound action plan for compliance with theprovision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.		Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.		Dec, 2023	CPCB/ UPPCB
		Open the site of CAAQMS from all the direction	Complied	-	-	-	-

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be Started		
8.	**M/s Northern Coalfields Limited (NCL) (NCL Khadia Project, Sonbhadra)**	Continuous operations of the ETP	Yes	Compliance being ensured	-	-	-
		Ensure that no treated/untreated effluent will be discharged in to the environment	Complied	-	-	-	CPCB/ UPPCB
		Regular operation of the water spraying system for effective control of fugitive dust emissions	-	Complied. Installation of 3 nos. of additional fixed fog cannon in progress	-	May'2023	CPCB/ UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	CCTV cameras installed. Truck without tarpaulin covering not allowed. One register has also been put at the Exit Gates for documenting any such violation and to take action against the security personnel manning the exit gates as well as against the defaulter trucks, if any.	-	-	-	CPCB/ UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May'2023	CPCB/ UPPCB
		Proper treatment and disposal of MSW generated in the residential colony	-	In progress	-	April'2023	CPCB/ UPPCB

		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec'2023	CPCB/ UPPCB
		Ensure that the site of CAAQMS is open from all the direction	Complied	-	-	-	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
9.	**M/s Northern Coalfields Limited (NCL) (NCL Krishna Shila Project)**	Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	62 CCTVs installed at different points in the mine. Monitoring of fugitive emissions is being done regularly from field and GM office.	-	-	-	CPCB/ UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	The Transportation agencies have been instructed. Strict action are being taken against the uncovered trucks if found.	-	-	-	CPCB/ UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress. Tyre washing facility to be jointly developed for Bina and Krishnashila projects.	-	31.03. 2023	CPCB/ UPPCB
		Proper treatment and disposal of MSW generated in their residential colony	-	The proposal for proper treatment and disposal of MSW generated in the residential colony is under tendering process.	-	30.06. 2023	CPCB/ UPPCB

		Submission of the time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	-		For utilization of fly ash, NCL had provided one pit of abandoned/closed Gorbi Mine to NTPC-Vindhyachal (VSTPP). MoU between NCL and NTPC-VSTPS has been done on 3rd Jan, 2019. Approx. 30 to 40 Million tons of fly ash will be accommodated in to this mine void. Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.	Dec-23	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
10.	**Aluminum Smelter: M/s HINDALCO Industries Ltd, Renukoot, Sonbhadra**	Take corrective measures to achieve the ZLD	ZLD status achieved. Process Water Recycling Plant (PWRP) has been installed.	-	-	-	UPPCB
		Ensure environment friendly disposal for the huge quantity of bottom ash stored in open inside the plant premises	ZLD status achieved. Process Water Recycling Plant (PWRP) has been installed.	-	-	-	CPCB/ UPPCB
		Proper treatment and disposal of the MSW	-	Collected non-biodegradable waste is segregated for further disposal through re-processors/recyclers. Biodegradable waste is converted into vermicompost for inhouse utilization in our horticultural activities. Procurement of equipment's for segregation of collected waste category wise is in progress. Installation of new machines requisite civil and electrical job is in progress	-	-	CPCB/ UPPCB
		Undertake corrective measures to control the fugitive emission effectively	Dust Extraction & Dust Suppression System is installed at coal discharge point and conveyors. Rain guns in yard periphery used for controlling dust in coal storage area. Stacker mouths discharge are mounted with water sprinklers in all the crushers in coal handling plant area.	-	-	-	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
11.	**M/s Grasim Industries Limited Chemical Division, Renukoot, Sonbhadra**	Submission of the clarification regarding the discharge of chemically contaminated effluent into the drain	Action plan not required. Unit is ZLD. Already installed ETP, RO, MEE and STP and achieved Zero Liquid Discharge since 2017. Intimation to the Board about installation and commissioning of ZLD is done vide our letter No. GIL/ENV/17-18/204 dated 17.11.2017.	-	-	NA	CPCB/ UPPCB
		Ensure environment friendly disposal of all the brine sludge stored in open pit	Fully complied. At present no legacy brine sludge is stored inside the plant premises.	-	-	-	CPCB/ UPPCB
		Completion of the remediation activities in the time bound manner of the area wherein the ash has been dumped	Complied. Process of reclamation has already been successfully completed.	-	-	-	CPCB/ UPPCB
		Preparation and execution of an action plan to shift the mercury bearing brine sludge and the muck contaminated with chlorinated chemicals from the factory premises to the TSDF in consultation with the UPPCB	• Matter sub-judiced before Hon'ble Apex Court. • On the basis of the Report of NEERI, Hon'ble Supreme Court has pleased to grant a stay against the NGT proceeding vide order dated 04.11.2019. In the interest of justice, it would be advisable to keep this issue in abeyance, till issue is disposed of by the Hon'ble Apex Court. Intimation through e-mail dated 14.11.2022 along with and Hard Copy, has been sent to MoEFCC.	-	-	-	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
12.	**M.P. Power Generating Co. Ltd. (MPPGCL)**	To check the strength of the bunds created around the dykes/low lying areas quarterly and one time especially before the on-set of the monsoon through expert agencies of repute and to submit Action Taken Reports to regional offices of MPPCB, CPCB & MoEF&CC periodically.	Ash dykes are proper & scientifically designed and present status is good for technical soundness, structural strength, stability, safety and is structurally sustainable and safe for adequacy for handling of fly ash generated from TPSs. Advised to monitor the performance of the dyke using geotechnical instrumentation. Report submitted to MPPCB vide no. 2235 dated: 10/12/2019. To comply with NGT order dated: 18/01/2022.	-	-	-	CPCB/ MPPCB
		To obtain prior permission from MPPCB before any disposal of fly ash / bottom ash in the low lying areas and ensure disposal as per the CPCB guideline.	The condition is regularly prescribed by MPPCB during the renewal of Consent to Operate (CTO) every year and same is being complied by the thermal power stations of MPPGCL as and when required. Action plan for fly ash utilization has been submitted	-	---	Timeline for ash utilization 31.03.2023	CPCB/ MPPCB
13.	**M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra**	Strict vigilance on the area from where the effluent was earlier reaching outside the plant boundary	-	The company has installed ETP & STP for treating effluent and sewage and achieved Zero liquid discharge since 2011.	-	-	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
14.	**M/s Obra Thermal Power Station (Power Plant)**	Undertake action to trap the continuous flow of ash slurry from powerhouse and ash pond overflow water carrying ash into the river Renu	Ash dyke has been raised and there is no overflow of water carrying ash into river Renu. AWRS has been made functional for recycling of ash water.	-	-	-	CPCB/UPPCB
		Restoration of the river bed areas on which a huge deposition of ash is visible in time-bound manner	-	Restoration of river bed area is under progress and 7800 Cum ash has been removed. Remaining quantity shall be done by June-2023.	-	Jun-23	CPCB/UPPCB
		Treatment of the industrial effluent, untreated effluent not to be discharged into the river Renu	-	ETP & STP are operational. No effluent is being discharged into river Renu.	-	-	CPCB/UPPCB
		Installation of an effluent collection and conveyance system for ETP & STP	A dedicated sump and sump pump house for all effluent collection has been completed and functional since April-2022.	-	-	-	CPCB/UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Already connected. Data is available on CPCB/SPCB server.	-	-	-	CPCB/UPPCB
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan submitted.	-	-	CPCB/UPPCB

		Installation and commissioning of the FGD system in realization of the revised timeline	-	-	Due to space constraint for installation of wet FGD system, Dry Sorbent Injection FGD was approved. Further tendering is under progress.	-	CPCB/UPPCB
		Adoption of scientific approach for treatment and disposal of MSW	-	Door to Door collection of waste is being done and segregated as Dry and Wet waste. Tender for treatment and disposal of MSW will be floated by 5.12.2022.	-	April, 23	CPCB/UPPCB
		Installation of flow meters for measuring amount of ash slurry discharged and water recycled through AWRS	-	Flow meter supplied and installation shall be done by 20.12.2022.	-	Dec., 22	CPCB/UPPCB
		Installation of flow meters for measuring the amount of wastewater treated through the ETP and STP	-	Flow meter supplied and installation shall be done by 20.12.2022.	-	Dec., 22	CPCB/UPPCB
		Fixing the personal responsibility of the officers seating at management level for causing environmental damage.	Responsibility of three officers of Chief Engineer level been fixed and disciplinary proceedings have been initiated.	-	-		CPCB/UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
15.	**M/s Anpara Thermal Power Plant (Power Plant)**	Installation of flow meters to measure the amount of ash slurry discharged into the ash pond and the amount of water recovered and recycled	-	Flow meter has been installed in Units B & D and their commissioning will be completed by 15.12.2022. Commissioning in Unit A shall be completed by January-2023.	-	Jan-23	UPPCB
		Entrapment of wastewater discharge containing ash into the Rihand reservoir through the drain at power house area	-	Installation of ETP for Anpara A & B is in progress and is likely to be completed by July-2023. Entrapment of waste water discharge is included in the scope of ETP contract.	-	Jul-23	UPPCB/CPCB
		Submission of explanation for not achieving ZLD in ETP & STP		Anpara A & B are more than 25 years old and there was no provision of ETP & STP. STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.	-	-	UPPCB/CPCB
		Submission of a time-bound action plan for achieving ZLD	-	STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.		Jul-23	UPPCB/CPCB
		Removal of deposited fly ash on the surface of the Rihand reservoir in time-bound manner	33000 Cum of fly ash deposited on the surface of the reservoir has been removed.	-	-	-	UPPCB/CPCB

		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan has been submitted.	-	-	UPPCB/CPCB
		Provision to prevent the surface runoff water from the surrounding area reaching the ash dyke	Raising of the ash dyke done. There is no surface runoff water coming inside the ash dyke (except rain water of Morcha Nala).	-	-	-	
		Installation and commissioning of the FGD system in realization of the revised timeline	-	-	Installation of FGD in Unit D under progress and is likely to be completed by Dec 2023. Retendering was done and the latest bid was rejected as it was 106% higher than the estimate. Next bid will be floated by 30.11.2022.	Dec, 2023	UPPCB

Annexure IV

Sl No.	Action	Status	Timeline	Enforcement Agency/Dept.
1	Constitution of Committee for to examine and review and recommend the eco-friendly ways of utilisation of ash, *Para A(3)*	Completed	-	CPCB
2	100% Utilisation of current ash by thermal power plants as per timelines, *Para A(4)*	Ongoing	As prescribed	SPCB/PCC
3	Guidelines for procedure for annual certification of the ash pond or dyke on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and greenbelt etc., *Para A(6)*	Ongoing	Immediate	CPCB and CEA
4	Loading, unloading, transport, storage and disposal of ash to be done in an environmentally sound manner by thermal power plants and all precautions to prevent air and water pollution to be taken and status to be reported to concerned SPCB/PCC, *Para A(7)*	Ongoing	Immediate	CPCB and SPCB/PCC
5	Installation of dedicated silos by TPPs for storage of dry fly ash for at least sixteen hours of ash based on installed capacity and report to concerned SPCB/PCC, inspection to be done by CPCB/SPCB/PCC from time to time, *Para A(8)*	Ongoing	Immediate	CPCB and SPCB/PCC
6	Thermal power plants to provide real time data daily regarding the availability of ash by providing the link to CPCB's web portal or mobile phone app, *Para A(9)*	To be started	Immediate	CPCB and SPC/PCC
7	Mandatory utilisation of ash by government, semi-government and private agencies for construction activities within 300 kms of the thermal power plants, *Para B(1)*	Ongoing	Immediate	CPCB and SPCB/PCC

8	Backfilling of ash in mine voids or mixing of ash with external overburden dumps under EPR by mines located within 300 km radius of thermal power plants, *Para B(3)*	Ongoing	Immediate	CPCB, SPCB/PCC, DGMS, IBM
9	Constitution of Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, *Para B(5)*	Completed	-	CPCB
10	Committee to get the updated quarterly reports for identified mines, *Para B(5)*	Ongoing	Immediate	CPCB
11	Filling of low lying areas with ash for approved projects with prior permission of SPCB in accordance to the guidelines by CPCB, *Para B(6)*	Ongoing	Immediate	CPCB and SPCB/PCC
12	SPCB/PCC to publish the approved low lying sites, location, area and permitted quantity annually on its website, *Para B(6)*	Ongoing	Annual	SPCB/PCC
13	CPCB to put the guidelines in place for all types of activities envisaged under the notification *Para B(7)*	Ongoing	Within one year of publication of notification	CPCB
14	Usage of ash bricks, tiles, sintered ash aggregate or other ash based products by all building construction projects located within a radius of 300 km from the thermal power plant , provided these are made available at prices not higher than the price of alternative products, *Para B(8)*	Ongoing	Immediate	CPCB and SPCB/PCC
15	Issuance of notice to agencies for mandatory utilization of ash & ash-based products, *Para D(1)*	Ongoing	On-need basis	Owners of TPPs, manufacturers of ash based products
16	Enforcement and monitoring of utilization of ash by TPPs, *Para E(1)*	Ongoing	Quarterly	CPCB, SPCB/PCC and District Magistrate
17	Development of web portal by CPCB for provisions under the notification, *Para E(1)*	Ongoing	Immediate	CPCB

18	Thermal power plants to upload monthly information regarding ash generation and utilisation, *Para E(2)(i)*	Ongoing	By 5th of next month	CPCB
19	Thermal power plants to upload annual implementation report providing information about compliance of provisions in the notification, *Para E(2)(i)*	Yet to start	By 30th of April	SPCB/PCC
20	Compilation of annual reports submitted by thermal power plants by CPCB and CEA, *Para E(2)(i)*	Yet to start	By 31st of May	CPCB, CEA
21	Constitution of a Committee for monitoring the implementation of the provisions of the notification, *Para E(3)*	Completed	-	CPCB
22	Meeting of the Committee to review annual implementation reports, *Para E(3)*	Ongoing	Once in six months	CPCB
23	Committee to hold stakeholder consultation for monitoring of ash utilization , *Para E(3)*	Ongoing	Once in six months	CPCB
24	Committee to submit six monthly report to MoEFCC, *Para E(3)*	Ongoing	Once in six months	CPCB
25	Constitution of State Level Committee to resolve disputes between TPPs and users of ash or manufacture of ash based products, *Para E(4)*	Ongoing	Immediate	CPCB
26	Compliance audit for ash disposal by thermal power plants and user agencies by auditors authorised by CPCB, *Para E(5)*	Ongoing	Annual	CPCB, SPCB/PCC
27	Audit report to be submitted to CPCB and concerned SPCB, *Para E(5)*	Yet to start	By 30th November every year	CPCB and SPCB/PCC
28	Initiation of action against non-compliant thermal power plants, *Para E(5)*	Yet to start	Within fifteen days of receipt of audit report	CPCB, SPCB/PCC

M/s Anpara Thermal Power Plant (Power Plant)

S.No	Recommendation of Joint Committee	Status
1.	Installation of flow meters to measure the amount of ash slurry discharged into the ash pond and the amount of water recovered and recycled	Flow meter has been installed in Units B & D and their commissioning will be completed by 15.12.2022. Commissioning in Unit A shall be completed by January-2023.
2.	Entrapment of wastewater discharge containing ash into the Rihand reservoir through the drain at power house area	Installation of ETP for Anpara A & B is in progress and is likely to be completed by July-2023. Entrapment of waste water discharge is included in the scope of ETP contract.
3.	Submission of explanation for not achieving ZLD in ETP & STP	Anpara A & B are more than 25 years old and there was no provision of ETP & STP. STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.
4.	Submission of a time-bound action plan for achieving ZLD	STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.
5.	Removal of deposited fly ash on the surface of the Rihand reservoir in time-bound manner	33000 Cum of fly ash deposited on the surface of the reservoir has been removed.
6.	Submission of time-bound action plan for 100% fly ash utilization	Action plan has been submitted.
7.	Provision to prevent the surface runoff water from the surrounding area reaching the ash dyke	Raising of the ash dyke done. There is no surface runoff water coming inside the ash dyke (except rain water of Morcha Nala).
8.	Installation and commissioning of the FGD system in realization of the revised timeline	Installation of FGD in Unit D under progress and is likely to be completed by Dec 2023. Due to non-receipt of clearance to L1 bidder regarding award of contract to entities from border sharing countries, the bids for Unit A and B were anulled. Retendering was done and the latest bid was rejected as it was 106% higher than the estimate. Next bid will be floated by 30.11.2022.

9.	Imposition and payment of EC of Rs. 1,36,80,000/- for not complying the condition of ZLD for ETP & STP	Civil Appeal has been filed (4581/2022) against the order of Hon NGT in Hon. Supreme court. Hearing on IA for stay application is scheduled on 17.01.2023

Annexure-1

ANPARA TPS FIVE-YEARS ROAD MAP FOR ASH UTILISATION

Financial Year	Projected Ash Generation (LMT)	Projected Ash utilisation (LMT)						Projected Total Utilisation (LMT)	Projected %age Ash utlisation
		Pond Ash				Fly Ash			
		Road Project	Mines/ Quarry	Low Lying Land	Other Head Adjustment quantity considering dyke safety bottom ash cover & others	Bricks & Tiles Industries	Cement, RMC & Asbestos Industries		
2022-23	51.10	0.00	0.00	0.10		-	1.00	1.10	2.15
2023-24	51.10	3.00	5.00	0.50	0.05	0.05	5.00	13.60	26.61
2024-25	51.10	10.00	15.00	5.00	0.05	0.05	12.25	42.35	82.88
2025-26	51.10	9.00	25.00	5.00	0.10	0.05	13.75	52.90	103.52
2026-27	51.10	8.00	25.00	5.00	0.10	0.05	15.28	53.43	104.56

Note:

1. Land Development:

a. Request letters have been submitted to District Administration for providing the details of low lying area available within vicinity of Anpara TPS for their reclaimation using pond ash in phased manner.

b. Quantity of ash utilization may increase or decrease depending on availability of avenues of low lying area development.

2. Use of ash in NHAI Projects:

a. NHAI has given consent to Anpara TPS for utilization of 10.00 LMT of pond ash to be used in two projects of NHAI i.e. Varanasi–Kolkata & Mau–Gazipur–Saiydraja projects

b. Pond ash requirement is expected to be received in view of expected forthcoming road projects in the vicinity viz. Varanasi–Kolkata & Mau–Gazipur–Saiydraja projects .

3. Use of ash mines filling:

a. Request has been submitted to Northern Coalfields Limited (NCL) for allocation of abandoned mines as well working mines in Uttar Pradesh for back filling with ash and mixing of ash along with OB respectively in line with MoEF & CC notification dated 31.12.2021.

b. Requests have also been made to District Administration for allocation of abandoned stone quarries for back filling with pond ash.

4. Above plan is based on potential avenues identified presently and Ash Utilization may increase /decrease in case of allocation / non allocation of identified avenues in future.

M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra

S.No.	Recommendations of Joint Committee	Status
1.	Strict vigilance on the area from where the effluent was earlier reaching outside the plant boundary	1. The company has installed ETP & STP for treating effluent & sewage respectively and achieved Zero liquid discharge since 2011. 2. Birla Carbon is a global company and follow Global standards on Safety, Health & Environment. Our Global standards provides holistic approach on management of water through reduced use, effective treatment and efficient recycling to ensure Zero Liquid Discharge. 3. Birla Carbon functions responsibly towards environment and don't discharge any effluent outside the plant boundary wall. 4. The company has installed 360 degree camera, in the year 2018, for continuous monitoring of ZLD system. The online feed of the camera reaches to CPCB round the clock. 5. The company has constructed dike wall for arresting any possible leakages around ZLD area in February 2021. 6. Additionally, the company has constructed pit to collect and recycle the water used for floor washing of ZLD area in February 2021. 7. The area between plant boundary wall and ZLD is being cleaned regularly. 8. A path way has been constructed nearby boundary wall for ensuring Zero discharge in June 2021. 8. A Camera has also been installed in the area between plant boundary wall and ZLD for continuous monitoring of the area for Zero Discharge in June, 2021.

ADITYA BIRLA

GRASIM

57

GIL/ENV/22-23/86

Date: -14/11/2022

To,

Mr. N. Subrahmanyam
Scientist D
Ministry of Environment, Forest and Climate Change
Hazardous Substances Management Division,
Indira Paryavaran Bhawan, Vayu Wing, 3rd Floor,
Jor Bagh Road, New Delhi-110003.
Ph. 01120819269
n.subrahmanyam@gov.in
Date : 14.11.2022

Respected sir,

RE: OA No. 164/2018 titled as Ashwani Kumar Dubey v. UOI &Ors. before the Hon'ble NGT, New Delhi (PB) with OA No. 117/ 2014 titled as Shantanu Sharma v. UOI &Ors. and other connected matters – reg.
Subject: Compliance report/Action taken by Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra.

Kindly find under the compliance report with annexures being the action taken by Grasim Industries Limited, Chemical Division, Renukoot, Sonebhadra for your record and perusal.

The above is in compliance to the recommendations made by the committee, for Grasim Industries Limited, in para 15 of the NGT Order dated 18.1.2022 in the matter of Ashwani Kumar Dubey vs UoI,

We are committed for the operationallzation of state of the art effective environment management systems at our unit.

We hope the above compliance and action is in order. In case of any clarification, please allow us to represent ourselves.

A hard copy of the above is being sent to your good office.

Kindly acknowledge receipt.

Thank you

Yours Faithfully,

For M/s Grasim Industries Limited
(Chemical Division, Renukoot)

Grasim Industries Ltd. Chemical Div. Renukoot Renukoot U.P.

(Vikas Maheshwari)
Assistant Vice President -Finance & Commercial

Grasim Industries Limited
Chemical Division Renukoot
P.O. Renukoot - 231 217.
Distt. Sonebhadra (U.P) India

Telephone +91- 5446 - 252044/55/75
Fax +91- 5446 - 252088

Website www.grasim.com
E-mail grasim.renukoot@adityabirla.com
CIN L17124MP1947PLC000410
PAN AAACG4464B

Regd. Office - Birlagram, Nagda - 456331, M.P., India

COMPLIANCE OF THE RECOMMENDATIONS BY THE COMMITTEE -ACTION PLAN AND COMPLIANCE REPORT

RE: OA No. 164/2018 titled as Ashwani Kumar Dubey v. UOI &Ors. before the Hon'ble NGT, New Delhi (PB) with OA No. 117/ 2014 titled as Shantanu Sharma v. UOI &Ors. and other connected matters – reg.

Recommendations of the Committee	Grasim Compliance and Action Plan
The unit should be asked to submit the clarification regarding the discharge of chemically contaminated effluent into the drain. Based on the reply from the unit a suitable environmental compensation can imposed for the said non-compliance.	We would like to humbly submit that the unit is not discharging any effluent outside their premises as the unit is ZLD. • It is pertinent to mention that Industry has already installed ETP, RO, MEE and STP to treat effluent as well as sewage and achieved Zero Liquid Discharge since 2017. • Adoption of ZLD means comprehensive management of wastewater, through reduced use, efficient recycling and treatment to ensure Zero Liquid Discharge. • Intimation to the Board about installation and commissioning of Zero Liquid Discharge system is done vide our letter No. GIL/ENV/17-18/204 dated 17.11.2017, copy of the letter is enclosed as **Annexure -1.** • Unit being committed ZLD Unit, is not at all discharging any effluent outside the premises since inception of its ZLD systems. Mere assumption and suspicion of underground pipeline is just surprising and not at all true. The alleged discharge seen in remote area is not at all attributable to our Unit as there are scores of other units which may be sources of effluent, like Railways, vehicle repairing workshops etc. in and around. • We are committed for the operationalization of state of the art effective environment management systems at our Unit. A total cost of about Rs 15 Crores has been incurred by the unit for continual improvement is ZLD systems. We assure to extend our full support during the PCB inspection visits.
The unit should ensure environment friendly disposal of all the brine sludge stored in open pit. The UPPCB need to initiate a required action so that the said Hazardous Waste can be disposed of in environmentally sound manner.	**Action –Complied** • It is submitted that, legacy brine sludge generated from the Membrane Cell was safely stored in secured landfill inside the premises under the knowledge of authorities. • Said brine sludge has been completely disposed of in environmentally sound manner through authorized TSDF-Kanpur in the month of July'2022 itself and same has also been intimated to the U.P.P.C.B. vide letter dated 01.08.2022. A copy of the intimation letter is attached as **Annexure-2** • Unit is already in contract with M/S Ramky Enviro Engineers Limited and M/S Bharat Oil & Waste Management Ltd. for disposal of brine sludge generated

	from Membrane cell caustic soda plant to common TSDF sites at Kanpur. • **In view of above, it is evident that no action plan is required in this regard.**
The unit should complete the remediation activities in the time bound manner of the area wherein the ash has been dumped.	**Action- Complied** • Process of reclamation has already been successfully completed. • The total land area of Grasim Industries Limited-Chemical Division-Renukoot is 325 acres. Out of this 62% of the area has been developed as Green Belt which is just double the green belt development target of National Forest Policy. • In compliance to the direction given by Member Secretary-UPPCB, vide letter GOOO691/Miyawaki/2021 dated 22.09.2021, Grasim Unit has completed Miyawaki Plantation at its Fly Ash Reclamation site. • The said afforestation covers about 5000 Sq. Mt. area with 15000 trees planted, apart from this additionally 3050 trees have also been planted to attain 100% sustainability. • Intimation to this affect has already been submitted to the PCB authorities vide letter dated 01.08.2022. A copy of intimation letter is attached herewith as **Annexure-3** • **At present Unit is having 100% disposal of flyash being generated through its CPP. A copy of flyash inventory & Annual flyash Compliance Report of the Unit submitted to MoEFC&CC, CPCB & UPPCB is collectively attached as Annexure-4** • **In aforesaid circumstances, the reclamation of fly ash area having completed successfully, under intimation of authorities it is evident that no further action plan is required in this regard.**
The unit can be asked to prepare and execute an action plan to shift the mercury bearing brine sludge and the muck contaminated with chlorinated chemicals from the factory premises to the TSDF in consultation with the UP-state Pollution Control Board.	**Action- Sub-judice- Pending before the Hon'ble Supreme Court** • It is humbly submitted that shifting of capped mercury brine sludge matter is sub-judice before the Hon'ble Supreme Court, in which interalia Central & State Pollution Control Board authorities are also party. The study conducted by NEERI for the capped SLF is already submitted to all concerned regulators. As per NEERI report – **"It was observed that mercury was not leaching from the SLF and also not contaminating the groundwater. In view of this, it was not recommended to decommission the stabilised SLF for shifting the mercury sludge. The report recommended the construction of storm water drainage (leachate collection system) around the SLF and treating this in existing ETP. It was observed that GRCD has installed leachate collection system and the leachate is being treated in the existing ETP. The summarise, the study has revealed that the mercury sludge in SLF is stabilized and there is no considerable evidence for leaching of mercury in SLF.**

	Geologically, the study area is comprised of Precambrian rocks, which is very hard rock and has no permeability" • Hon'ble Supreme Court took into consideration the NEERI Report, where it has opined that from the point of view of environmental perspective, it was not recommended to open the Secure Landfill Resource [SLR] and thus, shifting of Mercury bearing brine sludge would cause environmental hazards and no method has even been informed to the appellant besides queries raised the concerned authorities. • On the basis of the Report of NEERI, Hon'ble Supreme Court has pleased to grant a stay against the NGT proceeding vide order dated 04.11.2019. • **In the interest of justice, it would be advisable to keep this issue in abeyance, till issue is disposed of by the Hon'ble Apex Court.**

Annexure - 2

ADITYA BIRLA
GRASIM

GIL/ENV/17-18/ 204 Date: 17th, November 2017

Central Pollution Control Board,
Parivesh Bhawan,
East Arjun Nagar, Shahadra,
DELHI – 110 032.

Subject: Installation and Commissioning of Zero Liquid Discharge System

Dear Sir,

This is in reference to our e-mail dated 28th August 2017, regarding installation and commissioning of Zero Liquid Discharge System and after two months successfully operation of RO and MEE plant we confirm that our unit is not discharging any treated effluent from Effluent Treatment Plant installed in our premises. All effluent generated in plant are recycling through RO and MEE plant after treatment through ETP and reuse in manufacturing process.

As per the guideline HD camera has been also installed at final discharge point drain of ETP by NEVCO Engineers Private Limited and server connection at your end is in-progress. The photographs of ETP, STP, RO, MEE plant and HD camera at ETP final discharge point enclosed herewith for your reference.

This is for your information and necessary advice if any.

With Regards

(Dr. A.K. Mishra)

Copy to;

The Zonal Officer,
Central Pollution Control Board,
PICUP Bhawan Ground Floor
Gomti Nagar, Lucknow (U.P.)

Uttar Pradesh Pollution Control Board
TC-12/V, Vibhuti Khand,
Gomati Nagar, Lucknow-226 010.

Regional Officer,
Uttar Pradesh Pollution Control Board
H.No. – 152, Uttar Mohal, Near Chandi Hotel
Robertsganj, Sonebhadra (U.P.) – 231216

Grasim Industries Limited
Chemical Division - Renukoot
P.O. Renukoot - 231 217,
Distt. Sonebhadra (U.P.) India

Telephone +91-5446-252044/55/75
Telex +91-5446-252088

website www.grasim.com
E-mail grasimrenukoot@adityabirla.com
CIN L17124UP1947PLC000410
PAN AAACG1464B

62 Annexure - 2

GIL/ENV/2022-23/52

01st August 2022

To,
Regional Officer
U.P. Pollution Control Board
Uttar Mohal, Robertsganj,
Uttar Pradesh 231216

Subject: - Completion of legacy brine sludge disposal to authorized TSDF

Reference – Our letter dtd 11th August 2021 – no. GIL/ENV/2021-22/57

Dear Sir,
In above reference, we wish to inform your good self that the brine sludge generated from Membrane cell plant was stored in secured landfill within premises. We had started disposal of membrane cell plant brine sludge, since Dec 2019, to authorized TSDF at Kanpur, M/S Re Sustainability Limited (Formerly known as Ramky Enviro Engineers Ltd.) & M/S Bharat Oil & Waste Management Ltd.
We wish to inform your good self, that we have now completely disposed membrane cell plant brine sludge to authorised TSDF at Kanpur. Disposal work completed as on date 31st July 2022.
The brine sludge generated on daily basis shall be stored in intermittent storage site (developed as per CPCB guidelines) and regularly disposed to Kanpur TSDF, under contract agreement.
No legacy brine sludge is now stored in our plant premises.
This is for your kind information.

Thanking You,

Yours faithfully,
For Grasim Industries Limited
Chemical Division Renukoot

(S. N. Sastry)
Unit Head and Factory Manager

01/08/2022

क्षेत्रीय कार्यालय
उ० प्र० प्रदूषण नियंत्रण
प० सं०-162 उत्तर मोहाल,
रोबर्ट्सगंज

Encl:

Cc:
Member Secretary UPPCB,
Picup Bhawan B-Block,
4th Floor, Vibhuti Khand,
Gomti Nagar, Lucknow-226010

Grasim Industries Limited
Chemical Division Renukoot
P.O.: Renukoot - 231 217,
Distt.: Sonebhadra (U.P) India

Telephone +91-5446-252044/55/75
Fax +91-5446-252088

Website www.grasim.com
E-mail grasim.renukool@adityabirla.com
CIN L17124MP1947PLC000410
PAN AAACG4464B

Regd. Office - Birlagram, Nagda - 456331, M.P. India

ADITYA BIRLA

GRASIM

Annexure-3

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GIL/ENV/2022-23/51

01st August 2022

To,
Regional Officer
U.P. Pollution Control Board
Uttar Mohal, Robertsganj,
Uttar Pradesh 231216

Subject:- Completion of Miyawaki Model Plantation

Reference – UPPCB Regional office message dtd 02.04.2022, for submitting Miyawaki plantation proposal, approved by DFO Office

Dear Sir,
In above reference, we wish to inform your good self that total land area of Grasim Industries Limited – Chemical Division is 325 hectares. Out of this, 62% of the area is already under green belt.
In compliance to the direction given by MS-UPPCB and UPPCB-RO vide their letter no. G000691/Miyawaki/2021 dtd. 22/09/2021 and messages conveyed by UPPCB-RO time to time, we have completed Miyawaki Model plantation at our Fly Ash reclamation site. The afforestation covers about 5000 sq.M area with 15000 trees planted. Additional 3050 tree have been planted to sustain 100% survival.
This is for your kind information.

Thanking You,

Yours faithfully,
For Grasim Industries Limited
Chemical Division Renukoot

01/08/2022

(S. N. Sastry)
Unit Head and Factory Manager

Encl: E-mail copy of Vendor

Cc:
Member Secretary UPPCB,
Pick up Bhawan B-Block,
4th Floor, Vibhuti Khand,
Gomti Nagar, Lucknow-226010

Grasim Industries Limited
Chemical Division Renukoot
P.O.: Renukoot - 231 217
Distt.: Sonebhadra (U.P.) India

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CIN L17124MP1947PLC000410
PAN AAACG4464B

Regd. Office - Birlagram, Nagda - 456331, M.P., India

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Annexure – 5

Vinay Yadav

From: Navchetna FPO <navchetnafpo@gmail.com>
Sent: 01 August 2022 09:11
To: Bibhu Pandey
Cc: Sandeep Rathore; Vinay Yadav; Lalit Srivastava
Subject: Report- Miyawaki Model of Plantation

Dear Sir,

We the Navchetna would like to inform, that in order of the Miyawaki model of plantation, 15000.00 (fifteen thousand) plants have been planted at given site, for maintaining the proper survival we have planted 3050 plants extra that will cover mortality of plants in future, our one staff and two agri worker have been giving plenty of time to take care and further follow up. We trust to give you a 100% survival rate as promised, kindly refer below table for detail of planted plants.

मियावकी-पौध रोपड़ - स्थल ग्रासिम रेनूकूट सोनभद्र			
Sn	रोपित पौधे	पौधे की संख्या	ऊंचाई
1	नीम	1650	6
2	छितवान	217	6
3	अर्जुन	3560	3
4	कचनार	1870	3
5	अमलतास	2900	3
6	महोगनी	890	3
7	सागौन	364	3
8	बकायन	1978	3
9	करंज	1645	3
10	अगस्त	5	3
11	शीशम	20	3
12	कनेर	1543	3
13	पाकड़	6	3
14	पीपल	10	4
15	मीठी नीम	156	3
16	गुलमोहर	1230	4
17	कुल	18050	

Thanks & Regards
Mukesh Pandey (Saurabh)

Annexure- 4A

ay Yadav

m: Vinay Yadav
t: 12 November 2022 13:03
Sridhara Narasimha Sastry
ject: FW: Ash Compliance Report (for the period 1st April -31 March) FY 2021-22
achments: Fly Ash Utilization FY 2021-22.pdf.pdf

ear Sir,

IP Our Fly Ash Utilization is 100 %

egards

nay

om: Vinay Yadav
ent: 31 May 2022 01:07 PM
o: moefcccoalash@gov.in; 'rocz.lko-mef@nic.in' <rocz.lko-mef@nic.in>; rosonbhadra@uppcb.com; rdlucknow.cpcb@gov.in; ms@uppcb.com; mscb.cpcb@nic.in
c: Sridhara Narasimha Sastry <shridhara.sastry@adityabirla.com>; Sandeep Rathore <sandeep.rathore@adityabirla.com>
ubject: Ash Compliance Report (for the period 1st April -31 March) FY 2021-22

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indly Attention: Integrated Regional Office MoEF&CC, CPCB-Lucknow, MS CPCB-New Delhi, MS UPPCB Lucknow, Regional Officer UPPCB- Sonebhadra

ubject: Submission of Fly Ash Annual implemetation Report for the period of 1st April -31st March FY 2021-22.

ear Sir,

s desired Please find herewith enclosed soft Copy of Fly Ash Annual implemetation Report for the period of 1st April -31 March

Ve hope you will find above in order.

With regards
Dr.Vinay kumar Yadav
enior Manager- Environment

Annexure - Ash Compliance Report (for the period 1st April-31st March) to be submitted on or before 31st May.

Sl. No.	Details	
1	Name of Power Plant	Captive Power Plant (Grasim Industries Ltd. Renukoot)
2	Name of the company	Grasim Industries Limited Power Division Renukoot
3	District	Sonebhadra
4	State	Uttar Pradesh
5	Postal address for communication	Grasim Industries Limited Power Division Renukoot P.O. Renukoot, District-Sonbhadra(U.P.), Sonbhadra, Pin Code: 231217,
6	E-mail:	vinay.y@adityabirla.com, gil-rnq.uhoffice@adityabirla.com
7	Power Plant installed capacity (MW):	50 MW (2 Unit of 25 MW)
8	Plant Load Factor (PLF):	80.48%
9	No. of units generated (MWh):	352512.693
10	Total area under power plant (ha): (including area under ash ponds)	8.35
11	Quantity of coal consumption during reporting period (Metric Tons per Annum):	329058
12	Average ash content in percentage (per cent):	37.27%
13	Quantity of current ash generation during reporting period (Metric Tons per Annum):	122636
	Fly ash (Metric Tons per Annum):	110888
	Bottom ash (Metric Tons per Annum):	11748
14	Capacity of dry fly ash storage silo(s) (Metric Tons) :	500
15	Details of utilisation of current ash generated during reporting period	
(a)	**Total quantity of current ash utilised (MTPA) during reporting period:**	122636
(b)	**Quantity of fly ash utilised (MTPA):**	110888
(i)	Fly ash-based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	500
(ii)	Cement manufacturing:	94257
(iii)	Ready mix concrete:	
(iv)	Ash and Geo-polymer-based construction material:	
(v)	Manufacturing of sintered or cold bonded ash aggregate:	
(vi)	Construction of roads, road and flyover embankment:	
(vii)	Construction of dams:	
(viii)	Filling up of low-lying area:	
(ix)	Filling of mine voids:	
(x)	Use in overburden dumps:	
(xi)	Agriculture:	

(xii)	Construction of shoreline protection structures in coastal districts:	
(xiii)	Export of ash to other countries:	
(xiv)	Others (please specify):	16131.2 (construction and paver block manufacturing)
(c)	**Quantity of bottom ash utilised (MTPA):**	
(i)	Fly ash-based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	
(ii)	Cement manufacturing:	
(iii)	Ready mix concrete:	
(iv)	Ash and Geo-polymer-based construction material:	
(v)	Manufacturing of sintered or cold bonded ash aggregate:	
(vi)	Construction of roads, road and flyover embankment:	
(vii)	Construction of dams:	
(viii)	Filling up of low-lying area:	850
(ix)	Filling of mine voids:	
(x)	Use in overburden dumps:	
(xi)	Agriculture:	
(xii)	Construction of shoreline protection structures in coastal districts; xiii. Export of ash to other countries:	
(xiii)	Export of ash to other countries:	
(xiv)	Others (please specify):	10898 (construction project in premises)
	Total quantity of current ash unutilised (MTPA) during reporting period:	
16	Percentage utilisation of current ash generated during reporting period (per cent):	100%
17	Details of disposal of ash in ash ponds	We do not have any ash pond
(a)	Total quantity of ash disposed in ash pond(s) (Metric Tons) as on 31st March (excluding reporting period):	
(b)	Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons):	
(c)	Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m3):	
(d)	Total number of ash ponds:	
(i)	Active:	
(ii)	Exhausted (yet to be reclaimed):	
(iii)	Reclaimed:	
(e)	total area under ash ponds (ha):	
18	Individual ash pond details *Ash pond-1,2, etc. (please provide below mentioned details separately, if number of ash ponds is more than one)*	We do not have any ash pond
(a)	Status: Under construction or Active or Exhausted or Reclaimed	
(b)	Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY):	

(c)	Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds) (c) area (hectares):	
(d)	dyke height (m):	
(e)	volume (m3):	
(f)	available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons); quantity of ash disposed as on 31st March (Metric Tons):	
(g)	expected life of ash pond (number of years and months):	
(h)	co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates)	
(i)	type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining	
(j)	mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD)	
(k)	Ratio of ash: water in slurry mix (1:):	
(l)	Ash water recycling system (AWRS) installed and functioning: Yes, or No	
(m)	Quantity of wastewater from ash pond discharged into land or water body (m3):	
(n)	Last date when the dyke stability study was conducted and name of the organisation who conducted the study:	
(o)	Last date when the audit was conducted and name of the organization who conducted the audit:	
19	Quantity of legacy ash utilised (MTPA):	NA
(i)	Fly ash-based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	
(ii)	Cement manufacturing:	
(iii)	Ready mix concrete:	
(iv)	Ash and Geo-polymer-based construction material:	
(v)	Manufacturing of sintered or cold bonded ash aggregate:	
(vi)	Construction of roads, road and flyover embankment:	
(vii)	Construction of dams:	
(viii)	Filling up of low-lying area:	
(ix)	Filling of mine voids:	
(x)	Use in overburden dumps:	
(xi)	Agriculture:	
(xii)	Construction of shoreline protection structures in coastal districts; xiii. Export of ash to other countries:	
(xiii)	Export of ash to other countries:	
(xiv)	Others (please specify):	

20	Summary:			
	Details	Quantity generated (MTPA)	Quantity utilised (MTPA) and (per cent)	Balance quantity (MTPA)
	Current ash during reporting period	122636	122636 (100 %)	0
	Legacy ash	NA	NA	NA
	Total	122636	122636	0
21	Any other information:			

22 Signature of Authorised Signatory

Sandeep Rathore

Digitally signed by Sandeep Rathore
Date: 2022.05.31 12:27:28 +05'30'

Sandeep Rathore
AGM -EHS

Annexure 4-B

Grasim Industries Limited : Unit : Renukoot

Total Ash Inventory

Updated on 1-Nov-22

Month	Opening stock (MT)	Total Ash Generation (MT)	Utilization (MT)							Closing Stock (MT)
			Fly Ash Sent to Cement Industries (MT)	Bed Ash Sent to Cement Industries (MT)	Fly Ash Used for Brick Manufacturing (MT)	Bed Ash Used for Brick Manufacturing (MT)	Specify if any other utilization (Paver Tiles) (MT)	Civil Construction (MT)	Ash send to Telgurwa (MT)	
Apr-22	0	10,537.838	7,827.910	453.690	163.080	97.848	-	-	1,995.310	0
May-22	0	8,791.746	6,122.180	450.090	139.860	83.916	-	-	1,995.700	0
Jun-22	0	9,051.314	7,666.300	617.550	122.940	73.764	-	-	570.760	0
Jul-22	0	11,479.168	7,830.120	335.080	172.980	103.788	-	144.000	2,893.200	0
Aug-22	0	9,971.812	7,500.900	152.940	80.820	48.492	-	219.000	1,969.660	0
Sep-22	0	7,775.754	5,894.190	270.470	203.400	122.040	3.514	15.000	1,267.140	0
Oct-22	0	7,822.982	5,970.350	292.750	163.440	98.064	3.088	9.000	1,286.290	0
Nov-22										
Dec-22										
Jan-23										
Feb-23										
Mar-23										
Total		65,430.614	48,811.950	2,572.570	1,046.520	627.912	6.602	387.000	11,978.060	

Total Ash Generation (MT)	65,430.614
Total Utilization (MT)	65,430.614
Percentage Utilization (%)	100.00

U.P

Aluminum Smelter: M/s HINDALCO Industries Ltd, P.O. Renukoot, DISH Sonebhadra (UP).

Compliance status on recommendation of the Committee as per order dated January 18, 2022

SR. No	Recommendations of the Committee	Compliance Status (as on October 2022)
a.	The unit should immediately take corrective measures to achieve the ZLD. In no case, they should discharge treated or untreated effluent/sewage in the surrounding environment.	At Hindalco, Renukoot, we have established ZLD status for our plant process water. For achieving this conditions, we have installed Process Water Recycling Plant (PWRP) through M/s. Ion Exchange in the month of April 2019. All the effluent generated during the process that is being treated and recycled within the plant premises. ZLD for plant has been established and sustaining since November 23, 2021. A copy of communication to this effect given to RO, UPPCB is attached as **Annexure – I** for your kind reference. We have one Sewage Treatment Plant (STP) of 24000 KLD and running efficiently. At present hydraulic load is to the tune of 12000 – 16000 KLD. We treat total quantity of sewages, generated in our colony in this STP. Quality of treated sewage is within the limits prescribed by UPPCB. At present, we are able to recycle treated sewage partially (6331 m3/day) for toilet flushing and gardening. Remaining treated water approx. 5381 m3/day is being discharged. We have started converting all our open nallah domestic drain into a close drainage system through installation of hume piping network. This is being done to isolate the STP from any shock load during rainy season and to ensure consistent quality of treated sewage on 24x7 basis. We have also completed the drain survey, contour mapping and topography study of our colony area through our Project Department Team. A detailed study on identification and separation of the stream which falls into the natural drain has been done for making closed loop of all sewages generated from households. The estimate cost of the project is approx. Rs. 4.8 Crore. We have already placed PO with different agencies for this purpose and the project is under progress. Looking into feasibility at nearby rural areas, we have discussed & communicated to Zilla Paryavaran Samiti, Sonebhadra to suggest & establish utilization of treated sewage water. A copy of letter is attached as **Annexure -II** for your kind reference. We are awaiting positive response from Zilla Paryavaran Samiti. Renukoot Unit is surrounded by natural hilly terrane. Hence, there are no villages in nearby areas. Accordingly, we have very minimal agricultural activities. We have also engaged CSIR – NEERI, Nagpur to conduct a study for sustainable solution towards reduction of domestic water consumption and effective utilization of treated sewage to achieve ZLD.

		The Scope of NEERI'S team is assessed as under: • domestic water supply • consumption pattern • sewage generation from township & manufacturing complex • Characterization of domestic water supply and treated sewage. A Copy of Purchase Order to CSIR – NEERI Nagpur and Scope of work is attached as **Annexure - III** for your kind reference. Looking at the very large size of our colony with high population density, we need expert organization like M/s CSIR - NEERI to study and identify sustainable solutions (Techno-economic consideration and consistent compliance) for reuse of treated sewage. This will help us in taking necessary steps towards achieving 100% recycling of treated sewage as stipulated in the recent Consent to Operate on a sustainable basis. We have already intimated to UPPCB in this regard. **Once we receive report from CSIR-NEERI, we shall prepare action plan with time target based on their recommendation and submit the same to the Board.**
b.	The unit should immediately ensure environment friendly disposal for the huge quantity of bottom ash stored in open inside the plant premises.	We are operating 4 boilers capacity of 450 TPH along with co-generation facility of 84 MW. During the operation, Ash is being generated, that is regularly dispatched to various users in compliance of Fly Ash Notification, 2021. During **FY 22**, approx.**2.28 Lacs MT** total ash is generated which includes bottom ash also. We had dispatched approx. **3.77 Lacs MT** ash to Cement Plants/ NH-2 ring road/In-house utilization and to develop low-lying areas which is **165.26 %** utilization of total generation. In reference to the earlier heap of bottom ash, we have dispatched 2.21 Lacs MT for the development of low-lying areas. In **FY 23 till October'22**, approx. **1.69 Lacs MT** total ash is generated which includes bottom ash also. We had dispatched approx. **3.81 Lacs MT** ash to Cement Plants/ NH-2 ring road project/in-house utilization and low-lying area which is **225.46 %** utilization of total generation. In reference to the heap of bottom ash, we have dispatched **2.66 Lacs MT** for the development of low-lying areas and there remains no heap as on date.

		Thus, total of approx. 4.87 Lacs MT of stored bottom ash has been utilized for developing low-lying areas. Currently, there is no quantity of bottom ash stored inside the plant premises.
c.	UPPCB can initiate stringent action against the unit for storing a huge quantity of bottom ash in open and also impose the appropriate applicable environmental compensation for the same.	We have disposed all bottom ash stored in form of heap and there remain no heap.
d.	The unit should ensure the proper treatment and disposal of the MSW.	At Hindalco Renukoot, we have awarded contract to M/s Clean Enviro, Jodhpur for treatment and disposal of MSW generated at our premises since June 2, 2019. We collect MSW generated from our Colony as well as the market and it is being stored at an earmarked location. The collected non-biodegradable waste is segregated for further disposal through re-processors/recyclers. Biodegradable waste is converted into vermicompost for inhouse utilization in our horticultural activities. However, to further strengthen the MSW management with the latest equipment/ technology, we have awarded an order to M/s Indus for **Rs. 64 Lacs** for supplying of requisite equipment's for segregation of collected waste category wise. A copy of PO is attached as **Annexure-IV** for your kind reference. For installation of new machines requisite civil and electrical job is in progress at identified site. PO has been raised to execute the job earliest at a cost of **Rs. 99 Lacs**. The equipment's have been received at the site. The plant is expected to be fully commissioned by March 2023.
e.	The unit should immediately take corrective measures to control the fugitive emission effectively.	Fugitive emission of dust is being controlled by installation of Dust Extraction & Dust Suppression System installed at coal discharge point and conveyors. We also operate rain guns in yard periphery for controlling dust in coal storage area. Stacker mouths discharge are mounted with water sprinklers in all the crushers in coal handling plant area. Please see attached photographs as **Annexure – V**.

ADITYA BIRLA

HINDALCO

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November 23, 2021

To
The Regional Officer,
U.P. Pollution, Control Board,
H.No. 162, Uttar Mohal
Sonebhadra, U.P

Sub: Achieving Zero Liquid Discharge (ZLD) at Hindalco Renukoot Plant.

Dear Sir,

We write to confirm that the Process Water Recycling Plant (PWRP) installed in April, 2019 in our Renukoot Plant, as per the CTO conditions, has been commissioned. This would enable us to meet our commitment of Zero Liquid Discharge in our Plant.

We are pleased with the outcome particularly given certain technical challenges and delays owing to Covid-19 lockdown and inaccessibility of the experts from M/s. Ion Exchange. After consistent efforts this milestone has been possible in our Renukoot Plant.

Thanking You,

Yours faithfully,
FOR HINDALCO INDUSTRIES LIMITED

(Mukesh Kumar Mittal)
V.P (Environment)

Cc: Member Secretary, UPPCB, Lucknow

HINDALCO INDUSTRIES LIMITED

Renukoot Works
P.O.Renukoot - 231217
Distt. Sonebhadra (U.P.)
Telephone +91 5446 252077-79 / 254791-96
Fax +91 5446 252107 / 252427

REGISTERED OFFICE
Ahura Centre, 1st Floor, B-Wing
Mahakali Caves Road,
Andheri(East), Mumbai 400 030
Telephone +91 22 6691 7000
Fax +91 226691 7001

Website www.hindalco.com
E mail hindalco@adityabirla.com
Corporate Identity No. L27020MH1958PLC011238

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ADITYA BIRLA
HINDALCO

Dated: 03.03.2021

Divisional Forrest Officer/
Secretary,
'Jila Paryavaran Samiti'
Sonbhadra (UP)

Sub: **To look into avenues for utilization of treated water in District Sonbhadra.**

Dear Sir,

This is to bring to your kind notice that we, at Hindalco Industries Limited, P.O. Renukoot, District Sonbhadra are committed to save environment sustainably being a good corporate citizen. At our Renukoot Plant, it is our Policy to treat all our waste water generated during process operations as well as from domestic usages. The treated water is being reused for various purposes such as In-process, Horticulture, Spraying, Gardening etc. In spite of establishing utilization of waste water on sustainable manner, we are exploring further avenues of utilization of waste-treated water of approx. 5000 KL/day for which we don't have storing facility.

We, humbly, request to Jila Paryavaran Samiti to guide us in identifying the scope of utilization of treated water in District Sonbhadra for various purposes. We are ready to expedite all solutions to establish the effective utilization in district with support & guidance of Jila Paryavaran Samiti.

Kindly, provide us an opportunity to present our concern in the meetings of Jila Paryavaran Samiti, Sonbhadra (UP).

We will be highly obliged.

Thanking you,

Yours faithfully,
For Hindalco Industries Limited

03/03/2021

(VIVEK KUMAR)
Head - Legal

cc: District Magistrate/
Chairman,
Jila Paryavaran Samiti, Sonbhadra.

Recieved

76

ADITYA BIRLA
HINDALCO

Dated: 03.03.2021

Divisional Forrest Officer/
Secretary,
'Jila Paryavaran Samiti'
Sonbhadra (UP)

Sub: To look into avenues for utilization of treated water in District Sonbhadra.

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Kindly, provide us an opportunity to present our concern in the meetings of Jila Paryavaran Samiti, Sonbhadra (UP).

We will be highly obliged.

Thanking you,

Yours faithfully,
For Hindalco Industries Limited

03/03/2021

(VIVEK KUMAR)
Head - Legal

cc: District Magistrate/
Chairman,
Jila Paryavaran Samiti, Sonbhadra.

9/3/3

Hindalco Industries Limited
P.O. Renukoot-231217, District. Sonebhadra, Uttar Pradesh, India
T. +91 5446 252077-79/254791-96 | Fax: +91 5446 252107/252427 | E. hindalco@adityabirla.com | W: www.hindalco.com

ADITYA BIRLA
HINDALCO

HINDALCO INDUSTRIES LIMITED
PO- Renukoot, Distt. Sonebhadra(U P)
Phone No.05446-252077/78/79 Fax No.05446-252107 252427
(Regd Off:Ahura Centre,1st Floor,B Wing,Mahakali Caves Road,Andheri(East),Mumbai-400093)
Tel:(91-22) 6691 7000 Email ID: hindalco@adityabirla.com Website: www.hindalco.com

PURCHASE ORDER

Vendor Code : 1075832
M/s CSIR-NATIONAL ENVIORNMENTAL ENGINEERING RESEARCH INST
NHERU MARG
NAGPUR, MAHARASHTRA, India - 440020
Email Id :p_manekar@neeri.res.in,mp_patil@neeri.res.in
Contact Person : pravin prabhakar manekar

PO/PO Rel.No :B89/142120592 **Date** : 06-NOV-2020
Rev. No. : **Date** :
Price Basis :
Transportation arrangement :
Ship to Location : HSR: Hindalco Service Organization
Currency : INR
Hindalco C Person : CHANDAN MANDAL
Email of C Person : chandan.mandal@adityabirla.com

GSTIN No : 27AAATC2716R2ZE
TIN No : Not mentioned **PAN No** : AAATC2716R

REF : Reference to your offer for Develop sustainable solutions for effective Utilization of treated sewage for
Please Supply the following items subject to the terms & conditions mentioned here under and overleaf

SrNo.	Item Code/Desc.	UOM/DATE	Ship Qty	Unit Rate
1	CPS00004271	LOT	1.000	1500000.00
	PROVIDE: CONSULTANCY; TYPE: WATER STUDY; SCOPE: STUDY AND RECOMMENDATION, DETAIL: SUSTAINABLE SOLUTION FOR EFFECTIVE UTILISATION OF TREATED DOMESTIC WASTE WATER FOR ACHIEVING ZLD (ZERO LIQUID DISCHARGE), RESOURCE TYPE: TECHNOLOGY EXPERT			
	Shipment 1	31-JAN-2021		
	Description..	%/Amount	Rate	Amount
	Basic Value			15,00,000.00
	IGST - RKT IGST 018% B2B-Inward	%	18.00	2,70,000.00
			Item Total Value :	17,70,000.00
			Total Purchase Order Value :	17,70,000.00

Value(Words): **Seventeen Lakh Seventy Thousand Only**

Other Terms and Conditions :
Payment Terms:As per Annexure "A" attached

Price Type Terms :Fixed
Supplier Note: plesae refer to our annexure-A for scope of work and other terms & condition.
Billing Address : **Section Head - Account Procurements. Hindalco Industries Ltd,P.O.Renukoot,Distt. Sonbhadra-U.P , Pin 231217**
Shipping address : **Hindalco Industries Ltd,P.O.Renukoot,Distt. Sonbhadra-U.P ,Pin 231217**
A/c Hindalco Industries Ltd., Renukoot.
Please check correctness of TIN, PAN & address as mentioned above.'C' form is now system generated and linked with TIN no.
Hindalco is not responsible for wrong 'C' form generation due to incorrectness of TIN no.
Refer Attachment.

For Hindalco Industries Ltd.

AJAY KUMAR
Asst. Vice President (Purchase)

ECC NO.	:	AAACH1201RXM002	EXCISE REGD.NO.	:	1-Range Renukoot 1/92
DIVISION	:	Mirzapur	COLLECT.	:	Allahabad
CST REGD.NO.	:	RG5006130 dt.08.07.1960	LST REGD NO.	:	RG0001299 dt. 27.06.1960
PAN	:	AAACH1201R/MUMBAI/DC.SPL.RG-53	TIN NO	:	09415100001
CIN No	:	L27020MH1958PLC011238	GSTIN NO		09AAACH1201R1ZL

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ADITYA BIRLA GROUP

Hindalco Industries Limited – Renukoot

Special Commercial Terms PO B89/ 142120592 dt 06.11.2020

ANNEXURE-A

Subject: Study for sustainable solutions for effective Utilization of treated sewage for achieving ZLD.

1. **JOB:**
   Develop/Study sustainable solutions for effective Utilization of treated sewage for achieving ZLD at our works.

2. **Scope of work-**

   You shall depute adequate manpower to carry out following jobs:

   a. Site reconnaissance of HINDALCO Township and manufacturing Complex.
   b. Review of the Plant ETP and water balance and suggest ways and means to utilize treated ETP.
   c. Assessment of domestic water supply, consumption pattern and sewage Generation from township and manufacturing complex.
   d. Review of existing STP.
   e. Characterization of domestic water supply and treated sewage.
   f. Assessment of present practices of reuse/recycle of treated sewage.
   g. Development of sustainable solutions for 100 % utilization of treated Sewage considering the quality of treated sewage.
   h. Preparation and submission of report delineating observations and Recommendations on above mentioned issues.
   i. Technical Support during presentation/discussion with UPPCB on this Aspect.
   j. You will depute 02-03 manpower and spent one week during each visit, subject to maximum 03 visits to carry out aforesaid job. Additional visit for making technical Presentation at UPPCB on need basis.

3. **VALUE OF JOB:**

   a) Hindalco shall pay a sum of Rs 15.0 lakhs.
   b) GST shall be paid extra, on prevailing rates on submission of copy of GST registration no. certificate to claim ITC.
   c) The above price has firm for a contract period and carry no escalation whatsoever.

4. **HINDALCO'S OBLIGATION:**

   a) Hindalco will Provide all data, documents/reports, maps/drawings etc. related to project Work as required.
   b) Hindalco will Provide access to the HINDALCO Township and manufacturing complex during field visits.
   c) Hindalco shall provide Local Transport at project site during the field visits FOC basis.
   d) Hindalco shall provide Boarding & lodging facility at our works. Hindalco shall arrange vehicle for pickup & drop facility from Varanasi Airport to Renukoot and back.
   e) Hindalco shall reimburse To & Fro (Economic air fare or by Train I / II AC) Travelling expenses on submission of proof at actual.
   f) Hindalco shall provide you all PPEs during site visit at Hindalco for your manpower.

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4. **TERMS OF PAYMENT:**

Payment shall be made subject to deduction at source towards Income Tax as may be applicable, against your bill /invoice in duplicate duly certified by our concerned area Head in following manner:

Installment	Amount (Rs.)	Mode	Schedule
1st	Rs. 7.5 Lakhs + GST	Advance payment	To be paid along with work order
2nd	Rs. 7.5 Lakhs + GST	On Submission of DRAFT Final Report for Comments	Three Months from the date of commencement

5. **COMPLETION SCHEDULE:** 03 months from the date of receipt order.

6. **OTHERS TERMS AND CONDITIONS:**

- You shall comply with all statutory obligations in respect of Workman Compensation Act, Payment of Wages Act, Contract Labour (R&A) Act - 1970, and any other Statute/s and responsibilities as may be applicable from time to time.
- You shall be solely responsible for their workmen, who were found to be under influence of illicit drug /liquor during execution of the job at our works, we reserve the right to take strict action including cancellation of contract and /or de-listing of your company.
- You shall comply with all safety rules strictly and shall be wholly responsible for any injury to their workmen and staff member on the workplace and otherwise. Hindalco Industries Ltd will not have any liability whatsoever in this regard.
- You shall ensure that all persons employed by you shall be efficient, skilled and honest and conversant with nature of work.
- You shall be responsible for the conduct and behavior of his employees or any of your employee/workmen is found misbehaving with the Hindalco staff or any of your workmen /employee is found to be under the influence of illicit drug / liquor, we reserve the right to take strict action including cancellation of contract and/ or de-listing of your company.
- You shall not appoint any sub-contractor to carry out any obligations under the contract.
- You shall maintain all registers required under the various Acts & Rules, which may be inspected by the Hindalco as well as appropriate authorities.
- You agree to indemnify and keep Hindalco indemnified against any liability imposed on it due to non-compliance / non-observance of the terms of this contract. In case any liability arises Hindalco shall have right to recover the same from you.

7. **JURISDICTION:**

The contract shall be governed and construed according to the laws of India and only the Court of competent jurisdiction in the district Sonebhadra, Uttar Pradesh.

8. **ARBITRATION:**

If any dispute and/or differences shall at any time arise between HINDALCO and you in relation to any clause (s) or matters herein contained or their respective rights/claims or liabilities hereunder or otherwise in relation to or arising out of this contract, such disputes and/or differences shall be settled mutually through discussions between the Representatives of the parties in the first instance, failing which the same shall be referred to & finally settled by sole arbitrator to be nominated by Hindalco. The Award of the Arbitral Tribunal shall be final and binding on the parties and the provisions of the Arbitration and Conciliation Act, 1996 and the Rules made there under and any statutory modification and reenactment thereof shall be deemed to apply and to be Incorporated in this Contract, Place of Arbitration shall be Renukoot and Arbitration proceedings shall be in English language.

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9. ACCEPTANCE:

Please sign the duplicate copy of this contract in token of your acceptance and return to us.

End of Document

ADITYA BIRLA
HINDALCO.

HINDALCO INDUSTRIES LIMITED
PO:Renukoot, Distt. Sonebhadra(U P)
Phone No.05446-252077/78/79 Fax No.05446-252107 252427
(Regd Off:Ahura Centre,1st Floor,B Wing,Mahakali Caves Road,Andheri(East),Mumbai-400093)
Tel:(91-22) 6691 7000 Email ID: hindalco@adityabirla.com Website: www.hindalco.com

PURCHASE ORDER

Vendor Code : 1070455
M/s INDUS ENGINEERING PROJECTS INDIA PVT LTD
PLOT NO-2 KHSRA NO.28/2 , OPP.
SURENDER PIPE FACTORY,NANGLISA
NAJAFGARH
NEW DELHI, NEW DELHI, India - 110043
Email Id : indusgroupindialtd@gmail.com,orissaindusgroupind
Contact Person : Mr. ASHOK KUMAR SINHA
GSTIN No : 07AAECI7217C1ZV
TIN No : Not mentioned **PAN No** : AAECI7217C

PO/PO Rel.No : B74/142305351/PS1 **Date** : 14-MAY-2022
Rev. No. : **Date** :
Price Basis : FOR Central Stores Renukoot
Transportation arrangement : Supplier
Ship to Location : PS1: RKT Project Stores
Currency : INR
Hindalco C Person : MANOJ SINGH
Email of C Person : manoj.singh@adityabirla.com

REF : As per your ref 000565/22-23 dated 21.04.22 and LOI issued by us HIL/RKT/LOI/2022-23/0423 dated 29.04.22
Please Supply the following items subject to the terms & conditions mentioned here under and overleaf

SrNo.	Item Code/Desc.	UOM/DATE	Ship Qty	Unit Rate
1	MPM10155711 EQUIPMENT PACKAGE, GENERAL; TYPE: EQUIPEMENTS FOR WASTE SEGREGATION; ANNEXURE: HIL/RKT/MSW/2022 OF HINDALCO; APPLICATION: SOLID WASTE MANAGEMENT	LOT	1.000	5671500.00

Note to Supplier ERECTION AND COMMISSIONING INCLUDED

Shipment 1 20-AUG-2022

Description..	%/Amount	Rate	Amount
Basic Value			56,71,500.00
IGST - RKT IGST 018% B2B-Inward	%	18.00	10,20,870.00

Item Total Value : 66,92,370.00
Total Purchase Order Value : 66,92,370.00

Value(Words): Sixty Six Lakh Ninety Two Thousand Three Hundred Seventy Only

Other Terms and Conditions :
Payment Terms:

Insurance By : Supplier
Freight Terms: Freight Paid
Price Type Terms :Fixed
Supplier Note: PAYMENT TERMS: 50% and 18% GST against delivery within 07 days, 40% within 30 days after technical acceptance and balance 10% after installation and submission of PBG. Warranty : 06 months from date of commissioning or 12 months from date of delivery.
Billing Address : Section Head - Account Procurements. Hindalco Industries Ltd,P.O.Renukoot,Distt. Sonbhadra-U.P , Pin 231217
Shipping address : Hindalco Industries Ltd,P.O.Renukoot,Distt. Sonbhadra-U.P ,Pin 231217
A/c Hindalco Industries Ltd., Renukoot.
Please check correctness of TIN, PAN & address as mentioned above.'C' form is now system generated and linked with TIN no.
Hindalco is not responsible for wrong 'C' form generation due to incorrectness of TIN no.
Refer Attachment.

For Hindalco Industries Ltd.

AJAY KUMAR
Vice President (Purchase)

ECC NO.	:	AAACH1201RXM002	EXCISE REGD.NO.	:	1-Range Renukoot 1/92
DIVISION	:	Mirzapur	COLLECT.	:	Allahabad
CST REGD.NO.	:	RG5006130 dt.08.07.1960	LST REGD NO.	:	RG0001299 dt. 27.06.1960
PAN	:	AAACH1201R/MUMBAI/DC.SPL.RG-53	TIN NO	:	09415100001
CIN No	:	L27020MH1958PLC011238	GSTIN NO		09AAACH1201R1ZL

Note:(Specific LD Clause, where ever stipulated in POs shall override this clause): The term 'Shipment' indicates a specific date. However, we will allow -7/+15 Days deviation. In case the deviation is beyond this without our explicit written consent, we reserve the right to Reject the Supply or Cancel the Shipment.

HINDALCO INDUSTRIES LTD

GENERAL TERMS AND CONDITIONS- GOODS (DOMESTIC)

These General Terms & Conditions (GTC) shall apply to this Purchase Order (PO)/Specific Terms and Conditions(STC) to the PO and any Amendment/s thereof (hereinafter referred to as "contract"), unless specific clauses in the PO or the Amendment/s override them.

1.PRICE
The price and the pricing basis mentioned in the PO/ STC is firm and fixed for the entire quantity of Goods mentioned in the PO for supply within the agreed delivery period.

2.PACKING
The Supplier shall follow relevant packing standards and conditions as per applicable laws, rules and regulations for packaging of Goods. The Supplier shall be responsible for any damage to the Goods due to improper packing or improper handling or storage of Goods by Supplier or Supplier's agents or transporters.

3. ACCEPTANCE OF GOODS
Goods shall be accepted only after final quality and quantity check procedures [inspection] carried out by Hindalco, unless Hindalco has waived its right to such inspection in writing. The Supplier agrees that the title to the Goods in conformance to the Specifications shall transfer to Hindalco and shall always remain with Hindalco immediately after delivery of the Goods as per the delivery terms mentioned in the PO. All damages, losses, cost and expenses pertaining to the non-conforming Goods sold and delivered shall be to the Supplier's Account.

4.REJECTIONS
The Supplier shall have the responsibility to take back rejected goods within 15 days of Hindalco's informing of the same, failing which the rejected Goods will be returned at Supplier's risk and cost (including to and fro transportation cost). In case payment (in full or part) has been made by Hindalco, Hindalco at its sole discretion, shall have the option to accept replacement within the period agreed with the Supplier or require the Supplier to reimburse the cost of the Goods. Unless specifically advised by Supplier regarding mode of return of rejection, Hindalco shall be free to choose any means for return of rejected goods.

5.TAXES AND LEVIES
Hindalco agrees to make payment of the applicable Goods and Services Tax (GST) and other levies mentioned in the PO as per the rates prevailing under the applicable laws at the time of dispatch. The Invoice must contain all the relevant statutory information required under GST, wherever applicable.
All consequences and liabilities arising due to non-availability of input tax credit by Hindalco due to any default of Supplier [e.g. error/inability/delay in uploading returns in GST network(GSTN)], shall be to Supplier's account. It is an agreed term of this PO that any claim raised by Hindalco as a result of above shall be settled by the Supplier within thirty (30) days of receiving a written notice, without demur.
E-Way Bills, where applicable will be provided by Hindalco.

6. DISPATCH DOCUMENTS
Invoice/Bills/Challans should contain all relevant information like Vendor Code, PO No., Item Code/s, Unit rate, Quantity, Value etc. including Supplier's GST Identification Number (GSTIN), SSI/MSME Regn. No. etc. Goods replaced (against original supply) should bear Hindalco's dispatch document reference no. (PO or RGP or MSO).

Dispatch documents should consist of the following:
i. Valid GST Invoice
ii. E-Way bill, if applicable
iii. Packing list, if applicable
iv. Test/Inspection Report, if applicable
v. Test Certificate, if applicable
vi. Original consignee copy of LR, in case of supplies by road
vii. Warranty / Guarantee certificates, where applicable

7.COMPLETION PERIOD OF SUPPLY
Time is of essence to this contract. The delivery schedule must strictly be followed. If the Goods are not delivered within the stipulated time and quantity in full, Hindalco reserves the right not to accept the Goods and/or shall pay such charges as mentioned in the PO. Partial dispatches/change in delivery schedules, preponing and bunching of supplies are not allowed, unless requested and authorized in writing by Hindalco.

8.TRANSPORTATION
a. Goods shall be dispatched by the Supplier to Hindalco's designated site as per the mode of transport specified in the PO.
b. Hindalco may request the Supplier to arrange for road transport of Goods belonging to Hindalco through authorized and nominated transporter/s and Hindalco shall reimburse the Supplier, the cost for such transportation upon submission of relevant documentation. If the Supplier or its authorized agent delivers the Goods belonging to Hindalco in damaged condition, then the Supplier shall bear all the losses or damage affecting the Goods or any third party due to negligence on the part of the Supplier, its employees and/or its agents. Supplier shall arrange for transit insurance if specifically agreed in writing with Hindalco.
c. Any statutory penalty/liability imposed by any authority during transportation, inspection including but not limited to deficiency in any license or permission or approval or for any shortfall and failure to comply applicable laws or notification and/or for not maintaining proper records up to date, shall promptly be payable/paid by the Supplier.
d. The Supplier shall comply with the rules and regulations of Motor Vehicle Rules, 1989 and shall ensure that the Vehicle contains requisite documents for transportation of Goods. The Supplier shall also comply with all the safety guidelines from time to time.

9.REPRESENTATION & WARRANTIES
The Supplier represents and warrants to the other that:
a. It is a company/firm/ proprietor duly organized, validly existing and in good standing under the laws of India and is qualified to do business in the locations in which the nature of its business conducted by it makes such qualification necessary and where failure so to qualify would have a material adverse effect on its financial condition, operations, prospects or business.
b. The execution, delivery and performance of this contract and acceptance of the PO has been duly authorized by all necessary corporate or other

organizational action on its part and does not violate or conflict with any law applicable to its respective jurisdiction of incorporation, its organizational documents or any order or judgment or a court or other agency of government applicable to it or its assets; and
c. It has all necessary material governmental and other third party permits, approvals and licenses required in connection with the execution, delivery and performance of the contract, such permits, approvals and licenses are in full force and effect and all conditions thereto have been materially complied with, in each case to the extent required at the time of this representation.

10.INDEMNITY
Subject to the provisions herein, the Supplier agrees to indemnify and keep indemnified Hindalco and its officers, agents, employees, successors and assigns and authorized representatives against any costs, actions, losses, claims for damages owing to actions or omissions attributable to the Supplier(including its authorized agents) arising out of (i) Supplier's non-performance or violation of any of the terms and conditions of this contract (ii) violation of any applicable laws, rules, regulations and Code of Conduct (iii) any loss occasioned to Hindalco due to any discrepancy in information furnished by Supplier (iv) third party claims for infringement of intellectual property rights and (v) death, injury, damage to property.

11.LIABILITY
a. In so far as these conditions do not provide for other liability clauses, a party (non-affected party) shall be liable for material breach or damage directly caused to the other party (affected party) as a result of willful negligence, violation of agreed safety regulations or for any other legal reason, attributable to the non-affected party only.
b. Neither party shall in any event be liable to the other party for any special, indirect, incidental, consequential, exemplary, punitive, tort or strict liability damages of any nature or kind whatsoever, however caused including but not limited to lost profits, loss of production, loss of business, whether or not the possibility of such damages could have been reasonably foreseen and even if advised of the possibility of such damages.
c. To the maximum extent permitted at law, and notwithstanding anything contained in this contract to the contrary, Hindalco's total liability to the Supplier, whether arising in contract, tort, negligence, warranty or otherwise, shall not exceed the value of Goods paid to the Supplier as per the terms of the PO and any amendments thereto.

12.WARRANTY
The Supplier warrants that:-
a. The Supplier shall sell and supply Goods with good title, free and clear of all liens, charges, security, interests claims and encumbrances whatsoever
b. The Supplier shall ensure that the Goods supplied to Hindalco is acquired in legitimate manner, has not procured these Goods from a person based in a country on which economic sanctions have been imposed and shall be responsible for any consequences on non-compliance to the statutes.
c. The Supplier shall deliver as per the delivery schedule agreed in the PO and in case of the Supplier's failure to adhere to such schedule, Hindalco at its sole discretion, may reject goods delivered or reschedule the delivery of Goods or pay price for the Goods after adjusting the loss incurred by Hindalco.
d. The Goods supplied by the Supplier are in strict conformity with the specifications and technical and general data mentioned in the PO and shall be free from any defect arising out of poor design, workmanship, and inferior material. The warranty for the Goods shall be for a period of 12 months from the date of acceptance or 18 months from the date of dispatch, whichever is earlier.
e. Hindalco may have the option of rejection (as mentioned in clauses 3, 4 & 8(b) of this contract) and/or return of defective or non-conforming Goods against replacement of conforming Goods or receipt of all the monies paid to the Supplier. In case no settlement can be reached within thirty (30) days of commencement of such negotiation, Hindalco may procure goods from third party at risk and cost of the Supplier.
f. The Supplier's entity is not owned or controlled by a person named on the SDN List or any similar applicable blacklist, Sanctions maintained by the United States, European Union, United Kingdom or United Nations as amended form time to time.

13.INSPECTION & TESTING
a. Hindalco's authorized representatives shall have the right to witness the necessary inspection and testing of Goods mentioned in the PO.
b. The Supplier shall inform Hindalco in advance about the readiness of the Goods for inspection and testing. Inspection / inspection waiver / approval by Hindalco does not absolve Supplier's responsibility for conformity of the specification as per the terms of PO.

14.COMPLIANCE WITH LAWS
The Supplier shall comply with the applicable laws, rules and regulations whether local, state or centre and any amendments thereof. Hindalco will not be liable for any legal proceeding arising out of any breach or violation of any applicable laws by the Supplier. Supplier will pay for and be solely responsible for obtaining and maintaining his permits, licenses, approvals and documents as may be required for performance of this contract, to enter and remain in compliance with applicable laws (including all relevant laws, regulations, ordinances and rules with respect to bribery and corruption) for rendering the services in connection with this contract. The Supplier shall ensure that the permits, licenses, approvals and documents shall be valid during the entire Term of this contract and its renewal thereof. The Supplier shall abide by Hindalco's Code of Conduct and any other guidelines, instructions or rules, including those relating to safety and hazard while at Hindalco's premises, provided by Hindalco from time to time.

15.BRIBERY AND CORRUPTION
a. The Supplier hereby warrants that it shall not, directly or indirectly, and it has no knowledge that other persons will, directly or indirectly, make any payment, gift or favour or influence directors, employees of Hindalco or any other party or any government officials in a manner contrary to applicable laws or engage in any money laundering, bribery and corruption.
b. Nothing contained herein shall render Hindalco liable to reimburse the Supplier for any such consideration given or promised. The Supplier's breach of any of the obligations contained in this Clause may be considered by Hindalco to be a material breach of this contract and shall entitle Hindalco to terminate this contract with immediate effect and without prejudice to any further right or remedies on the part of Hindalco under this contract or applicable law.

16.INTELLECTUAL PROPERTY RIGHTS
The Supplier warrants that neither the sale, nor the use of the Goods, nor the performance of the obligations under this contract, will infringe any Intellectual Property Rights either of Hindalco or any third party.

17 FORCE MAJEURE
a. If any time during the continuance of the accepted PO, the performance by either party shall be prevented by reasons of any war (whether declared

or not), hostility, acts of the public or enemy, riots, civil commotion, sabotage, Supplier's or Hindalco's, Hindalco Customer's plant breakdown, fire flood, earthquakes, explosion, epidemic, quarantine restriction, government act/ legislation, officially declared or proclaimed strikes or lockout including at mines (but not including slowdown or any other industrial disturbance) or other acts of God (hereinafter referred to as "Force Majeure") then the time for performing those obligations, shall be extended by a period equal to the effect of such Force Majeure, provided notice of happening of such Force Majeure is given by either party to the other within 10 (ten) days from the date of occurrence thereof.
b. If the parties foresee that the effect of a Force Majeure occurrence shall last for more than 30 days, parties shall discuss and define a method to resolve the difficulties arising there from, including all contractual obligations.
c. Neither party shall be considered to be in default or in breach of its obligations under the accepted Purchase order to the extent that performance of such obligations is prevented by any circumstances of Force Majeure which arise after the date of purchase order.

18. DISPUTE RESOLUTION & ARBITRATION
a. If any dispute and/or difference shall at any time arise between Hindalco and the Supplier in relation to any clause (s) or matters herein contained or their respective rights/claims or liabilities hereunder or otherwise in relation to or arising out of PO, such disputes and/or differences shall be settled mutually through discussions between the representatives of the parties in the first instance, the parties shall exert their best effort to find an amicable settlement within 30 days from the date receipt of notice.
b. Failing agreement to the above, either party may forthwith give to the other notice in writing of the existence of such question, dispute or differences, and the same shall be referred to and finally settled by arbitration in accordance with the Indian Arbitration and Conciliation Act, 1996 and Arbitration Rules (the "Rules") as at present in force and as modified from time to time which Rules shall be deemed incorporated into this clause. Such Arbitration proceeding shall be conducted by a sole Arbitrator mutually agreed and appointed by both the parties. Place of Arbitration shall be Mumbai and Arbitration proceedings shall be in English language. The cost of arbitration shall be borne by the losing party.

19.GOVERNING LAWS
If the parties have not agreed otherwise, these contract terms and conditions shall be governed by and construed in accordance with the laws of India without regard to principles of conflicts of laws.

20.INFORMATION SECURITY & CONFIDENTIAL AGREEMENT
All non-public, confidential or proprietary information of the Hindalco, including, but not limited to, specifications, samples, patterns, designs, plans, drawings, documents, data, business operations, pricing, discounts or rebates, disclosed by Hindalco to the Supplier's representatives or agents, whether disclosed orally or disclosed or accessed in written, electronic, or other form or media, and whether or not marked, designated or otherwise identified as "confidential," in connection with the PO is confidential, solely for the use of performing the PO and may not be disclosed or copied unless authorized by Hindalco in writing. Hindalco shall be entitled to injunctive relief for any violation of this Section.

21.TERM AND TERMINATION
a. This Contract expires when performance of all obligations under it are complete; however, the parties' rights and obligations that are intended by their nature to continue beyond the term of the Contract, such as warranties, indemnification, confidentiality and records retention, survive the Contract's expiration or termination.
b. Either party may terminate or suspend its performance of all or any of its obligations under this contract, and at any time, if the other party commits any material breach of the conditions of Contract and fails to rectify the breach within thirty (30) days of such first party's written notice, or where the material breach is not capable of being rectified within thirty (30) days if the breaching party fails to commence reasonable actions to rectify the breach within thirty (30) days of receiving such notice.
c. Notwithstanding any other provision in this Contract, a party may terminate this PO if the other party becomes insolvent or is the subject of insolvency proceedings;

22.NOTICE
Notices under this contract shall be given in writing and must be delivered personally or by registered post/speed post to the registered address of the Company, i.e. Hindalco Industries Limited, Century Bhavan, Dr. Annie Besant Road, Mumbai-400030, Maharashtra, India. Routine correspondence with respect to supplies, specifications, schedules, documents, etc. should be addressed to the signatory of the PO and to contact persons, if any, mentioned in the PO.

23.WAIVER
No waiver by either Party or any breach of the terms or conditions of this Purchase order to be performed by the other Party shall be construed as a waiver of any succeeding breach of the same or any other terms or conditions.

24. SEVERABILITY
Should one of the provisions of these conditions of contract or of any additional stipulations agreed upon be or become invalid, the validity of the remaining part of these conditions shall not be affected thereby. The contracting parties are committed to replace the invalid provision by another equivalent term, in so far as this is possible, with respect to the commercial effect.

25.AMENDMENT
Any amendment to these conditions of contract shall be mutually discussed and agreed in writing between the Parties.

26.INDEPENDENT CONTRACTOR
This Contract is on a 'principal-to-principal' basis and the Supplier or its representatives shall act as an independent entity. Nothing contained in this Contract shall be construed or deemed to create any agency, partnership or employer-employee relationship in any manner whatsoever between the Supplier and Hindalco. The Supplier acknowledges that its performance of this Contract are solely within its own control, subject to the terms and conditions agreed upon and agrees not to hold itself out to be an employee or servant of the Hindalco or any subsidiary or affiliate of Hindalco. The Supplier shall be solely liable to all persons for all the acts or omissions or commission, deeds and things done by the Supplier, its personnel and/or its representatives in the course of performance of obligations specified under this Contract.

27.NO SUBCONTRACTING AND ASSIGNMENT
a. The Supplier shall not subcontract the contract or any part thereof without the prior written approval of Hindalco, which approval shall not be

unreasonably withheld or delayed. Approval to subcontract shall not relieve the Supplier from any of its obligations under the contract, or impose any liability upon Hindalco to a sub-supplier. Any failure to perform by a sub-supplier of the Supplier shall not constitute an event of Force Majeure.
b. This contract is personal to Supplier and Supplier must not assign it, nor any portion of it, without Hindalco's prior written consent. Hindalco is entitled to assign this contract to any group Company or to any other party, associate, subsidiary or other entities that agrees to honor the terms of this contract. This contract binds and benefits the parties and their respective representatives, successors, and permitted assigns.

28.ENTIRETY

In the event of any inconsistency between these conditions of contract and the accepted PO, the terms of such accepted PO shall prevail. This contract constitutes the complete agreement and sets forth the entire understanding and agreement of the parties as to the subject matter of this contract and supersedes all prior discussions and understandings in respect to the subject of this contract, whether written or oral.

Safety Guidelines for Transportation of Hazardous Goods in Schedule I

Schedule I

GENERAL TERMS AND CONDITIONS - GOODS (DOMESTIC)

Safety Guidelines for Transportation of Hazardous Goods

The Supplier / transporter / owner / driver of the carriage carrying hazards goods shall obey all the relevant provisions of Indian Central Motor Vehicle Act, Explosive Act, Petroleum Act and rules made thereunder and as amended from time to time, specifically:

a. Every goods carriage carrying goods of dangerous or hazardous nature to human life shall be fitted with a spark arrester.
b. It shall be responsibility of the consignor / transporter / owner to ensure the following, namely:
i. The goods carriage has a valid registration to carry the said goods
ii. The vehicle is equipped with necessary first-aid, safety equipment and antidotes as may be necessary to contain any accident
iii. That transporter or the owner of the goods carriage has full and adequate information about the dangerous or hazardous goods being transported; and
iv. That the driver of the goods carriage is trained in handling the dangers posed during transport of such good
c. Every consignor/transporter shall supply to the owner/driver of the goods carriage, full, adequate and accurate information i.e. Material Safety Data Sheet (MSDS) & Transport Emergency Card (TREM Card) about the dangerous nature hazardous goods being transported as to enable owner and its driver to tackle any emergency arising out while transporting
d. The consigner / transporter / owner of goods carriage shall ensure that the driver of such carriage is given all the relevant information in writing for transport (MSDS / TREM Card) and satisfy himself that such driver has sufficient understanding of the nature of such good and the nature of the risks involved in the transport of such goods and is capable of taking appropriate action in case of an emergency.
e. The Consigner / transporter / owner of the goods carriage dangerous or hazardous goods shall lay down the route for each trip which the driver shall be bound to take unless directed or permitted otherwise by the Police Authorities. They shall also fix a time table for each trip to the destination and back with reference to the route so laid down.
f. It shall be the duty of the transporter / owner / consigner to ensure that the driver of the goods carriage carrying dangerous or hazardous goods holds a driving license and possess a certificate of having successfully passed a course as mentioned in Central Motor Vehicles Act and Rules.
g. The driver of a goods carriage transporting dangerous or hazardous goods shall ensure that the information given to him in writing is kept in the driver's cabin and is available at all times while the dangerous or hazardous goods to which it relates, are being transported.
h. Supplier shall be responsible for & shall follow the safety rule under the provision of Factory Act 1948 & state specific factory rules and Indian electricity safety rules amended up to date and other statutory safety rules and regulations in force during currency of the contract. Trucks are liable to be checked at Hindalco's premises for safety features like brakes, reverse horns, lights, reverse lights, seat belts, etc., as per statutory requirements.
i. Ensuring Safety and prevention of any accident / incident of the employees of the vendor will be sole responsibility of the Supplier.
j. Charges towards any damage of the Hindalco's goods caused by the trucks will be deducted from the bill after assessment by Hindalco.
k. Supplier's vehicle entering the factory premises must be comprehensively insured.
l. Supplier shall take all safety precaution and provide adequate supervision by competent persons in order to do the job safely and without damage to plant, personal equipment and the environment.
m. The Truck driver must have valid driving license, without which the driver will be restricted entry permission inside Hindalco main gate.
n. Two working head lights, rear lights and rear mirror should be in good working condition. Reverse horn to be made available in I truck. Number plates to be available and Vehicle Registration number to be mentioned legibly in all trucks.
o. All the tyres of the trucks should be in good condition.
p. Trucks should maintain speed limit of 20 KM per hour inside Hindalco's factory premises, beyond which penalty will be imposed per Hindalco's Safety Officer.
q. No overtaking of vehicles shall be permitted inside plant premises.
r. If any truck driver is found in drunken condition by Hindalco representative, the truck shall not be allowed entry inside the factory premises. If found, suitable penalty will be imposed as per Hindalco's Security.

OUR VALUES

INTEGRITY, COMMITMENT, PASSION, SEAMLESSNESS AND SPEED

EXTRACTS FROM OUR POLICIES

To procure goods and services by honest use of sound business principles in an impartial/unbiased & transparent manner and dignity by way of fair competition, ethical and equitable dealings from right source, of desired quality, at right time, at optimal cost & in right quantity. Adopt the State of the Art purchase procedures to reduce internal and external lead times, deliver value for money, for all concerned, to create a strong network of competent and reliable suppliers. Preference will be given to manufacturers over dealers. Vendors not complying with environment norms will be discouraged. Vendors who are found to be resorting to unfair or unethical business practice will be deregistered. Vendors will be regarded as partners in our business. We will give preference to local vendors.

QUALITY, ENVIRONMENT, OCCUPATIONAL HEALTH & SAFETY POLICY

We, at "Hindalco Industries Limited", are committed to demonstrate excellence in quality, environment and occupational health & safety for sustainable development.
To Achieve this, we shall:

- Ensure customer satisfaction by providing value added products and services;
- Continually establish systems, procedures and best practices with technological interventions;
- Optimize resource consumption particularly – raw material, energy, water, oil and promote pollution prevention;
- Nurture and sustain safe and healthy work environment;
- Comply with applicable legislation in letter and spirit;
- Strengthen competence of employees and business associates through continuous training.

We shall communicate and make this policy available to all stakeholders

ADITYA BIRLA
HINDALCO

HINDALCO INDUSTRIES LIMITED
PO:Renukoot, Distt. Sonebhadra(U P)
Phone No.05446-252077/78/79 Fax No.05446-252107 252427
(Regd Off:Ahura Centre,1st Floor,B Wing,Mahakali Caves Road,Andheri(East),Mumbai-400093)
Tel:(91-22) 6691 7000 Email ID: hindalco@adityabirla.com Website: www.hindalco.com

PURCHASE ORDER

Vendor Code : 1070455
M/s INDUS ENGINEERING PROJECTS INDIA PVT LTD
PLOT NO-2 KHSRA NO.28/2 , OPP.
SURENDER PIPE FACTORY,NANGLISA
NAJAFGARH
NEW DELHI, NEW DELHI, India - 110043
Email Id :indusgroupindialtd@gmail.com,orissaindusgroupind
Contact Person : Mr. ASHOK KUMAR SINHA
GSTIN No : 07AAECI7217C1ZV
TIN No : Not mentioned **PAN No** : AAECI7217C

PO/PO Rel.No :B74/142305368/PS1 **Date** : 14-MAY-2022
Rev. No. : **Date** :
Price Basis : FOR Central Stores Renukoot
Transportation arrangement : Supplier
Ship to Location : PS1: RKT Project Stores
Currency : INR
Hindalco C Person : MANOJ SINGH
Email of C Person : manoj.singh@adityabirla.com

REF : As per your ref 000565/22-23 dated 21.04.22 and LOI issued by us HIL/RKT/LOI/2022-23/0423 dated 29.04.22
Please Supply the following items subject to the terms & conditions mentioned here under and overleaf

SrNo.	Item Code/Desc.	UOM/DATE	Ship Qty	Unit Rate
1	MPM10127239 PRESS, HYDRAULIC; TYPE: BALING (PLASTIC WASTE); LOAD CAPACITY: 60 KG, STROKE LENGTH: 1000 MM, SPECIFICATION: SUITABLE TO BALE WASTE PLASTIC UP TO 60 KG WITH COMPRISING OF POWER PACK, CYLINDER, MOTOR AND ALL ELECTRICAL.	NUMBER	1.000	418600.00

Note to Supplier INSTALLATION INCLUDED

Shipment 1	20-AUG-2022		
Description..	%/Amount	Rate	Amount
Basic Value			4,18,600.00
IGST - RKT IGST 018% B2B-Inward	%	18.00	75,348.00
		Item Total Value :	**4,93,948.00**

SrNo.	Item Code/Desc.	UOM/DATE	Ship Qty	Unit Rate
2	MPM10127580 SHREDDER; TYPE: INDUSTRIAL, UNIT; POWER SUPPLY: 415 V; CAPACITY : 300- 800 KG, CUTTING CHAMBER SIZE: WD 550 X LG 1000 MM, OVERALL SIZE OF MACHINE: WD 800 X LG 3000 X HT 1600 MM, NUMBER OF SHAFT : 2 NO, NUMBER OF BLADES: 20 PLUS, BLADES MATERIAL OF CONSTRUCTION (MOC): SPECIAL ALLOY AND MS SHAFT TYPE: HEXAGONAL, BLADES AND SPACER ARRANGEMENT: ALTERNATERPM: 15 OR AS PER REQUIRED FEEDING: THROUGH TOP HOPPER, DISCHARGE SHREDDED MATERIAL: AT BOTTOM DRIVEN THROUGH: HELICAL GEARBOX, DRIVING FORCE: MOTOR (ABB/CG/SIEMENS OR KIRLOSKAR), POWER REQUIRE: 25 HP (12.5 HP X 2NO) , 415V, 3PH +N+E	NUMBER	1.000	262200.00

Note to Supplier INSTALLATION INCLUDED

Shipment 1	20-AUG-2022		
Description..	%/Amount	Rate	Amount
Basic Value			2,62,200.00
IGST - RKT IGST 018% B2B-Inward	%	18.00	47,196.00
		Item Total Value :	**3,09,396.00**
		Total Purchase Order Value :	**8,03,344.00**

Value(Words): Eight Lakh Three Thousand Three Hundred Forty Four Only

ADITYA BIRLA
HINDALCO

HINDALCO INDUSTRIES LIMITED
PO:Renukoot, Distt. Sonebhadra(U P)
Phone No.05446-252077/78/79 Fax No.05446-252107 252427
(Regd Off:Ahura Centre,1st Floor,B Wing,Mahakali Caves Road,Andheri(East),Mumbai-400093)
Tel:(91-22) 6691 7000 Email ID: hindalco@adityabirla.com Website: www.hindalco.com

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PURCHASE ORDER

Vendor Code : 1070455
M/s INDUS ENGINEERING PROJECTS INDIA PVT LTD
PLOT NO-2 KHSRA NO.28/2 , OPP.
SURENDER PIPE FACTORY,NANGLISA
NAJAFGARH
NEW DELHI, NEW DELHI, India - 110043
Email Id :indusgroupindialtd@gmail.com,orissaindusgroupind
Contact Person : Mr. ASHOK KUMAR SINHA
GSTIN No : 07AAECI7217C1ZV
TIN No : Not mentioned **PAN No** : AAECI7217C

PO/PO Rel.No :B74/142305368/PS1 **Date** : 14-MAY-2022
Rev. No. : **Date** :
Price Basis : FOR Central Stores Renukoot
Transportation arrangement : Supplier
Ship to Location : PS1: RKT Project Stores
Currency : INR
Hindalco C Person : MANOJ SINGH
Email of C Person : manoj.singh@adityabirla.com

REF : As per your ref 000565/22-23 dated 21.04.22 and LOI issued by us HIL/RKT/LOI/2022-23/0423 dated 29.04.22
Please Supply the following items subject to the terms & conditions mentioned here under and overleaf

Other Terms and Conditions :
Payment Terms:

Insurance By : Supplier
Freight Terms: Freight Paid
Price Type Terms :Fixed
Supplier Note: PAYMENT TERMS: 50% and 18% GST against delivery within 07 days, 40% within 30 days after technical acceptance and balance 10% after installation and submission of PBG. Warranty : 06 months from date of commissioning or 12 months from date of delivery.
Billing Address : Section Head - Account Procurements. Hindalco Industries Ltd,P.O.Renukoot,Distt. Sonbhadra-U.P , Pin 231217
Shipping address : Hindalco Industries Ltd,P.O.Renukoot,Distt. Sonbhadra-U.P ,Pin 231217
A/c Hindalco Industries Ltd., Renukoot.
Please check correctness of TIN, PAN & address as mentioned above.'C' form is now system generated and linked with TIN no. Hindalco is not responsible for wrong 'C' form generation due to incorrectness of TIN no.

For Hindalco Industries Ltd.

AJAY KUMAR
Vice President (Purchase)

ECC NO.	: AAACH1201RXM002	**EXCISE REGD.NO.**	: 1-Range Renukoot 1/92
DIVISION	: Mirzapur	**COLLECT.**	: Allahabad
CST REGD.NO.	: RG5006130 dt.08.07.1960	**LST REGD NO.**	: RG0001299 dt. 27.06.1960
PAN	: AAACH1201R/MUMBAI/DC.SPL.RG-53	**TIN NO**	: 09415100001
CIN No	: L27020MH1958PLC011238	**GSTIN NO**	09AAACH1201R1ZL

Note:(Specific LD Clause, where ever stipulated in POs shall override this clause): The term 'Shipment' indicates a specific date. However, we will allow -7/+15 Days deviation. In case the deviation is beyond this without our explicit written consent, we reserve the right to Reject the Supply or Cancel the Shipment.

HINDALCO INDUSTRIES LTD

GENERAL TERMS AND CONDITIONS- GOODS (DOMESTIC)

These General Terms & Conditions (GTC) shall apply to this Purchase Order (PO)/Specific Terms and Conditions(STC) to the PO and any Amendment/s thereof (hereinafter referred to as "contract"), unless specific clauses in the PO or the Amendment/s override them.

1.PRICE

The price and the pricing basis mentioned in the PO/ STC is firm and fixed for the entire quantity of Goods mentioned in the PO for supply within the agreed delivery period.

2.PACKING

The Supplier shall follow relevant packing standards and conditions as per applicable laws, rules and regulations for packaging of Goods. The Supplier shall be responsible for any damage to the Goods due to improper packing or improper handling or storage of Goods by Supplier or Supplier's agents or transporters.

3. ACCEPTANCE OF GOODS

Goods shall be accepted only after final quality and quantity check procedures [inspection] carried out by Hindalco, unless Hindalco has waived its right to such inspection in writing. The Supplier agrees that the title to the Goods in conformance to the Specifications shall transfer to Hindalco and shall always remain with Hindalco immediately after delivery of the Goods as per the delivery terms mentioned in the PO. All damages, losses, cost and expenses pertaining to the non-conforming Goods sold and delivered shall be to the Supplier's Account.

4.REJECTIONS

The Supplier shall have the responsibility to take back rejected goods within 15 days of Hindalco's informing of the same, failing which the rejected Goods will be returned at Supplier's risk and cost (including to and fro transportation cost). In case payment (in full or part) has been made by Hindalco, Hindalco at its sole discretion, shall have the option to accept replacement within the period agreed with the Supplier or require the Supplier to reimburse the cost of the Goods. Unless specifically advised by Supplier regarding mode of return of rejection, Hindalco shall be free to choose any means for return of rejected goods.

5.TAXES AND LEVIES

Hindalco agrees to make payment of the applicable Goods and Services Tax (GST) and other levies mentioned in the PO as per the rates prevailing under the applicable laws at the time of dispatch. The Invoice must contain all the relevant statutory information required under GST, wherever applicable.

All consequences and liabilities arising due to non-availability of input tax credit by Hindalco due to any default of Supplier [e.g. error/inability/delay in uploading returns in GST network(GSTN)], shall be to Supplier's account. It is an agreed term of this PO that any claim raised by Hindalco as a result of above shall be settled by the Supplier within thirty (30) days of receiving a written notice, without demur.

E-Way Bills, where applicable will be provided by Hindalco.

6. DISPATCH DOCUMENTS

Invoice/Bills/Challans should contain all relevant information like Vendor Code, PO No., Item Code/s, Unit rate, Quantity, Value etc. including Supplier's GST Identification Number (GSTIN), SSI/MSME Regn. No. etc. Goods replaced (against original supply) should bear Hindalco's dispatch document reference no. (PO or RGP or MSO).

Dispatch documents should consist of the following:

i. Valid GST Invoice
ii. E-Way bill, if applicable
iii. Packing list, if applicable
iv. Test/Inspection Report, if applicable
v. Test Certificate, if applicable
vi. Original consignee copy of LR, in case of supplies by road
vii. Warranty / Guarantee certificates, where applicable

7.COMPLETION PERIOD OF SUPPLY

Time is of essence to this contract. The delivery schedule must strictly be followed. If the Goods are not delivered within the stipulated time and quantity in full, Hindalco reserves the right not to accept the Goods and/or shall pay such charges as mentioned in the PO. Partial dispatches/change in delivery schedules, preponing and bunching of supplies are not allowed, unless requested and authorized in writing by Hindalco.

8.TRANSPORTATION

a. Goods shall be dispatched by the Supplier to Hindalco's designated site as per the mode of transport specified in the PO.

b. Hindalco may request the Supplier to arrange for road transport of Goods belonging to Hindalco through authorized and nominated transporter/s and Hindalco shall reimburse the Supplier, the cost for such transportation upon submission of relevant documentation. If the Supplier or its authorized agent delivers the Goods belonging to Hindalco in damaged condition, then the Supplier shall bear all the losses or damage affecting the Goods or any third party due to negligence on the part of the Supplier, its employees and/or its agents. Supplier shall arrange for transit insurance if specifically agreed in writing with Hindalco.

c. Any statutory penalty/liability imposed by any authority during transportation, inspection including but not limited to deficiency in any license or permission or approval or for any shortfall and failure to comply applicable laws or notification and/or for not maintaining proper records up to date, shall promptly be payable/paid by the Supplier.

d. The Supplier shall comply with the rules and regulations of Motor Vehicle Rules, 1989 and shall ensure that the Vehicle contains requisite documents for transportation of Goods. The Supplier shall also comply with all the safety guidelines from time to time.

9.REPRESENTATION & WARRANTIES

The Supplier represents and warrants to the other that:

a. It is a company/firm/ proprietor duly organized, validly existing and in good standing under the laws of India and is qualified to do business in the locations in which the nature of its business conducted by it makes such qualification necessary and where failure so to qualify would have a material adverse effect on its financial condition, operations, prospects or business.

b. The execution, delivery and performance of this contract and acceptance of the PO has been duly authorized by all necessary corporate or other

organizational action on its part and does not violate or conflict with any law applicable to its respective jurisdiction of incorporation, its organizational documents or any order or judgment or a court or other agency of government applicable to it or its assets; and
c. It has all necessary material governmental and other third party permits, approvals and licenses required in connection with the execution, delivery and performance of the contract, such permits, approvals and licenses are in full force and effect and all conditions thereto have been materially complied with, in each case to the extent required at the time of this representation.

10.INDEMNITY
Subject to the provisions herein, the Supplier agrees to indemnify and keep indemnified Hindalco and its officers, agents, employees, successors and assigns and authorized representatives against any costs, actions, losses, claims for damages owing to actions or omissions attributable to the Supplier(including its authorized agents) arising out of (i) Supplier's non-performance or violation of any of the terms and conditions of this contract (ii) violation of any applicable laws, rules, regulations and Code of Conduct (iii) any loss occasioned to Hindalco due to any discrepancy in information furnished by Supplier (iv) third party claims for infringement of intellectual property rights and (v) death, injury, damage to property.

11.LIABILITY
a. In so far as these conditions do not provide for other liability clauses, a party (non-affected party) shall be liable for material breach or damage directly caused to the other party (affected party) as a result of willful negligence, violation of agreed safety regulations or for any other legal reason, attributable to the non-affected party only.
b. Neither party shall in any event be liable to the other party for any special, indirect, incidental, consequential, exemplary, punitive, tort or strict liability damages of any nature or kind whatsoever, however caused including but not limited to lost profits, loss of production, loss of business, whether or not the possibility of such damages could have been reasonably foreseen and even if advised of the possibility of such damages.
c. To the maximum extent permitted at law, and notwithstanding anything contained in this contract to the contrary, Hindalco's total liability to the Supplier, whether arising in contract, tort, negligence, warranty or otherwise, shall not exceed the value of Goods paid to the Supplier as per the terms of the PO and any amendments thereto.

12.WARRANTY
The Supplier warrants that:-
a. The Supplier shall sell and supply Goods with good title, free and clear of all liens, charges, security, interests claims and encumbrances whatsoever
b. The Supplier shall ensure that the Goods supplied to Hindalco is acquired in legitimate manner, has not procured these Goods from a person based in a country on which economic sanctions have been imposed and shall be responsible for any consequences on non-compliance to the statutes.
c. The Supplier shall deliver as per the delivery schedule agreed in the PO and in case of the Supplier's failure to adhere to such schedule, Hindalco at its sole discretion, may reject goods delivered or reschedule the delivery of Goods or pay price for the Goods after adjusting the loss incurred by Hindalco.
d. The Goods supplied by the Supplier are in strict conformity with the specifications and technical and general data mentioned in the PO and shall be free from any defect arising out of poor design, workmanship, and inferior material. The warranty for the Goods shall be for a period of 12 months from the date of acceptance or 18 months from the date of dispatch, whichever is earlier.
e. Hindalco may have the option of rejection (as mentioned in clauses 3, 4 & 8(b) of this contract) and/or return of defective or non-conforming Goods against replacement of conforming Goods or receipt of all the monies paid to the Supplier. In case no settlement can be reached within thirty (30) days of commencement of such negotiation, Hindalco may procure goods from third party at risk and cost of the Supplier.
f. The Supplier's entity is not owned or controlled by a person named on the SDN List or any similar applicable blacklist, Sanctions maintained by the United States, European Union, United Kingdom or United Nations as amended form time to time.

13.INSPECTION & TESTING
a. Hindalco's authorized representatives shall have the right to witness the necessary inspection and testing of Goods mentioned in the PO.
b. The Supplier shall inform Hindalco in advance about the readiness of the Goods for inspection and testing. Inspection / inspection waiver / approval by Hindalco does not absolve Supplier's responsibility for conformity of the specification as per the terms of PO.

14.COMPLIANCE WITH LAWS
The Supplier shall comply with the applicable laws, rules and regulations whether local, state or centre and any amendments thereof. Hindalco will not be liable for any legal proceeding arising out of any breach or violation of any applicable laws by the Supplier. Supplier will pay for and be solely responsible for obtaining and maintaining his permits, licenses, approvals and documents as may be required for performance of this contract, to enter and remain in compliance with applicable laws (including all relevant laws, regulations, ordinances and rules with respect to bribery and corruption) for rendering the services in connection with this contract. The Supplier shall ensure that the permits, licenses, approvals and documents shall be valid during the entire Term of this contract and its renewal thereof. The Supplier shall abide by Hindalco's Code of Conduct and any other guidelines, instructions or rules, including those relating to safety and hazard while at Hindalco's premises, provided by Hindalco from time to time.

15.BRIBERY AND CORRUPTION
a. The Supplier hereby warrants that it shall not, directly or indirectly, and it has no knowledge that other persons will, directly or indirectly, make any payment, gift or favour or influence directors, employees of Hindalco or any other party or any government officials in a manner contrary to applicable laws or engage in any money laundering, bribery and corruption.
b. Nothing contained herein shall render Hindalco liable to reimburse the Supplier for any such consideration given or promised. The Supplier's breach of any of the obligations contained in this Clause may be considered by Hindalco to be a material breach of this contract and shall entitle Hindalco to terminate this contract with immediate effect and without prejudice to any further right or remedies on the part of Hindalco under this contract or applicable law.

16.INTELLECTUAL PROPERTY RIGHTS
The Supplier warrants that neither the sale, nor the use of the Goods, nor the performance of the obligations under this contract, will infringe any Intellectual Property Rights either of Hindalco or any third party.

17 FORCE MAJEURE
a. If any time during the continuance of the accepted PO, the performance by either party shall be prevented by reasons of any war (whether declared

or not), hostility, acts of the public or enemy, riots, civil commotion, sabotage, Supplier's or Hindalco's, Hindalco Customer's plant breakdown, fire flood, earthquakes, explosion, epidemic, quarantine restriction, government act/ legislation, officially declared or proclaimed strikes or lockout including at mines (but not including slowdown or any other industrial disturbance) or other acts of God (hereinafter referred to as "Force Majeure") then the time for performing those obligations, shall be extended by a period equal to the effect of such Force Majeure, provided notice of happening of such Force Majeure is given by either party to the other within 10 (ten) days from the date of occurrence thereof.
b. If the parties foresee that the effect of a Force Majeure occurrence shall last for more than 30 days, parties shall discuss and define a method to resolve the difficulties arising there from, including all contractual obligations.
c. Neither party shall be considered to be in default or in breach of its obligations under the accepted Purchase order to the extent that performance of such obligations is prevented by any circumstances of Force Majeure which arise after the date of purchase order.

18. DISPUTE RESOLUTION & ARBITRATION
a. If any dispute and/or difference shall at any time arise between Hindalco and the Supplier in relation to any clause (s) or matters herein contained or their respective rights/claims or liabilities hereunder or otherwise in relation to or arising out of PO, such disputes and/or differences shall be settled mutually through discussions between the representatives of the parties in the first instance, the parties shall exert their best effort to find an amicable settlement within 30 days from the date receipt of notice.
b. Failing agreement to the above, either party may forthwith give to the other notice in writing of the existence of such question, dispute or differences, and the same shall be referred to and finally settled by arbitration in accordance with the Indian Arbitration and Conciliation Act, 1996 and Arbitration Rules (the "Rules") as at present in force and as modified from time to time which Rules shall be deemed incorporated into this clause. Such Arbitration proceeding shall be conducted by a sole Arbitrator mutually agreed and appointed by both the parties. Place of Arbitration shall be Mumbai and Arbitration proceedings shall be in English language. The cost of arbitration shall be borne by the losing party.

19.GOVERNING LAWS
If the parties have not agreed otherwise, these contract terms and conditions shall be governed by and construed in accordance with the laws of India without regard to principles of conflicts of laws.

20.INFORMATION SECURITY & CONFIDENTIAL AGREEMENT
All non-public, confidential or proprietary information of the Hindalco, including, but not limited to, specifications, samples, patterns, designs, plans, drawings, documents, data, business operations, pricing, discounts or rebates, disclosed by Hindalco to the Supplier's representatives or agents, whether disclosed orally or disclosed or accessed in written, electronic, or other form or media, and whether or not marked, designated or otherwise identified as "confidential," in connection with the PO is confidential, solely for the use of performing the PO and may not be disclosed or copied unless authorized by Hindalco in writing. Hindalco shall be entitled to injunctive relief for any violation of this Section.

21.TERM AND TERMINATION
a. This Contract expires when performance of all obligations under it are complete; however, the parties' rights and obligations that are intended by their nature to continue beyond the term of the Contract, such as warranties, indemnification, confidentiality and records retention, survive the Contract's expiration or termination.
b. Either party may terminate or suspend its performance of all or any of its obligations under this contract, and at any time, if the other party commits any material breach of the conditions of Contract and fails to rectify the breach within thirty (30) days of such first party's written notice, or where the material breach is not capable of being rectified within thirty (30) days if the breaching party fails to commence reasonable actions to rectify the breach within thirty (30) days of receiving such notice.
c. Notwithstanding any other provision in this Contract, a party may terminate this PO if the other party becomes insolvent or is the subject of insolvency proceedings;

22.NOTICE
Notices under this contract shall be given in writing and must be delivered personally or by registered post/speed post to the registered address of the Company, i.e. Hindalco Industries Limited, Century Bhavan, Dr. Annie Besant Road, Mumbai-400030, Maharashtra, India. Routine correspondence with respect to supplies, specifications, schedules, documents, etc. should be addressed to the signatory of the PO and to contact persons, if any, mentioned in the PO.

23.WAIVER
No waiver by either Party or any breach of the terms or conditions of this Purchase order to be performed by the other Party shall be construed as a waiver of any succeeding breach of the same or any other terms or conditions.

24. SEVERABILITY
Should one of the provisions of these conditions of contract or of any additional stipulations agreed upon be or become invalid, the validity of the remaining part of these conditions shall not be affected thereby. The contracting parties are committed to replace the invalid provision by another equivalent term, in so far as this is possible, with respect to the commercial effect.

25.AMENDMENT
Any amendment to these conditions of contract shall be mutually discussed and agreed in writing between the Parties.

26.INDEPENDENT CONTRACTOR
This Contract is on a 'principal-to-principal' basis and the Supplier or its representatives shall act as an independent entity. Nothing contained in this Contract shall be construed or deemed to create any agency, partnership or employer-employee relationship in any manner whatsoever between the Supplier and Hindalco. The Supplier acknowledges that its performance of this Contract are solely within its own control, subject to the terms and conditions agreed upon and agrees not to hold itself out to be an employee or servant of the Hindalco or any subsidiary or affiliate of Hindalco. The Supplier shall be solely liable to all persons for all the acts of omissions or commission, deeds and things done by the Supplier, its personnel and/or its representatives in the course of performance of obligations specified under this Contract.

27.NO SUBCONTRACTING AND ASSIGNMENT
a. The Supplier shall not subcontract the contract or any part thereof without the prior written approval of Hindalco, which approval shall not be

unreasonably withheld or delayed. Approval to subcontract shall not relieve the Supplier from any of its obligations under the contract, or impose any liability upon Hindalco to a sub-supplier. Any failure to perform by a sub-supplier of the Supplier shall not constitute an event of Force Majeure.
b. This contract is personal to Supplier and Supplier must not assign it, nor any portion of it, without Hindalco's prior written consent. Hindalco is entitled to assign this contract to any group Company or to any other party, associate, subsidiary or other entities that agrees to honor the terms of this contract. This contract binds and benefits the parties and their respective representatives, successors, and permitted assigns.

28.ENTIRETY
In the event of any inconsistency between these conditions of contract and the accepted PO, the terms of such accepted PO shall prevail. This contract constitutes the complete agreement and sets forth the entire understanding and agreement of the parties as to the subject matter of this contract and supersedes all prior discussions and understandings in respect to the subject of this contract, whether written or oral.

Safety Guidelines for Transportation of Hazardous Goods in Schedule I

Schedule I

GENERAL TERMS AND CONDITIONS - GOODS (DOMESTIC)

Safety Guidelines for Transportation of Hazardous Goods

The Supplier / transporter / owner / driver of the carriage carrying hazards goods shall obey all the relevant provisions of Indian Central Motor Vehicle Act, Explosive Act, Petroleum Act and rules made thereunder and as amended from time to time, specifically:

a. Every goods carriage carrying goods of dangerous or hazardous nature to human life shall be fitted with a spark arrester.
b. It shall be responsibility of the consignor / transporter / owner to ensure the following, namely:
i. The goods carriage has a valid registration to carry the said goods
ii. The vehicle is equipped with necessary first-aid, safety equipment and antidotes as may be necessary to contain any accident
iii. That transporter or the owner of the goods carriage has full and adequate information about the dangerous or hazardous goods being transported; and
iv. That the driver of the goods carriage is trained in handling the dangers posed during transport of such good
c. Every consignor/transporter shall supply to the owner/driver of the goods carriage; full, adequate and accurate information i.e. Material Safety Data Sheet (MSDS) & Transport Emergency Card (TREM Card) about the dangerous nature hazardous goods being transported as to enable owner and its driver to tackle any emergency arising out while transporting
d. The consigner / transporter / owner of goods carriage shall ensure that the driver of such carriage is given all the relevant information in writing for transport (MSDS / TREM Card) and satisfy himself that such driver has sufficient understanding of the nature of such good and the nature of the risks involved in the transport of such goods and is capable of taking appropriate action in case of an emergency.
e. The Consigner / transporter / owner of the goods carriage dangerous or hazardous goods shall lay down the route for each trip which the driver shall be bound to take unless directed or permitted otherwise by the Police Authorities. They shall also fix a time table for each trip to the destination and back with reference to the route so laid down.
f. It shall be the duty of the transporter / owner / consigner to ensure that the driver of the goods carriage carrying dangerous or hazardous goods holds a driving license and possess a certificate of having successfully passed a course as mentioned in Central Motor Vehicles Act and Rules.
g. The driver of a goods carriage transporting dangerous or hazardous goods shall ensure that the information given to him in writing is kept in the driver's cabin and is available at all times while the dangerous or hazardous goods to which it relates, are being transported.
h. Supplier shall be responsible for & shall follow the safety rule under the provision of Factory Act 1948 & state specific factory rules and Indian electricity safety rules amended up to date and other statutory safety rules and regulations in force during currency of the contract. Trucks are liable to be checked at Hindalco's premises for safety features like brakes, reverse horns, lights, reverse lights, seat belts, etc., as per statutory requirements.
i. Ensuring Safety and prevention of any accident / incident of the employees of the vendor will be sole responsibility of the Supplier.
j. Charges towards any damage of the Hindalco's goods caused by the trucks will be deducted from the bill after assessment by Hindalco.
k. Supplier's vehicle entering the factory premises must be comprehensively insured.
l. Supplier shall take all safety precaution and provide adequate supervision by competent persons in order to do the job safely and without damage to plant, personal equipment and the environment.
m. The Truck driver must have valid driving license, without which the driver will be restricted entry permission inside Hindalco main gate.
n. Two working head lights, rear lights and rear mirror should be in good working condition. Reverse horn to be made available in I truck. Number plates to be available and Vehicle Registration number to be mentioned legibly in all trucks.
o. All the tyres of the trucks should be in good condition.
p. Trucks should maintain speed limit of 20 KM per hour inside Hindalco's factory premises, beyond which penalty will be imposed per Hindalco's Safety Officer.
q. No overtaking of vehicles shall be permitted inside plant premises.
r. If any truck driver is found in drunken condition by Hindalco representative, the truck shall not be allowed entry inside the factory premises. If found, suitable penalty will be imposed as per Hindalco's Security.

OUR VALUES

INTEGRITY, COMMITMENT, PASSION, SEAMLESSNESS AND SPEED

EXTRACTS FROM OUR POLICIES

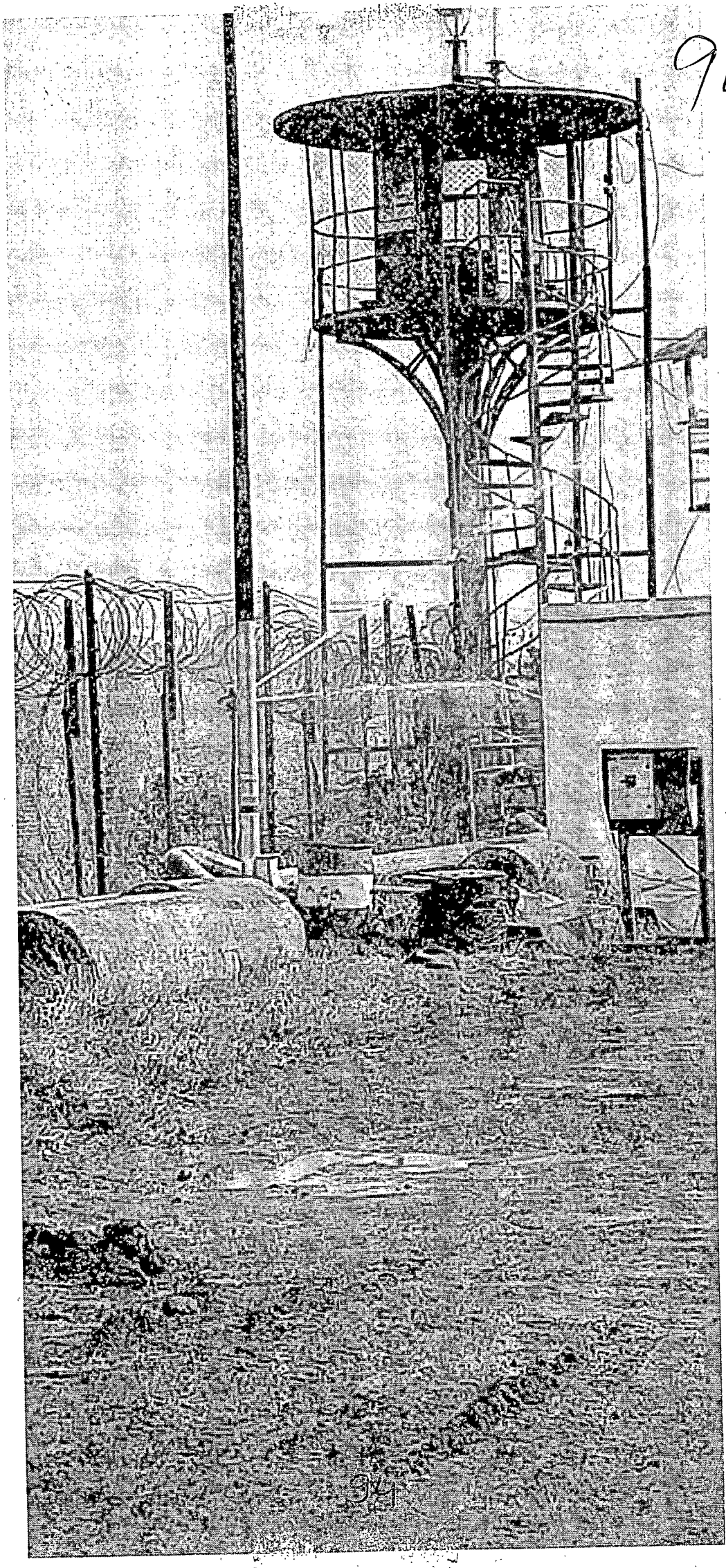
To procure goods and services by honest use of sound business principles in an impartial/unbiased & transparent manner and dignity by way of fair competition, ethical and equitable dealings from right source, of desired quality, at right time, at optimal cost & in right quantity. Adopt the State of the Art purchase procedures to reduce internal and external lead times, deliver value for money, for all concerned, to create a strong network of competent and reliable suppliers. Preference will be given to manufacturers over dealers. Vendors not complying with environment norms will be discouraged. Vendors who are found to be resorting to unfair or unethical business practice will be deregistered. Vendors will be regarded as partners in our business. We will give preference to local vendors.

QUALITY, ENVIRONMENT, OCCUPATIONAL HEALTH & SAFETY POLICY

We, at "Hindalco Industries Limited", are committed to demonstrate excellence in quality, environment and occupational health & safety for sustainable development.
To Achieve this, we shall:

- Ensure customer satisfaction by providing value added products and services;
- Continually establish systems, procedures and best practices with technological interventions;
- Optimize resource consumption particularly – raw material, energy, water, oil and promote pollution prevention;
- Nurture and sustain safe and healthy work environment;
- Comply with applicable legislation in letter and spirit;
- Strengthen competence of employees and business associates through continuous training.

We shall communicate and make this policy available to all stakeholders

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Dated: 05.05.2021

Divisional Forrest Officer/
Secretary,
'Jila Paryavaran Samiti'
Sonbhadra (UP)

Sub: To look into avenues for utilization of treated water in District Sonbhadra.

Ref: Our letter dated 03.03.2021.

Dear Sir,

Please refer to our letter dated 03.03.2021 on subject matter (copy attached for ready reference).

We, hereby further request you for new avenues of utilization of waste-treated water of approx. 5000 KL/day as we are facing problem in storing of the same.

Therefore, we, once again request to Jila Paryavaran Samiti to guide us in identifying the scope of utilization of treated water in District Sonbhadra for various purposes. We are ready to expedite all solutions to establish the effective utilization in district with support & guidance of Jila Paryavaran Samiti.

We once again request you to kindly provide an opportunity to us to present our concern in the meetings of Jila Paryavaran Samiti, Sonbhadra (UP).

Thanking you,

Yours faithfully,
For Hindalco Industries Limited

(VIVEK KUMAR)
Head - Legal

cc: District Magistrate/
Chairman,
Jila Paryavaran Samiti, Sonbhadra.

Hindalco Industries Limited
P.O. Renukoot-231217, District Sonebhadra, Uttar Pradesh, India
[illegible]
Registered Office: Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road, Andheri (East), Mumbai 400 093
T: +91 22 [illegible] | Fax: +91 22 [illegible]
Corporate ID No. L27020MH1958PLC011238

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Speed Post

M. P. POWER GENERATING CO. LTD.
(A GOVT. OF MP UNDERTAKING)
CIN-U40109MP200SGC0148221

No:07-03/CC/ 750 Jabalpur dated: 04 MAY 2022

To,

The Scientist D
Ministry of Environment, Forest and Climate Change (HSM Division),
3rd Floor, Vayu Wing, Indira Paryavaran Bhawan
Jor Bagh Road, New Delhi – 110 003

Sub.: OA No. 164/2018 titled as Ashwani Kumar Dubey Vs. UOI & Ors. Before the Hon'ble NGT, New Delhi (PB) with OA No. 117/2014 titled as Shantanu Sharma Vs. UOI & Ors. and others connected matters – reg.

Ref. 1) Hon'ble NGT, New Delhi order dated: 18/01/2022.
2) Office Memorandum no. F.No.:11/3/2018-HSM dated: 09/03/2022.
3) Your Email dated: 10/03/2022 to Energy department, GoMP, Bhopal.

In reference to above, the Hon'ble NGT in the order dated: 18/01/2022 has directed the constitution of "Fly Ash Management and Utilization Mission" to co-ordinate and monitor issues relating to handling and disposal of fly ash as well as other associated issues.

The mission is required to prepare an "Action Plan" considering the recommendations of the Joint Committees as specified in Para 15 of the order dated 18.01.2022.

Therefore, in compliance to the above directives, "Action Plan" with respect to the thermal power stations of M.P. Power Generating Company Limited (MPPGCL), Jabalpur is enclosed herewith (Annexure I) for further needful at your end please.

Thanking You.

Encl. Annexure I

(B.L. Newal)
E. D. (O&M: Gen)
MPPGCL, Jabalpur

(Approved from competent authorities)

Copy to –

1) The Director, Ministry of Environment, Forest and Climate Change (HSM Division), 6thFloor, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003.
2) Member Secretary, M.P. Pollution Control Board, ParyavaranParisar, E-5, Arera Colony, Bhopal - 462016.

Address for Correspondence: OFFICE OF THE EXECUTIVE DIRECTOR (O&M: GEN)
Block No.6, Shakti Bhawan, Rampur, Jabalpur-482008 (M.P.)
Phone No. 0761-2661589 / 2702600 Fax No. 0761-2664572
Email: edomg_mpeb@rediffmail.com

Annexure I

Action Plan as per the recommendations of the Joint Committees as specified in Para 15 of the order dated 18.01.2022 with respect to the Thermal Power Stations of MPPGCL

(1) Action Plan of Ash Utilization in accordance with the MOEFCC notification 31/12/2021 :

i) Thermal power plants (TPPs) of M.P. Power Generating Company Limited (MPPGCL), being a coal based is primarily responsible to ensure 100 percent utilisation of ash (fly ash, and bottom ash) generated by it in an eco-friendly manner as per the said notification dated: 31/12/2021.

ii) The ash generated by the thermal power plants of MPPGCL is being and shall be utilised only for the following eco-friendly purposes,

(i) Fly ash based products viz. bricks, blocks, tiles.
(ii) Cement manufacturing, ready mix concrete.
(iii) Construction of road and fly over embankment.
(iv) Filling up of low lying area.
(v) Back filling of South Estern Coal Limited (SECL) old / abandoned coal mines.
(vi) Filling of some Western Coal Limited (WCL) mine voids.
(vii) Filling of old ash bund voids, being surrendered to the Forest Department, GoMP.
(viii) Agriculture in a controlled manner based on soil testing.

iii) The stipulated timelines for achieving 100% ash utilization as per the said notification is as follows -

a) For annually generated;

Utilisation percentages of thermal power plants	First compliance Cycle to meet 100 per cent utilisation	Second compliance cycle onwards, to meet 100 per cent utilisation
> 80 per cent	3 years	3 years
60-80 per cent	4 years	3 years
< 60 per cent	5 year	3 years

b) For legacy ash;

Year from date of publication	1st	2nd	3rd- 10th
Utilisation of legacy ash (in percentage of Annual ash	At least 20 per cent	At least 35 per cent	At least 50 per cent

iv) The legacy ash utilisation shall not be required for ash dyke of STPS, Sarni (373 ha) & SGTPS, Birsinghpur (100 ha) thermal power plant of MPPGCL, where ash dyke has stabilised and the reclamation has been initiated. Stabilisation and reclamation of an ash dyke including certification by the Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) shall be obtained within a year from the date of publication of this notification. However, the ash remaining in all other ash ponds or dykes of thermal power plants of MPPGCL shall be utilised in progressive manner as per the above mentioned timelines.

v) For the purpose of utilisation of ash as per the "Action Plan" of MPPGCL for FY 2022-23, as given under point no. (vii) & (viii) herein, following major conditions of said notification dated: 31/12/2021 are being complied & shall be complied -

a) All agencies (Government, Semi-government and Private) engaged in construction activities such as road laying, road and flyover embankments and dams within 300 kms from thermal power plants shall be provided ash at the project site free of cost and if required, transportation cost shall be borne by thermal power plants.

Address for Correspondence: **OFFICE OF THE EXECUTIVE DIRECTOR (O&M: GEN)**
Block No.6, Shakti Bhawan, Rampur, Jabalpur-482008 (M.P.)
Phone No. 0761-2661589 / 2702600 Fax No. 0761-2664572
Email: edomg_mpeb@rediffmail.com

b) For all mines located within 300 kilometres radius of thermal power plant, ash will be supplied for backfilling in mine voids or mixing of ash with external Overburden dumps, under Extended Producer Responsibility (EPR). The thermal power plants shall facilitate the availability of required quantity of ash by delivering it free of cost and bearing the cost of transportation or cost or transportation arrangement decided on mutually agreed terms.

c) Filling of low-lying areas with ash shall be carried out / are being carried with prior permission of the State Pollution Control Board and in accordance with the guidelines laid down by Central Pollution Control Board (CPCB).

d) The owner of thermal power plants shall serve written notice to persons or agencies who are liable to utilise ash, offering for sale, or transport or both.

vi) Ash generation and utilization w.r.t. the thermal power stations of MPPGCL in last three years is as under –

Name of TPS	FY	Ash Generation (LMT)	Ash Utilization (LMT)	% Utilization
SGTPS, Birsinghpur	2019-20	17.50	17.43	99.59
	2020-21	20.46	20.48	100.10
	2021-22	18.89	13.51	71.50
ATPS, Chachai	2019-20	3.15	3.16	100.55
	2020-21	3.37	2.18	64.81
	2021-22	3.58	1.40	39.09
STPS, Sarni	2019-20	14.69	9.36	63.72
	2020-21	12.89	12.14	94.20
	2021-22	8.97	8.95	99.82
SSTPP, Khandwa	2019-20	23.64	4.30	18.19
	2020-21	14.82	6.46	43.58
	2021-22	27.40	9.94	36.27
MPPGCL	2019-20	58.97	34.25	58.08
	2020-21	51.53	41.26	80.07
	2021-22	58.84	33.80	57.44

vii) Action Plan for utilization of Yearly Generated Ash for FY 2022-23 –

Description	**Unit**	**SGTPS, Birsinghpur**	**ATPS, Chachai**	**STPS, Sarni**	**SSTPP, Khandwa**
Estimated Ash Generation (Fly + Bottom)	MT	2337770	346550	953783	4150382
Cement Manufacturing	MT	1800083	155948	47689	1245115
Fly ash based products viz. bricks, blocks, tiles	MT	70133	51983	143067	207519
Construction of road and fly over embankment	MT	0	0	0	0
Back filling of abandoned coal mines / Stone Quarries	MT	0	0	190757	1265544
Filling up of low lying area	MT	0	36400	0	0
Filling of voids in old ash bund	MT	350665	0	572270	0
Bund raising	MT	0	0	0	0
Total ash utilization	MT	2220881	244331	953783	2718178
Percentage Utilization	**%**	**95.00**	**70.50**	**100.00**	**65.49**

Address for Correspondence: **OFFICE OF THE EXECUTIVE DIRECTOR (O&M: GEN)**
Block No.6, Shakti Bhawan, Rampur, Jabalpur-482008 (M.P.)
Phone No. 0761-2661589 / 2702600 Fax No. 0761-2664572
Email: edomg_mpeb@rediffmail.com

viii) Action Plan for utilization of Legacy Ash for FY 2022-23 :

Description	Unit	SGTPS, Birsinghpur	ATPS, Chachai	STPS, Sarni	SSTPP, Khandwa
Ash Generation (Fly +Bottom)	MT	2337770	346550	953783	4150382
Quantity to be utilized in first year i.e. 2022-23 (20% of annual estimated ash generation)	MT	467554	69310	190757	830076
Cement Manufacturing	MT	0	0	0	0
Fly ash based products viz. bricks, blocks, tiles	MT	0	0	0	0
Construction of road and fly over embankment (MT)	MT	471716	0	137408	468000
Back filling of abandoned coal mines / Stone Quarries	MT	0	90055	52500	714420
Filling up of low lying area	MT	0	0	0	0
Filling of voids in old ash bund	MT	0	0	0	0
Bund raising	MT	0	0	0	48440
Total ash utilization	MT	471716	90055	189908	1230860
Percentage Utilization	%	**100.89**	**129.93**	**99.56**	**148.28**

(2) Committees recommandentations for deposition of Environmental Compensation (EC) –

Compliance:

In compliance to the NGT order dated: 12/02/2020, CPCB has levied Environmental Compensation (EC) to the thermal power stations of MP Power Generating Company Limited vide letter dated: 02/07/2020 due to non utilization of 100% ash utilization. Further decision in the matter is pending, as the matter is under sub-judice in Hon'ble Supreme Court, hence no EC has been paid by MPPGCL.

(3) Committes recommendation for checking the strength of live Ash Bunds –

Compliance:

Name of TPS	Name of Expert agency	Year of study	Recommendation of Expert agency	Remark
SGTPS, Birsinghpur	IIT, Indore	2019	Ash dykes are proper & scientifically designed and present status is good for technical soundness, structural strength, stability, safety and is structurally sustainable and safe for adequacy for handling of fly ash generated from TPSs.	i) Report submitted to MPPCB vide no. 2235 dated: 10/12/2019. ii) To comply with NGT order dated: 18/01/2022, directives for frequency to carry out stability test being obtained from MPPCB. iii) Instruction of expert as regard of ash bund of SSTPP, Khandwa being complied.
ATPS, Chachai	IIT, Indore	2019		
STPS, Sarni	IIT, Indore	2019		
SSTPP, Khandwa	IIT, Indore	2019	i) Suggested to carry out regular maintenance of the slope due to erosion during monsoon season. ii) Advised to monitor the performance of the dyke using geotechnical instrumentation.	

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Phone No. 0761-2661589 / 2702600 Fax No. 0761-2664572
Email: edomg_mpeb@rediffmail.com

(4) Committes recommendation for prior permission from MPPCB before any disposal of fly ash / bottom ash in the low-lying areas and as per the CPCB guideline –

Compliance:

This condition is regularly prescribed by MPPCB during the renewal of Consent to Operate (CTO) every year & same is being complied by the thermal power stations of MPPGCL as and when required.

Address for Correspondence: OFFICE OF THE EXECUTIVE DIRECTOR (O&M: GEN)
Block No.6, Shakti Bhawan, Rampur, Jabalpur-482008 (M.P.)
Phone No. 0761-2661589 / 2702600 Fax No. 0761-2664572
Email: edomg_mpeb@rediffmail.com

नॉर्दर्न कोलफील्ड्स लिमिटेड
(मिनिरत्न कंपनी)
(कोल इण्डिया लिमिटेड की अनुषंगी कंपनी)

एन सी एल
NCL

Northern Coalfields Limited
(A Miniratna Company)
(A subsidiary of Coal India Limited)

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Office of Director(Tech./Project & Planning)

CIN- U10102MP1985GOI003160
An ISO: 9001, ISO: 14001 & ISO: 45001 Certified Company
पोस्ट- सिंगरौली कोलियरी, जिला- सिंगरौली, म.प्र., पिन 486889/ Post- Singrauli Colliery, Distt- Singrauli, M.P. PIN-486889
Phone: 07805- 266607, (FAX) 266652 website : www.nclcil.in

क्र :.एन.सी.एल./मुख्यालय/पर्यावरण/2022/1225 दिनांक: 26.03.22

सेवा में,

Shri Satyendra Kumar,
Director (HSM Division),
MoEF&CC, Govt. of India,
New Delhi

विषय:- OA No. 164/2018 titled as Ashwani Kumar Dubey v. UOI & Ors. before the Hon'ble NGT, New Delhi (PB) with OA No. 117/2014 titled as Shantanu Sharma v. UOI & Ors. and other connected matters – reg.

संदर्भ:- Office Memorandum No. 11/3/2018-HSM dated 9th March, 2022 issued by HSM Division, MoEF&CC.

महोदय,

Kindly refer the above office memorandum issued by your good office on subject matter. As per aforesaid office memorandum, action plan on the recommendations of the Joint Committees along with their timelines for their implementation was sought.

Accordingly, the desired information in respect of Bina OCP, Dudhichua OCP, Kakri OCP, Khadia OCP and Krishnashila OCP of Northern Coalfields Limited, Singrauli is enclosed herewith.

This is for your kind information please.

26/03/22

निदेशक (तकनीकी/ परि. एवं यो.),
एन.सी.एल.

Copy for kind information –

1. CMD, NCL
2. D(T/Op.), NCL

Copy to:-

1. TS to CMD, NCL
2. Area General Manager - Bina/ Dudhichua/ Kakri/ Khadia/ Krishnashila Area
3. GM/HoD - Civil/Safety & Rescue/Marketing & Sales/Environment, NCL

नॉर्दर्नकोलफील्ड्सलिमिटेड
(मिनीरत्नकंपनी)
(कोलइंडियालिमिटेडकीअनुषंगीकंपनी)

NCL Bina Project
Northern Coalfields Limited
(A Miniratna Company)
(A subsidiary of Coal India Limited)

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महाप्रबंधककार्यालय / Office of the General Manager

CIN- U10102MP1985GOI003160
An ISO: 9001, ISO: 14001 & OHSAS: 18001 Certified Company
पोस्ट- बीना परियोजना, जिला- सोनभद्र (उ.प्र.)पिन- 231220 / Post- Bina Project, Distt- Sonebhadra (U.P.)- 231220
Phone :05446-276279 (O), 267280 (R) Fax :05446-276274, 07805-25610 e-mail :gmbin.ncl@coalindia.in Website :www.nclcil.in

No.: Bina/Env/GM Env/22/14 Dated: 15.03.2022

To
General Manager (Env)
NCL, Singrauli

Subject: Preparation of time- bound action plan to implement the recommendation of the NGT Oversight committee mentioned in Para 15 of NGT Order dtd 18.01.2022 OA No. 164/2018.

Reference: Your email dated 10/03/2022.

Dear Sir
In reference to above subject , time bound action plan for implementing the recommendation of NGTOversight committee with respect to Bina project is as follows:-

S. No.	Recommendation of the committee	Action Plan with time line
1.	The unit can be asked to submit time bound action plan for controlling the fire in the coal stock yard.	At present, fire in coal stock yard has been controlled at Bina project by taking following measures:- 1. A new fire tender has been commissioned at Bina project as additional firefighting equipment. 2. There is a specific team (properly trained) working under Fire Fighting Officer (FFO- Bina) to tackle fire hazard in Bina mine. 3. Fire hydrant pipeline is provided at coal stock yard no.1 covering the periphery of coal stock yard. 4. Truck mounted mist spraying guns along with mobile sprinkler (70 Kl and 28 Kl) are provided to control fire hazards. 5. 2 no. of fixed fog cannon machine have been commissioned at coal yard no.1 and deshaling reject yard for control of fugitive emission and coal fire. In additional to this, another fire hydrant pipeline along with pumping arrangement will be provided near coal stock yard no.2 by June 2022
2.	The unit can be asked to explore the possibility to monitor the status of fugitive emissions through the existing CCTV	A log book is being kept in CCTV Control Room at GM Office, Bina Project, where, record is being maintained where fugitive emissions are visible in CCTV cameras and corrective action taken on the report.

	network provided for monitoring of production activities.	
3.	The unit can be asked to strengthen the vigilance mechanism to identify the default transporters and take stringent action against them.	Compliance of fully tarapualin covered trucks is being ensured by at Bina Project. Random inspections are being carried out to report default transporters. Further stringent action will be taken against any default transporter. This is being complied.
4.	The unit can be asked to provide effective tyre washing facility for transport vehicles.	The estimate for wheel washing facility has been approved and presently under tendering process and will be completed by October 2022.
5.	The unit can be asked to ensure proper treatment and disposal of MSW generated in residential colony.	Currently all MSW generated from residential colony is being collected door to door and stored at earmarked place within the colony premises. Further a estimate has been approved for the management of solid waste generated in Bina Colony as per SWM Rules 2016. The work will be awarded by June 2022 after tendering process.
6.	The unit can be asked to submit the time bound action plan for compliance with provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over burden (OB) for back-filling the abandoned mine.	The last five year overburden and coal production figure of NCL Bina Project are as follows:

S. No.	Year	Coal Production(In Tonne)	Overburden Removal(Million m^3)	Stripping ratio
1.	2020-21	8.413	36.35	4.32
2	2019-20	7.500	38.42	5.12
3.	2018-19	7.500	29.73	3.96
4	2017-18	7.500	25.89	3.45
5.	2016-17	7.500	29.78	3.97

As it is evident from the above table, that Bina Mine operates at a high stripping ratio (ratio of volume of waste rock to be removed per ton of coal). There are following constraints in fly ash filling in operating mines:

1. Bina Mine is working with only internal dumping of the overburden. The external dump has already achieved their capacity as per maximum permissible height granted by MoEF&CC and have been biologically reclaimed.
2. The Bina OCP requires additional space to accommodate OB of 275 MCum as per PR.
3. Mine is working with HEMM and there is high traffic density in the mines including dump area.
4. Mixing and dumping of fly ash in such huge volume of overburden is impractical and unsafe. In this

		IIT(BHU). As per results of the technical study: ***"It is technically not feasible to dump the fly ash in Mine dump in Bina OCP due to geo mining conditions, high stripping ratio, and huge rate of OB removal and instability of dump during rainy season in present condition."*** (Copy of the study report is attached). 5. Further study is currently being conducted at NCL by CIMFR- Dhanbad related to mine Backfilling through Fly Ash and its stability analysis Action plan will be submitted on the basis of recommendations of above mentioned study.
7.	The unit can be asked to take corrective action so that site of CAAQMS could be open from all direction	This being complied. Trees within the close vicinity of CAAQMS have been trimmed to minimize hindrance at the site.

This is for your kind information and for further needful.

Yours faithfully,

15/03/22

Area General Manager
Bina Extn Project

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Time Bound Action Plan to implement Recommendations of NGT Oversight Committee

S.No.	Recommendation of Oversight Committee	Action Plan/To be taken	Target date
1.	The unit should ensure regular operations of ETP and proper utilization of the treated effluent to achieve zero discharge.	1.Proper O&M of ETP is done by the department. Copy of active(work order enclosed). 2.Zero discharge is being maintained. Treated Effluent from ETP is effectively being used in Water sprinklers, Firefighting and Washing of HEMMs. 3. Proposal for relocation of ETP has been initiated vide E-581788 dtd: 27.09.2021 Location has been finalized in March,2022.	Complied
2.	The coal mine should ensure that no treated/untreated effluent will be discharged into the Balia Nalla which finally meets the Rihand reservoir.	1. Zero discharge is maintained. Treated effluent is used for Dust suppression, Fire fighting and washing of HEMM and Discharge from STP is within limits. Zero discharge is being maintained. 2. Treated Effluent from ETP is effectively being used in Water sprinklers, Firefighting and Washing of HEMMs. Zero discharge of STP has been made by re-using the treated sewage water in nursery. 3. De-Silting of drains is done regularly every year. Catch drain of size 2 x 2 m to 5 x 5 m of length 7 km and two siltation ponds of size 200m x 40-60 m x 4 m and 300m x 60m x 5m respectively have been designed and constructed to arrest silt and sediments flows from soil, OB and mineral dumps. 4. Proper silt cleaning is done to arrest flow of silt every year (work order enclosed).	Complied
3.	The unit can be asked to explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	CCTV network is being provided for monitoring of production activities in the Project. CCTV network will be utilized for proper monitoring of Fugitive emissions within 3 months.	30.06.2022

21.03.22
Staff Officer(Civil)
DCH

22/3/22
Staff Officer(E&M)
DCH

22-03-2022
Project Officer
DCH

22/3/2022
Staff Officer(Mining)
DCH

22.3.2022
Area General Manager
DCH

Time Bound Action Plan to implement Recommendations of NGT Oversight Committee

S.No.	Recommendation of Oversight Committee	Action Plan/To be taken	Target date
4.	The unit can be asked to strengthen the vigilance mechanism to identify the default transporters and take stringent action against them.	Transportation of coal, to the extent permitted by road is already being done by only covered trucks with proper tarpaulin cover. CCTV has been installed at the exit check post which is being monitored randomly by the dispatch Incharge and Environment department. Dispatch Incharge has been entrusted with the job of identifying the default transporters. Security Guard at the check post has also been instructed to ensure the strict compliance.	Complied.
5.	The unit can be asked to provide effective tyre washing facility for transport vehicles.	Work for Commissioning of Wheel Washing Plant at Dudhichua Project as per the recommendation of NGT Oversight Committee is under process. Expected to be completed by December 2022.	31.12.2022
6.	The unit can be asked to ensure proper treatment and disposal of MSW generated in their residential colony.	Residential colony of Dudhichua lies in Municipal limits. A MSW thus generated is segregated at project as dry and wet waste. Dry waste is handled by Municipal Corporation (copy of receipts as proof is enclosed for reference) where wet waste is turned into compost. Wet Waste is also send to Nagar Nigam Depo.(copy Enclosed).	Complied
7.	The unit can again be asked to submit the time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	1. A work order was issued on 10.07.2021 to IIT-BHU for carrying out "**Scientific Study of fly ash utilization/dumping/mixing in the OB of the running /active mines of NCL along with its viability and safety aspect of man and machinery**". 2.Final Report regarding Fly Ash has been submitted by IIT BHU which states that Fly Ash used in overburden is not feasible both external and internal. 3.Further guidance from DGMS has been sought for regarding the matter vide letter DCH/GM/PO/DGMS/Permission/22/235 (copy attached) and response is awaited. 4. Study on applicability of utilization of 25% fly ash along with Over Burden (OB) for back-filling in Dudhichua Mine is currently being conducted by CIMFR-Dhanbad.Action Plan will be submitted on the basis of recommendations of the above mentioned study.	30.09.2022

21.03.21
Staff Officer(Civil)
DCH

22/3/22
Staff Officer(E&M)
DCH

22-03-2022
Project Officer
DCH

22/3/2022
Staff Officer(Mining)
DCH

22.3.2022
Area General Manager
DCH

108 (257) Mail Send

NORTHERN COALFIELDS LIMITED
DUDHICHUA PROJECT

No. DCH/SO(Civil)/WO/F 1062/2021-22/ 92 Date :- 24.09.21

To,

M/s Singh Enterprises
Vill and post Sarsawa,
Distt- Varanasi (U.P.)- 221003

Bank A/c No.	: 33850064664
Bank Name	: SBI, Jayant
PAN No	: AYPPS5830B
GSTIN No	: 23 AYPPS5830B 1ZF
Email Id	: vijendrasinghg@yahoo.co.in
Mobile No.	: 9425176522

Sub: Work Order for the work **"Cleaning of sump near ETP and Cutting of kutcha drain from mobile crusher to RCC box culvert and east section drain including protection work to arrest over flown silt from OB dump during monsoon in east section at Dudhichua Project."**

Ref: 1. Tender Notice No: DCH/C/21-22/ETN-03 Dated – 22.05.2021
2. LOA No: DCH/SO(CIVIL)/F 1062/LOA/ETN-03/2021-22/204 dated : 23.06.2021

Dear Sir,

With reference to the above, the subject work is awarded to you at a total value of **Rs. 36,93,597.93/- (Rupees Thirtyu six lakhs ninety three thousand five hundred ninety seven and paise ninety three Only) (including GST @ 18% Rs. 5,63,430.19/- Rupees Five lakhs sixty three thousand four hundred thirty and paise nineteen Only)** with to the following stipulations:

1. All the materials, equipment, tools & plants and labour required for the work will be arranged by you. The company does not undertake any responsibility for supply of the same.

2. Total security money for the subject work will be **Rs. 2,95,488/- (Rupees Two lakh ninety five thousand four hundred eighty eight only)** and subsequent deposit of TDR A/C No.- 40438714272 Dt- 14.09.2021 **Rs. 1,11,000.00/-** issued by **SBI, Jayant** towards initial Security money has been taken into first part of 3% initial security deposit. All running on account bills shall be paid @ 95% of the work value and 5% deduction made from your bill will be retained as second part of the security deposit.

   All running on account bills shall be paid @ 95% of the work value. This 5% deduction towards Retention Money will be the second part of the security deposit.

3. The work shall be completed within 180 (one hundred eighty) days from the date of commencement of the work.
4. The work should be executed as per the BOQ, General Terms & Conditions, Additional Terms & Conditions, CPWD specifications, BIS Standards, description of the items of the accepted tender document and instructions of EIC.

5. You should ensure implementation of CMPF and Miscellaneous Provisions Act, 1952 and allied scheme framed thereunder in respect of workers deployed by you and will have to recover statutory dues and deposit the same along with employer's contribution (Contractor's Share) to the respective CMPF office and submit statutory returns under intimation to Principal Employer.

24/9/21
Staff Officer (Civil)
Dudhichua Area

108

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6. All taxes (except GST), local, municipal, provincial or central etc. and cess, royalties etc. as payable shall be to the contractor's account and shall be deemed to have been included in the tendered rate for the work to be executed.
7. Regarding GST, the following may please be noted:

(i) GST will be reimbursed on production of uploaded invoice / documentary evidence. Amount of statutory levies like CGST, SGST or IGST will be released when the same will appear in GSTR-2A of NCL in the common portal of GST and after submission of documentary evidence of deposition of GST Taxes and filing of GST Returns.

(ii) You will have to pass on Input Tax Credit by way of enclosing original Tax Input invoice with bill.

(iii) You will be required to submit the certificate from practicing Chartered Accountant having a valid membership number for complying of Anti-Profiting Clause U/S 171 as well as office memorandum F No. 296/07/2017-CX.9 dated- 15.06.2017 issued by department of Revenue ,Ministry of finance, Government of India.

(iv) All invoices submitted by you will have to be in the form of GST invoice giving all details as required under the law. You will raise invoice strictly adhering to provisions of Section 31 under CGST Act 2017 along with Rule 46 & 47 of CGST Rule, 2017. You will indicate the rate as well as amount of CGST, SGST or IGST in invoice. You will upload the details of invoice on GST portal as per the provisions of GST Act. Invoice issued by you should bear GST Registration Number of NCL (23AABCN4884H1ZE for MP & 09AABCN4884H1Z4 for UP) to enable NCL to claim input tax credit.

(v) You will file all the Returns and details as applicable under GST Laws & Rules within due dates.

(vi) You will give an undertaking on invoice or as separate Annexure along with the invoice that the Invoice / applicable GST Returns has been / will be uploaded on GST Portal within due time as prescribed in CGST Act and CGST, SGST or IGST has been deposited as per the provisions of GST Act and rules thereof.

(vii) If there is any delay of payment against the Invoice due to your fault and if any reversal of input tax arises, the same will be recovered from you along with interest and penalty if any, as paid by NCL due to reversal.

(viii) In case the GST rating of vendor on the GST Portal / Government's official website is negative / black listed at any stage even after award of work, NCL has right to cancel the Letter of Award. NCL shall not be obliged or liable to pay or reimburse GST to such vendor and shall also be entitled to deduct/recover such GST along with all penalties / interest, if any incurred by NCL.

(ix) You will issue credit note as per the provisions of Rule 53 of CGST Rule, 2017 on quality deduction or Liquidated Damages, if any arises.

(x) You will be required to submit a Certificate from practicing Chartered Accountant having a valid Membership Number for complying of Anti-Profiting Clause U/S 171 as well as Office Memorandum F. No. 296/07/2017-CX.9 dated 15.06.2017 issued by Department of Revenue, Ministry of Finance, GOI.

(xi) If you default in uploading the invoice / applicable GST Returns or default in deposit of applicable GST Taxes, NCL reserves the right to upload such defaulter on NCL website and may also debar you from participating in future tenders for a minimum period of one year.

8. You shall not pay less than the minimum wages to the labourers engaged by you as per Minimum Wages Act or such other legislation or award of minimum wages fixed by the respective State Govt. or Central Govt. as may be in force.

9. You shall maintain all records as per the provisions made in various statutes including contract labour regulation and abolition act.

24/9/21

Staff Officer (Civil)
Dudhichua Area

10. You are required to make timely payment of government dues which you are under legal obligation to pay to state government or any other legal authority every month.

11. You shall depute yourself/your agent/representative at the work site during the period of contract to receive instructions from the department. Intimation in this regard should be submitted to the department.

12. All the Clauses of Safety Code of the Tender Document as laid down in Additional Safety Measures to be taken by the contractor are to be strictly followed.

13. In addition to above, the award shall be guided by the standard General Terms & Conditions as per provision of MCEW and the NIT & tender document for the subject work as referred above, that shall be considered as integral part of this work order.

14. Please contact PE(Civil)/Mines/DCH for further instructions regarding the work.

15. This work order will form a part of the agreement.

16. **The date of commencement and completion of the work will be reckoned as 24.06.2021 and 20.12.2021 (180 days) respectively for all future purpose.**

Yours faithfully,

24/6/21

Staff Officer (Civil)
Dudhichua Area

Copy to:

1. CVO, Singrauli
2. GM, Dudhichua Area
3. GM(C),NCL HQ, Singrauli
4. PO/DCH
5. I/C Quality Control/HQ (Civil)- with a request to collect the samples as per norms from the site during execution of the work.
6. AFM, Dudhichua Area --- this is as per **FC-FY 21-22: REG. 1/150/11 Dated 22.06.2021** for Amount- **Rs. 36,93,597.93/- (FY-21-22) Under Head- Monsoon Preparation Civil**
7. SO(P),Dudhichua Area
8. Chief Manager(Civil)/Mines/Dudhichua.
9. Asst. Manager(Civil)/Mines/DCH
10. Regional Labour Commissioner(C), Bhoot Nath Ashram, Sarvodaya Nagar, Kanpur-208005(UP)
11. Assistant Labour Commissioner(C),189/A-4,Alopibagh, PO-Daraganj, Allahabad (UP)
12. Labour Enforcing Officer (C), 189/A-4,Alopibagh, PO-Daraganj, Allahabad (UP)

नॉर्दर्न कोलफील्ड्स लिमिटेड
(मिनिरत्न कंपनी)
(कोल इण्डिया लिमिटेड की अनुषंगी कंपनी)

Northern Coalfields Limited
(A Miniratna Company)
(A subsidiary of Coal India Limited)

सिविल विभाग/ Civil Department

CIN- U10102MP1985GOI003160
An ISO: 9001, ISO: 14001 & OHSAS: 18001 Certified Company
पोस्ट- सिंगरौली कोलियरी,जिला- सिंगरौली, म.प्र., पिन 486889/ Post- Singrauli Colliery, Distt- Singrauli, M.P. PIN-486889
Phone: 07805- 256431,266588, (FAX) 266640 email: gmcivil.ncl@coalindia.in website : www.nclcil.in

No. GM(C)/NCL/SGR/WO/ETN-98/20-21/21/863 Date: 03/09/2021

Registered Post

To
M/s. Chandrika Prasad Singh,
Shakar Market, Jayant, Distt. Singauli (M.P.) Pin 486890
Email Id: vinodksingh68@gmail.com

PAN: AHOPS6213N
GSTIN: 23AHOPS6213N1ZV
09AHOPS6213N1ZL

Sub: Work Order for the work **"Operation & maintenance of Effluent treatment plant and other miscellaneous works at Dudhichua Project for a period of 2 years."**

Ref: (i) Tender Notice No. GM(C)/SGR/20-21/ETN-98 Dated: 21.11.2020.
Tender ID: 2020_NCL_188446_1
(ii) LOA No. GM(C)/SGR/LOA-03/ETN-98/21-22/59 Date: 09.04.2021

Dear Sir,

With reference to the above, the subject work is awarded to you at a total value of ₹ 74,50,267.32 **(Rs. 63,13,785.86 + GST@18% Rs. 11,36,481.46) (Rupees Seventy Four Lakh Fifty Thousand Two Hundred Sixty Seven and Paise Thirty Two only) (including GST)** with the following stipulations.

1. All the materials, equipment and manpower required for the work will be arranged by you.

2. Total security money shall be ₹ **5,96,022/-(Rupees Five Lakh Ninety Six Thousand and Twenty Two only),** 8% (Eight Percent) of contract value, as per the terms & conditions of the tender/contract. TDR deposited vide TDR no. EM/TDR/M/No. 698832 with date of issue 28.06.2021 date of maturity 28.12.2023 for ₹ 80,810/- (Rupees Eighty Thousand Eight Hundred and Ten only) issued by Union Bank of India, Branch: Nigahi and earnest money amounting to ₹ 1,42,700/- online deposited along with the tender vide Bank Name: Axis Agreegator Bank Netbanking, Bank/UTR Number: 73323715, eProcurement Ref./PRN Number: 193983583967 has been taken towards 3% performance security which is first part of security deposit.

   All running on account bills shall be paid @ 95% of work value. This 5% deduction towards retention money will be the second part of security deposit.

   TDR submitted by you vide TDR no. EM/TDR/M/No. 698829 with date of issue 25.06.2021 date of maturity 25.06.2023 for ₹ 15,00,000/- (Rupees Fifteen Lakh only) and TDR no. EM/TDR/M/No. 698831 with date of issue 28.06.2021 date of maturity 28.06.2023 for ₹ 15,48,350/- (Rupees Fifteen Lakh Forty Eight Thousand Three Hundred and Fifty only) issued by Union Bank of India, Branch: Nigahi have been taken into account towards Additional Performance Security. Total amount of Rs. 30,48,350/- has been submitted by M/s Chandrika Prasad Singh for the Additional Performance Security.

03.10.21

3. The work shall be completed within 730 (Seven Hundred and Thirty) days from the date of commencement of the work. The date of commencement of the work shall be reckoned from the 10th day of issue of letter of acceptance or from the 7 days of actual date of handing over of the site whichever is later. However, the date of commencement may be decided with mutual consent with the contractor prior to the date as prescribed above.

4. The work should be executed as per the BOQ, General Terms & Conditions, Additional Terms & Conditions, Scope of Work, Special Terms & Conditions, CPWD specifications, BIS Standards, description of the items of the accepted tender document and instructions of EIC.

5. You should ensure implementation of CMPF and allied schemes and Miscellaneous Provisions Act, 1948 or Employees Provident Fund and Miscellaneous Provisions Act, 1952 as the case may be and allied scheme framed there under in respect of workers deployed by you and will have to recover statutory dues and deposit the same along with employer's contribution (Contractor's share) to the respective CMPF/EPF Office and to submit statutory return under intimation to the Principal Employer.

6. All duties, taxes (excluding Goods and Services Tax (GST) & GST Compensation Cess (if applicable only), local, municipal, provincial or central etc. and other levies, royalty, building and construction workers cess (as applicable in States) etc. as payable shall be to the contractor's account and shall be deemed to have been included in the tendered rate for the work to be executed. Payment of GST & GST Compensation Cess shall be dealt as per NIT Provisions, GST Act and Rules and other stipulations mentioned in this letter.

7. Regarding GST, the following may please be noted:

(i) GST will be reimbursed on production of uploaded invoice/documentary evidence. Amount of Statutory levies like CGST, SGST or IGST will be released when the same will appear in GSTR-2A of NCL in the common portal of GST and after submission of documentary evidence of deposition of GST Taxes and filing of GST Returns.

(ii) You will have to pass on Input Tax Credit by way of enclosing original Tax input invoice with bill.

(iii) You will be required to submit a certificate from Practicing Chartered Accountant having a valid membership number with Institute of Chartered Accountants of India for complying of Anti-Profiting Clause under Section 171 of CGST Act, 2017 as well as office memorandum No 296/07/2017-CX.9 dated 15th June 2017 issued by Department of Revenue, Ministry of Finance, GOI.

(iv) All invoices submitted by you will have to be in the form of GST invoice giving all details as required under the law. You will raise invoice strictly adhering to provisions of section 31 of CGST Act, 2017 along with Rule 46 & 47 of CGST Rule, 2017. You will indicate the rate as well as amount of CGST, SGST or IGST in invoice. You will upload the details of Invoice on GST portal as per the provision of GST Act. Invoice issued by you should bear GST Registration Number of NCL [23AABCN4884HEM1ZE for M.P. & 09AABCN4884H1Z4 for U.P.] to enable NCL to claim INPUT TAX CREDIT.

(v) You will file all the Returns and details as applicable under GST laws & rules within due dates.

(vi) You will give an undertaking on invoice or as separate Annexure along with invoice that Invoice/ applicable GST returns has been/will be uploaded in GST portal within due time as prescribed in CGST Act and CGST, SGST or IGST has been deposited as per the provision of GST Act and rules thereon.

(vii) If there is any delay of payment against the invoice due to your fault and if any reversal of input tax arises, the same will be recovered from you along with interest and penalty if any, as paid by NCL due to reversal.

05.10.21

(viii) In case the GST rating of vendor on the GST portal / Government's official website is negative / black listed at any stage even after award of work, NCL has right to cancel the letter of award. NCL shall not be obligated or liable to pay or reimburse GST to such vendor and shall also be entitled to deduct / recover such GST along with all penalties / interest, if any, incurred by NCL.

(ix) You will issue credit note as per the provision of Rule 53 of CGST Rule, 2017 on quality deduction or liquidated damages, if any arises.

(x) If you defaults in uploading the invoice/ applicable GST returns or default in deposit of applicable GST Taxes, NCL reserves the right to upload such defaulter on NCL website and may also debar you from participating in future tenders for a minimum period of one year.

8. You shall not pay less than the minimum wages to the labourers engaged by you as per Minimum wages act or such other legislation or award of minimum wages fixed by the respective State Govt. or Central Govt. as may be in force.

9. All the Clauses of Safety Code of the Tender Document, as laid down in Additional Safety Measures to be taken by the contractor, are to be strictly followed.

10. Please contact **Staff Officer(Civil), DudhichuaArea, NCL** for further instructions regarding execution of work.

11. This work order will form a part of the agreement.

Yours faithfully,

20.10.21

General Manager (Civil)
NCL, Singrauli

Copy to:-

1 CVO, NCL, Singrauli
2 TS to Dir(P/T/P&P)/NCL
3 GM(Personnel)/ GM(Finance) I/c NCL, Singrauli
4 GM Dudhichua NCL
5 GM(Civil), NCL
6 GM(Civil/TC), NCL
7 Staff Officer(Civil), Dudhichua, NCL
8 AFM, Dudhichua, NCL
9 Secretary to GM (CSR).

Operator's Signature:

Party Signature:

Nagar Palik Nigam Singrauli
Litadel 15WM Project Singrauli P.Ltd.

Baniyari 1

Txn No	: 2643	VEHICLE NU	: MP 66 G 2739
PARTY NAME	: ANIL	MATERIAL	: PLASTIC
VEHICLE TYPE	: TATA 207	SOURCE	: NLL DUDHICHUA

GROSS WT	:	25000 kg	Date :25-02-2022	Time :15:46	
TARE WT	:	19600 kg	Date :25-02-2022	Time :15:55	
NET WT	:	5400 kg			

Contact us for Weighbridge Requirement
APS ANCHOR Electronics Mob 8839748166

8109397435

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नॉदर्न कोलफील्ड्स लिमिटेड
(मिनिरत्न कंपनी)
(कोल इण्डिया लिमिटेड की अनुषंगी कंपनी)

Northern Coalfields Limited
(A Miniratna Company)
(A subsidiary of Coal India Limited)

115

Dudhichua Project

CIN: U10102MP1976GOI001160
An ISO: 9001, ISO: 14001 & OHSAS: 18001 Certified Company
Post- Khadia, Dist.Sonbhadra (U.P) PIN-231222
Phone: 05446-232204/07805 226970, (FAX) 05446 - 231614 email: gmdudh.ncl@coalindia.in

NO: DCH/GM/PO/DGMS/Permission/22/235

Date: 15.01.2022

To,
The Director of Mines Safety,
Northern Zone, Varanasi Region
House No S-2/039-36, VarunaVihar Colony
Central Jail Road, Near JP Mehta Int. College
Varanasi - 221002 (UP)

Subject: Guidance regarding dumping of Fly Ash in Dumps of Dudhichua OCP.

Dear Sir,

This is to inform you that application for CTO renewal for Dudhichua OCP has been submitted from our end and RO inspection has been done.The Department of Mining Engineering of Indian Institute of Technology (BHU) was assigned the job of scientific study of fly ash utilization/dumping Mixing in the OB of the running/active mines of NCL along with the viability and safety aspect of man and machinery on 10.07.2021. The final report in respect of our project has been submitted by the institute. (Report attached).

In view of the recent Gazette Notification (copy attached) and the CTO conditions, it is requested to kindly guide us regarding dumping of fly ash in the OB dumps of Dudhichua OCP as per the report of IIT, BHU and clause B (3) of attached Gazette notification since it is also a condition required for CTO compliance of MPPCB, Bhopal.

With regards

Encl:
1. CTO application no - 1102755
2. Fly ash Utilization Notification dated 31.12.2021
3. IIT, BHU – Final report.

Yours faithfully,

15-01-2022

Project Officer
Dudhichua Project.

नॉर्दर्न कोलफील्ड्स लिमिटेड
(मिनिरत्न कंपनी)
(कोल इण्डिया लिमिटेड की अनुषंगी कंपनी)

एन सी एल NCL

ककरी परियोजना / Kakri Project

NCL Kakri Project
Northern Coalfields Limited
(A Miniratna Company)
(A subsidiary of Coal India Limited)

Digital India

CIN- U10102MP1985GOI003160
An ISO: 9001, ISO: 14001 & OHSAS: 18001 Certified Company
पोस्ट- ककरी, जिला- सोनभद्र, उ.प्र., पिन 231224/ Post- Kakri, Distt- Sonbhadra, U.P. PIN-231224
Phone: 05446- 278094, (FAX) 05446-278375 email: gmkak.ncl@coalindia.in website : www.nclcil.in

No. GM/KKR/Env/21-22/ 1304

Date: -15/03/2022

पर्यावरण / आई.एस.ओ
एन.सी.एल. मु. सिंगरौली
प्राप्ति / निर्गत नं Env/5655.
दिनांक 16/03/22

To,
The General Manager (Env)
NCL HQ, Singrauli

Sub: - Preparation of time-bound action plan to implement the Recommendations of the NGT Oversight Committee mentioned in Para 15 of NGT Order dtd 18.01.2022 in O.A. 164 of 2018.

Sir,

In reference to the above subject, time bound Action Plan for implementing recommendations of NGT Oversight Committee with respect to Kakri Project is as follows: -

S. No.	Recommendation of the Committee	Action taken / to be taken	Target Date
1.	The coal mine should ensure that no treated or untreated effluent will be discharged into the Rihand Reservoir through the drain.	1. Alternate mine water point has been strategically erected in the mines to recycle sump water. 2. Further, capacity storage of siltation pond, where excess treated water is being stored, is being enhanced (Work Order attached as Annexure 1). 3. Truck mounted Fog canon hiring has been completed. The machine will start its operation from 01.04.2022 onwards (Annexure 2). The same would help in further utilization of treated water and suppression of fugitive emissions.	Complied 30.05.2022 01.04.2022
2.	The coal mine should immediately trap seepage in the drain at mine water collection sump.	Seepage has been arrested in the drain at mine water collection sump.	Complied
3.	The unit can be asked to strengthen the vigilance mechanism to identify the default transporters and take stringent action against them.	Compliance of fully tarpaulin covered trucks is being ensured by Security team with the help of CCTV. Random Inspections are being carried out by Nodal Officer (Envt.) to report default transporters and practices (Annexure 3). Banning of default truck for certain period is being implemented.	-
4.	The unit can be asked to explore possibility to monitor the status of	Monitoring of fugitive emissions inside the mines is being done through CMPDIL	-

Ch.Mgr.(Env.) 16-3-22

	fugitive emissions through the existing CCTV network provided for monitoring of production activities	each fortnightly, and the report of the same is being communicated to UPPCB quarterly. CCTV have been installed at strategic positions in mines and monitoring of fugitive emissions through CCTV is being considered.	
5.	The unit can be asked to provide effective tyre washing facility for transport vehicles.	Work for commissioning of tyre washing facility at Kakir Project is under process. Expected to be completed by Sept 2022.	30.09.2022
6.	The unit can be asked to ensure proper treatment and disposal of MSW generated in their residential colony.	Tender for the management of Solid Waste generated in Kakri Colony as per Solid Waste Management Rules, 2016 has been floated vide KKR/NCL/Civil/2021-22/ETN-43 on 07.03.2022 in 'coalindia.nic.in'. The Tender would be finalized by June 2022.	30.06.2022
7.	The unit can be again asked to submit the time bound action plan for complaicne with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over- Burden (OB) for backfilling the abandoned mine.	Study on applicability of utilization of 25% fly ash along with Over-Burden (OB) for backfilling in Kakri Mine is currently being conducted by CIMFR-Dhanbad. Action plan on the same would be submitted on the basis of recommendations of the above mentioned study.	30.09.2022
8.	The unit can be asked to take corrective action so that the site of CAAQMS could be open from all directions.	Trees in the close vicinity of CAAQMS, which were pointed out by the NGT Oversight committee in their last visit, have been trimmed to minimize hindrance for horizontal movement of wind.	Complied

This is for your perusal and further needful.

Yours faithfully,

14/07/22

General Manager
Kakri Project

नॉर्दन कोलफील्ड्स लिमिटेड
(मिनि रत्न कंपनी)
(कोल इण्डिया लिमिटेड की अनुषंगी कंपनी)

Annexure-1
Northern Coalfields Limited
(A Mini ratna Company)
(A subsidiary of Coal India Limited)

ककरी क्षेत्र/ Kakri Area

CIN- U10102MP1985GOI003160
An ISO: 9001, ISO: 14001 & OHSAS: 18001 Certified Company
पोस्ट-ककरी,जिला- सोनभद्र,(उ.प्र.), पिन 231224/ Post- Kakri, Distt- Sonebhadra, (U.P.) PIN-231224
email: soc.kakri.2017@gmail.com website : www.nclcil.in

No. KKR/Civil/LOA/2021-22/298

Date: 22/02/2022

To
M/s Ishani Construction
Anpara, Mahaveer Colony-231225
Distt: Sonebhadra (U.P.)
E-mail: niraj.choubey1975@gmail.com
Mb. 9473983864

PAN : AIEPC1048C
GSTIN No. 09AIEPC1048C1ZW
BANK A/C NO. 650301010050136, UBI, Bina

Sub: Letter of Acceptance for the work **"Desilting of zero discharge pond and making of another pond and cleaning of connecting nala at Kakri Project."**
Ref: Tender Notice No. NCL/KKR/Civil/2021-22/ETN-33, dtd. 29/01/2022

Dear Sir,

With reference to the above, this is to communicate the approval of the competent authority for award of the subject work to you for an amount of ₹9,93,257.40 **(₹8,41,743.56 + GST @18% ₹1,51,513.84) (Rupees Nine Lakh Ninety-Three Thousand Two Hundred Fifty-Seven and Paisa Forty) only including GST** has been accepted subject to the following stipulations.

1. All the materials, equipment and manpower required for the work will be arranged by you.
2. You are required to submit the Registration / license under Contract Labour (R&A) Act, 1970 within 10 (Ten) days from the date of receipt of this Letter of Acceptance, if required.
3. The Performance security (first part of security deposit) shall be 5% of the contract value amounting to **₹49,663/- only.** The earnest money amounting to **₹19,300/-** deposited by you along with the tender as per Online Payment Information vide **Bank Name : AXIS Aggregator, Bank/ UTR Number 100040008, Ref/ PRN Number 238595780894** has been taken as part of Performance Security.
4. All running on account bills shall be paid @ 95% of work value. This 5% deduction towards retention money will be the second part of security deposit.
5. You are required to submit the following within **21 (Twenty-one) days** from the date of issue of this letter of acceptance for issuing formal work order and executing agreement for the work:

   i. **₹30,363/-** towards balance performance security money in acceptable form.
   ii. Copy of GST Registration Certificate and Service Accounting Code (SAC) of works/services.
   iii. Copy of Income Tax PAN.
   iv. Copy of Partnership deed, Power of Attorney, an affidavit regarding Proprietorship status etc.
   v. Copy of CMPF/EPF Registration or Copy of undertaking for implementation of CMPF Act.
   vi. Authorisation form for e-Payment duly filled-in.
   vii. PERT/BAR Chart showing percentage of periodical progress for completion of work.
   viii. Non - Judicial Stamp Paper worth Rs. 100.00 of U.P State.
   ix. Copy of the letter of Handing over the site.

Kumar

Recvd Dinesh 22-2-22

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Annexure-2

Contract

Contract No: GEMC-511687739991545
Generated Date: 16-Feb-2022
Bid/RA/PR No: GEM/2021/B/1813105

Organisation Details

Type:	Central PSU
Ministry:	Ministry of Coal
Department:	Materials Management
Organisation Name:	Northern Coalfields Limited
Office Zone:	Singrauli

Buyer Details

Designation:	HEAD OF E&M DEPT KAKRI
Contact No.:	05446-278094-
Email ID:	hariohm.2607@coalindia.in
GSTIN:	09AABCN4884H1Z4
Address:	O/O GENERAL MANAGER, E&M DEPARTMENT, KAKRI PROJECT, KAKRI, DISTT - SONEBHADRA (U.P. - 231224), SONBHADRA, UTTAR PRADESH-231224, India

Financial Approval Detail

IFD Concurrence:	No
Designation of Administrative Approval:	AREA GENERAL MANAGER, KAKRI PROJECT
Designation of Financial Approval:	AREA FINANCE MANAGER, KAKRI PROJECT

Paying Authority Details

Payment Mode:	GPA - Challan
Designation:	AFM KAKRI
Email ID:	bishan.s8221@coalindia.in
GSTIN:	N
Address:	REGIONAL STORES, KAKRI PROJECT, NCL, PO - KAKRI, SONBHADRA, UTTAR PRADESH-231224, India
Payment Timelines:	Payments shall be made to the seller within 30 days of issue of consignee receipt-cum-acceptance certificate (CRAC) and on-line submission of bills (This is in supersession of 10-days time as provided in clause 12 of GeM GTC)

Consignee Details

S.No	Consignee Name & Address	Service Description
1	Contact: 05446-278094- Email ID: hariohm.2607@coalindia.in GSTIN: 09AABCN4884H1Z4 Address: O/O GENERAL MANAGER, E&M DEPARTMENT, KAKRI PROJECT, KAKRI, DISTT - SONEBHADRA (U.P. - 231224), SONBHADRA, UTTAR PRADESH-231224, India	Hiring of Earth Moving Equipments, Material Handling Equipments and Cranes

Service Provider Details

GeM Seller ID:	FC4D200001096590
Company Name:	M/S SAI RAM TRAVELS
Contact No.:	08517999438
Email ID:	dinesh2010dubey@gmail.com
Address:	WARD NO- 47 HOUSE NO -148,AMBIKAPUR RING ROAD,GANGAPUR KHURD, NEAR PRATIKSHA BUS STND.AMBIKAPUR,SURGUJA,CHHATISGARH,497001, Surguja, CHHATTISGARH-497001,
MSME verified:	Yes
MSME Registration number:	CG16E0000968
MSE Social Category:	General
MSE Gender:	Male
GSTIN:	22AQNPD8845K1ZI

*GST / Tax invoice to be raised in the name of - Buyer

Service Details

Contract Start Date : 01-Apr-2022 **Contract End Date :** 31-Mar-2024

Category Name : Hiring of Earth Moving Equipments, Material Handling Equipments and Cranes

Billing Cycle : monthly

Description		Number of Machines Required	(Unit Price) Rate per Hr.
Fuel to be provided by Buyer :	Yes	1	345.000
Type of Machinery Required :	Fog Canon - On Truck		
Type of Special Purpose Equipment :	Truck Chasis Mounted Fog Canon Composite System		
Manufacturing / Registration year from the date of award of contract :	up-to 5 years		

Total Amount (Formula) :
(Number of Machines Required*Rate per Hr.*Nos. of working hours per day*Nos. of w orking days in a month*No. of months of contract period)

Total Value without Addons :	3974400
Total Addon Value	0
Total Value including Addons	3974400

Amount of Contract

Total Contract Value including All Duties and Taxes in INR	3974400

SLA Details - Hiring of Earth Moving Equipments, Material Handling Equipments and Cranes

SERVICES STC

SPECIAL TERMS AND CONDITIONS

FOR HIRING OF EARTH MOVING EQUIPMENTS,

MATERIAL HANDLING EQUIPMENTS AND CRANES

1. Preamble

This Agreement represents the Special Terms and Conditions (STC) and the Service Level Agreement (SLA) between the Buyer and Service provider. The purpose of this agreement is to facilitate the implementation of required services at the buyer's premises or any other premises designated by buyer.

This Agreement outlines the scope of work, buyer's obligations, special terms and conditions related to service delivery and payment of services for mutual understanding of the stakeholders.

The Agreement remains valid till completion of scope of services or end of contractual duration (whichever is earlier) unless either superseded by a revised agreement mutually endorsed by the stakeholders or terminated by either of the parties thereof.

The Services contracts placed through GeM shall be governed by following set of Terms and Conditions:

1. General terms and conditions for Services;
2. Service Specific STC of the Services contracts shall include the service level agreement (SLA) for the service;
3. BID / Reverse Auction specific ATC.

The above terms and conditions are in reverse order of precedence i.e. ATC supersedes Service specific STC which supersede GTC, whenever there are any conflicting provisions. The above set of terms and conditions along with scope of work and service level agreement as enumerated in the document shall be construed to be part of the Contract between Buyer and Service Provider. The service will be provided in bid only mode.

2. Objectives and Goals

The objective of this agreement is to ensure that all the commitments and obligations are in place to ensure consistent delivery of services to buyer by service provider. The goals of this agreement are to:

1. Provide clear reference to service ownership, accountability, roles and responsibilities of both parties
2. Present a clear, concise and measurable description of services offered to the buyer
3. Establish terms and conditions for all the involved stakeholders, it also includes the actions to be taken in case of failure to comply with conditions specified
4. To ensure that both the parties understand the consequences in case of termination of services due to any of the stated reasons

The agreement will act as a reference document that both the parties have understood the above-mentioned terms and conditions and have agreed to comply by the same. The agreement may be revised/ modified in written on mutual consent of the stakeholders.

3. Parties to the Agreement

The main stakeholders associated with this agreement are below-

1. **Buyer:** Buyer is responsible to provide clear instructions, approvals and timely payments for the services availed
2. **Service Provider:** Service provider is responsible to provide all the required services in timely manner. Service provider may also include seller, any authorized agents, assignees, successors and nominees as described in the agreement

The responsibilities and obligations of the stakeholders have been outlined in this document. The document also encompasses service level/ penalties in case of non-adherence to the defined terms and conditions. It is assumed that all stakeholders have read and understood the same before signing the document.

4. Scope of Services

The scope of Service will include, but not necessarily limited to the following:

Hiring of Earth Moving Equipment's, Material Handling Equipment's and Cranes for Cutting, Leveling, Dressing of Ground, Dismantling of Structures, Clearing of Debris, Loading and Un-loading of Debris and other material, Moving Material in the site etc. using the required machinery and skilled drivers and manpower for safe usage of machines and other equipment's desired for the work.

The contract can be

1. *All Inclusive* –Buyer will ask the Service Provider to quote their best prices per hour rate of renting the machine along-with the manpower, cost of fuel and consumables, repairs and periodic maintenance and commission.

2. *Fuel Paid by the Buyer*– Buyer will ask the Service Provider to give their best prices per hour rate of renting the machine along-with the manpower, and consumables, repairs and periodic maintenance and commission with-out the cost of fuel (In this case customer can fix-up the max fuel required per hour by the machine.)

Annexure 3 (1/2)

NORTHERN COALFIELDS LIMITED
KAKRI PROJECT

121

No. NCL/KKR/NO (Env)/2022/1149

Date: 31.01.2022.

To,
Project Officer / Area Sales Officer
Kakri Project
NCL

Subject: - Report on random surprise inspection conducted on Kakri barrier.
Ref: - Office Order No: - KKR/GM/Admin/21-22/1333 dtd 26.10.2021 of GM/KKR.

Sir,

With reference to above office order, the undersigned has been assigned to conduct random inspections to ensure strict compliance regarding fully covered coal transport trucks by tarpaulin. On 29.01.2022, the undersigned made surprise inspection and observed following points: -

1. Transportation road was properly sprinkled with water.
2. Most trucks were properly covering the trucks at all sides. However, a truck with licence plate **UP 64 BT 1493** had shorter and ragged tarpaulin, and the same was not properly secured with ropes at the rear end. This resulted in truck not being fully covered during transportation.

The undersigned kindly requests you to take necessary action so that 100% compliance of fully covered tarpaulin trucks could be achieved at Kakri Project. This is for your information and further necessary action.

Encl: As above

Yours Sincerely,

31/1/22

Nodal Officer (Envt.)
Kakri Project

Copy to: -

1. GM KKR for kind information.
2. Security Incharge/KKR

O/C

121

Annexure 3 (2/3)

NORTHERN COALFIELDS LIMITED
KAKRI PROJECT

122

No. NCL/KKR/NO (Env)/2022/1097 Date: 17.01.2022

To,
Project Officer / Area Sales Officer
Kakri Project
NCL

Subject: - Report on random surprise inspection conducted on Kakri barrier.
Ref: - Office Order No: - KKR/GM/Admin/21-22/1333 dtd 26.10.2021 of GM/KKR.

Sir,

With reference to above office order, the undersigned has been assigned to conduct random inspections to ensure strict compliance regarding fully covered coal transport trucks by tarpaulin. On 14.01.2022, the undersigned made surprise inspection and observed following points: -

1. Most trucks were properly covering the trucks at all sides. However, a truck with licence plate **UP 64 T 4055** had shorter tarpaulin and was not properly secured with ropes at the rear end. This resulted in truck not being fully covered during transportation.
2. No register was found at Security check at the barracks where they were reporting incidences of such trucks so that penal actions could be taken against them.

This is for your information and further neecssary action.

Encl: As above

Yours Sincerely,
15/1/22
Nodal Officer (Envt.)
Kakri Project

Copy to: -
1. GM KKR for kind information.
2. Security Incharge/KKR for compliance of 2nd point.

O/C
122

Annexure 2 (2/2

NORTHERN COALFIELDS LIMITED
KAKRI PROJECT

123

No. NCL/KKR/NO (Env)/2022/ 1253 Date: 26.02.2022

To,
Area Sales Officer
Kakri Project
NCL

Subject: - Report on random surprise inspection conducted on Kakri barrier.
Ref: - Office Order No: - KKR/GM/Admin/21-22/1333 dtd 26.10.2021 of GM/KKR.

Sir,

With reference to above office order, the undersigned has been assigned to conduct random inspections to ensure strict compliance regarding fully covered coal transport trucks by tarpaulin. On 25.02.2022, the undersigned made surprise inspection and observed following points:-

1. Transportation road was properly sprinkled with water.
2. Most trucks had tarpaulin properly covering the truck at all sides and firmly secured by ropes. However, trucks with license plate **UP 64 T 9555 and MP 66 H 1279** had shorter tarpaulin, and the same was not properly secured with ropes at the sides as well as the rear end. When the undersigned asked them about securing the same with ropes, the drivers expressed inability to do so as they did not have ropes. This resulted in improper covering of truck during transportation.

The undersigned kindly requests you to take necessary action against the above so that 100% compliance of fully covered tarpaulin trucks could be achieved at Kakri Project. This is for your information and further necessary action.

Yours Sincerely,

Nodal Officer (Envt.)
Kakri Project

Copy to: -

1. GM KKR for kind information.
2. Project Officer/KKR for kind information.
3. Security Incharge/KKR - For compliance of fully covered tarpaulin in trucks, secured with ropes.

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नॉर्दर्न कोलफील्ड्स लिमिटेड
खड़िया परियोजना
(मिनिरत्न कंपनी)
(कोल इण्डिया लिमिटेड की अनुषंगी कंपनी)

एन सी एल
NCL

Northern Coalfields Limited
Khadia Project
(A Miniratna Company)
(A subsidiary of Coal India Limited)

Office of the General Manager

Digital India

CIN- U10102MP1985GOI003160
An ISO: 9001, ISO: 14001 & OHSAS: 18001 Certified Company
थाना–शक्तिनगर, जिला–सोनभद्र (उ0प्र0) पिन–231222/ Thana-Shaktinagar, Dist. Sonebhadra (U.P.) Pin- 231222
Phone: 05446- 232274, (FAX) 05446- 232274 Email: cgm.khd@gmail.com, website www.nclril.in

No. KHD/GM/M/Env./21-22/3329
.03.2022

Date: 25/03/2022

To,
The General Manager (Env.),
NCL, Singrauli

Sub: Preparation of time bound Action Plan to implement the recommendations of the committee (revised)
Ref: 1) Your letter no NCL / HQ / Env / 2022 / 8669 dated 15/02/2022
2)NGT Judgement dated 18/01/2022 in O.A. No. 164 of 2018 and other connected matters

Dear Sir,

Please refer to your above cited letter. Point wise reply to the points are given below:-

S. No	Recommendation	Status and Action plan	Timeline
1	The unit should ensure continuous operations of ETP. The unit should trap all the bypasses and should ensure that no treated/untreated effluent will be discharged into the environment.	Continuous operation of ETP is being ensured. Additional provision of drain for feeding raw water into ETP has been provided to ensure that untreated water reaches ETP for treatment. Creation of 02 new Siltation ponds has been proposed to further arrest any treated / untreated water from flowing outside.	Completed 31.08.2022
2	The unit can be asked to ensure the proper and regular operation of water spraying system for effective control of fugitive	Multi approach water sprinkling is in place at Khadia Project:- • Water sprinkling on haul roads is being done through high capacity (70 KL) 04 departmental water tankers & 29 contractual tankers	Completed

	dust emissions	(details attached). • 23 Fixed water sprinklers have been installed near coal yard. • Regular sprinkling is being ensured in CHP at all transfer points for control of dust emmissions. • One Fixed Fog cannon has been installed near coal yard. 03 additional fixed cannons are proposed for procurement. • One Truck mounted mist spray machine is being deployed for dust suppression on daily basis. 01additional truck mounted mist spray machine is under process of hiring.	31.12.2022 31.07.2022
3	The unit can be asked to strengthen the vigilance mechanism to identify the default transporters and take stringent action against them.	It is being strictly monitored through a network of CCTV cameras on the exit gates of the mine and no truck is being allowed to go out without tarpaulin covering. One register has also been put at the Exit Gates for documenting any such violation and to take action against the security personnel manning the exit gates as well as against the defaulter trucks, if any.	Completed
4	The unit can be asked to provide effective tyre washing facility for transport vehicles.	Proposal for establishment of wheel washing system is already under process. Meanwhile, a pit has been provided for washing of tyres near mine exit	31.01.2023
5	The unit can be asked to ensure proper treatment and disposal of MSW generated in their residential colony.	MSW is being collected and dumped in low lying area within the premises. In order to further strengthen the overall MSW management, a new scheme has been prepared and is under approval.	30.11.2022
6	The unit can again be asked to submit the time bound action plan for compliance with the provision of Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back filling the abandoned mine.	A study conducted by IIT BHU regarding "fly ash utilization/dumping/Mixing in the OB of the running/active mines of NCL along with its viability and safety aspect of man and machinery". As per the report, it has been recommended against the dumping of fly ash in internal or external dump of Khadia Project, Following are the recommendations / advice of the report :- 1) "it is advisable not to dump the fly ash on **external dump** in Khadia OCP."	

		2) "as per mine closure plan the fly ash is not advisable to be dumped in **internal dump.**" 3) "it is technically not feasible to dump the 25% fly ash in Mine dump in Khadia OCP due to geo mining conditions, high stripping ratio, and huge rate of OB removal and instability of dump during rainy season in present condition." Further CIMFR study is proposed to be taken up for determining viable amount of fly ash that can be dumped with OB.	
7	The unit can be asked to take corrective action so that the site of CAAQMS could be open from all the direction.	It is being ensured that CAAQMS is free from obstruction in its surroundings.	Completed

This is for your kind information.

Yours sincerely,

25/03/2022

General Manager
Khadia Area

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नॉर्दर्न कोलफील्ड्स लिमिटेड
(मिनिरत्न कंपनी)
(कोल इण्डिया लिमिटेड की अनुषंगी कंपनी)
कृष्णशिला परियोजना

NCL Krishnashila Project

Northern Coalfields Limited
(A Miniratna Company)
(A subsidiary of Coal India Limited)
Krishnashila Project

महाप्रबंधक कार्यालय / Office of the General Manager

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पोस्ट-बीना, जिला- सोनभद्र, उ.प्र., पिन 231220/ Post- Bina, Distt- Sonebhadra, U.P. PIN-231220
Phone: 05446-276633, (FAX) 05446-276633 email: gmkrsl@gmail.com website : www.nclcil.in

Date: 14.03.2022

No. KSL/GM/Env//2021-22/ 224

To,
The General Manager (Env)
Northern Coalfields Limited
Singrauli

Subject: Action Plan against the Recommendations of Joint committee of Hon'ble National Green Tribunal for Krishnashila Project, NCL
Ref:- Para 15 of NGT Order dated 18.01.2022 in Original Application No. 164/2018 titled as Ashwani Kr. Dubey vs Union of India & Others

Dear Sir,

Please find enclosed herewith the copy of action plan with necessary enclosures against the recommendations of Joint committee of Hon'ble National Green Tribunal for Krishnashila project in the matter of Ashwani Kr. Dubey vs Union of India & Others (Original application no. 164/2018).

This is for needful action and onward submission at your end.

14/3/22

Area General Manager
Krishnashila Area

14/03/22

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नॉर्दर्न कोलफील्ड्स लिमिटेड
(मिनिरत्न कंपनी)
(कोल इण्डिया लिमिटेड की अनुषंगी कंपनी)
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Phone: 05446-276633, (FAX) 05446-276633 email: gmkrsl@gmail.com website : www.nclcil.in

Action Plan against the Recommendations of Joint Committee of Hon'ble National Green Tribunal

S.No.	Recommendations of Committee for Krishnashila Project	Action Plan	Expected Completion Time
1	The unit can be asked to explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	At present 18 nos. CCTVs have been installed at different points in the mine. Monitoring of fugitive emissions and other environment & safety related aspects have been already being done regularly from field and GM office.	Being Complied
2	The unit can be asked to strengthen the vigilance mechanism to identify the default transporters and take stringent action against them.	The Transportation agencies have been instructed time to time for steps to avoid spillage of coal during transportation on public roads (copy of instruction enclosed as Annexure-I). Strict action are being taken against the uncovered trucks if found (copy of letter enclosed as Annexure-II).	Being Complied
3	The unit can be asked to provide effective tyre washing facility for transport vehicles.	The proposal of construction of common tyre washing facility for Krishnashila & Bina project of NCL is under tendering process. The construction work for the same will be done through Bina Project.	31.12.2022
4	The unit can be asked to ensure proper treatment and disposal of MSW generated in their residential	Tender for the management of solid waste for Krishnashila B,C & D type quarters in Bina Colony for collection, segregation and	Being complied. Composting facility will be completed

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(मिनिरत्न कंपनी)
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	colony.	disposal of solid waste has already been awarded by LOA no. NCL/GM(C)/LOA-47/ETN-09/945 dated 28.10.2021. Further a separate composting facility will be developed for disposal of organic solid waste. The proposal for the same is under tendering process. (copy of estimate enclosed as Annexure-III)	by 30.09.2022
5	The unit can again be asked to submit the time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	A study is currently being conducted by CSIR-CIMFR, Dhanbad related to filing of fly ash in mine void. Action plan of the same would be submitted on the basis of recommendations of the above mentioned study.	30.09.2022

Area General Manager
Krishnashila Area
14/03/22

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ANNEXURE – I

उत्तर कोलफील्ड्स लिमिटेड
कृष्णशिला परियोजना

Northern Coalfields Limited
Krishnashila Project
(A Miniratna Company)
(A Subsidiary of Coal India Limited)

विक्रय विभाग / Department

CIN-U ISO 14001:6

पोस्ट– बीना प्रोजेक्ट, जिला–सोनभद्र (उ०प्र०), पिन 231220

Post – Bina Project Distt – Sonebhadra, (U.P.) Pin 231220

e-mail krslsales2017@gmail.com website www.nclcil.in

No : Krsl/sales/2020/485

Date: 25/06/2020

Office Order

According to the guidelines issued by National Green Tribunal (NGT), all consumers of Krishnashila project are directed to ensure that all coal transporting vehicles should have arrangements to cover the vehicle with tarpaulin properly upto half dala in three sides. If any vehicle engaged in coal transportation is found violating this order, then suitable action will be taken against the consumers as per rule.

25/6/20

DESPATCH INCHARGE
KRISHNASHILA PROJECT, NCL

ANNEXURE – II

नार्दर्न कोलफील्ड्स लिमिटेड
कृष्णशिला परियोजना
(कोल इंडिया लिमिटेड की अनुषंगी)
पोस्ट– बीना प्रोजेक्ट, जिला–सोनभद्र (उ०प्र०), पिन 231220

विक्रय विभाग
Sales Department

Northern Coalfields Limited
Krishnashila Project
(A Navratna Company)
(A Subsidiary of Coal India Limited)
Post – Bina Project Distt – Sonebhadra, (U.P.) Pin 231220
e-mail: krlsales2017@gmail.com website : www.nclcil.in

No. : Krsl/sales/2020/538 Date: 29/07/2020

Office Order

During inspection the following vehicles were found not covered with tarpaulin properly.

1. UP64AT4081
2. RJ52F1616

The above two vehicles are black listed in Krishnashila Project with immediate effect

29/7/20

DESPATCH INCHARGE
KRISHNASHILA PROJECT, NCL

Copy to :

1. Security Incharge
2. W.B.C.

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ANNEXURE - III

NORTHERN COALFIELDS LIMITED

NOTING SHEET

No. NCL/Civil/2021-22/ 41
Dated: 26/10/2021

Subject : Estimate for the work " Solid waste management at Krishnashila project "

Details of the Estimate:

Estimate value	:	₹ 40,42,546.38 (with GST ₹ 47,70,204.73)
Est. Based on	:	Updated DSR 2018 rates and HQC Rates
PR Provision/Budget Provision	:	Special Activity 2021-22 –Activity no. 12
Time Period required	:	120 days
Head of Account	:	Revenue - Special Activity 2021-22
Report	:	The estimate includes providing sheds for solid waste management surrounding the area with boundary wall. It includes providing CC platforms for sagregation and decompostion of solid waste also one shed for storing the decomposed manure and other official works has been included.
Attachments	:	1. Estimate, quantity calculation, abstract of cost 2. Checklist

Submitted to competent authority for kind perusal and sanction of the estimate.

26/10/21
Asst. Manager(C)
Krishnashila Project

26/10/21
Manager(C)
Krishnashila Project

Staff Officer (C)
Krishnashila Project

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Checklist

Estimate for the work: Solid waste management at Krishnashila project

1.	The proposed work covered in the approved activity list of the year Concerned/ administrative approval:	To be covered under Revenue- Special Activity 2021-22 Activity no. 12
	If not, justification to be recorded to initiate	
2.	Estimate value vis-à-vis fund provision as per approved activity list exist or Not to be certified by HOD at the time of initiation	Special Activity 2021-22
3.	Total estimated value -	₹ 40,42,546.38
4.	Total: Without GST	₹ 40,42,546.38
	With GST (18% of above)	₹ 47,70,204.73
	a. If the rates based on (ii) duly accepted by Staff Officer(Civil) of the Unit/GM(C),Hqr. – analysis to be enclosed. :-	
5.	Drawing & Designs – related to proposed work. :-	Enclosed.
	Certificates to be given:	
	a. The estimate prepared after due site inspection.	Given in body of estimate
	b. The site is free from all encumbrances.	Given in body of estimate
6.	If the estimate related to	
	a. Hqrs. Duly checked by Accounts person attached with the Civil Department. :-	NA
	b. Units/ Project – (i) Specific comments of AFM. :-	Will be routed through AFM
	c. Proposals related to 6a & 6b duly vetted by GM(C)/Hqrs. :-	NA
7.	In case of AMC/Regular Maintenance Works :-	NA
	a. Last year's estimated value vis-à-vis awarded value of work done. :-	
	Estimated cost	
	Awarded cost	
	b. If the current year's estimate varies from the last year's – reasons to be recorded/ justification – whether scope increases with details or due to change of rate :-	

P.T.O.

8.	Compliance of the circulars/office orders time to time by Competent Authority :-	Will be complied.
	Is being complied/will be complied :	
N.B.	The estimate should be checked at Unit level in all respect – checking of arithmetical calculation is not sufficient.	Will be checked.
	CAPITAL WORKS :-	
1.	Proposed work covered in the PR/RPR in the case of growing projects.	NA
2.	Including the value of the proposed work the total expenditure will be within the total approved capital outlay of the Project/Unit.	
3.	Fund provision in Capital Budget :-	
	a. PR/RPR provision – regarding scope vis-à-vis estimate.	
	b. PR/RPR fund provision, expenditure already incurred, proposed estimate value.	
	c. In case of shortage of fund – appropriation/ additional fund requirements to be indicated.	
4.	All capital works to be approved by GM(CP)/CGM(CP).	
5.	Estimate to be checked at unit level and specific comments of concerned A.F.M.	
6.	Drawing & Designs for the proposed work.	
N.B.	The above details in addition to the points on page-1.	

Staff Officer(C)/KSL

Mgr. (C)/KSL

Asst. Mgr. (C)/KSL

Name of work:- Solid waste management

Sl.No	Clause No.	Description	Quantity	Unit	Rate	Total Amount
1	2.6.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth, 1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth, lead up to 50m and lift up to 1.5m,as directed by Engineer-in-Charge. All kinds of soil	65.00	Cum	148.90	9,678.50
2	2.27	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	19.00	Cum	1499.90	28,498.10
3	4.1.5	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand(zone-III) : 6 graded stone aggregate 20 mm nominal size).	19.00	Cum	5436.40	103,291.60
4	4.1.3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:2:4 (1 cement : 2 coarse sand(zone-III) : 4 graded stone aggregate 20 mm nominal size)	8.00	Cum	6016.45	48,131.60
5	13.7.2	12 mm cement plaster finished with a floating coat of neat cement of mix 1:4 (1 cement: 4 fine sand)	83.00	Sqm	271.60	22,542.80
6	HQC	Brickwork 1:6 in foundation	12.00	Cum	3585.57	43,026.84
7	11.3.1	Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete. 40 mm thick with 20 mm nominal size stone aggregate	69.00	Sqm	419.70	28,959.30
8	10.2	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	3560.00	Kg	107.00	380,920.00
9	10.5.2	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6mm angle iron and 3mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer. Using flats 30x6mm for diagonal braces and central cross piece.	6.00	Sqm	3800.10	22,800.60
10	12.50	Providing and fixing precoated galvanised iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm (+ 0.05 %), total coated thickness with zinc coating 120 gm per sqm as per IS:277 in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12metre or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling /self tapping screws of size (5.5x 55mm) with EPDM seal, complete upto any pitch in horizontal/ vertical or curved surfaces excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.	212.00	Sqm	529.95	112,349.40
11	18.12.3	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc. : External work 25 mm dia. nominal bore	50.00	metre	299.70	14,985.00

12	18.10.1	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, I/c cutting and making good the walls etc. (internal work – Exposed on wall. 15 mm dia. nominal bore	6.00	metre	229.00	1,374.00
13	18.17.1	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) : 25 mm nominal bore	2.00	No.	450.15	900.30
14	18.15.1	Providing and fixing brass bib cock of approved quality : 15 mm nominal bore	2.00	No.	274.05	548.10
15	17.7.2	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever required: White Vitreous China Wash basin size 630x450 mm with a single 15 mm C.P. brass pillar tap.	1.00	No.	2303.80	2,303.80
16	17.28.2.1	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.. Flexible pipe 32 mm dia	1.00	No.	94.25	94.25
17	17.1.1	Providing and fixing water closet squatting pan (Indian type W.C. pan) with 100 mm sand cast iron P or S trap, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required White Vitreous china Orissa pattern W.C. pan of size 580x440 mm with integral type foot rests	1.00	No.	4527.05	4,527.05
18	18.22.1	Providing and fixing C.P. brass shower rose with 15 or 20 mm inlet : 100 mm diameter	1.00	No.	137.80	137.80
19	18.16.1	Providing and fixing brass stop cock of approved quality : 15 mm nominal bore	3.00	No.	274.05	822.15
20	17.60.1.1	Providing and fixing trap of self cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors :100 mm inlet and 100 mm outletSand cast iron S&S as per IS: 3989	2.00	each	1236.50	2,473.00
21	19.1.1	Providing, laying and jointing glazed stoneware pipes class SP-1 with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete : 100 mm diameter	50.00	m	257.15	12,857.50
22	17.56.1.1	Providing and fixing terminal guard :100 mmSand cast iron S&S as per IS - 1729	1.00	each	309.40	309.40
23	17.35.1.1	Providing and fixing soil, waste and vent pipes : 100 mm dia. Sand cast iron S&S pipe as per IS: 1729.	6.00	m	877.05	5,262.30
24	18.48	Providing and placing on terrace (at all floor levels) polyethylene water storage tank ISI : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	500.00	Litre	7.05	3,525.00
25	9.62.2	Providing and fixing ISI marked oxidised M.S. sliding door bolts with nuts and screws etc. complete : 250x16 mm	6.00	No.	143.70	862.20
26	9.55.2	Providing and fixing ISI marked M.S. pressed butt hinges bright finished with necessary screws etc. complete : 100x58x1.90 mm	18.00	No.	29.60	532.80
27	13.61.1	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : Two or more coats on new work.	180.00	Sqm	93.45	16,821.00

28	18.21 1.1	Providing and fixing unplasticised PVC connection pipe with brass unions 30 cm length 15 mm nominal bore	2.00	No	65.70	131.40
						868,665.79
						1,737,331.58
		For 1 shed				
		For 2 nos sheds				
1	2.6.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth, 1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth, lead up to 50m and lift up to 1.5m, as directed by Engineer-in-Charge. All kinds of soil	110.16	Cum	148.90	16,402.37
2	2.27	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	9.22	Cum	1499.99	13,829.08
3	4.1.5	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand(zone-III) : 6 graded stone aggregate 20 mm nominal size).	9.22	Cum	5436.40	50,123.61
4	5.1.2	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	26.90	Cum	6817.00	183,377.30
5	5.2.2	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. above plinth level up to floor five level, excluding cost of centering, shuttering, finishing and reinforcement : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	10.30	Cum	8009.80	82,500.94
6	5.3	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	13.00	Cum	8347.35	108,515.55
7	5.9.1	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	64.00	Sqm	215.80	13,811.20
8	5.9.6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Columns, Pillars, Piers, Abutments, Posts and Struts.	249.70	Sqm	544.50	135,961.65
9	5.9.5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Lintels, beams, plinth beams, girders, bressumers and cantilevers.	169.05	Sqm	403.95	68,287.75
10	5.22.3	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete up to plinth level. Cold twisted bars	5020.00	Kg	81.20	407,624.00
11	10.2	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	800.00	Kg	107.00	85,600.00
12	HOC	Brickwork 1:6 in superstructure	110.00	Cum	4181.29	459,941.90

13	13.1.2	12 mm cement plaster of mix : 1:6 (1 cement: 6 fine sand)	720.00	Sqm	206.40	148,608.00
14	13.46.1	Finishing walls with Acrylic Smooth exterior paint of required shade : New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.70 kg/10 sqm).	720.00	Sqm	133.10	95,832.00
15	HQC	Transportation OB	1300.00	Cum	61.34	79,742.00
16	2.6.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth, 1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth, lead up to 50m and lift up to 1.5m,as directed by Engineer-In-Charge. All kinds of soil	1050.00	Cum	148.90	156,345.00
17	2.6.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth, 1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth, lead up to 50m and lift up to 1.5m,as directed by Engineer-In-Charge. All kinds of soil	30.00	Cum	148.90	4,467.00
18	2.27	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	15.00	Cum	1499.90	22,498.50
19	4.1.5	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand(zone-III) : 6 graded stone aggregate 20 mm nominal size).	15.00	Cum	5436.40	81,546.00
20	HQC	Transportation OB	75.00	Cum	61.34	4,600.50
21	10.2	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	800.00	Kg	107.00	85,600.00
						2,305,214.80
		Total				4,042,546.38
		GST @18%				727,658.35
		Total with GST				4,770,204.73

1. Estimate has been prepared after proper site survey.
2. Site is free from all encumbrances.

AOE(C) 26-10-21

26/10/21 AM(C)

26/10/21 Mgr(C)

ce No. #1 .

Attachment

Original Estimate

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N/W Processing of waste collected at transfer point of NCL HQ Township

Sl No.	Description	Qty	Unit	Rate	Amount	Remarks
i	Processing of waste collected at transfer point of NCL HQ Township comprises of following items:					Analyted rate based on quotation.
i)	Civil works: a)Construction of open working sheds of size 20 feets x 15 feets , with conc. flooring and profile sheet roofing(2 Nos.). b)Conc. platform of size 30 feets x 20 feets for composting beds(3 Nos.) .c) Workman/Labour accommodation with Toilet of approximate size 18 feets x 20 feets and for toilet 8 feets x 8 feets (1 No.). d) Making one store of approximate size 20 feets x 15 feets for storage of manure/khads with necessary rec racks/ selves(1 No.). e) Construction of shed of approximate size 40 feets x 20 feets for non-biodegradable waste management(1 No.). f) Dressing and leveling of the ground/site.	1	Job	1660000.00	1660000.00	
ii)	Operational Cost: Project Coordinator/Supervisor(1 No./month) Choukidar/Security person/Guard(1 No./month) Waste handling workers/unskilled labour(7 Nos./month)	12	Months	141275.16	1695301.92	
iii)	Cost of Materials/ Tools/Uniforms/safety equipments. Shoe(18 pairs per year) Uniform & tools and tackles(14 sets per year) Gloves & Mask(84 sets per year) Helmet(9 Nos./year) Bacteria for culture/decomposition of bio degradable waste.(1800 litres/year)	12	Months	40791.67	489500.00	
iv)	Transportation cost from Singrauli to nearby cement facory(i.e.Dala)	12	months	15000.00	180000.00	
v)	Contractor's profit per month	12	months	50310.02	603720.25	
	Total				46,28,522.21	
				GST @ 18%	833137.00	
				Total	5461656.21	

NOTE- Estimate was prepared after due inspection of site.

The site is free from any type of encumburance.

The work has not been executed in advance without any proper work order.

No splitting of work has been done in this proposal and it is a complete proposal as per requirement.

SO(C)/TA 04.3.20

AM(C)/TA 04/03/2020

DM(C)/TA 04/03/2020

CM (C) /TA Inc. 4/3

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Speed Post

M. P. POWER GENERATING CO. LTD.
(A GOVT. OF MP UNDERTAKING)
CIN-U40109MP200SGC0148221

No:07-03/CC/ 1942 Jabalpur dated: 21 NOV 2022

To,

The Director
MOEF&CC (HSM Division), Hazardous substances Managmenet Division
6th Floor, Prathivi Wing, Indira Paryavaran Bhawan
Aliganj, Jor Bagh Road, New Delhi – 110 003
Attn. Dr. Satyendra Kumar, Email:satyendra.kumar07@nic.in

Sub.: OA No. 164/2018 titled as Ashwani Kumar Dubey Vs. UOI &Ors. Before the Hon'ble NGT, New Delhi (PB) with OA No. 117/2014 titled as Shantanu Sharma Vs. UOI &Ors. and others connected matters – Meeting of Fly Ash Managmenet and Utilization Mission – reg.

Ref. 1) OM no. F.No.:11/3/2018-HSM, MOEF&CC, GoI dated: 09/03/022.
2) This office letter no. 07-03/CC/750, Jabalpur, dated:04/05/2022.
3) OM no. F.No.:09/01/2019-HSMD, MOEF&CC, GoI dated: 16/11/022.

As directed vide OM dated: 09/03/2022 cited under reference 1), the Action Plan w.r.t. the thermal power stations of M.P. Power Generating Company Limited (MPPGCL) was submitted vide letter dated: 04/05/2022 (under reference 2). While acknowledging the Action Plan, it has now been directed vide OM dated: 16/11/2022 to provide the timeline as well with the action plan.

Therefore, in compliance to the OM dated: 16/11/2022, the updated Action Plan along with timelines of ash utilization is enclosed herewith (Annexure I&II) for placing before the Mission in its meeting schedules to be held on dated: 24/11/2022 at your end please.

(Rajeev Shrivastava)
C. E. (O&M: Gen)
MPPGCL, Jabalpur

Encl. Annexure I&II

Copy to –

1) The Scientist D, Ministry of Environment, Forest and Climate Change (HSM Division), 3rd Floor, Vayu Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003
2) Member Secretary, M.P.Pollution Control Board, ParyavaranParisar, E-5, Arera Colony, Bhopal - 462016.

Address for Correspondence: OFFICE OF THE EXECUTIVE DIRECTOR (O&M: GEN)
Block No.6, Shakti Bhawan, Rampur, Jabalpur-482008 (M.P.)
Phone No. 0761-2661589 / 2702600 Fax No 0761-2664572
Email: edomg_mpeb@rediffmail.com

Annexure I

Ash generation and utilization w.r.t. the thermal power stations of MPPGCL for FY-19-20 to 21-22

Name of TPS	FY	Ash Generation (LMT)	Ash Utilization (LMT)	% Utilization
SGTPS, Birsinghpur	2019-20	17.50	17.43	99.59
	2020-21	20.46	20.48	100.10
	2021-22	18.89	13.51	71.50
ATPS, Chachai	2019-20	3.15	3.16	100.55
	2020-21	3.37	2.18	64.81
	2021-22	3.58	1.40	39.09
STPS, Sarni	2019-20	14.69	9.36	63.72
	2020-21	12.89	12.14	94.20
	2021-22	8.97	8.95	99.82
SSTPP, Khandwa	2019-20	23.64	4.30	18.19
	2020-21	14.82	6.46	43.58
	2021-22	27.40	9.94	36.27
MPPGCL	2019-20	58.97	34.25	58.08
	2020-21	51.53	41.26	80.07
	2021-22	58.84	33.80	57.44

Sr. Chemist
% ED(O&M:GEN)

Address for Correspondence: OFFICE OF THE EXECUTIVE DIRECTOR (O&M: GEN)
Block No.6, Shakti Bhawan, Rampur, Jabalpur-482008 (M.P.)
Phone No. 0761-2661589 / 2702600 Fax No. 0761-2664572
Email: edomg_mpeb@rediffmail.com

Annexure - II

Action Plan with Time line for Ash Utilziation w.r.t. Thermal Power Stations of MPPGCL in FY-2022-23

TPS	First Compliance Cycle to meet 100% utilization as per MOEF&CC norms (w.e.f. Apr'22)	Targeted Utilization Qty (Estimated) (Cureent +Legacy)	Qty. Utilized from April'22 to October'22	Qty. proposed to be utilized from Nov '22 to Mar'23)		Total expected quantity utilization from April'22 to March'23	Expected % Utilization from April'22 to March'23	Timeline for Ash Utilization
1	2	3	4	5	6	7 (4+6)	8	9
-	--	LMT	LMT	Proposed heads	Qty. (LMT)	LMT	%	--
ATPS	5 Years	4.2	0.43	Cement, brick, blocks & Misc. etc.	1.7	4.75	**113.10**	31-03-2023
				Abandoned coal Mine filling	2.25			
				Low lying area filling	0.37			
				Total	**4.32**			
SGTPS	4 Years	24.55	5.85	Cement, brick, blocks etc.	4.25	19.00	**77.38**	
				Rail mode	0.6			
				Low lying area filling	2.80			
				NHAI road projects	5.46			
				MPRRDA road	0.04			
				Total	**13.146**			
STPS	3 Years	11.4	5.78	Cement, brick, blocks, RMC etc.	6.79	16.09	**141.14**	
				NHAI road projects	3.32			
				Rail mode	0.2			
				Total	10.31			
SSTPP	5 Years	46.8	5.68	Cement, brick, blocks, trader etc.	4.95	39.59	**84.59**	
				NHAI road projects	20.76			
				Mine filling	7.0			
				Rail mode	1.2			
				Total	33.91			
MPPGCL	--	**86.95**	**17.74**	--	**61.686**	**79.43**	**91.35**	--

Note- As per MOEF&CC notification dated: 31/12/2021, efforts shall be made to achieve 100% utilization -

i) For Current ash - As per the compliance cycle stipulated in Para 4 of the notification.

ii) For Legacy ash - As per the utilization target stipulated in Para 5 of the notification.

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Sr. Chemist
O/O ED (O&M: PGCL)

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Ref: 01/CP/P&CA/MoEF&CC Ref/22-23
Dated: 23.05.2022

Shri N. Subrahmanyam
Scientist D (Hazardous Substances Management Division)
MoEF&CC
Vayu wing, Indira Paryavaran Bhawan
Jor Bagh Road, New Delhi-110003.

Subject: OA No. 164/2018 titled as Ashwani Kumar Dubey v. UOI & Ors. before the Hon'ble NGT, New Delhi (PB) with OA No. 117/ 2014 titled as Shantanu Sharma v. UOI & Ors. and other connected matters– reg.

Sir,

Please refer to email dated 10.03.2022 enclosing letter no. 11/3/2018-HSM dated 09.03.2022 seeking action plan on the recommendations of the Joint Committee as specified in the Para 15 (Page 113) of the NGT Order dated 18.01.2022 (OA No. 164/2018 and OA No. 117/2014).

In this regard, NTPC's comments are enclosed as **Annexure-I**.

Thanking you.

Yours faithfully
Sd/-
(Vinod S. Bhoyar)
Addl. General Manager (CP)

Annexure-I

NTPC's comments on the recommendations (Para 15: Page 113) of Joint Committee in the NGT Order dated 18.01.2022 are as under:

M/s NTPC Limited Shakti Nagar Sonbhadra (NTPC Singrauli)			
S. No.	**Committee Recommendations (Para 15)**	**Compliance status**	**Target Date / Remarks**
1	The unit should immediately take required measures to stop the discharge of ash pond overflow into Rihand reservoir.	• Discharge of ash pond overflow has been stopped, by resolving the disturbance in system (which was for a short period), and there is no discharge into Rihand Reservoir. • NTPC Shakti Nagar have taken short-term and long-term remedial actions which are as under: ▪ **Short-term:** Additional line to increase AWRS flow by 500 M^3/hr is installed. ▪ **Long-term:** Augmentation of AWRS capacity by installing another pump (2000 m^3/hr capacity).	Complied Augmentation of AWRS capacity by July'2022.
2	The unit may be asked to relocate the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter.	Online Continuous Emission Monitoring System (OCEMS) will be installed along with FGD installation (by extension of ducts to new chimney) for obtaining iso-kinetic sample.	December' 2024
3	The unit may be asked to complete the installation of the third CAAQMS at the earliest.	02/03 Continuous Ambient Air Quality Monitoring Stations (CAAQMS) connected to CPCB/UPCB. 3rd CAAQMS installation work has been completed.	Complied
4	The unit may be asked to ensure that the CAAQMS is connected to the CPCB/SPCB server at the earliest.	Commissioning and linking of the 3rd CAQMS with CPCB/UPPCB server are in progress.	Mail sent to CPCB on 25.04.2022 for linking with CPCB and registration is completed, and work is being done by CPCB for linking.

5	The unit may be asked to submit the time bound action plan for 100% fly ash utilization at the earliest.	Action plan attached as **Annexure-A**.	Action plan for ash utilization is attached as **Annexure – A.**
6	The process of installation and commissioning of the FGD system needs to be expedited realization of the revised timeline.	▪ Work of chimney construction, absorber and associated work is in progress. ▪ All three Chimneys construction have been completed up to 100-meter height. ▪ Efforts are being made to complete FGD installation within the revised timeline.	Within revised timeline i.e., December' 2024
7	The unit may be asked to properly treat the MSW generated from their residential colony.	MSW generated from residential colony being segregated & collected through special motorized vehicle. For biodegradable waste, composting pits with covered shed are being constructed and bio-methanation plant is also commissioned. While non-biodegradable waste (plastic waste) is being sent to registered recycler.	March'2023
8	The unit shall take immediate measures to control fugitive emission in the ash dyke area.	Measures for regular water sprinkling have been taken and fugitive emission is under control in the dyke area.	Complied
9	Further committee recommends for imposing environment compensation (EC) of Rs. 27,60,000/- for discharging ash pond overflow water into Rihand reservoir.	**NTPC Comments:** ▪ Treated effluent are being fully recycled through AWRS. ▪ Discharge observed was due to disturbance in system for a short period which was controlled and compliance (snapshots indicating no discharge) of the same was submitted ▪ Further, regarding CCTV footage, water leakage was observed only due to rain in the month of Aug'2021. To support the same, photographs were also submitted during August'2021 to October'2021. ▪ In the light of the above facts, EC recommendation for 92 days (mentioned in page 40 of NGT Order) not to be imposed considering the fact that one 500 MW unit (which can produce 12.78 Lakh Cubic Meter ash slurry during the period) was under shutdown for 50 days.	

M/s NTPC Limited Rihand Super Thermal Power			
S. No.	**Committee Recommendations (Para 15)**	**Compliance status**	**Target Date / Remarks**
1.	The unit may be asked to ensure that the CAAQMS is connected to the CPCB/SPCB server at the earliest.	CAAQMS are already connected to the servers of CPCB/SPCB.	Complied
2.	The unit may be asked to submit a time-bound action plan for 100% fly ash utilization at the earliest	▪ It is submitted that NTPC Rihand is very remotely located in Sonbhadra region where ash is generated in abundance and its utilization avenues are very limited. ▪ The nearest ash consumption belt from NTPC Rihand is Varanasi - Satna – Rewa which is located at a distance of 250 – 300 kms. ▪ Despite the above odds, full efforts are being taken at NTPC-Rihand to achieve ash utilization targets. ▪ Action plan is attached as **Annexure-A**.	Action plan for ash utilization is attached as **Annexure – A.**
3.	The process of installation and commissioning of the FGD system needs to be expedited in realization of the revised timeline	▪ Civil and mechanical works for installation of FGD are in progress. ▪ Efforts are being made to complete FGD installation within the revised timeline.	Within revised timeline i.e., December' 2024

M/s NTPC Limited Vindhyachal Super Thermal Power Plant			
S. No.	**Committee Recommendations (Para 15)**	**Compliance status**	**Target Date / Remarks**
1.	The unit may be asked to submit a time-bound action plan for 100% fly ash utilization at the earliest	Action plan attached as **Annexure-A**.	Action plan for ash utilization is attached as **Annexure – A.**

Annexure-A: Ash Utilization Plan of NTPC Shakti Nagar (Singrauli STPS), Rihand, and Vindhyachal

M/s NTPC Limited Shakti Nagar Sonbhadra (Singrauli STPS): Ash Utilization Action Plan									
Financial Year	Projected Ash Generation (LMT)	Projected Ash Utilisation (LMT)						Total Projected Ash Utilisation (LMT)	Projected Ash Utilisation (%)
		Pond Ash				Fly Ash			
		Road Project	Mine/Quarry	Low Lying Land	RMC & Sand	Bricks & Tiles Industries	Other Industries		
2022-23	30.00	11.00	1.00	3.00	0.70	1.00	0.50	17.20	57.33
2023-24	30.00	11.00	3.00	3.00	0.60	1.00	1.00	19.60	65.33
2024-25	30.00	11.00	3.00	3.00	0.70	1.30	2.00	21.00	70.00

Note:

- Ash Utilisation in Road Projects, Stone quarries, Coal Mines and Low-lying land is subject to availability of avenues.
- NTPC Shakti Nagar has submitted letter to NCL for allotment of 3rd pit of Gorbi mine for ash filling and mixing of ash with OB.
- Request letter has been submitted to DM-Sonbhadra for allocation of low-lying land for reclamation by ash filling.

M/s NTPC Limited Rihand Super Thermal Power Plant: Ash Utilization Action Plan									
Financial Year	Projected Ash Generation (LMT)	Projected Ash Utilization (LMT)						Total Projected Ash Utilisation (LMT)	Projected Ash Utilisation (%)
		Roads/fly over Embankment	Mine filling	Land Development	Issue Brick/Block /Tiles Industries Outside	Issue to Industries (Cement/RMC/ Asbestos, etc.)	Others (MT) (Agriculture/ Cenosphere etc		
2022 - 23	37.5	10.0	0.50	6.0	1.50	3.25	1.20	22.45	60
2023 - 24	37.5	10.0	1.50	7.0	1.50	3.50	1.20	24.70	66
2024 - 25	37.5	10.0	4.0	8.2	1.50	5.0	1.20	29.90	80

Note:

- Above plan is based on potential avenues identified presently. NTPC Rihand is putting in its best efforts to further identify the new avenues of ash utilization on sustainable basis to ensure compliance of statutory obligations.
- District Administration has been requested for providing the details of low-lying area available within 100 Kms of Rihand, details are awaited.

M/s NTPC Limited Vindhyachal Super Thermal Power Plant: Ash Utilization Action Plan								
Financial Year	Projected Ash Generation (LMT)	Projected Ash Utilization (LMT)					Total Projected Ash Utilisation (LMT)	Projected Ash Utilisation (%)
		Roads/ flyover Embankment	Mine filling/OB Mixing	Land Development	Brick Manu., Aggregate, Other Fly ash-based industry & Bottom Ash Utiln./Supply	Issue to Cement Plants		
2022 - 23	88	13.0	8.0	4.0	6	4	35	40
2023 - 24	88	12.0	20.0	4.0	9	8	53	60
2024 - 25	88	6.0	32.0	3.0	12	9	62	70

M/s Obra Thermal Power Station (Power Plant)

S.No.	Recommendations of the Joint Committee	Status
1.	Undertake action to trap the continuous flow of ash slurry from powerhouse and ash pond overflow water carrying ash into the river Renu	Ash dyke has been raised and there is no overflow of water carrying ash into river Renu. AWRS has been made functional for recycling of ash water.
2.	Restoration of the river bed areas on which a huge deposition of ash is visible in time-bound manner	Restoration of river bed area is under progress and 7800 Cum ash has been removed. Remaining quantity shall be done by June-2023.
3.	Treatment of the industrial effluent, untreated effluent not to be discharged into the river Renu	ETP & STP are operational. No effluent is being discharged into river Renu.
4.	Installation of an effluent collection and conveyance system for ETP & STP	A dedicated sump and sump pump house for all effluent collection has been completed and functional since April-2022.
5.	Connection of CAAQMS to the CPCB/SPCB server	Already connected. Data is available on CPCB/SPCB server.
6.	Submission of time-bound action plan for 100% fly ash utilization	Action plan submitted.
7.	Installation and commissioning of the FGD system in realization of the revised timeline	Due to space constraint for installation of wet FGD system, Dry Sorbent Injection (DSI) FGD was approved. Despite repeated tendering, there was no participation in bids. Further tendering is under progress. Date of bid opening is 30.11.2022.
8.	Adoption of scientific approach for treatment and disposal of MSW	Door to Door collection of waste is being done and waste thus collected is seggregated as Dry and Wet waste. Tender for treatment and disposal of MSW will be floated by 5.12.2022.
9.	Installation of flow meters for measuring amount of ash slurry discharged and water recycled through AWRS	Flow meter supplied and installation shall be done by 20.12.2022.
10.	Installation of flow meters for measurement of amount of	Flow meter supplied and installation shall be done by 20.12.2022.

	wastewater treated through the ETP and STP	
11.	Fixing the personal responsibility of the officers seating at management level for causing environmental damage.	Responsibility of three officers of Chief Engineer level 1.Er R. P. Saxena, HOP Obra TPS, 2. Er. Deepak Kumar, HOP Obra TPS and 3. Er. Anand Kumar, CE (E&S), Lko has been fixed and disciplinary proceedings have been initiated.
12.	Imposition and payment of EC of Rs. 01,36,80,000/- for discharging untreated wastewater and ash slurry into River Renu (Responsibility: CPCB/SPCB)	Civil Appeal has been filed (4525/2022) against the order of Hon NGT in Hon. Supreme court. Hearing on IA for stay application is scheduled on 17.01.2023

ANNEXURE-A

OBRA THERMAL POWER STATION FIVE-YEARS ROAD MAP FOR ASH UTILIZATION

PROJECTED ASH UTILIZATION (LMT)

FINANCIAL YEAR	PROJECTS ASH GENERATION (LMT)	LEGACY ASH TARGET (LMT) AS PER MoEF NOTIFICATION	POND ASH				FLY ASH		PROJECTED TOTAL UTILIZATION (LMT)	PROJECTED %AGE ASH UTILIZATION
			ROAD PROJECT	MINE / QUARRY	LOW LYING AREA	OTHER HEAD (ADJUSTMENT QTY CONSDIDERING DYKE SAFETY), BOTTOM ASH COVER & OTHERS	BRICKS & TILES INDUSTRIES	CEMENT, RMC & ASBESTOS INDUSTRIES		
2022-23	15.50	13.10	1.00	3.00	10.00	1.00	0.04	0.65	15.69	55%
2023-24	27.20	18.35	2.00	1.00	12.00	1.50	0.05	8.00	24.55	54%
2024-25	31.22	17.04	4.00	1.00	12.00	1.50	1.00	16.00	35.50	74%
2025-26	31.22	8.52	4.00	1.00	12.00	1.50	1.00	16.00	35.50	89%
2026-27	31.22	4.26	4.00	1.00	12.00	1.50	1.00	16.00	35.50	100%

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NOTE

1 **Land Development**

a. Low lying area at Sector 2 & 3 of Obra Project colony has capacity of approx 12 LMT
b. Abandoned stone quarries at Dalla area having capacity of approx 3 LMT
c. Low lying area near Lodhi Toll Plaza has capacity of approx 1.8 LMT
d. Quantity of ash utilization may be increased by seeking nearby low lying areas

2 **Use of ash in NHAI / Other projects**

a. Various letters have been sent to various NHAI projects, PMGSY projects, PWD, UP Expressway, Rajkiya Nirman Nigam, UP Rajya Setu Nigam for giving information of their projects for utilization of ash in their construction / projects

3 Above plan is based on potential avenues identified presently and ash utilization may increase / decrease in case of allocation / non-allocation of identified avenues in future.

29/11/2022
CE CE ES

Renusagar Thermal Power Plant.

Compliance status on recommendation of the Committee as per order dated January 18, 2022.

SR. No.	Recommendations of the Committee	Compliance Status (as on October 2022)
a.	The unit can be asked to complete the installation of proper sludge drying beds in the existing ETP at the earliest.	Installation of 02 No. Filter Press (of modern technology sludge drying beds) has been completed. Commissioning started. All parts of the machine are working satisfactorily. Commissioning of the filter expected to be completed by end of November 2022.
b.	The unit may be asked to relocate the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter.	For isokinetic sampling, we have installed new analyzers for Boiler#6 to #10. Data connectivity of OCEMS with CPCB server is in process and is expected to be completed by January 2023.
c.	The unit can again be asked to submit time bound action plan to relocate the existing CAAQMS for ensuring representative ambient air quality monitoring as per the guideline and complete the installation of another 02 CAAQMS.	• We have relocated the existing 01 No. CAAQMS at lower altitude near Civil Office in March 2022. Data is linked with CPCB/SPCB server. • 02 nos. new CAAQMS machine has also been installed at Renusagar premises at the following locations: 1. Near Gurudwara N17/9 2. Near D&E Buildings.
e.	To ensure 100% fly ash utilization in accordance with MoEF&CC Notification dated 31.12.2018 and Hon'ble NGT order dated 12.02.2020 in the matter of OA No. 117/2014.	• The fly ash utilization during April 2022 to October 2022 is 118 %. Total Ash Generation is 867600 MT & ash utilization is 1025767 MT. Brick plat utilization is 23055 MT, Cement Plant 488280 MT, Low lying area & road projects -514432 MT. • Ash is being disposed of regularly to cement companies, road projects & bricks making units etc.
f.	Installation of FGD for control of gaseous emissions.	For FGD installation in one unit, we have placed PO to the vendor in the month of Dec. 21. Vendor is from overseas & material receiving may take in approx. 17.5 months. Foundation construction and site readiness & civil work is in progress. Materials may arrive by September 2023. Installation is expected to be completed by December 2023.
g.	The unit should immediately stop the burning of the MSW. And they can be asked to adopt a proper scientific approach for disposal of MSW.	MSW management is being done in-house. Segregated dry and wet waste is collected from the residence of the colony. Non-biodegradable waste is being sent to vendors and Biodegradable waste is being converted to compost for in-house utilization.
h.	Control of pollution during coal storage, transportation and handling. The unit can be asked to take corrective measures to control the fugitive emissions	Adequate actions are regularly undertaken in CHP yard area to keep the fugitive emission to the minimum level. Water Sprinkling arrangements and rain guns are installed. These are operated regularly and properly. Additional water sprinkling systems installed and are fully operational.

	from raw material storage and fly ash transportation areas.	
i.	The unit can be asked to submit explanation for dumping the fly ash in haphazard manner. They should take immediate action for its proper disposal.	The ash which was disposed of allegedly in haphazard manner has been reclaimed and the area has been further cleaned.

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Speed Post

M. P. POWER GENERATING CO. LTD.
(A GOVT. OF MP UNDERTAKING)
CIN-U40109MP200SGC0148221

No:07-03/CC/ 760 Jabalpur dated: 04 MAY 2022

To,

The Scientist D
Ministry of Environment, Forest and Climate Change (HSM Division),
3rd Floor, Vayu Wing, Indira Paryavaran Bhawan
Jor Bagh Road, New Delhi – 110 003

Sub.: OA No. 164/2018 titled as Ashwani Kumar Dubey Vs. UOI & Ors. Before the Hon'ble NGT, New Delhi (PB) with OA No. 117/2014 titled as Shantanu Sharma Vs. UOI & Ors. and others connected matters – reg.

Ref. 1) Hon'ble NGT, New Delhi order dated: 18/01/2022.
2) Office Memorandum no. F.No.:11/3/2018-HSM dated: 09/03/2022.
3) Your Email dated: 10/03/2022 to Energy department, GoMP, Bhopal.

In reference to above, the Hon'ble NGT in the order dated: 18/01/2022 has directed the constitution of "Fly Ash Management and Utilization Mission" to co-ordinate and monitor issues relating to handling and disposal of fly ash as well as other associated issues.

The mission is required to prepare an "Action Plan" considering the recommendations of the Joint Committees as specified in Para 15 of the order dated 18.01.2022.

Therefore, in compliance to the above directives, "Action Plan" with respect to the thermal power stations of M.P. Power Generating Company Limited (MPPGCL), Jabalpur is enclosed herewith (Annexure I) for further needful at your end please.

Thanking You.

Encl. Annexure I

(B.L. Newal)
E. D. (O&M: Gen)
MPPGCL, Jabalpur

(Approved from competent authorities)

Copy to –

1) The Director, Ministry of Environment, Forest and Climate Change (HSM Division), 6thFloor, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003.
2) Member Secretary, M.P. Pollution Control Board, ParyavaranParisar, E-5, Arera Colony, Bhopal - 462016.

Address for Correspondence: OFFICE OF THE EXECUTIVE DIRECTOR (O&M: GEN)
Block No.6, Shakti Bhawan, Rampur, Jabalpur-482008 (M.P.)
Phone No. 0761-2661589 / 2702600 Fax No. 0761-2664572
Email: edomg_mpeb@rediffmail.com

Annexure I

Action Plan as per the recommendations of the Joint Committees as specified in Para 15 of the order dated 18.01.2022 with respect to the Thermal Power Stations of MPPGCL

(1) Action Plan of Ash Utilization in accordance with the MOEFCC notification 31/12/2021 :

i) Thermal power plants (TPPs) of M.P. Power Generating Company Limited (MPPGCL), being a coal based is primarily responsible to ensure 100 percent utilisation of ash (fly ash, and bottom ash) generated by it in an eco-friendly manner as per the said notification dated: 31/12/2021.

ii) The ash generated by the thermal power plants of MPPGCL is being and shall be utilised only for the following eco-friendly purposes,

(i) Fly ash based products viz. bricks, blocks, tiles.
(ii) Cement manufacturing, ready mix concrete.
(iii) Construction of road and fly over embankment.
(iv) Filling up of low lying area.
(v) Back filling of South Estern Coal Limited (SECL) old / abandoned coal mines.
(vi) Filling of some Western Coal Limited (WCL) mine voids.
(vii) Filling of old ash bund voids, being surrendered to the Forest Department, GoMP.
(viii) Agriculture in a controlled manner based on soil testing.

iii) The stipulated timelines for achieving 100% ash utilization as per the said notification is as follows -

a) For annually generated;

Utilisation percentages of thermal power plants	First compliance Cycle to meet 100 per cent utilisation	Second compliance cycle onwards, to meet 100 per cent utilisation
> 80 per cent	3 years	3 years
60-80 per cent	4 years	3 years
< 60 per cent	5 year	3 years

b) For legacy ash;

Year from date of publication	1st	2nd	3rd- 10th
Utilisation of legacy ash (in percentage of Annual ash	At least 20 per cent	At least 35 per cent	At least 50 per cent

iv) The legacy ash utilisation shall not be required for ash dyke of STPS, Sarni (373 ha) & SGTPS, Birsinghpur (100 ha) thermal power plant of MPPGCL, where ash dyke has stabilised and the reclamation has been initiated. Stabilisation and reclamation of an ash dyke including certification by the Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) shall be obtained within a year from the date of publication of this notification. However, the ash remaining in all other ash ponds or dykes of thermal power plants of MPPGCL shall be utilised in progressive manner as per the above mentioned timelines.

v) For the purpose of utilisation of ash as per the "Action Plan" of MPPGCL for FY 2022-23, as given under point no. (vii) & (viii) herein, following major conditions of said notification dated: 31/12/2021 are being complied & shall be complied -

a) All agencies (Government, Semi-government and Private) engaged in construction activities such as road laying, road and flyover embankments and dams within 300 kms from thermal power plants shall be provided ash at the project site free of cost and if required, transportation cost shall be borne by thermal power plants.

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b) For all mines located within 300 kilometres radius of thermal power plant, ash will be supplied for backfilling in mine voids or mixing of ash with external Overburden dumps, under Extended Producer Responsibility (EPR). The thermal power plants shall facilitate the availability of required quantity of ash by delivering it free of cost and bearing the cost of transportation or cost or transportation arrangement decided on mutually agreed terms.

c) Filling of low-lying areas with ash shall be carried out / are being carried with prior permission of the State Pollution Control Board and in accordance with the guidelines laid down by Central Pollution Control Board (CPCB).

d) The owner of thermal power plants shall serve written notice to persons or agencies who are liable to utilise ash, offering for sale, or transport or both.

vi) Ash generation and utilization w.r.t. the thermal power stations of MPPGCL in last three years is as under –

Name of TPS	FY	Ash Generation (LMT)	Ash Utilization (LMT)	% Utilization
SGTPS, Birsinghpur	2019-20	17.50	17.43	99.59
	2020-21	20.46	20.48	100.10
	2021-22	18.89	13.51	71.50
ATPS, Chachai	2019-20	3.15	3.16	100.55
	2020-21	3.37	2.18	64.81
	2021-22	3.58	1.40	39.09
STPS, Sarni	2019-20	14.69	9.36	63.72
	2020-21	12.89	12.14	94.20
	2021-22	8.97	8.95	99.82
SSTPP, Khandwa	2019-20	23.64	4.30	18.19
	2020-21	14.82	6.46	43.58
	2021-22	27.40	9.94	36.27
MPPGCL	2019-20	58.97	34.25	58.08
	2020-21	51.53	41.26	80.07
	2021-22	58.84	33.80	57.44

vii) Action Plan for utilization of Yearly Generated Ash for FY 2022-23 –

Description	**Unit**	**SGTPS, Birsinghpur**	**ATPS, Chachai**	**STPS, Sarni**	**SSTPP, Khandwa**
Estimated Ash Generation (Fly + Bottom)	MT	2337770	346550	953783	4150382
Cement Manufacturing	MT	1800083	155948	47689	1245115
Fly ash based products viz. bricks, blocks, tiles	MT	70133	51983	143067	207519
Construction of road and fly over embankment	MT	0	0	0	0
Back filling of abandoned coal mines / Stone Quarries	MT	0	0	190757	1265544
Filling up of low lying area	MT	0	36400	0	0
Filling of voids in old ash bund	MT	350665	0	572270	0
Bund raising	MT	0	0	0	0
Total ash utilization	MT	2220881	244331	953783	2718178
Percentage Utilization	%	**95.00**	**70.50**	**100.00**	**65.49**

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viii) Action Plan for utilization of Legacy Ash for FY 2022-23 :

Description	Unit	SGTPS, Birsinghpur	ATPS, Chachai	STPS, Sarni	SSTPP, Khandwa
Ash Generation (Fly +Bottom)	MT	2337770	346550	953783	4150382
Quantity to be utilized in first year i.e. 2022-23 (20% of annual estimated ash generation)	MT	467554	69310	190757	830076
Cement Manufacturing	MT	0	0	0	0
Fly ash based products viz. bricks, blocks, tiles	MT	0	0	0	0
Construction of road and fly over embankment (MT)	MT	471716	0	137408	468000
Back filling of abandoned coal mines / Stone Quarries	MT	0	90055	52500	714420
Filling up of low lying area	MT	0	0	0	0
Filling of voids in old ash bund	MT	0	0	0	0
Bund raising	MT	0	0	0	48440
Total ash utilization	MT	471716	90055	189908	1230860
Percentage Utilization	**%**	**100.89**	**129.93**	**99.56**	**148.28**

(2) Committees recommandentations for deposition of Environmental Compensation (EC) –

Compliance:

In compliance to the NGT order dated: 12/02/2020, CPCB has levied Environmental Compensation (EC) to the thermal power stations of MP Power Generating Company Limited vide letter dated: 02/07/2020 due to non utilization of 100% ash utilization. Further decision in the matter is pending, as the matter is under sub-judice in Hon'ble Supreme Court, hence no EC has been paid by MPPGCL.

(3) Committes recommendation for checking the strength of live Ash Bunds –

Compliance:

Name of TPS	Name of Expert agency	Year of study	Recommendation of Expert agency	Remark
SGTPS, Birsinghpur	IIT, Indore	2019	Ash dykes are proper & scientifically designed and present status is good for technical soundness, structural strength, stability, safety and is structurally sustainable and safe for adequacy for handling of fly ash generated from TPSs.	i) Report submitted to MPPCB vide no. 2235 dated: 10/12/2019. ii) To comply with NGT order dated: 18/01/2022, directives for frequency to carry out stability test being obtained from MPPCB. iii) Instruction of expert as regard of ash bund of SSTPP, Khandwa being complied.
ATPS, Chachai	IIT, Indore	2019		
STPS, Sarni	IIT, Indore	2019		
SSTPP, Khandwa	IIT, Indore	2019	i) Suggested to carry out regular maintenance of the slope due to erosion during monsoon season. ii) Advised to monitor the performance of the dyke using geotechnical instrumentation.	

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(4) Committes recommendation for prior permission from MPPCB before any disposal of fly ash / bottom ash in the low-lying areas and as per the CPCB guideline –

Compliance:

This condition is regularly prescribed by MPPCB during the renewal of Consent to Operate (CTO) every year & same is being complied by the thermal power stations of MPPGCL as and when required.

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Email: edomg_mpeb@rediffmail.com

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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

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PUBLISHED BY AUTHORITY

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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 31 दिसम्बर, 2021

का.आ. 5481(अ).—केन्द्रीय सरकार ने भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना सं. का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 द्वारा कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से तीन सौ किलोमीटर के विनिर्दिष्ट व्यास के भीतर ईंटों के विनिर्माण के लिए उपजाऊ मिट्टी के उत्खनन को प्रतिबंधित करने के लिए और भवन निर्माण सामग्री के विनिर्माण में और संनिर्माण क्रियाकलाप में फ्लाई-राख के उपयोग को बढ़ावा देने के लिए निदेश जारी किए हैं;

और, प्रदूषणकर्ता भुगतान सिद्धांत (पीपीपी) के आधार पर, ऐसा करके कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों द्वारा फ्लाई-राख का 100 प्रतिशत उपयोग सुनिश्चित करते हुए और फ्लाई-राख प्रबंधन प्रणाली की संधारणीयता के लिए पूर्वोक्त अधिसूचना को और अधिक प्रभावकारी ढंग से कार्यान्वित करने हेतु, केंद्रीय सरकार ने मौजूदा अधिसूचना की समीक्षा की;

और प्रदूषणकर्ता भुगतान सिद्धांत के आधार पर पर्यावरणीय प्रतिकर निर्धारित किए जाने की आवश्यकता है;

और, विनिर्माण को बढ़ावा देकर तथा निर्माण कार्य के क्षेत्र में राख आधारित उत्पादों तथा भवन निर्माण सामग्रियों के प्रयोग को अनिवार्य करके उपजाऊ मिट्टी को संरक्षित करने की आवश्यकता है;

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और, सड़क बनाने, सड़क एवं फ्लाई ओवर के रेलिंग बनाने, तटरेखा की सुरक्षा का उपाय करने, अनुमोदित परियोजनाओं के निचले क्षेत्रों को भरने, खनित स्थलों को फिर से भरने में मिट्टी की सामग्रियों से भरने के विकल्प के रूप में राख उपयोग को बढ़ावा देकर उपजाऊ मिट्टी और प्राकृतिक संसाधनों को संरक्षित करने की आवश्यकता है;

और, पर्यावरण को सुरक्षित करना तथा कोयला अथवा लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित फ्लाई राख के निक्षेपण तथा निपटान की रोकथाम करना आवश्यक है;

और, उक्त अधिसूचना में जो 'राख' शब्द का प्रयोग किया गया है उसमें कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित फ्लाई-राख और बॉटम-राख दोनों शामिल हैं;

और, केंद्रीय सरकार प्रदूषणकर्ता भुगतान सिद्धांत के आधार पर, पर्यावरणीय प्रतिकर की प्रणाली सहित राख के उपयोग के लिए एक व्यापक ढांचा लाना चाहती है;

अत: पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत सरकार के पर्यावरण एवं वन मंत्रालय की अधिसूचना जो का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 द्वारा भारत के राजपत्र, असाधारण भाग ।।, खंड 3, उप खंड (i) में प्रकाशित का अधिक्रमण करते हुए, कोयला या लिग्नाईट आधारित ताप विद्युत संयंत्रों द्वारा राख के उपयोग के संबंध में प्रारूप अधिसूचना जो सा.का.नि. 285 (अ) तारीख 22 अप्रैल, 2021 द्वारा भारत के राजपत्र, असाधारण, भाग-2, धारा 3, उप धारा (i) में प्रकाशित की गई थी जिसमें उन सभी व्यक्तियों से जिनका इससे प्रभावित होना सामान्य है उस तारीख से, जिसको उक्त प्रारूप उपबंधों की शासकीय राजपत्र में अंतर्विष्ट प्रतियां जनता को उपलब्ध करा दी गई थी, साठ दिनों के अवसान से पूर्व आक्षेप और सुझाव आमंत्रित किए गए थे।

और उक्त प्रारूप अधिसूचना के संबंध में उससे संभावित तौर पर प्रभावित होने वाले सभी व्यक्तियों से प्राप्त आक्षेपों और सुझावों पर केंद्रीय सरकार द्वारा सम्यक रूप से विचार कर लिया गया है;

अत: पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए और अधिसूचना का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 का उन बातों के सिवाय अधिकांत करते हुए जिन्हें ऐसे अधिक्रमण से पूर्व किया गया है या करने का लोप किया गया है, केन्द्रीय सरकार कोयलों या लिग्नाईट आधारित ताप विद्युत संयंत्रों से राख के उपयोग के संबंध में निम्नलिखित अधिसूचना जारी करती है, जो इस अधिसूचना के प्रकाशन की तिथि से प्रवृत्त होगी, अर्थात्

क. फ्लाई-राख और बॉटम-राख का निपटान करने हेतु ताप विद्युत संयंत्रों (टीपीपी) के उत्तरदायित्व.-

(1) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र (जिनमें कैप्टिव और/या सह-उत्पादन केंद्र शामिल हैं या दोनों) की यह प्राथमिक जिम्मेदारी होगी कि वह अपने द्वारा सृजित राख (फ्लाई-राख और बॉटम-राख) का उप पैरा (2) में दिए गए पारि-अनुकूल तरीके से 100 प्रतिशत उपयोग सुनिश्चित करे;

(2) कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित राख का उपयोग केवल निम्नलिखित पारि-अनुकूल प्रयोजनों के लिए किया जाएगा, अर्थात्:-

(i) फ्लाई राख पर आधारित उत्पाद अर्थात्: ईंट ब्लॉक टाइल, फाइबर सीमेंट शीट, पाइप, बोर्ड, पैनल का विनिर्माण;

(ii) सीमेंट विनिर्माण, रेडी-मिक्स कंक्रीट;

(iii) सड़क निर्माण और फ्लाई-ओवर के रेलिंग का निर्माण, राख और जिओ-पॉलीमर आधारित निर्माण सामग्री;

(iv) बांध का निर्माण;

(v) निचले क्षेत्र को भरना;

(vi) खनन कार्य से रिक्त हुए स्थान को भरना;

(vii) सिंटर्ड या शीत–बद्ध राख संचय का विनिर्माण;

(viii) मृदा परीक्षण के आधार पर नियंत्रित तरीके से कृषि;

(ix) तटीय जिलों में तटरेखा संरक्षण संरचनाओं का निर्माण;

(x) अन्य देशों को राख का निर्यात;

(xi) समय-समय पर यथाधिसूचित किसी अन्य पारि-अनुकूल प्रयोजन के लिए।

(3) अध्यक्ष, केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति गठित की जाएगी जिसमें पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफसीसी), विद्युत मंत्रालय, खान मंत्रालय, कोयला मंत्रालय, सड़क परिवहन और राजमार्ग मंत्रालय, कृषि अनुसंधान एवं शिक्षा विभाग, सड़क कांग्रेस संस्थान तथा राष्ट्रीय सीमेंट एवं भवन सामग्री परिषद के प्रतिनिधियों को सदस्यों के रूप में शामिल किया जाएगा, जिसका प्रयोजन राख के उपयोग के पारि-अनुकूल तौर-तरीकों की जांच करना, उनकी समीक्षा एवं अनुशंसा करना तथा प्रौद्योगिकीय विकासों तथा पणधारी से प्राप्त अनुरोधों के आधार पर उप-पैरा (2) में यथोल्लिखित ऐसे तौर-तरीकों की सूची में समिति द्वारा सुझाए गए तौर-तरीकों को शामिल करना या किसी तौर-तरीके को सूची से हटाना या उसमें संशोधन करना है। जब भी इस प्रयोजन के लिए अपेक्षित हो, यह समिति राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति, ताप विद्युत संयंत्र और खानों के प्रचालकों को आमंत्रित कर सकती है। इस समिति सिफारिश के आधार पर, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय ऐसे पारि-अनुकूल प्रयोजन प्रकाशित करेगा।

(4) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र उस वर्ष के दौरान सृजित राख (फ्लाई-राख और बॉटम-राख) का 100 प्रतिशत उपयोग करने हेतु उत्तरदायी होगा; तथापि, किसी भी स्थिति में, किसी वर्ष में राख का उपयोग 80 प्रतिशत से नीचे नहीं होगा और साथ ही, उस ताप विद्युत संयंत्र को तीन वर्ष की अवधि में 100 प्रतिशत औसत राख के उपयोग का लक्ष्य प्राप्त करना होगा :

परंतु, यह और कि पहली बार के लिए लागू तीन वर्ष के चक्र को ऐसे ताप विद्युत संयंत्रों, जहां राख का उपयोग 60-80 प्रतिशत के बीच होता है, एक वर्ष के लिए और ऐसे संयंत्रों, जहां राख का उपयोग 60 प्रतिशत से कम है, दो वर्ष के लिए बढ़ाया जा सकता है, और राख के उपयोग की प्रतिशतता की गणना के प्रयोजन के लिए वर्ष 2021-2022 में उपयोग की प्रतिशत प्रमात्रा को नीचे दी गई तालिका के अनुसार ध्यान में रखा जाएगा:

तापीय विद्युत संयंत्रों के उपयोग की प्रतिशतता	100 प्रतिशत उपयोगिता प्राप्त करने के लिए प्रथम अनुपालन चक्र	100 प्रतिशत उपयोगिता प्राप्त करने के लिए द्वितीय अनुपालन चक्र
>80 प्रतिशत	3 वर्ष	3 वर्ष
60-80 प्रतिशत	4 वर्ष	3 वर्ष
<60 प्रतिशत	5 वर्ष	3 वर्ष

परन्तु, ताप विद्युत संयंत्रों के लिए 80 प्रतिशत न्यूनतम उपयोग प्रतिशतता, क्रमश: 60-80 प्रतिशत और <60 प्रतिशत की उपयोगिता की श्रेणी के तहत आने वाले ताप विद्युत संयंत्रों के लिए प्रथम अनुपालन चक्र के पहले वर्ष और पहले दो वर्षों पर लागू नहीं होगी।

परन्तु, अनुपालन चक्र के अंतिम वर्ष में सृजित 20 प्रतिशत राख को अगले चक्र में भी ले जाया जाएगा जिसका उपयोग उस अनुपालन चक्र के दौरान सृजित राख के साथ अगले तीन वर्षों में किया जाएगा।

(5) अप्रयुक्त संचित राख अर्थात् लीगेसी राख, जिसका इस अधिसूचना के प्रकाशन से पहले भंडारण किया गया है, को ताप विद्युत संयंत्र (टीपीपी) द्वारा इस रीति से क्रमिक रूप से उपयोग में लाया जाएगा, कि लीगेसी राख को इस अधिसूचना के प्रकाशन की तिथि से दस वर्षों के भीतर पूरी तरह उपयोग कर लिया जाएगा और यह उस विशिष्ट वर्ष के चालू संचालनों के माध्यम से राख उत्सर्जन के लिए निर्धारित उपयोग लक्ष्यों से अतिरिक्त होगा।

परन्तु, निम्नलिखित प्रतिशतताओं में यथा उल्लिखित लीगेसी राख की न्यूनतम मात्रा का उपयोग तास्थानी वर्ष के दौरान कर लिया जाएगा और लीगेसी राख की न्यूनतम मात्रा की ताप विद्युत संयंत्र की संस्थापित क्षमता के अनुसार वार्षिक राख उत्सर्जन के आधार पर की जानी है।

प्रकाशन की तिथि से वर्ष	पहला	दूसरा	तीसरा-दसवां
लीगेसी राख का उपयोग (वार्षिक राख की प्रतिशतता)	कम से कम 20 प्रतिशत	कम से कम 35 प्रतिशत	कम से कम 50 प्रतिशत

परन्तु, यह और कि लीगेसी राख का उपयोग वहां अपेक्षित नहीं है, जहां राख के तालाब या डाइक स्थिर हो गए हैं और हरित पट्टी के निर्माण या पौध रोपण से पुनरूद्धार किया गया है और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड इस संबंध में प्रमाणित करेगा। किसी राख तालाब या डाइक के स्थिरीकरण और भूमि-उद्धार का कार्य, जिसमें केन्द्रीय प्रदूषण नियंत्रण बोर्ड या राज्य प्रदूषण नियंत्रण बोर्ड द्वारा प्रमाणन शामिल है, इस अधिसूचना के प्रकाशन की तारीख से एक वर्ष के भीतर किया जाएगा। अन्य सभी राख के कुंड या डाइक में शेष बचे राख का उपयोग ऊपर उल्लिखित समय-सीमाओं के अनुसार क्रमिक रूप से किया जाएगा।

टिप्पण: राख के उपयोग के लक्ष्यों को हासिल करने के लिए उप पैरा (4) और (5) के अधीन दायित्व 01 अप्रैल, 2022 की तारीख से लागू होंगे।

(6) किसी भी नए तापीय विद्युत संयंत्र (टीपीपी) में 0.1 हेक्टेयर प्रति मेगावाट (एमडब्ल्यू) क्षेत्रफल के साथ आपातकालीन या अस्थायी राख कुंड की अनुमति दी जा सकती है। राख के तालाब या डाइकों का तकनीकी विर्निदेश, केन्द्रीय विद्युत प्राधिकरण (सीईए) के परामर्श से केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा बनाए गए दिशानिर्देशों के अनुसार होगा और ये दिशानिर्देश राख के कुंड या डाइक के संबंध में इसकी सुरक्षा, पर्यावरणीय प्रदूषण, उपलब्ध प्रमात्रा, निपटान का तरीका, निपटान में जल की खपत या संरक्षण, राख जल पुनर्चक्रण और ग्रीन बेल्ट आदि के वार्षिक प्रमाणन के लिए कार्यविधि भी निर्धारित करेंगे और इस अधिसूचना के प्रकाशन की तारीख से तीन महीनों के भीतर प्रस्तुत किए जाएंगे।

(7) प्रत्येक कोयला या लिग्नाईट आधारित ताप विद्युत संयंत्र यह सुनिश्चित करेगा कि राख की लदाई, उतराई, ढुलाई, भंडारण और निपटान पर्यावरणीय दृष्टि से अनुकूल रीति से किया गया है और वायु और जल प्रदूषण की रोकथाम के लिए सभी ऐहितयात किए गए हैं और इस संबंध में स्थिति की सूचना इस अधिसूचना में संलग्न अनुबंध में संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को दी जाएगी।

(8) प्रत्येक कोयला या लिग्नाइट आधारित तापीय विद्युत संयंत्र, संस्थापित क्षमता पर आधारित राख के कम से कम 16 घंटों के भंडारण के लिए समर्पित शुष्क फ्लाई राख साइलोस प्रतिष्ठापित करेगा, जिनके पास पृथक पहुंच मार्ग होंगे, जिससे कि राख पहुंचाने के कार्य को सुगम बनाया जा सके। इसकी सूचना संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को उपाबंध में दी जाएगी और केन्द्रीय प्रदूषण नियंत्रण

बोर्ड (सीपीसीबी) या राज्य केन्द्रीय प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति द्वारा समय-समय पर निरीक्षण किया जाएगा।

(9) प्रत्येक कोयला या लिग्नाईट आधारित तापीय विद्युत संयंत्र (जिसके अंतर्गत कैप्टिव या सह उत्पादन केन्द्र भी है या दोनों), वास्तविक उपयोगकर्ता (उपयोगकर्ताओं) के हित के लिए केन्द्रीय प्रदूषण नियंत्रण बोर्ड के वेब पोर्टल या मोबाईल फोन एप्प का लिंक उपलब्ध कराकर ताप विद्युत संयंत्र के पास राख की उपलब्धता के वास्तविक आंकड़े प्रदान करेगा।

(10) राख के 100 प्रतिशत उपयोग का वैधानिक दायित्व, जहां भी लागू हो, विधि में बदलाव के रूप में माना जाएगा।

ख. राख के उपयोग के प्रयोजनार्थ, उत्तरवर्ती उप पैराग्राफ लागू होंगे .-

(1) ऐसे सभी अभिकरण (सरकारी, अर्द्धसरकारी और निजी), जो सड़क बिछाने, सड़क और फ्लाई ओवर के किनारों, तटीय जिलों में तटरेखा की सुरक्षा संरचनाओं और लिग्नाईट या कोयला आधारित ताप विद्युत संयंत्र से 300 किमी के भीतर बांधों जैसे निर्माण संबंधी कार्यकलापों में लगे हुए हैं, इन कार्यकलापों में अनिवार्य रूप से राख का उपयोग करेंगे :

परंतु इसको परियोजना स्थल पर निशुल्क पहुंचाया जाए और परिवहन लागत, ऐसे कोयला या लिग्नाईट आधारित ताप विद्युत संयंत्रों द्वारा वहन की जाए।

परंतु यह और कि ताप विद्युत संयंत्र पारस्परिक सहमत हुई शर्तों के अनुसार राख की लागत और परिवहन के लिए शुल्क ले सकता है उस मामले में जहां ताप विद्युत संयंत्र अन्य माध्यम से राख का निपटान करने में समर्थ है और ये अभिकरण इसके लिए प्रर्थाना कर सकते हैं और बिना लागत और बिना परिवहन शुल्क के राख उपलब्ध कराने के प्रावधान तभी लागू होंगे यदि उसके लिए ताप विद्युत संयंत्र उस निर्माण अभिकरण को नोटिस जारी करता है।

(2) उक्त कार्यकलापों में राख का उपयोग भारतीय मानक ब्यूरो, भारतीय रोड कांग्रेस, केन्द्रीय भवन अनुसंधान संस्थान, रूड़की, केन्द्रीय सड़क अनुसंधान संस्थान, दिल्ली, केन्द्रीय लोक निर्माण विभाग, राज्य लोक निर्माण विभागों और अन्य केन्द्रीय और राज्य सरकार के अभिकरणों द्वारा निर्धारित किए गए विनिर्देशों और दिशानिर्देशों के अनुसार किया जाएगा।

(3) तापीय विद्युत संयंत्र की 300 किलोमीटर की परिधि के भीतर अवस्थित सभी खानों के लिए विस्तारित उत्पादक उत्तरदायित्व (ईपीआर) के तहत खुली आवर्त खानों में राख का पृष्ठ भंडारण करना या अधिक भार के ढेरों के साथ राख का मिश्रण करना बाध्यकारी होगा। सभी खान के स्वामी या प्रचालक (चाहे सरकारी, सार्वजनिक और निजी क्षेत्र के हो) कोयला या लिग्नाईट आधारित तापीय विद्युत संयंत्रों से तीन सौ किलोमीटर (सड़क द्वारा) के भीतर, महानिदेशक, खान सुरक्षा (डीजीएमएस) के दिशानिर्देशों के अनुसार ओवर बर्डन के बाह्य निक्षेप खान की बैकफिलिंग अथवा स्टोविंग (प्रचालित या छोड़ी गई खानों, जैसा भी मामला हो) के लिए उपयोग की गई सामग्रियों के भार-दर-भार के आधार पर कम से कम 25 प्रतिशत राख को मिश्रित करने के लिए उपाय करेंगे :

परंतु ऐसे तापीय विद्युत केन्द्र नि:शुल्क राख प्रदान करके और परिवहन की लागत को वहन करके या पारस्परिक सहमत हुई शर्तों पर लिए गए निर्णय के अनुसार लागत या परिवहन व्यवस्था करके राख की अपेक्षित मात्रा की उपलब्धता को सुकर बनायेंगे और खानों के खाली स्थानों और ढेरो में अधिकभार के साथ राख को मिश्रित करना, सृजित अधिभार के लिए इस अधिसूचना के प्रकाशन की तिथि से लागू होगा और उक्त कार्यकलापों में राख का उपयोग, केंद्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक खान सुरक्षा और भारतीय खदान ब्यूरो द्वारा निर्धारित दिशा-निर्देशों के अनुसार किया जाएगा।

स्पष्टीकरण .- इस उप-पैरा के प्रयोजन के लिए यह भी स्पष्ट किया जाता है कि लागत मुक्त राख और नि:शुल्क परिवहन के उपबंध केवल तभी लागू होंगे यदि ताप विद्युत संयंत्र इसके लिए खान मालिक को नोटिस देते हैं और अधिभार वाले ढेर के साथ मिश्रित करने और खान में खाली स्थान को भरने के लिए राख के 25 प्रतिशत हिस्से के उपयोग का अधिदेश तब तक लागू नहीं होगा जब तक कि ताप विद्युत संयंत्र द्वारा खान मालिक को नोटिस न दिया गया हो।

(5) (i) सभी खान मालिकों को खान में खाली स्थानों में राख को समायोजित करने के लिए खान बंद योजना (प्रगामी और अंतिम) तैयार करनी होगी और खान में खाली स्थान में राख के निपटान और अधिभार वाले ढेर के साथ राख को मिश्रित करने के लिए खान योजनाओं को संबंधित प्राधिकारी अनुमोदित करेगा। पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय द्वारा ताप विद्युत संयंत्रों और कोयला खदानों की पर्यावरणीय मंजूरी की अपेक्षा से छूट देने के साथ-साथ ऐसे निपटान के लिए अपनाए जाने वाले दिशानिर्देशों के संबंध में तारीख 28 अगस्त, 2019 को दिशानिर्देश जारी किए गए।

(ii) मंत्रालय, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक, खान सुरक्षा (डीजीएमएस) और भारतीय खान ब्यूरो (आईबीएम) के साथ परामर्श करके, खानों में खाली स्थानों में राख के निपटान करने तथा अधिभार वाले ढेरो में इसे मिश्रित करना सुगम बनाने के लिए समय-समय पर आगे भी दिशानिर्देश जारी कर सकता है और यह खान मालिकों की जिम्मेदारी होगी कि वे ऐसी खानों को अभिज्ञात करने की तिथि से एक वर्ष के भीतर विभिन्न विनियामक प्राधिकरणों द्वारा जारी की गई अनुमतियों में आवश्यक संशोधन या परिवर्तन प्राप्त करेंगे।

(6) (i) पर्यावरणीय प्रदूषण के संदर्भ में सुरक्षा, व्यवहार्यता (आर्थिक व्यवहार्यता नहीं) और पहलुओं की जांच सहित राख से खान में खाली स्थान को वापस भरने/अधिभार वाले ढेर के साथ राख को मिश्रित करने के लिए खानों की पहचान करने के लिए पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, विद्युत मंत्रालय, खान मंत्रालय, कोयला मंत्रालय, महानिदेशक खान सुरक्षा और भारतीय खान ब्यूरो से प्रतिनिधियों को शामिल करते हुए अध्यक्ष, केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति का गठन किया जाएगा और यह समिति पणधारी मंत्रालयों या विभागों के लिए अभिज्ञात खानों (भूमिगत और खुली, दोनों) के संबंध में तैयार की गई तिमाही रिपोर्टों को अद्यतन करेगी और यह समिति, इस अधिसूचना के प्रकाशन के तुरंत पश्चात उपयुक्त खानों की पहचान करना आरंभ करेगी।

(ii) ताप विद्युत संयंत्र या खानें, उपरोक्त अनुसार अधिदेशित उपयोग लक्ष्यों को पूरा करने के लिए उपर्युक्त समिति द्वारा पहचान किए जाने तक राख के निपटान हेतु प्रतीक्षा नहीं करेंगी।

(7) राख से निचले क्षेत्र को भरने का कार्य, अनुमोदित परियोजनाओं के लिए राज्य प्रदूषण नियंत्रण बोर्ड की पूर्व अनुमति से और केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्धारित दिशा-निर्देशों के अनुसार किया जाएगा और राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति द्वारा अनुमोदित स्थलों, अवस्थान, क्षेत्र और अनुमत मात्रा को अपनी वेबसाइट पर प्रतिवर्ष प्रकाशित किया जाएगा।

(8) केन्द्रीय प्रदूषण नियंत्रण बोर्ड, संगत पणधारी के साथ मिलकर, राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा अनुमति प्रदान करने के लिए समयबद्ध ऑनलाइन आवेदन प्रक्रिया प्रस्तुत करने के साथ-साथ इस अधिसूचना के अधीन परिकल्पित सभी प्रकार के कार्यकलापों के लिए एक वर्ष के भीतर दिशानिर्देश प्रस्तुत करेगा।

(9) कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र से तीन सौ किलोमीटर के दायरे में स्थित सभी भवन निर्माण परियोजनाएं (केंद्रीय, राज्य और स्थानीय प्राथिकरणों सरकारी उपक्रमों, अन्य सरकारी अभिकरणों तथा सभी निजी अभिकरणों) राख की ईटों, टाईल्स, धातुमल राख अथवा अन्य राख आधारित उत्पादों का उपयोग करेंगी बशर्ते कि वे वैकल्पिक उत्पादों की कीमत से अधिक कीमत पर उपलब्ध न हो।

(10) राख आधारित उत्पादों के विनिर्माण और ऐसे उत्पादों में राख के उपयोग में भारतीय मानक ब्यूरो, भारतीय सड़क कांग्रेस और केंद्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्धारित विनिर्देशों और दिशानिर्देशों की अनुपालना होगी।

ग. गैर-अनुपालन के लिए पर्यावरणीय प्रतिकर .-

(1) तीन वर्ष के चक्र के प्रथम दो वर्षों में, यदि कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र (कैप्टिव और/ या सह-उत्पादक स्टेशनों या दोनों सहित) ने कम-से-कम 80 प्रतिशत राख (फ्लाई-राख और बॉटम-राख) उपयोग नहीं की है तो ऐसे गैर-अनुपालन ताप विद्युत संयंत्रों पर प्रस्तुत की गई वार्षिक रिपोर्टों के आधार पर वित्तीय वर्ष के

अंत में अप्रयुक्त राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि यह तीन वर्ष के चक्र के तीसरे वर्ष में 100 प्रतिशत राख का उपयोग करने में असमर्थ रहता है, तो वह अप्रयुक्त मात्रा पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर के भुगतान का पात्र होगा, जिस पर पहले पर्यावरणीय प्रतिकर नहीं लगायी गयी है।

परंतु पर्यावरणीय प्रतिकर को पैरा क के उप-पैरा (4) में उल्लिखित विभिन्न उपयोगी श्रेणियों के अनुसार प्रथम अनुपालन चक्र के अंतिम वर्ष के अंत में अनुमान लगाया जाएगा और अधिरोपित किया जाएगा।

(2) अधिकारियों द्वारा एकत्रित पर्यावरणीय प्रतिकर को केन्द्रीय प्रदूषण नियंत्रण बोर्ड के निर्दिष्ट खाते में जमा किया जाएगा।

(3) लैगेसी राख के मामले में, यदि कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र (कैप्टिव या सह-उत्पादक स्टेशनों या दोनों सहित) ने स्थापित क्षमता पर आधारित उत्पन्न राख का कम-से-कम 20 प्रतिशत (प्रथम वर्ष के लिए), 35 प्रतिशत (द्वितीय वर्ष के लिए), 50 प्रतिशत (तीसरे से दसवें वर्ष तक) उपयोग के बराबर लक्ष्य प्राप्त नहीं किया है तो उस वित्तीय वर्ष के दौरान अप्रयुक्त लैगेसी राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि 10 वर्ष के अंत में लैगेसी राख का उपयोग नहीं किया जाता है तो 1000 रुपए प्रति टन की दर से शेष अप्रयुक्त मात्रा पर पर्यावरणीय प्रतिकर लगाया जाएगा जिस पर पहले पर्यावरणीय प्रतिकर नहीं लगाया गया है।

(4) अधिकृत खरीददारों या उपभोक्ता अभिकरणों तक राख भेजने की जिम्मेदारी परिवाहकों या वाहन मालिक की जिम्मेदारी है और यदि इसका अनुपालन नहीं किया जाता है, तो अनधिकृत उपयोगकर्ताओं अथवा गैर-अधिकृत उपयोगर्ताओं को ऐसी मात्रा गलत तरीके से वितरित करने पर 1500 रूपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगायी, इसके अतिरिक्त राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा गैर अनुपालनकर्ता परिवाहकों पर अभियोजन लागू होगा।

(5) इस अधिसूचना के पैरा ख में विहित पर्यावरण अनुकूल तरीके में राख के उपयोग की जिम्मेदारी खरीददार या उपभोगकर्ता एजेंसियों की है और ऐसा नहीं करने पर केन्द्रीय प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा 1500 रूपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा।

(6) यदि उपयोगकर्ता अधिकरण पैरा ख के अधीन निर्धारित सीमा तक अथवा पैरा घ के उप-पैरा (1) के अधीन, दिए गए नोटिस के माध्यम से सूचित की गई सीमा, इनमें से जो भी कम हो, तक राख का उपयोग नहीं करती है, वे अतिरिक्त राख की मात्रा का 1500 रूपए प्रति टन की दर से भुगतान करने के लिए उत्तरदायी होंगी।

परंतु भवन निर्माण के संबंध में पर्यावरणीय प्रतिकर निर्मित क्षेत्र के 75 रूपये प्रति वर्ग फीट की दर से वसूल किया जाएगा।

(7) (i) ताप विद्युत संयंत्रों अन्य बकायादारों से केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा लगायी गई का पर्यावरणीय प्रतिकर उपयोग अप्रयुक्त राख के सुरक्षित निपटान हेतु किया जाएगा और राख आधारित उत्पादों सहित राख के उपयोग के संबंध में और अधिक अनुसंधान करने के लिए भी निधि का उपयोग किया जा सकता है।

(ii) अप्रयुक्त मात्रा पर लगाए गए पर्यावरणीय प्रतिकर के पश्चात भी राख के उपयोग का उत्तरदायित्व ताप विद्युत संयंत्रों की होगी और यदि पश्चातवती चक्रों में पर्यावरणीय प्रतिकर लगाने के पश्चात ताप विद्युत संयंत्र, किसी विशेष चक्र की राख के उपयोग के लक्ष्य को प्राप्त करता है तो अगले चक्र के दौरान अप्रयुक्त मात्रा पर एकत्र की गई पर्यावरणीय प्रतिकर में 10 प्रतिशत कटौती के पश्चात उक्त रकम ताप विद्युत संयंत्र को वापस कर दी जाएगी और पश्चातवती चक्रों में राख के उपयोग के मामले में एकत्र की गई पर्यावरणीय प्रतिकर की 20 प्रतिशत, 30 प्रतिशत और उसी क्रम में कटौती की जानी है।

घ. राख या राख आधारित उत्पादों की आपूर्ति हेतु प्रक्रिया .–

(1) ताप विद्युत संयंत्रों के स्वामी अथवा राख की ईंटों या टाईल्स या धातुमल आधारित राख के विनिर्माता उन व्यक्तियों या अभिकरणों को लिखित सूचना देंगे जो बिक्री या परिवहन या दोनों के लिए प्रस्तुत राख या राख आधारित उत्पादों के उपयोग के लिए उत्तरदायी हैं।

(2) ऐसे व्यक्ति या उपयोगकर्ता अभिकरणों जिन्हें ताप विद्युत संयंत्रों के स्वामी द्वारा या राख की ईंटों या टाईल्स या धातुमल आधारित राख के उत्पादकों द्वारा सूचना दी गई है, यदि वे पहले ही राख या राख उत्पादों के उपयोग के प्रयोजन से अन्य अभिकरणों के साथ जुड़े हुए हैं, यदि वे किसी भी राख/राख उत्पादों का उपयोग नहीं कर सकते हैं अथवा कम मात्रा का उपयोग कर सकते हैं, तदनुसार ताप विद्युत संयंत्र को सूचित करेंगे।

ड. प्रवर्तन, निगरानी, लेखा परीक्षा और प्रतिवेदन करना

(1) केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी), उपबंधों के अनुपालना सुनिश्चित करने के लिए प्रवर्तन और निगरानी प्राधिकरण होंगे। सीपीसीबी या एसपीसीबी या पीसीसी तिमाही आधार पर राख के उपयोग की निगरानी करेंगे और सीपीसीबी इस प्रयोजन के लिए अधिसूचना की प्रकाशन की तारीख से छः माह के भीतर एक पोर्टल विकसित करेगा। संबंधित जिला अधिकारी के पास इस अधिसूचना के उपबंधों को लागू करने और निगरानी करने के लिए समवर्ती अधिकारिता होगी।

(2) (i) ताप विद्युत संयंत्र, राख उत्सर्जन और उपयोग से संबंधित मासिक सूचना वेब पोर्टल पर अगले महीने की 5 तारीख तक अपलोड करेगा। कोयला या लिग्नाइट आधारित ताप ऊर्जा संयंत्रों द्वारा केंद्रीय प्रदूषण नियंत्रण बोर्ड, संबंधित राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति (पीसीसी), केंद्रीय विद्युत प्राधिकरण (सीईए) और पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय के संबंधित एकीकृत क्षेत्रीय कार्यालयों को इस अधिसूचना के उपबंधों के अनुपालन संबंधी सूचना उपलब्ध कराते हुए वार्षिक कार्यान्वयन रिपोर्ट प्रत्येक वर्ष (1 अप्रैल से 31 मार्च तक की अवधि के लिए) अप्रैल माह के 30वें दिन तक प्रस्तुत की जाएगी। सीपीसीबी और सीईए द्वारा सभी ताप विद्युत संयंत्रों द्वारा प्रस्तुत वार्षिक रिपोर्टों का समेकन किया जाएगा और उसे पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को 31 मई तक प्रस्तुत किया जाएगा।

(ii) सभी अन्य उपयोगकर्ता अधिकरण पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय या राज्य स्तरीय पर्यावरण प्रभाव आकलन प्राधिकरण (एसईआईएए) द्वारा जारी पर्यावरणीय मंजूरी (ईसी) अथवा राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा जारी संचालन की सहमति (सीटीओ), जो भी लागू हो, की अनुपालना रिपोर्ट में इस अधिसूचना में आज्ञापकता के अनुसार राख के उपभोग या उपयोग या निस्तारण तथा राख आधारित उत्पादों के उपयोग संबंधी सूचना प्रस्तुत करेंगे। केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) या राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) अधिसूचना के उपबंधों के प्रभावी कार्यान्वयन की समीक्षा करने हेतु ताप विद्युत संयंत्रों के अतिरिक्त अन्य सभी अधिकरणों की राख उपयोग की वार्षिक रिपोर्ट प्रकाशित करेंगे।

(3) इस अधिसूचना के उपबंधों की निगरानी और कार्यान्वयन के प्रयोजन के लिए केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति का गठन किया जाएगा जिसके सदस्य विद्युत मंत्रालय, कोयला मंत्रालय, खनन मंत्रालय, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, सड़क परिवहन और राजमार्ग मंत्रालय और भारी उद्यम विभाग से होने के साथ-साथ समिति के अध्यक्ष द्वारा नामित किए जाने वाले कोई संबंधित पणधारी होंगे। यह समिति संगत पणधारी को आमंत्रित कर सकती है। यह समिति इस अधिसूचना के उपबंधों के प्रभावी और दक्ष कार्यान्वयन के लिए सिफारिशें कर सकती है। यह समिति छः माह में कम से कम एक बार एक बैठक करेगी और वार्षिक कार्यान्वयन रिपोर्टों की समीक्षा करेगी और यह समिति, इस अधिसूचना द्वारा आजापक किए गए अनुसार छः महीनों में कम से कम एक बार संगत पणधारी (को) को आमंत्रित करके राख के उपयोग की निगरानी करने के लिए पणधारी से साथ परामर्शदात्री बैठकें आयोजित करेगी। यह समिति पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफसीसी) को छः मासिक रिपोर्ट प्रस्तुत करेगी।

(4) ताप विद्युत संयंत्रों और राख के उपयोगकर्ताओं या राख आधारित उत्पादों के विनिर्माताओं के बीच के विवाद का समाधान करने के प्रयोजन से राज्य सरकारें या संघ राज्यक्षेत्र की सरकारें इस अधिसूचना के प्रकाशन की तारीख से तीन माह के भीतर राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) की अध्यक्षता में एक समिति का गठन करेंगी जिसमें विद्युत विभाग के प्रतिनिधि और एक प्रतिनिधि उस विभाग का होगा, जो विवाद वाले संबंधित अभिकरण का कार्य देख रहे हैं।

(5) केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) द्वारा प्राधिकृत लेखा परीक्षकों द्वारा ताप विद्युत संयंत्रों और उपयोगकर्ता अभिकरणों द्वारा किए गए राख के निपटान की अनुपालन लेखा परीक्षा संचालित की जाएगी और लेखा परीक्षा की रिपोर्ट प्रत्येक वर्ष 30 नवम्बर तक केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को प्रस्तुत की जाएगी। केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) लेखा परीक्षा की रिपोर्ट प्राप्त होने के पंद्रह दिनों के भीतर अनुपालन न करने वाले ताप विद्युत संयंत्रों के विरूद्ध कार्रवाई प्रारंभ करेगें।

[फा. सं. एचएसएम-9/1/2019-एचएसएम]

नरेश पाल गंगवार, संयुक्त सचिव

उपाबंध

31 मई तक अथवा उससे पहले प्रस्तुत की जाने वाली राख संबंधी उपबंधों की अनुपालन रिपोर्ट (01 अप्रैल से 31 मार्च की अवधि के लिए)।

क्र.सं.	**ब्यौरा**	
1.	विद्युत संयंत्र का नाम	
2.	कंपनी का नाम	
3.	जिला	
4.	राज्य	
5.	पत्राचार के लिए डाक का पता :	
6.	ई-मेल :	
7.	विद्युत संयंत्र की संस्थापित क्षमता (मेगा वॉट) :	
8.	संयंत्र लोड फैक्टर (पीएलएफ) :	
9.	उत्पादित यूनिटों की संख्या (एमडब्ल्यूएच) :	
10.	विद्युत संयंत्र के अंतर्गत कुल क्षेत्र (हेक्टेयर) (राख कुंडों के अधीन क्षेत्र सहित) :	
11.	रिपोर्टिंग की अवधि के दौरान कोयला खपत की मात्रा (प्रति वर्ष मीट्रिक टन) :	
12.	औसत राख सामग्री प्रतिशतता में (%) :	
13.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख की मात्रा (प्रति वर्ष मीट्रिक टन) : फ्लाई राख (प्रति वर्ष मीट्रिक टन) : बॉटम राख (प्रति वर्ष मीट्रिक टन) :	
14.	ड्राई फ्लाई राख भंडारण गड्ढा (गड्ढों) की क्षमता (मीट्रिक टन) :	
15.	**रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख के उपयोग का ब्यौरा:** (क) रिपोर्टिंग की अवधि के दौरान वर्तमान में उपयोग की गई राख की	

	कुल मात्रा (एमटीपीए) : (ख) उपयोग की गई फ्लाई राख की मात्रा (एमटीपीए) : i. फ्लाई-एश आधारित उत्पाद (ईंट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड/पैनल) : ii. सीमेंट विनिर्माण : iii. रेडी मिक्स कंक्रीट : iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : vi. सड़कों, सड़क और फ्लाई ओवर के पुश्तों का निर्माण : vii. बांधों का निर्माण : viii. निम्न भू-क्षेत्र का भराव : ix. खनिज क्षेत्रों का भराव : x. अधिभार वाले डम्पों में उपयोग : xi. कृषि : xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : xiii. अन्य देशों को राख का निर्यात : xiv. अन्य (कृपया विनिर्दिष्ट करें) : (ग) उपयोग किए गए तल के राख की मात्रा (एमटीपीए) : i. फ्लाई-एश आधारित उत्पाद (ईंट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड या पैनल) : ii. सीमेंट विनिर्माण : iii. रेडी मिक्स कंक्रीट : iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : vi. सड़कों, सड़क और फ्लाईओवर के पुश्तों का निर्माण : vii. बांधों का निर्माण : viii. निम्न भू-क्षेत्र का भराव : ix. खनिज क्षेत्रों का भराव : x. अधिभार वाले डम्पों में उपयोग : xi. कृषि : xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : xiii. अन्य देशों को राख का निर्यात : xiv. अन्य (कृपया विनिर्दिष्ट करें) : रिपोर्टिंग की अवधि के दौरान वर्तमान में अप्रयुक्त राख की कुल मात्रा (एमटीपीए :	
16.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख का प्रतिशतता उपयोग (%) :	
17.	**राख कुंडों में राख के निपटान का ब्यौरा** क) तारीख 31 मार्च तक (रिपोर्टिंग की अवधि को छोड़कर) राख कुण्ड (कुण्डों) में निपटान किए गए राख की कुल मात्रा (मीट्रिक टन):	

	ख) रिपोर्टिंग की अवधि के दौरान राख कुण्ड (कुण्डों) में निपटान किए गए राख की मात्रा (मीट्रिक टन): ग) रिपोर्टिंग की अवधि के दौरान राख कुण्डों में गारा निस्सरण हेतु खपत हुए जल की कुल मात्रा (मी^{3}): घ) राख कुण्डों की कुल संख्या: (i) सक्रिय: (ii) खाली किए गए (पुन: भरा जाना है) (iii) पुन: भरे गए: ड.) राख कुण्डों के अधीन कुल क्षेत्र (हेक्टेयर):	
18.	**अलग-अलग राख कुण्ड का ब्यौरा** *राख कुण्ड 1,2 आदि (यदि राख कुण्डों की संख्या एक से अधिक हो, तो कृपया निम्नलिखित ब्यौरा अलग से उपलब्ध कराएं)* क) स्थिति: निर्माणाधीन या सक्रिय या खाली किया गया या पुन: भरा गया ख) राख कुण्ड में राख का निपटान शुरू करने की तारीख/महीना/वर्ष या महीना/वर्ष): ग) राख कुण्ड की क्षमता पूर्ण किए जाने के पश्चात् उसमें राख निपटान रोकने की तारीख (तारीख/महीना/वर्ष या महीना/वर्ष): (सक्रिय राख कुण्डों के लिए लागू नहीं) ग) क्षेत्र (हेक्टेयर): घ) डाइक की ऊंचाई (मी.): घ) आयतन (मी^{3}): ड.) तारीख 31 मार्च तक निपटान किए गए राख की मात्रा (मीट्रिक टन): च) उपलब्ध आयतन का प्रतिशत (%) और आगे निपटान किए जा सकने वाले राख की मात्रा (मीट्रिक टन): छ) राख कुण्ड के भरे जाने की अनुमानित अवधि (वर्षों और महीनों की संख्या): ड.) निर्देशांक (अक्षांश और देशान्तर): (कृपया न्यूनतम 4 निर्देशांकों को विनिर्दिष्ट करें) ज) राख कुण्ड में की गई लाइनिंग का प्रकार: एचडीपीई लाइनिंग या एलडीपीई लाइनिंग या क्ले लाइनिंग या कोई लाइनिंग नहीं छ) निपटान की विधि: शुष्क निपटान या नम गारा (नम गारा के मामले में कृपया विनिर्दिष्ट करें कि क्या एचसीएसडी या एमसीएसडी या एलसीएसडी है) ज) राख का अनुपात: गारा मिश्रण में जल (1:____): झ) संस्थापित और कार्यशील राख जल पुनर्चक्रण प्रणाली (एडब्ल्यूआरएस): हां या नहीं ञ) जमीन के अंदर या जल निकाय में राख कुण्ड से निस्सरित अपशिष्ट जल की मात्रा (मी^{3}): ट) डाइक की स्थिरता का अध्ययन कराए जाने की पिछली तारीख और उस संगठन का नाम जिसने अध्ययन किया: ठ) लेखा-परीक्षा किए जाने की पिछली तारीख और उस संगठन का नाम जिसने लेखा-परीक्षा की:	
19.	उपयोग किए गए पुराने राख की मात्रा (एमटीपीए): i. फ्लाई-एश आधारित उत्पाद (ईंट या ब्लॉक या टाइल्स या फाइबर	

	सीमेंट शीट या पाइप या बोर्ड या पैनल): ii. सीमेंट विनिर्माण: iii. रेडी मिक्स कंक्रीट: iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री: v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण: vi. सड़कों, सड़क और फ्लाई ओवर के पुश्तों का निर्माण: vii. बांधों का निर्माण: viii. निम्न भू-क्षेत्र का भराव: ix. खनिज क्षेत्रों का भराव: x. अधिभार वाले डम्पों में उपयोग: xi. कृषि: xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण: xiii. अन्य देशों को राख का निर्यात xiv. अन्य (कृपया विनिर्दिष्ट करें):	
20.	**सार :**	

	ब्यौरा	सृजित मात्रा (एमटीपी)	उपयोग की गई मात्रा (एमटीपी) और (%)	शेष मात्रा (एमटीपी)
	रिपोर्टिंग की अवधि के दौरान राख			
	पुरानी राख			
	कुल			

21.	कोई अन्य सूचना : वार्षिक अनुपालन रिपोर्ट, और विद्युत संयंत्रों और राख कुण्डों की शेप फाइलों की सॉफ्ट कॉपी ई-मेल:- moefcc-coalash@gov.in पर भेजी जाए।	
22.	प्राधिकृत हस्ताक्षरकर्ता के हस्ताक्षर	

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 31st December, 2021

S.O. 5481(E).—Whereas by notification of the Government of India in the erstwhile Ministry of Environment and Forests *vide* S.O.763 (E), dated the 14th September, 1999, as amended from time to time, the Central Government, issued directions for restricting the excavation of top soil for manufacturing of bricks and promoting the utilisation of fly ash in the manufacturing of building materials and in construction activity within a specified radius of three hundred kilometres from the coal or lignite based thermal power plants;

And whereas, to implement the aforesaid notification more effectively based on the polluter pays principle (PPP) thereby ensuring 100 per cent utilisation of fly ash by the coal or lignite based thermal power plants and for the sustainability of the fly ash management system, the Central Government reviewed the existing notification; and whereas environmental compensation needs to be introduced based on the polluter pays principle;

And whereas, there is a need to conserve top soil by promoting manufacture and mandating use of ash based products and building materials in the construction sector;

And whereas, there is a need to conserve top soil and natural resources by promoting utilisation of ash in road laying, road and flyover embankments, shoreline protection measures, low lying areas of approved projects, backfilling of mines, as an alternative for filling of earthen materials;

And whereas, it is necessary to protect the environment and prevent the dumping and disposal of fly ash discharged from coal or lignite based thermal power plants on land;

And whereas, in the said notification the phrase 'ash', has been used which includes both fly ash as well as bottom ash generated from the Coal or Lignite based thermal power plants;

And whereas, the Central Government intends to bring out a comprehensive framework for ash utilisation including system of environmental compensation based on polluter pays principle;

And whereas, a draft notification on ash utilisation by coal or lignite thermal power plants in supersession of the notification of the Government of India, Ministry of Environment and Forests published in the Gazette of India, Extra Ordinary part II, section 3, sub-section (i) *vide* S.O.763 (E), dated the 14th September, 1999, by notification in exercise of the powers conferred under sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, was published in the Gazette of India, Extraordinary, Part II, section 3, sub-section (i), *vide* G.S.R. 285(E), dated the 22nd April, 2021 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of sixty days from the date on which copies of the Gazette containing the said draft provisions were made available to the public;

And, whereas all the objections and suggestions received from all persons likely to be affected thereby in respect of the said draft notification have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, and in supersession of the Notification S.O.763 (E), dated the 14th September, 1999 except as respect things done or omitted to be done before such supersession, the Central Government hereby issues the following notification on ash utilisation from coal or lignite thermal power plants which shall come into force on the date of the publication of this notification, namely:-

A. Responsibilities of thermal power plants to dispose fly ash and bottom ash.—

(1) Every coal or lignite based thermal power plant (including captive or co-generating stations or both) shall be primarily responsible to ensure 100 per cent utilisation of ash (fly ash, and bottom ash) generated by it in an eco-friendly manner as given in sub-paragraph (2);

(2) The ash generated from coal or lignite based thermal power plants shall be utilised only for the following eco-friendly purposes, namely:-

(i) Fly ash based products viz. bricks, blocks, tiles, fibre cement sheets, pipes, boards, panels;

(ii) Cement manufacturing, ready mix concrete;

(iii) Construction of road and fly over embankment, Ash and Geo-polymer based construction material;

(iv) Construction of dam;

(v) Filling up of low lying area;

(vi) Filling of mine voids;

(vii) Manufacturing of sintered or cold bonded ash aggregate;

(viii) Agriculture in a controlled manner based on soil testing;

(ix) Construction of shoreline protection structures in coastal districts;

(x) Export of ash to other countries;

(xi) Any other eco-friendly purpose as notified from time to time.

(3) A committee shall be constituted under the chairmanship of Chairman, Central Pollution Control Board (CPCB) and having representatives from Ministry of Environment, Forest and Climate Change (MoEFCC), Ministry of Power, Ministry of Mines, Ministry of Coal, Ministry of Road Transport and Highways, Department of Agricultural Research and Education, Institute of Road Congress, National Council for Cement and Building Materials, to examine and review and recommend the eco-friendly ways of utilisation of ash and make inclusion or exclusion or modification in the list of such ways as mentioned in Sub-paragraph (2) based on technological developments and requests received from stakeholders. The committee may invite State Pollution Control Board or Pollution Control Committee, operators of thermal power plants and mines, cement plants and other stakeholders as and when required for this purpose. Based on the recommendations of the Committee, Ministry of Environment, Forest and Climate Change (MoEFCC) may publish such eco-friendly purpose.

(4) Every coal or lignite based thermal power plant shall be responsible to utilise 100 per cent ash (fly ash and bottom ash) generated during that year, however, in no case shall utilisation fall below 80 per cent in any year, and the thermal power plant shall achieve average ash utilisation of 100 per cent in a three years cycle:

Provided that the three years cycle applicable for the first time is extendable by one year for the thermal power plants where ash utilisation is in the range of 60-80 per cent, and two years where ash utilisation is below 60 per cent and for the purpose of calculation of percentage of ash utilisation, the percentage quantity of utilisation in the year 2021- 2022 shall be taken into account as per the table below:

Utilisation percentages of thermal power plants	First compliance Cycle to meet 100 per cent utilisation	Second compliance cycle onwards, to meet 100 per cent utilisation
>80 per cent	3 years	3 years
60-80 per cent	4 years	3 years
<60 per cent	5 years	3 years

Provided further that the minimum utilisation percentage of 80 per cent shall not be applicable to the first year and first two years of the first compliance cycle for the thermal power plants under the utilisation category of 60-80 per cent and <60 per cent, respectively.

Provided also that 20per cent of ash generated in the final year of compliance cycle may be carried forward to the next cycle which shall be utilised in the next three years cycle along with the ash generated during that cycle.

(5) The unutilised accumulated ash i.e. legacy ash, which is stored before the publication of this notification, shall be utilised progressively by the thermal power plants in such a manner that the utilization of legacy ash shall be completed fully within ten years from the date of publication of this notification and this will be over and above the utilisation targets prescribed for ash generation through current operations of that particular year:

Provided that the minimum quantity of legacy ash in percentages as mentioned below shall be utilised during the corresponding year and the minimum quantity of legacy ash is to be calculated based on the annual ash generation as per installed capacity of thermal power plant.

Year from date of publication	1st	2nd	3rd-10th
Utilisation of legacy ash (in percentage of Annual ash)	At least 20 per cent	At least 35 per cent	At least 50 per cent

Provided further that the legacy ash utilisation shall not be required where ash pond or dyke has stabilised and the reclamation has taken place with greenbelt or plantation and the concerned State Pollution Control Board shall certify in this regard. Stabilisation and reclamation of an ash pond or dyke including certification by the Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be carried out within a year from the date of publication of this notification. The ash remaining in all other ash ponds or dykes shall be utilised in progressive manner as per the above mentioned timelines.

Note: The obligations under sub-paragraph (4) and (5) above for achieving the ash utilisation targets shall be applicable from 1st April, 2022.

(6) Any new as well as operational thermal power plant may be permitted an emergency or temporary ash pond with an area of 0.1 hectare per Mega Watt (MW). Technical specifications of ash ponds or dykes shall be as per the guidelines of Central Pollution Control Board (CPCB) made in consultation with Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the ash pond or dyke on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and greenbelt, etc., and shall be put in place within three months from the date of publication of this notification.

(7) Every coal or lignite based thermal power plant shall ensure that loading, unloading, transport, storage and disposal of ash is done in an environmentally sound manner and that all precautions to prevent air and water pollution are taken and status in this regard shall be reported to the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) in Annexure attached to this notification.

(8) Every coal or lignite based thermal power plant shall install dedicated silos for storage of dry fly ash silos for at least sixteen hours of ash based on installed capacity and it shall be reported upon to the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) in the Annexure and shall be inspected by Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) from time to time.

(9) Every coal or lignite based thermal power plant (including captive or co-generating stations or both) shall provide real time data on daily basis of availability of ash with Thermal Power Plant (TPP), by providing link to Central Pollution Control Board's web portal or mobile phone App for the benefit of actual user(s).

(10) Statutory obligation of 100 per cent utilisation of ash shall be treated as a change in law, wherever applicable.

B. **For the purpose of utilisation of ash, the subsequent sub-paras shall apply.—**

(1) All agencies (Government, Semi-government and Private) engaged in construction activities such as road laying, road and flyover embankments, shoreline protection structures in coastal districts and dams within 300 kms from the lignite or coal based thermal power plants shall mandatorily utilise ash in these activities:

Provided that it is delivered at the project site free of cost and transportation cost is borne by such coal or lignite based thermal power plants.

Provided further that thermal power plant may charge for ash cost and transportation as per mutually agreed terms, in case thermal power plant is able to dispose the ash through other means and those agencies makes a request for it and the provisions of ash free of cost and free transportation shall be applicable, if thermal power plant serves a notice on the construction agency for the same.

(2) The utilisation of ash in the said activities shall be carried out in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Road Congress, Central Building Research Institute, Roorkee, Central Road Research Institute, Delhi, Central Public Works Department, State Public Works Departments and other Central and State Government Agencies.

(3) It shall be obligatory on all mines located within 300 kilometres radius of thermal power plant, to undertake backfilling of ash in mine voids or mixing of ash with external Overburden dumps, under Extended Producer Responsibility (EPR). All mine owners or operators (Government, Public and Private Sector) within three hundred kilometres (by road) from coal or lignite based thermal power plants, shall undertake measures to mix at least 25 per cent of ash on weight to weight basis of the materials used for external dump of overburden, backfilling or stowing of mine (running or abandoned as the case may be) as per the guidelines of the Director General of Mines Safety (DGMS):

Provided that such thermal power stations shall facilitate the availability of required quantity of ash by delivering ash free of cost and bearing the cost of transportation or cost or transportation arrangement decided on mutually agreed terms and mixing of ash with overburden in mine voids and dumps shall be applicable for the overburden generated from the date of publication of this notification and the utilisation of ash in the said activities shall be carried out in accordance with guidelines laid down by the Central Pollution Control Board, Director General of Mines Safety and Indian Bureau of Mines.

Explanation.- For the purpose of this sub-paragraph, it is also clarified that the provisions of ash free of cost and free transportation shall be applicable, if thermal power plants serve a notice on the mine owner for the same and the mandate of using 25 per cent of ash for mixing with overburden dump and filling up of mine voids shall not be applicable unless a notice is served on the mine owner by thermal power plant.

(4) (i) All mine owners shall get mine closure plans (progressive and final) to accommodate ash in the mine voids and the concerned authority shall approve mine plans for disposal of ash in mine voids and mixing of ash with overburden dumps. The Ministry of Environment, Forest and Climate Change (MoEFCC) has issued guidelines on 28th August, 2019 regarding exemption of requirement of Environmental Clearance of thermal power plants and coal mines along with the guidelines to be followed for such disposal.

(ii) The Ministry in consultation with Central Pollution Control Board (CPCB), Director General of Mine Safety (DGMS) and Indian Bureau of Mines (IBM) may issue further guidelines time to time to facilitate ash disposal in mine voids and mixing with overburden dumps and it shall be the responsibility of mine owners to get the necessary amendments or modifications in the permissions issued by various regulatory authorities within one year from the date of identification of such mines.

(5) (i) There shall be a committee headed by Chairperson, Central Pollution Control Board (CPCB) with representatives from Ministry of Environment, Forest and Climate Change, Ministry of Power, Ministry of Mines, Ministry of Coal, Director General of Mine Safety and Indian Bureau of Mines for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump including examination of safety, feasibility (not economic feasibility) and aspects of environmental contamination and the committee shall get updated quarterly reports prepared regarding identified mines (both underground and opencast) for the stakeholder Ministries or Departments and the committee shall start identifying the suitable mines immediately after the publication of this notification.

(ii) Thermal power plants or mines shall not wait for disposal of ash till the identification is done by the above mentioned committee, to meet the utilisation targets mandated as above.

(6) Filling of low lying areas with ash shall be carried out with prior permission of the State Pollution Control Board or Pollution Control Committee for approved projects, and in accordance with guidelines laid down by Central Pollution Control Board (CPCB) and the State Pollution Control Board or Pollution Control Committee (PCC) shall publish approved sites, location, area and permitted quantity annually on its website.

(7) Central Pollution Control Board after engaging relevant stakeholders, shall put in place the guidelines within one year for all types of activities envisaged under this notification including putting in place time bound online application process for the grant permission by State Pollution Control Boards (SPCBs) or Pollution Control Committees (PCCs).

(8) All building construction projects (Central, State and Local authorities, Govt. undertakings, other Govt. agencies and all private agencies) located within a radius of three hundred kilometres from a coal or lignite based thermal power plant shall use ash bricks, tiles, sintered ash aggregate or other ash based products, provided these are made available at prices not higher than the price of alternative products.

(9) Manufacturing of ash based products and use of ash in such products shall be in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Road Congress, and Central Pollution Control Board.

C. Environmental compensation for non-compliance.—

(1) In the first two years of a three years cycle, if the coal or lignite based thermal power plant (including captive or co-generating stations or both) has not achieved at least 80 per cent ash (fly ash and bottom ash) utilisation, then such non-compliant thermal power plants shall be imposed with an environmental compensation of Rs. 1000 per ton on unutilised ash during the end of financial year based on the annual reports submitted and if it is unable to utilise 100 per cent of ash in the third year of the three years cycle, it shall be liable to pay an environmental compensation of Rs. 1000 per ton on the unutilised quantity on which environmental compensation has not been imposed earlier:

Provided that the environmental compensation shall be estimated and imposed at the end of last year of the first compliance cycle as per the various utilisation categories as mentioned in sub-paragraph (4) of Para A.

(2) Environmental compensation collected by the authorities shall be deposited in the designated account of Central Pollution Control Board.

(3) In case of legacy ash, if the coal or lignite based thermal power plant (including captive or co-generating stations or both) has not achieved utilisation equivalent to at least 20 per cent (for the first year), 35 per cent (for the second year), 50 per cent (for third to tenth year) of ash generated based on installed capacity, an environmental compensation of Rs. 1000 per ton of unutilised legacy ash during that financial year shall be imposed and if the utilization of legacy ash is not completed at the end of 10 years, an environmental compensation of Rs.1000 per ton shall be imposed on the remaining unutilised quantity which has not been imposed earlier.

(4) It shall be the responsibility of the transporters or vehicle owner to deliver ash to authorised purchaser or user agency and if it is not complied, then an environmental compensation of Rs. 1500 per ton on such quantity as mis-delivered to unauthorised users or non- delivered to authorised users will be imposed besides prosecution of such non-compliant transporters by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC).

(5) It is the responsibility of the purchasers or user agencies to utilise ash in an eco-friendly manner as laid down at para B of this notification and if it is not complied, then an environmental compensation of Rs. 1500 or per ton shall be imposed by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC).

(6) If the user agencies do not utilise ash to the extent obligated under para B or the extent to which they have been intimated through Notice(s) served under sub-paragraph (1) of para D, whichever is lower, they shall be liable to pay Rs. 1500 per ton of ash for the quantity they fall short off:

Provided that the environmental compensation on building constructions shall be levied at Rs.75/- per square feet of built up area of construction.

(7) (i) The environmental compensation collected by Central Pollution Control Board from the thermal power plants and other defaulters shall be used towards the safe disposal of the unutilised ash and the fund may also be utilised for advancing research on use of ash including ash based products.

(ii) The liability of ash utilisation shall be with thermal power plants even after imposition of environmental compensation on unutilised quantities and in case thermal power plant achieves the ash utilisation of any

particular cycle after imposition of environmental compensation in subsequent cycles, the said amount shall be returned to thermal power plant after deducting 10 per cent of the environmental compensation collected on the unutilised quantity during the next cycle and deduction of 20 per cent, 30 per cent, and so on, of the environmental compensation collected is to be made in case of utilisation of ash in subsequent cycles.

D. Procedure for supply of ash or ash based products.—

(1) The owner of thermal power plants or manufacturers of ash bricks or tiles or sintered ash aggregate shall serve written notice to persons or agencies who are liable to utilise ash or ash based products, offering for sale, or transport or both.

(2) Persons or user agencies who have been served notices by owner of thermal power plants or manufacturers of ash bricks or tiles or sintered ash aggregate, if they have already tied up with other agencies for the purpose of utilisation of ash or ash products, shall inform the thermal power plant accordingly, if they cannot use any ash or ash products or use reduced quantity.

E. Enforcement, Monitoring, Audit and Reporting.—

(1) The Central Pollution Control Board (CPCB) and the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be the enforcing and monitoring authority for ensuring compliance of the provisions and shall monitor the utilisation of ash on quarterly basis. Central Pollution Control Board shall develop a portal for the purpose within six months of date of publication of the notification. The concerned District Magistrate shall have concurrent jurisdiction for enforcement and monitoring of the provisions of this notification.

(2) (i) Thermal power plants shall upload monthly information regarding ash generation and utilisation by 5th of the next month on the web portal. Annual implementation report (for the period 1st April to 31st March) providing information about the compliance of provisions in this notification shall be submitted by the 30th day of April, every year to the Central Pollution Control Board, concerned State Pollution Control Board or Pollution Control Committee (PCC), Central Electricity Authority (CEA), and concerned Integrated Regional Office of Ministry of Environment, Forest and Climate Change by the coal or lignite based thermal power plants. Central Pollution Control Board and Central Electricity Authority shall compile the annual reports submitted by all the thermal power plants and submit to Ministry of Environment, Forest and Climate Change by 31st May.

(ii) All other user agencies shall submit consumption or utilisation or disposal of ash and use of ash based products as mandated in this notification in the compliance report of Environmental Clearance (EC) issued by Ministry of Environment, Forest and Climate Change or State Level Environment Impact Assessment Authority (SEIAA) or Consent to Operate (CTO) issued by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC), whichever is applicable. The Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall publish annual report of ash utilisation of all other agencies except thermal power plants to review the effective implementation of the provisions of the notification.

(3) For the purpose of monitoring the implementation of the provisions of this notification, a committee shall be constituted under the Chairperson, Central Pollution Control Board (CPCB), with members from Ministry of Power, Ministry of Coal, Ministry of Mines, Ministry of Environment, Forest and Climate Change, Ministry Road Transportation and Highways, Department of Heavy Industry as well as any concerned stakeholder(s), to be nominated by the Chairman of the committee. The committee may make recommendations for effective and efficient implementation of the provisions of the notification. The committee shall meet at least once in six months and review annual implementation reports and the committee shall also hold stakeholder consultations for monitoring of ash utilisation as mandated by this notification by inviting relevant stakeholder(s) at least once in six months. The committee shall submit the six monthly report to Ministry of Environment, Forest and Climate Change (MoEFCC).

(4) For the purpose of resolving disputes between thermal power plants and users of ash or manufacturer of ash based products, the State Governments or Union territory administration constitute a Committee within three months from the date of publication of this notification under the Chairman, State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) with representatives from Department of Power, and one representative from the Department which deals with the subject of concerned agency with which dispute is made.

(5) The compliance audit for ash disposal by the thermal power plants and the user agency shall be conducted by auditors, authorised by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report.

[F. No. HSM-9/1/2019-HSM]

NARESH PAL GANGWAR, Jt. Secy.

Annexure

Ash Compliance Report (for the period 1st April-31st March) to be submitted on or before 31st May.

Sl. No.	Details	
1.	Name of Power Plant	
2.	Name of the company	
3.	District	
4.	State	
5.	Postal address for communication:	
6.	E-mail:	
7.	Power Plant installed capacity (MW):	
8.	Plant Load Factor (PLF):	
9.	No. of units generated (MWh):	
10.	Total area under power plant (ha): (including area under ash ponds)	
11.	Quantity of coal consumption during reporting period (Metric Tons per Annum):	
12	Average ash content in percentage (per cent):	
13.	Quantity of current ash generation during reporting period (Metric Tons per Annum): Fly ash (Metric Tons per Annum): Bottom ash (Metric Tons per Annum):	
14.	Capacity of dry fly ash storage silo(s) (Metric Tons) :	
15	Details of utilisation of current ash generated during reporting period (a) Total quantity of current ash utilised (MTPA) during reporting period: (b) Quantity of fly ash utilised (MTPA): (i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels) (ii) Cement manufacturing:	

	(iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and fly over embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts; (xiii) Export of ash to other countries: (xiv) Others (please specify): (c) Quantity of bottom ash utilised (MTPA): (i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): (ii) Cement manufacturing: (iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and flyover embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts: (xiii) Export of ash to other countries: (xiv) Others (please specify): Total quantity of current ash unutilised (MTPA) during reporting period:	
16.	Percentage utilisation of current ash generated during reporting period (per cent):	
17.	Details of disposal of ash in ash ponds (a) Total quantity of ash disposed in ash pond(s) (Metric Tons) as on 31st March (excluding reporting period): (b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons): (c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m^3): (d) Total number of ash ponds: (i) Active: (ii) Exhausted (yet to be reclaimed): (iii) Reclaimed: (e) total area under ash ponds (ha):	
18.	Individual ash pond details *Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one)* (a) Status: Under construction or Active or Exhausted or	

	Reclaimed (b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY): (c) Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds) (c) area (hectares): (d) dyke height (m): (d) volume (m^3): (e) quantity of ash disposed as on 31st March (Metric Tons): (f) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons): (g) expected life of ash pond (number of years and months): (e) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates) (f) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining g) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD) (h) Ratio of ash: water in slurry mix (1:___): (i) Ash water recycling system (AWRS) installed and functioning: Yes or No (j) Quantity of wastewater from ash pond discharged into land or water body (m3): (k) Last date when the dyke stability study was conducted and name of the organisation who conducted the study: (l) Last date when the audit was conducted and name of the organisation who conducted the audit:	
19.	Quantity of legacy ash utilised (MTPA): i. Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): ii. Cement manufacturing: iii. Ready mix concrete: iv. Ash and Geo-polymer based construction material: v. Manufacturing of sintered or cold bonded ash aggregate: vi. Construction of roads, road and flyover embankment: vii. Construction of dams: viii. Filling up of low lying area: ix. Filling of mine voids: x. Use in overburden dumps: xi. Agriculture: xii. Construction of shoreline protection structures in coastal districts; xiii. Export of ash to other countries: xiv. Others (please specify):	

20. Summary:

Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)

	Current ash during reporting period			
	Legacy ash			
	Total			
21.	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcc-coalash@gov.in			
22.	Signature of Authorised Signatory			

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Annexure- R4

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सत्यमेव जयते

GUIDELINES ON DESIGN, CONSTRUCTION, O&M AND ANNUAL CERTIFICATION OF COAL ASH PONDS

Government of India
Ministry of Power
Central Electricity Authority

SEPTEMBER 2022

182

अध्यक्ष और पदेन सचिव
भारत सरकार

सत्यमेव जयते

केंद्रीय विद्युत् प्राधिकरण
विद्युत् मंत्रालय
सेवा भवान, आर.के.पुराम
नई दिल्ली - 110066

Ghanshyam Prasad
Chairperson & Ex-officio Secretary
to the Government of India

Central Electricity Authority
Ministry of Power
Sewa Bhawan, R.K. Puram
New Delhi – 110 066

FOREWORD

Indian coal fired thermal plants generate approximately 226 million metric tonnes of ash every year on an average from burning of coal. The figure is expected to grow to many folds by 2031. India shall rely on coal power to a significant extent 42-50% of the energy mix for decades to come. At present, ash utilization is lower than its production on all India basis.

MoEF&CC estimates that ash dumps occupy nearly 40,000 hectares of land. The ash ponds are of metre high and are prone to leaking and breaching, posing serious ecological and public security dangers. Unfortunately, there are no standards governing the design and maintenance of the coal-ash ponds. Coal Ash ponds across India are not subject to any regulations, engineering standards and guidelines.

Recently, the Ministry of Environment & Forests and Climate Change (MoEF & CC) has issued Notifications on fly ash utilization dated 31st December 2021 which supersedes all the earlier notifications. The environmental norms aspire to use the ash to 100 percent. Given the gravity of the coal ash crisis in India, regulating ash ponds with standard guidelines was urgently required the same was also highlighted in the notification.

I wish to express my sincere thanks to the officers and staff of Civil Design Division, CEA who have taken initiative and have compiled this guidelines taking inputs from the power utilities. I believe that this guidelines would be useful for all the stakeholders and shall help in better pond-ash management, design and construction and aid in country's climate goal .

New Delhi
September, 2022

(Ghanshyam Prasad)
Chairperson, CEA

PREFACE

Management of fly ash at coal / lignite based Thermal Power Stations in the country is a challenging task in view of large quantity of ash being generated and target of achieving 100% utilization of fly ash in a time bound manner as prescribed in MoEF&CC Notification of 31st December,2021. The land for creating ash dykes for ash disposal facilities at thermal power plants is becoming difficult to be acquired. Fly ash, if not managed well, may pose environmental challenges.

I am confident that the guidelines will also be useful to all the stakeholders involved in fly ash management in the country for planning, design, construction as well as operation and maintenance the fly ash pond having necessary tie-up with the concerned thermal power station.

I would also like to place on record my appreciation of the efforts made by the officers and staff of Civil Design Division. ANY suggestions / views as well as intimations for any unintended errors observed in this document may kindly be sent to the Chief Engineer, Civil Design Division, Central Electricity Authority, 9th Floor, North Wing, Sewa Bhawan, R.K. Puram, New Delhi-110066 (E-mail ID: tcdcea@nic.in).

New Delhi

September, 2022

(M.A.K.P. Singh)

Member (Hydro)

ACKNOWLEDGEMENT

I express my sincere thanks to all the power utilities and the Thermal Power Stations for furnishing the data and information for bringing out this guidelines ash pond and its annual certification.

I am grateful to the Chairperson, CEA / Member (Hydro), CEA for the valuable suggestions and guidance in the preparation of this report.

I also express my thanks to the team comprising Shri Anuj Kanwal, Director, Ms Manisha Senior Manager, and other officers of TCD Division, CEA in the preparation of this report.

New Delhi **(Anil Jain)**

September, 2022 **Chief Engineer (CD)**

CONTENTS

CHAPTER 1: INTRODUCTION

1.0 General

The combustion of coal in Thermal Power Plant (TPP) produces Coal Combustion Residues (CCRs) which is a collective term referring to fly ash, bottom ash, boiler slag, and fluidized bed combustion ash. After ignition at high temperature the coal resolve in to different solid fractions. Most of the fine dust entrained by the flue gages leaving the boiler and collected by fabric filter or electrostatic precipitator is known as **precipitated fly Ash (PFA)**, which results 80% of the total coal combustion. The rest of 20% particle, including unburned carbon settle to the bottom of the boiler called **Bottom Ash (BA)**. Because of economic viability, thermal power stations most widely dispose both perforated fly ash and bottom ash together as a slurry to the pond in which it stored for a longer period. As the reuse potential of ash has been increasing during recent years, segregated storage of fly ash and bottom ash is likely to gain popularity among power plant considering better economical returns from sale of fly ash.

According to the notification of Union Ministry of Environment, Forest & Climate Change (MoEF&CC), Ash means all the coal or lignite ash generated at TPP, such as ESP Ash (Electro Static Precipitator), dry Fly Ash, Bottom Ash (BA), Pond Ash and Mound Ash fort the purpose of utilization.

Schematic view of a thermal plant indicating the process of generation of fly ash and bottom ash is shown in the following figure 1.

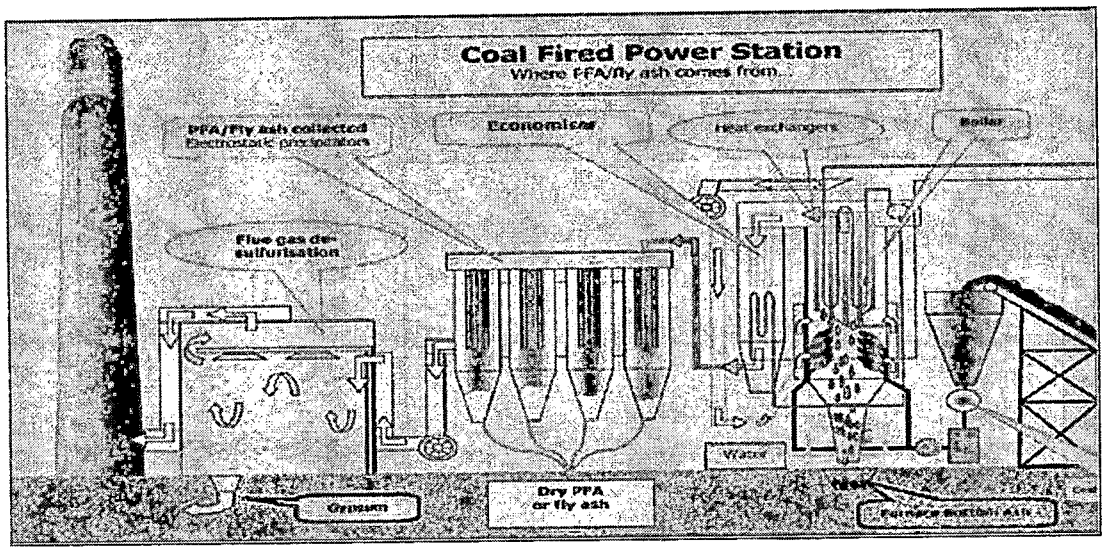

Fig 1. Schematic view of a thermal plant indicating the process of generation of fly ash and bottom ash

Presently in India, more than 65,000 acres of land is occupied for storage of this huge quantity of ash. Over a period of time, the fly ash disposal can cause problems like large surface setting lagoons for storage, infiltration of transport of water from deposit to soil, dust carryover in wind from dried lagoons and leads ecological and environmental imbalances if proper safeguards are not taken in their design, construction, operation and maintenance.

Environmental pollution by the coal based thermal power plants are cited to be the major source of pollution affecting the general aesthetics of environment in terms of land use, health hazardous and air, soil and water in particular and thus leads environmental dangers. Safe disposal and gainful utilization are the prime concerns to safe guard the interest of environmental system

In India about 73% of the total electrical energy is generated from coal-based source. Annually about 271 million tons of Ash as solid waste/ by product being released during the process of generation of electricity by combustion of pulverized bituminous, sub bituminous, and lignite coal. Indian coal has low calorific value (3500 Kcal/kg), and results 30-60% of ash content. India's major source of power, even in the future, is going to remain coal based thermal power plants hence, Ash disposal would continue to be a subject of priority since environmental issues holds greater importance in this century.

Though it has been proven to be a resource material for various uses such as earth material, ingredient for cement manufacture, raw material for manufacture of bricks, tiles and aggregates, the demand for ash may not at all time match with the supply of ash, which is produced 24x7, as

the power plant operates. This requires a suitable system for storage of ash till its user is found and the economic use of the ash is explored.

Union Ministry of Environment, Forest and Climate Change (MoEF&CC) of India has issued notifications to address utilization of ash for various purposes.

1.1 Physical and Chemical Properties of Fly Ash

Physical, chemical and mineralogical properties of Fly Ash in general varies as they are influenced by coal source / quality, combustion process, degree of weathering, particle size and age of the ash. In addition, the particle size of ash at different locations and depth in the ash pond distinctly based on the length and width of the pond, flow rate, existing natural slope *etc.*

As per the ASTM standards India bituminous and sub bituminous coal results class F ash and lignite coal ash is class C type having high degree of self-hardening capacity.

Particle size of Ash varies widely from 0.1 µm to 900 µm with specific surface area greater than 0.1038m^2 /gm. Fly Ash is a non-degradable, non-perishable, inert material. Typical properties of Ash are represented in table-1 below:

Table 1: Typical Properties of Fly Ash

Engineering Properties	***Range***	
Grain size,%	Bottom Ash	PFA
Clay	0	0
Silt	15-40	60-90
Sand	50-80	05-20
Gravel	0	0
Specific Gravity	1.85	1.84
Maximum Dry Density(gm/cc)	1.004	1.037
Optimum Moisture Content.%	39.4	60.6
Effective Cohesion(Kg/cm^2))	0	0
Effective angle of shearing resistance degree	42	34
Coefficient of Permeability (cm/sec)	10^{-2} to 10^{-4}	10^{-5} to 10^{-8}

Chemical constituents	**Range (%)**	
	Bottom Ash	PFA
Silica (SiO2)	70.0	73.2
Alumina(Al2O3)	24.4	21.3
Iron Oxide (Fe2O3)	2.50	2.50
Calcium Oxide (CaO)	0.50	0.60

Magnesium Oxide (MgO)	1.1	1.0
Sulphur Oxide(SO3)	0.5	0.5

2.0 Ash Pond/ Dykes

Ash Dykes are retaining structures to contain ash slurry (or continuous placement of unused ash to ensure uninterrupted operation of the thermal power plant) and settled ash (till it is used for any beneficial purpose). At the disposal areas, storage space is created by constructing ash dyke embankments all around, within which ash particles will be allowed to settle and the decanted water is allowed to escape though outlet structure.

The dyke around the ash disposal area is constructed in multi-stage. Initially a small height of dyke is constructed utilizing earth excavated from the ash disposal area itself and when it is filled with discharged ash the height of ash dyke embankment is raised. Power plants in India have been generally using ash as the main construction material for subsequent dyke raisings, over the ash dyke to reduce cost. Over the ash core in raising dyke, a layer of earth (generally>500mm thick) is laid to protect ash from erosion due to wind and water since ash is a light material compared to earth. For the purpose of design and construction of embankment with ash, and the principles of Soil Mechanics are applied. Typical section of ash dyke is shown below in figure 2

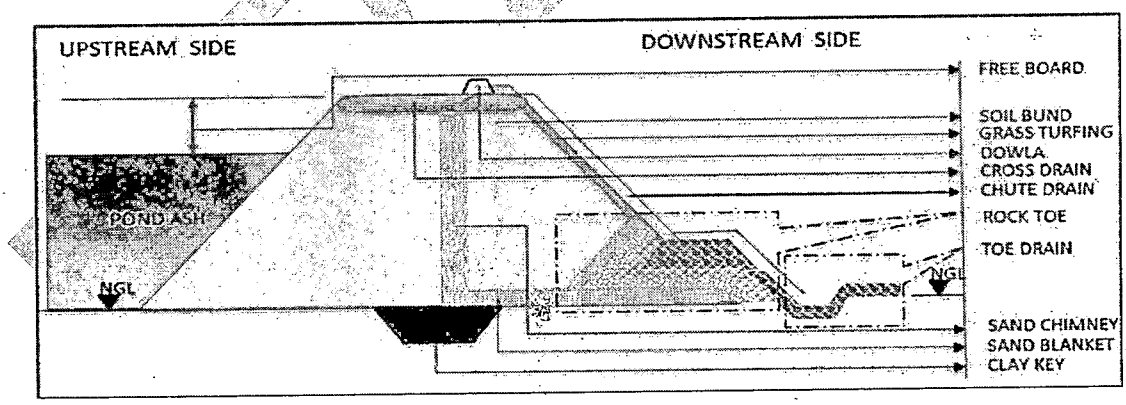

Fig 2. Typical section of Ash dyke

3.0 Ministry of Environment and Forests and Climate Change (MoEF&CC) Notifications

Fly Ash Mission, a Technology Project in Mission Mode of Government of India, was commissioned during 1994 as a joint activity of Department of Science & Technology (DST), Ministry of Power (MoP) and Ministry of Environment and Forests and Climate Change (MoEF&CC) with Department of Science & Technology as nodal agency. The Fly Ash Mission was set up to promote research in the area of fly ash utilization

so that fly ash could be gainfully utilized instead of its disposal in ash ponds. Ministry of Environment & Forests and Climate Change, Government of India issued 1st Notification on Fly Ash Utilization in September 1999, which was subsequently amended in 2003, 2009 and 2016 stipulating targets for fly ash utilization for Thermal Power Stations and use of fly ash by construction agencies within a prescribed radius of any thermal power station.

Ministry of Environment and Forests and Climate Change (MoEF&CC) vide Notification No. S.O. 5481 (E) dated 31st December 2021, issued a notification on Ash utilization by coal and lignite thermal power plants which shall be applicable for Financial Year 2022-23 onwards. The notification as published is placed at Annexure-I for reference.

The notification mandates 100% ash utilization. The relevant clauses of the notification are reproduced here

A(4) Every coal or lignite based thermal power plant shall be responsible to utilize 100 per cent ash (fly ash and bottom ash) generated during that year, however, in no case shall utilization fall below 80 per cent in any year, and the thermal power plant shall achieve average ash utilization of 100 per cent in a three years' cycle:

Provided that the three years cycle applicable for the first time is extendable by one year for the thermal power plants where ash utilization is in the range of 60-80 per cent, and two years where ash utilization is below 60 per cent and for the purpose of calculation of percentage of ash utilization, the percentage quantity of utilization in the year 2021- 2022 shall be taken into account as per the table below:

Utilization percentages of thermal power plants	First compliance Cycle to meet 100 percent utilization	Second compliance cycle onwards, to meet 100 percent utilization
>80 per cent	3 years	3 years
60-80 per cent	4 years	3 years
<60 per cent	5 years	3 years

Provided further that the minimum utilization percentage of 80 per cent shall not be applicable to the first year and first two years of the first compliance cycle for the thermal power plants under the utilization category of 60-80 per cent and <60 per cent, respectively. Provided also that 20 percent of ash generated in the final year of

compliance cycle may be carried forward to the next cycle which shall be utilized in the next three years cycle along with the ash generated during that cycle.

A(5) The unutilized accumulated ash i.e. legacy ash, which is stored before the publication of this notification, shall be utilized progressively by the thermal power plants in such a manner that the utilization of legacy ash shall be completed fully within ten years from the date of publication of this notification and this will be over and above the utilization targets prescribed for ash generation through current operations of that particular year:

Provided that the minimum quantity of legacy ash in percentages as mentioned below shall be utilized during the corresponding year and the minimum quantity of legacy ash is to be calculated based on the annual ash generation as per installed capacity of thermal power plant.

Year from date of publication	1st	2nd	3rd -10th
Utilization of legacy ash (in percentage of Annual ash)	At least 20 per cent	At least 35 per cent	At least 50 per cent

Provided further that the legacy ash utilization shall not be required where ash pond or dyke has stabilized and the reclamation has taken place with greenbelt or plantation and the concerned State Pollution Control Board shall certify in this regard. Stabilization and reclamation of an ash pond or dyke including certification by the Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be carried out within a year from the date of publication of this notification. The ash remaining in all other ash ponds or dykes shall be utilized in progressive manner as per the above mentioned timelines.

Note: The obligations under sub-paragraph (4) and (5) above for achieving the ash utilization targets shall be applicable from 1st April, 2022.

A(6) Any new as well as operational thermal power plant may be permitted an emergency or temporary ash pond with an area of 0.1 hectare per Mega Watt (MW). Technical specifications of ash ponds or dykes shall be as per the guidelines of Central Pollution Control Board (CPCB) made in consultation with Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the ash pond or dyke on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling

from the date of publication of this notification. CPCB to come out with Technical specifications of ash ponds or dykes in consultation with CEA.

The scope of guidelines shall cover the siting/location/planning, technical specifications /design& engineering standards disposal system regulation and procedure for maintenance and annual certification to ensure that the ash storage shall be safe and ash utilization shall fulfill the requirement of the plant and comply with the MoEF&CC norms. The factors affecting the environment i.e. land for ash disposal, pollution on Groundwater and surface water bodies, fugitive dust emission and failure/breach of ash dyke.

3.0 Useful definitions/Explanation

Ash: All the coal or lignite ash generated at TPP, such as ESP Ash (Electro Static Precipitator), dry Fly Ash, Bottom Ash (BA), Pond Ash and Mound Ash for the purpose of utilization.

Fly Ash: Ash Extracted from flue gases by any suitable process.

Bottom Ash: Ash collected separately at the bottom of the boiler furnace.

Pond Ash: Fly ash or bottom ash or both mixed in any proportion and conveyed in slurry / paste form and deposited in pond / lagoon.

Mound Ash: Fly ash or bottom ash or both mixed in any proportion and conveyed in dry form and deposited dry.

Legacy Ash: It is the unutilized/ accumulated fly ash deposited in ash ponds before the publication of MOEF&CC Notification for ash utilization dated 31st, December 2021.

SECTION-A

(Siting, Design and Engineering Standard)

Chapter 2:

Ash conveyance from Plant to Ash Pond

1.0 Disposal of Fly ash

The generated ash is disposed of in well designed, constructed and maintained ash ponds generally in wet slurry form. At specific location, compared to wet ash disposal system, dry ash disposal system may also be suitable. In new projects, due to inherent benefit of the system, high concentration slurry disposal (HCSD) system is being preferred to reduce land and water requirements as well as to prevent contamination of ground water.

Basically, thermally power projects are to be provided with systems for 100% dry ash extraction and storage and supply of ash to various entrepreneurs for promoting ash utilization. As per MOEF&CC notification clause no A (8), Each TPP shall install dedicated dry Fly Ash silos for storage of at least 16 hours of ash based on the installed capacity having separate access roads so as to ease the delivery of ash.

The unutilized ash may be disposed-off using mainly three types of ash disposal systems:

a. Wet Disposal in lean slurry form into ash dyke/ mine voids
b. Dry Disposal in Ash Mound form
c. Wet Disposal in High Concentrated Slurry form into ash dykes

The details of all the above systems are described in the following sections.

1.1 Wet Disposal in Lean Slurry Form:

This system is widely used in India. The system consists of extraction of fly ash from Electro Static Precipitator (ESP), conveying to fly ash silos and slurry mixing tanks and pumping slurry to disposal area using centrifugal pumps. A free-flowing lean ash slurry is made with water, which is pumped into storage areas. Ash disposal pond/lagoons are formed by constructing dykes (embankments) made of earth / ash or using natural depressions such as mine voids and the slurry is discharged into the lagoons from pipelines. Ash particles settle in the lagoons and clear water above the ash surface is decanted. Decanted water is taken out through water escape structure and recirculated to plant through an Ash Water Recirculation System (AWRS) for reuse in ash disposal system. A photograph of a typical lean slurry is shown in figure 3.

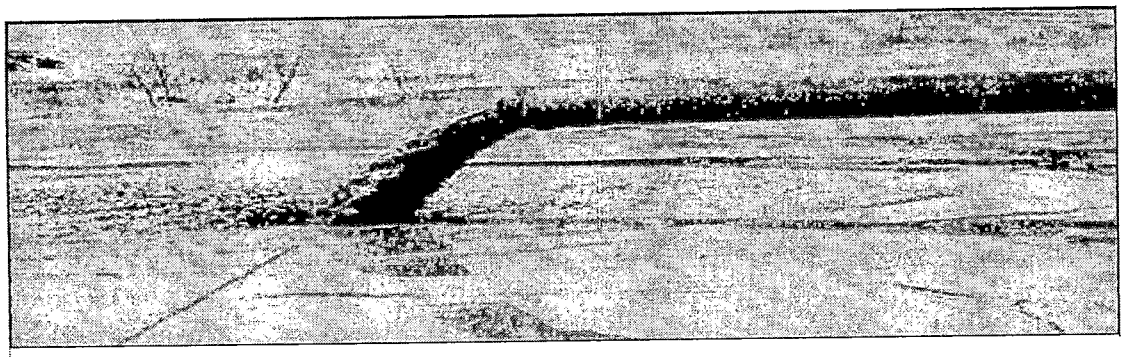

Figure 3: Lean Slurry Disposal System

Fresh deposits of ash are in the form of marsh. However, over a period of time, especially when overlain by several layers, these ash deposits get consolidated into high density layers with little or no free water. This system has following limitations:

1. Due to high velocity wear and tear of pipes is more
2. The dykes are designed as dams and are always filled with slurry, with a risk of breach/ seepage. It needs continuous operation and maintenance.

1.2 Wet Disposal in High Concentration Slurry Form:

This is an advance system of wet disposal with fly ash concentration of 60% to 70% of ash by weight. Due to high concentration of ash, it is pumped through high pressure slurry pumps to disposal area and needs steel pipes for conveying slurry. Flexible pipes are used at disposal area. Centrifugal pumps have also been tried for conveying high concentration slurry to long distance in one plant and reported to be working satisfactorily.

High concentration slurry is homogeneous in nature which ensures that no water is released when slurry is discharged in the ash disposal area. Dense, compact deposit is formed with rapid drying. High concentration slurry attains relatively steep slopes at the time of disposal. A photograph of a typical high concentration system is shown in Figure 4.

Figure 4: High Concentration Slurry Flowing on Slopes which dries out by the time it travels 30-40 m from the source

High Concentration Slurry Disposal (HCSD) system has the following advantages and limitations.

Advantages of High Concentration Slurry Disposal (HCSD):

1. HCSD reduces water and land requirement, it is ecofriendly, no leachate discharge
2. Low water consumption with respect to lean slurry disposal and no release of free water at disposal
3. As the slurry travels at slow speed, wear and tear of pipes is less
4. High concentration slurry is easy to dig and can be used for various purposes at a later stage
5. Low maintenance of ash dyke
6. Danger of breaching the dyke is negligible.

Limitations of High Concentration Slurry Disposal (HCSD):

1. Ash pipes often get choked due to high concentration slurry
2. Seamless steel pipes for conveying HC slurry are required.
3. High concentration slurry disposal requires high pressures.

1.3 Dry Ash Disposal System:

This system is entirely different from the wet disposal system. In the dry ash disposal system, furnace bottom ash (FBA) and pulverized fly ash (PFA) are transported in moistened form from Hydro bins and Silos respectively to ash mound site on fixed belt conveyors in enclosed gantries. In the ash mound area ash is disposed of by various types of equipment like fixed, extendable, shift able and mobile belt conveyors, a crawler mounted boom spreader, a crawler mounted bucket wheel reclaimer and a variety of wheeled and crawler mounted mobile equipment. At present, it is being used at only one station – National Capital Thermal Power Station at Dadri. The second such system has been proposed at Patratu STPP.

For surface stabilization and dust suppression at the mound, a number of measures are applied depending upon the nature of surface (flat, finished slope or natural ash dump surface), such as surface compaction & landscaping, sprinkling of water and polymers, spreading of cut grass and vegetation by growing grass, shrubs & trees. As the mound construction proceeds and finished slopes are available, the same are covered with grass & plantation. It is proposed to cover the entire ash mound area by plantation. Photographs of dry ash disposal system are shown in following Figure 5,6.

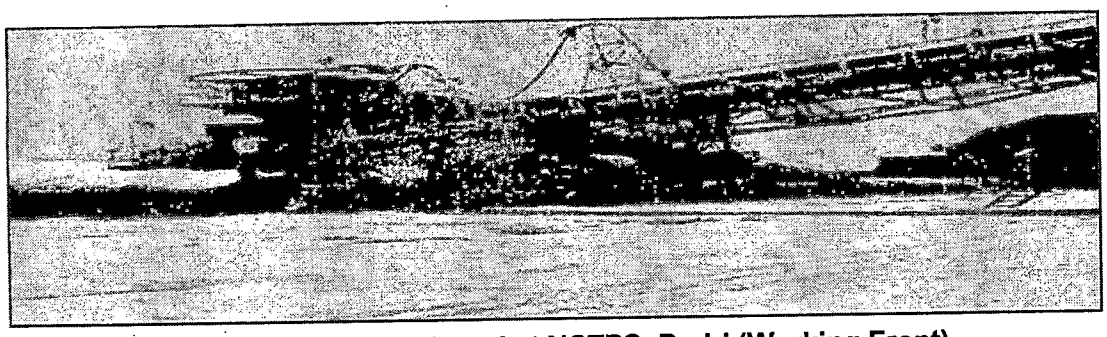

Figure 5 : Dry Ash Mound at NCTPS, Dadri (Working Front)

Figure 6: Dry Ash Mound at NCTPS, Dadri (After Stabilization and Plantation)

Dry ash Disposal has several advantages over the above two systems:

1. Less land Requirement
2. Less water Requirement
3. Less risk of Ground Water Pollution
4. Progressive restoration of ash disposal site as useful land in form of Park

However, it has certain constraints and limitations too, such as:

1. High maintenance Cost.
2. Dependency on weather/climate conditions. Difficult to operate during rains
3. Constraints of distance. It is feasible only if disposal area is near to plant

1.4 Recommended system for conveyance of ash from plant to ash pond:

1. New plants shall use high concentration slurry disposal system for ash ponds.
2. Existing plants shall submit time bound action plan to SPCBs to switch over to high concentration slurry disposal system in a shortest possible time.
3. In case of ash mounds dry ash slurry disposal system, which is a requirement of the process shall be used.

Chapter 3:

Planning for Ash Pond:

1.0 General

Coal ash is produced by coal-based thermal power plants (TPPs) for power generation. There are two types of ash produced by TPPs, i.e. fly ash (80%) and bottom ash (20%). The fly ash is collected by electrostatic precipitators from the flue gases of power plants, and the bottom ash is collected from the bottom of the boilers. The ash generated by TPPs is generally disposed by one of following two ways:

(1) Fly and bottom ashes are mixed with suitable proportion of water and pumped as slurry to the ash pond., or

(2) Fly and bottom ashes are mixed with suitable proportion of water and pumped out from the TPPs as slurry in the ash pond. The second method is known as wet-disposal, which is most commonly used as a less expensive ash management practice worldwide. The mixed fly and bottom ashes in ash pond is called pond ash.

1.1 ASH POND

Ash ponds are engineered dam and dyke facilities used for storage of bottom ash and Pulverized Fly Ash (PFA) generated at Thermal Power Stations. Ash ponds are also used to enable water to separate from the fly ash slurry. Water from the Ash ponds is recycled back, reducing the use of fresh water. Ash ponds use gravity to settle out large particulates (measured as total suspended solids) from the thermal power plant. This technology does not treat dissolved pollutants.

2.0 PARAMETERS FOR DESIGN AND CONSTRUCTION OF ASH POND

2.1 Quantity of Ash

The quantity of Ash produced in a power plant will depend upon the ash content in the coal and total quantity of coal used by thermal power stations.

2.2 Storage Volume

In-situ dry density of pond ash varies from 0.78 to 1.05 gm /cc, specific gravity varies from 1.58 to 2.21. In absence of the site specific data, average density of 0.90 tons/m^3 may be taken for storage volume calculations in wet disposal system. The design life of the ash pond varies from plant to plant and based on site conditions and ash utilization rate in view of latest notification for ash utilization.

2.2.1 Lagoon Size

A minimum area shall be provided for each of the lagoons, depending upon the discharge rate of slurry, the specific gravity of ash particles, and the size of smallest particles of ash to ensure proper sedimentation of ash particles.

In the absence of data, the smallest size of ash particles may be assumed as 0.002 mm, unless reliable ash test results are available for that project. Particles settling velocities are inversely proportional to the viscosity of water which will vary with temperature and for sizing calculation, the value at 5°C may be considered.

2.3 Land Requirement

As per clause no A(6) of MOEF&CC notification (Dec,2021), any new TPP may be permitted an emergency/temporary ash pond with an area of 0.1 hectare per MW. However, from storage point of view the area required could be less considering ash utilization as per MOEF notification.

2.4 Height of Ash Dyke

The ash dyke shall be designed for ultimate heights (starter dyke and subsequent raisings) based on ground topography, foundation soil, availability of construction materials etc. The minimum height of ash dyke is finalized based on natural ground level in ash pond area, High Flood Level (HFL), ash water recirculation requirements and free board requirements as per IS code. In general, starter dyke height of the storage lagoon is made in the range of 10m-15m. The ash dyke embankments are to be analyzed and designed as water retaining structures conforming to IS: 7894, IS:12169 & IS:9429.

The initial starter dyke shall be constructed using earth in new project. In case of expansion projects ash may be used for starter dyke construction. In such cases expert advice shall ~~also~~ be obtained for taking precautions design if any. However, below HFL, ash shall not be used as fill. The raising of ash dyke may be done using ash with a minimum 500 mm thick earth cover subject to

satisfying the stability criteria as laid down in IS 7894. However, the thickness of earth cover may be increased based on expert advice depending upon site and geology, rainfall etc. Internal drainage shall be as indicated in the construction drawing.

3.0 Site Selection:

The main aspects to be considered are the distance to the ash dyke, properties of coal, topographical conditions, geological locations, meteorological conditions etc. To protect the environment due to ash disposal various site-specific studies like topographical survey, earlier land use map, drainage pattern, environmental impact assessment, archives, meteorological data, hydrological studies, geotechnical investigations are carried out at the proposed site.

Recommended siting conditions:

i) Site should be selected to ensure that the base can be located no less than 5 ft above the upper limit of the uppermost aquifer, or it must be demonstrated that there will not be any hydraulic connection between the base and the uppermost aquifer due to normal fluctuations in groundwater elevations

ii) Site should not be located in wetland.

iii) Site should not be located within 60 m of the outermost damage zone of a fault that had displacement in Holocene time, unless it is demonstrated that an alternative setback distance of less than 60 meters (200 feet) will prevent damage to the structural integrity.

iv) Site should not be locatedin seismic impact zones unless it is demonstrated that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

v) Site should not be located in an unstable area unless it is demonstrated that good engineering practices have been incorporated into the design to ensure that the integrity of the structural components will not be disrupted.

4.0 Configuration

The scheme for ash disposal generally envisages two lagoons for bottom ash (BA) with one common over flow lagoon (OFL) and one lagoon for fly ash (FA) with one silting basin. The silting basin is to be used for collecting excess rainwater to ensure dyke safety. The dykes are planned

with various numbers of raisings depending on maximum height of starter dyke, capacity requirement and foundation conditions. Well type water escape structure with flexible opening are envisaged for decanting water from storage lagoon to over flow lagoon for recirculation through Ash water recirculation system (AWRS). Spillways shall also be envisaged for discharging excess rainwater from storage lagoons/OFL. Since fly ash can act as impervious liner, therefore no liner is necessitated in HCSD lagoon, however, BA Storage lagoon and OFL are necessarily to be provided with impervious liner using bentonite-blended soil or equivalent to ensure no ground water contamination.

The topography of the ash dyke area is undulating terrain with varying levels. The total length of the starter dyke may be in few kilometers. Typical configuration of ash pond is shown in following figures 7 and 8.

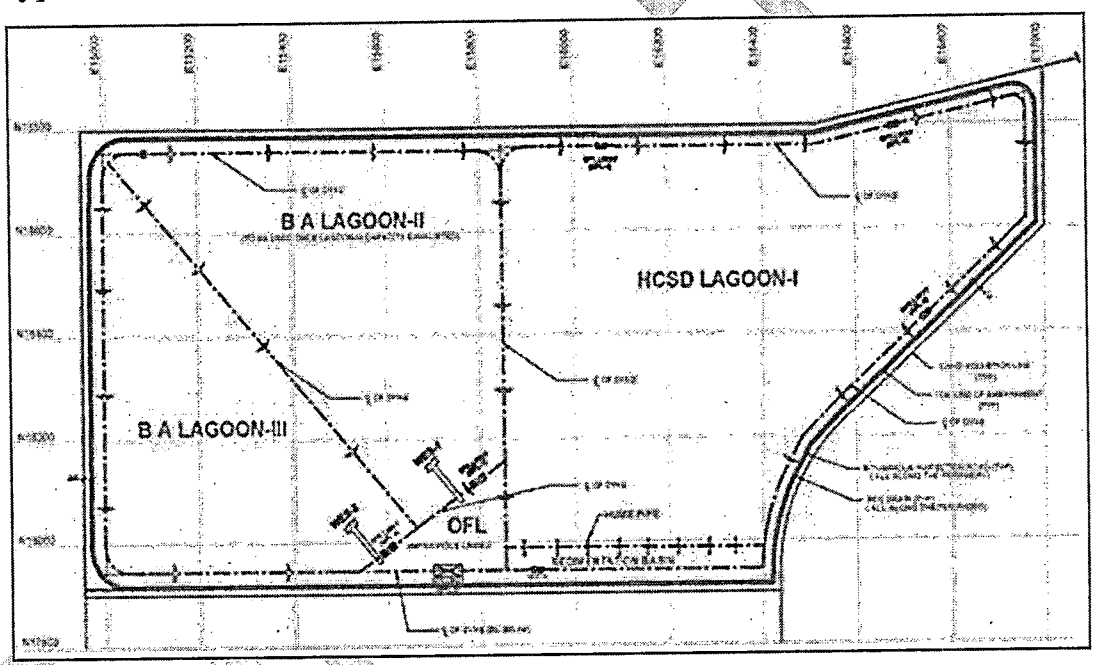

Figure 7: Typical layout of ash pond

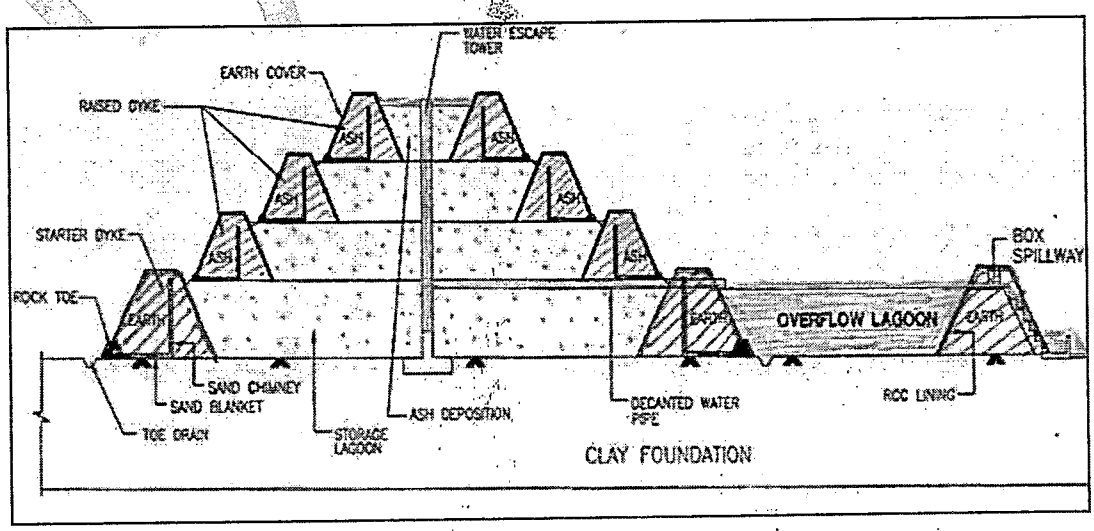

Figure 8: Typ Section of storage lagoon and OFL

5.0 Type of Embankment

From the point of view of material of fill, an earthen embankment can be classified as:

I. Homogeneous Embankment
II. Zoned Embankment

5.1 Homogeneous Embankment

A homogeneous embankment is one which consists of practically uniform materials throughout. This type of embankment is suitable where the readily available soils show little variation in permeability or soils of contrasting permeability are available only in minor quantities.

For embankment in ash disposal areas, soil excavated from the disposal area itself shall be made use of, as far as possible. Within the limited areas of lagoons in the order of 300 to 500 acers, not much variation is expected in the soil characteristics, in the top one to two metre depth from surface. Hence homogeneous embankment can be constructed in general. Typical homogeneous ash dyke section is shown in following figures 9.

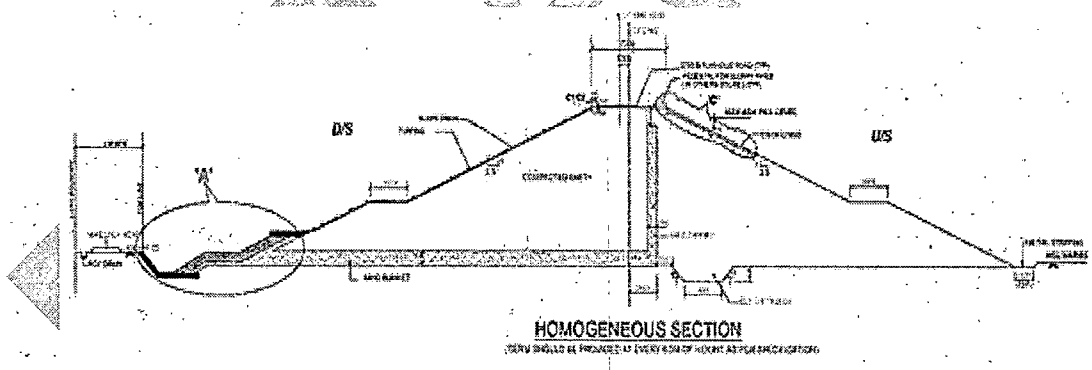

Fig 9. Typical homogeneous ash dyke section

5.2 Zoned embankment

A zoned embankment consists essentially of an inner or enclosed impervious zone supported by two or more outer zones of relatively pervious materials. Thus the scheme of zoning may divide the dyke into three or more zones, with the supporting zones increasing in coarseness of particle size and perviousness towards the outer slope. For this type of embankment, it is essential that materials of different size ranges should be available either in different borrow areas or at different levels in the same borrow area.

For zoned embankments, materials of contrasting permeability will have to be brought from outside in large quantities which may be uneconomical and result in loss of additional storage volume which could have been obtained with excavation of material from within the ash disposal areas. Typical zoned ash dyke section is shown in following figures 10.

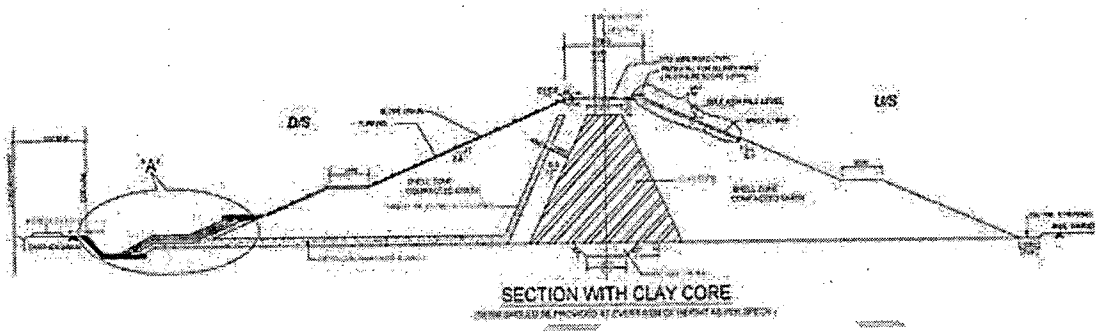

Fig 10. Typical zoned ash dyke section

6.0 Over Flow Lagoons (OFL)

Over flow lagoons are provided with overflow type spillway with stilling basin. The capacity of overflow spillway is decided based on the water used in making slurry and flow generated by rainfall over the pond area.

7.0 Water Escape Structure (WES)

Construction of well type Water Escape Structure (WES) in each bottom ash lagoon with flexible opening is provided for taking out the decanted water from storage lagoon to overflow lagoon for recirculation through AWRS pump house. The flexible opening provided in the WES wells would be used to maintain adequate water cover over the deposited ash in the lagoon under charge to prevent any fugitive dust emission from storage lagoon.

Any pipe embedment inside the dyke body is a vulnerable point from the dyke safety point of view and extreme care shall be taken. Hence, preferably a single pipe may be provided.

Draw off pipes shall be provided from the water escape wells such that their outlet level is 0.25 m above the maximum water level in the overflow lagoon. If the pipes are to be kept above ground level, suitable earthen/ ash embankment shall be provided along the pipe routed to support the pipes. The size of well/wells shall be sufficient to also draw out the rainwater collected within the ash pond in addition to the decanted water from the ash slurry.

Approach bridges/bunds shall be provided for access to wells from the dyke tops. A typical sketch of WES is shown below.

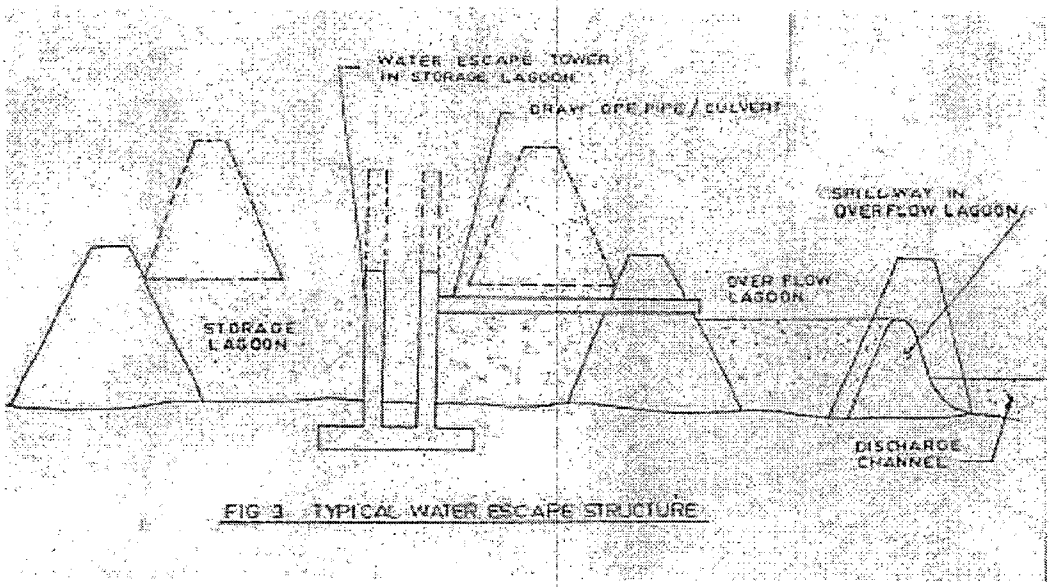

Fig 11: Typical Water Escape Structure (WES)

8.0 Requirement of Toe drain/ Seepage water pump house

National Green Tribunal (NGT) & State Pollution Control Boards (SPCBs) have issued directive for zero discharge from Plant and prohibiting any discharge of liquid effluent from ash dyke into the river or any surface water body.

Accordingly, the toe drain water from the ash dykes is not to be discharged into the nearest river/ water body and needs to be recirculated. In recent projects, the above aspect is taken care during the engineering of the AHS/ Ash dyke package where in toe drain water is envisaged to be pumped back into ash dyke for recirculation.

9.0 Requirement of inspection road for dyke and ash/ash water pipe corridor

In view of heavy and frequent movement of vehicles on ash dyke, the following needs to be considered:

1) The WBM road on dyke need to be designed for heavy load at least 40 MT as per IRC guidelines.
2) Along with WBM of 100 mm thickness, BM (Bituminous macadam) of and BC

3) (Bituminous concrete) of 40 mm is to be provided to facilitate Ash Utilization.
4) Single lane road of about 6 m width shall be constructed on top of dyke throughout the length of lagoons having provisions for overtaking zone of 10 m width.
5) At each entry point for vehicle movement, there is need to widen the dyke top up to 10m on either side of entry point by 50 m considering double lane road. The base width of dyke shall be increased accordingly considering the slope of the dyke.
6) Ash dyke embankment should not be used for regular plying of heavily loaded vehicles; however, exit/ entry of the vehicles into or from ash pond may done by Site by providing additional number of suitable approaches/ ramps on either side as per requirement and site condition.
7) Wherever ramps are required as per site requirement to approach on the dyke top, suitable drainage provision through number and size of pipes to be decided depending upon discharge at toe drain shall be provided.
8) At the junctions between approach road & dyke top, the kerb shall be replaced by suitable hump as per site conditions.
9) Alternatively, for road construction on ash dyke fly ash based Geo-Polymer concrete road preferably be adopted

10. Slurry discharge points for Lean slurry disposal

Multi point discharge shall be adopted to (i) achieve more or less uniform ash filling within the lagoon, (ii) completely utilize the available storage capacity and (iii) maintenance of water cover throughout to avoid island formations of ash within the lagoon leading to fugitive dust problem.

Ash slurry shall be discharged in a lagoon starting from the areas near the well and progressively shifting from the well area to the areas away from the well. No discharge shall be allowed on the slopes. A minimum of 50m shall be maintained from the kerb of the road.

The discharge shall also ensure that ash surface is not exposed anywhere above the water level.

11. Slurry discharge points for HCSD disposal

It is recommended to locate the discharge spigots at every 200 meter intervals by providing T sections on top of the main dyke. A blind flange should isolate each T open end. There will be 2 or 3 discharge lines at each discharge spigot going inside the storage area depending of the number of main discharge lines on the top of the relevant dyke.

Just downstream each T the piping should also be isolated from the slurry flow in order to avoid clogging of this pipe by slurry.

12. Rehabilitation of the storage area

After completion of the storage area operations, designated areas can be rehabilitated by covering these areas by top soil and vegetation after checking stability and consistency. It is advised that a civil engineering survey is to be executed to verify the stability of the filled area and to advise in a cultivation scheme.

Chapter 4: Design Procedure for Ash Pond

1.0 General

In general, for Ash disposal, Starter Dyke of height 10-15m height and subsequent raisings of 3-5m height each (effective height) for future storage are considered. The stability analysis is to be performed for starter ash dyke without raising and with each subsequent raising separately for static and seismic cases as per IS 7894. The starter dyke to be constructed first and subsequent raisings to be constructed in stages after the starter dyke is filled with ash to its capacity. Homogeneous embankment is generally preferred using earth for starter dyke and ash in dyke raisings with 500mm(min) thick earth cover. Typical section of Ash Pond with upstream raisings is shown below fig 12

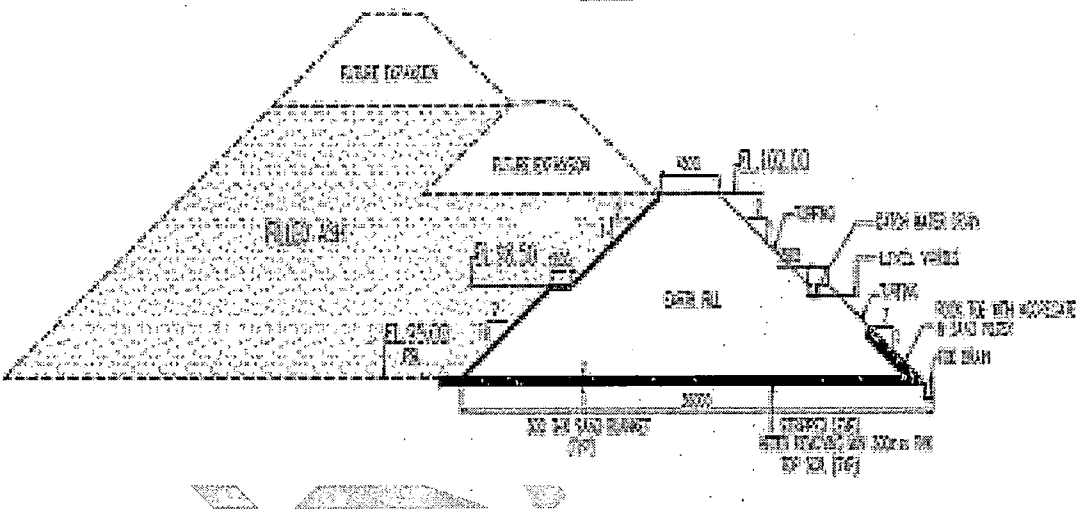

Fig 12 Typical section of Ash Pond

The topography of the proposed ash dyke area shall be evaluated. The top levels of dyke in different lagoons are to be decided based on the ground topography, ash characteristics, ash disposal system and foundation conditions. Fly ash is generally disposed as high concentration slurry (HCS) with approximate 1.5:1 (ash: water) ratio and bottom ash is disposed as lean slurry (Wet disposal) with approximate 1:7 (ash: water) ratio.

1.1 Stability

The stability of the dyke embankments is checked for i) static and ii) seismic conditions as per IS: 7894.

The Criteria for safe design of earthen dyke should be in line with IS:12169 (Criteria for Design of Small Embankment Dams) and

IS:8826 (Guidelines for Design of Large Earth & Rock-fill Dams) as applicable. The basic requirements for design of embankment dams are to ensure:

a) safety against overtopping;
b) stability, and
c) safety against internal erosion

d) base design and leachate collection to prevent infiltration

e) run-on control and runoff control & collection

2.0 Factors to be considered for safe design of ash dyke embankments.

1) There should be no danger of over topping. This involves sufficient spillway capacity, and adequate net free board, considering also the settlement of the dam and foundations. In seismic zones, extra allowance is needed for free board. A minimum free board (from water level to top of the dyke) of 1.5m is suggested for ash ponds as per IS 7894.

2) The location of the outlet/spillway shall be such that by suitably locating the ash slurry discharge pipe outlets, the fringes of the ash dyke all around are filled up first. The top of the outlet shall be decided so as to ensure continuous flow of slurry water towards the outlet without allowing heading up of water along the fringes of dyke.

3) The seepage line should not cross the downstream face above one third height of the dyke. This is to prevent "sloughing" of the face and possible failure. If the seepage line meets the downstream face, the toe softens by saturation and due to adverse seepage forces, a local failure at the toe may occur. This is avoided by the provision of internal drainage arrangement in the dyke. In case of no data, the top seepage line (phreatic line slope may be taken as 1(V):6(H), sloping down wards.

4) Water passing through or under the dyke should be unable to remove material of the dyke or foundation. This criterion is meant for protection against piping failures and involves provision of filters in the embankment section, and seepage control measures for foundations.

5) There should be no opportunity for free flow of water from upstream to downstream face. Free flow may occur through internal cracks, along conduits or after erosion caused by leaks from pressure conduits, at joint with masonry or concrete sections or with abutments, through layers left loosely compacted, through holes made by rats or animals or those left by rotten roots of dead trees etc. Once a concentrated leak starts, it is almost impossible to avoid failure. Precautions have to be taken against all these eventualities.

6) The upstream and downstream slopes should be stable against the most adverse conditions to which they can be subjected. Both slopes have to be checked for end of construction condition when rapid mechanized construction is carried out, which generates large undissipated pore pressures in the compacted layers. Instability may also arise from presence of thin pervious seams in clay foundations which may transmit high consolidation pore pressures generated under the embankment by its load to lightly loaded areas beyond the toe of the dam and thus cause failure.

7) In seismic zones any of the above conditions may have to be combined with seismic effects.

8) The foundation shear stresses should be smaller than the shear strength to provide a suitable margin of safety. This problem is likely to arise in case of foundations of highly plastic clays, the period just after the construction of dam being the most critical.

9) Both the upstream face and the downstream face should be properly protected against wave action and rain cuts.

3.0 Geotechnical investigation

Detailed investigations shall be conducted to find out the properties of foundation soil within the proposed ash pond area including permeability of soil. The dyke shall be founded on a firm stratum suitable ground improvement if required shall also be carried out based on geotechnical investigation.

Detailed laboratory tests shall be conducted to establish the physical, chemical and engineering properties of soil and analysis of subsoil water. In case, grained surface is not suitable, it should be used only after ground improvement based on the detailed Geotechnical investigation report. Based on properties of foundding soil and fill material, the stability and seepage analysis shall be carried out.

Detailed investigations shall be conducted to find out the properties of foundation soil as well as the borrow area soil for starter dyke embankment, filter material. Detailed investigations shall include but not be limited to the following:

i) Foundation Soil along the alignment of dyke embankment

a. Collection of disturbed and undisturbed samples and conducting Standard Penetration Test in Boreholes.
b. Collection of undisturbed samples from trial pits.

c. Conducting field permeability test in bore holes by pumping in/out tests depending upon the position of Ground Water Table and in trial pits by percolation test. Packet tests in rock.
d. Laboratory tests to determine
   1) Bulk density and moisture content
   2) Grain size analysis
   3) Liquid limit and plastic limit
   4) Shrinkage limit
   5) Specific gravity
   6) Unconfined compression test
   7) Triaxial test - U-U test, C-U test and C-D test on undisturbed samples.
   8) Compressibility of foundation material

ii) Borrow area material

Laboratory test to determine:
1) Grain size analysis
2) Liquid limit, plastic limit and shrinkage limit
3) Specific gravity
4) Standard Proctor Compaction Test
5) Tri axial shear test - U-U test, C-U test and C-D test on samples compacted to 95% of Standard Proctor Density.
6) One dimensional Consolidation test on samples compacted to 95% of Standard Proctor Density.

iii) Filter Material (Sand filter)

The following laboratory tests on sand/ bottom ash (filter material) are required to be carried out. Further analysis regarding suitability of sand/ bottom ash as filter media w.r.t. base material of ash dyke embankment.

i) Grain size Distribution
ii) Density (Bulk & Dry)
iii) Permeability test (Laboratory)
iv) Specific Gravity
v) Atterberg limits, if non-plastic the same shall be reported.

4.0 Design criteria

For defining the profile of the phreatic line across the dyke section, a comprehensive seepage analysis shall be done for the ultimate height of the dyke, with full water inside and tail water (if any due to H.F.L.), on outside of the dyke, before doing the stability analysis. The slope stability analysis of the dyke for ultimate stage shall be done for steady seepage condition both for static and dynamic (earthquake) cases as per IS. 7894 -Code of Practice for Stability Analysis of Earth Dams. Dyke shall be

designed as per best engineering practice including IS and studies by reputed institutions. The design is done for the ultimate height and the unutilized ash to be stored on temporary basis/ emergency use. Base should have required liner system and leachate collection system to prevent infiltration. Design should ensure run-on control and runoff collection and disposal.

MINIMUM DESIRED VALUES OF FACTORS OF SAFETY AND TYPE OF SHEAR STRENGTH RECOMMENDED FOR VARIOUS LOADING CONDITIONS AS PER IS 7894-1975

Case No.	Loading Condition of Dam	Slope Most Likely to be Critical	Pore Pressure Assumptions	Type of Shear Strength Test to be Adopted	Minimum Desired Factor of Safety
I	Construction condition with or without partial pool*	Upstream and downstream	To be accounted for by Hilf's method	QR	1.0
II	Reservoir partial pool	Upstream	Weights of material in all zones above phreatic line to be taken as moist and those below as buoyant	R S	1.3
III	Sudden drawdown: a) Maximum head water to minimum with tail water at maximum b) Maximum tail water to minimum with reservoir full	Upstream Downstream	As given in 5.4.2 of IS 7894 As given in 5.4.5 of IS 7894	R S R S	1.3 1.3
IV	Steady seepage with reservoir full	Downstream	As given in 5.5.2 of IS 7894	R S	1.5
V	Steady seepage with sustained rainfall	Downstream	As given in 5.6.1 of IS 7894	RS	1.3
VI	Earthquake condition: a) Steady Seepage b) Reservoir full	Downstream Upstream	As given in case IV As given in Case II	RS RS	1.0 1.0

Q-Unconsolidated Undrained Test, R-Consolidated Undrained Test, S-Consolidated drained Test

Note: These factors of safety are applicable for the methods of analysis mentioned in this standard.

*Where the reservoir is likely to be filled immediately after completion of the dam, construction pore pressure would not have dissipated and these should be taken into consideration

This is to be adopted for failure plane passing though impervious foundation layer. S test may be adopted only in cases where the material is cohesion less and free draining. Values are according to IS:1983-1975 "Criteria for earthquake resistant design of structures (Third revision).

5.0 OTHER BASIC DESIGN GUIDELINES

In addition to the structural stability requirements for the design of ash dyke, some basic design guide lines are given below:

a) Lagooning system

The water from the storage lagoons shall escape to the overflow lagoon (OFL) through RCC water escape well type structures and RCC hume pipes of suitable diameter. These hume pipes shall be lined with a rectangular RCC section, with minimum lining thickness of 250 mm at bottom & 150 mm on all other sides.

The water from the OFL shall escape through a RCC box culvert spillway. The outfall structure shall have stair-way type energy dissipating devices on the downstream slope of the dyke.

b) Design of Embankment

The design of embankment shall be done by a process of successive trials and refinements. The following steps may be followed.

Select a trial embankment section incorporating the available materials, with the following parameters.

i) Top **width** – is usually kept upto 3 to 10 m metre having a WBM road of with 100 mm and 150 mm of base & sub-base respectively.

One overtaking space shall be provided on each side on Top of the dyke. Ramp at one location shall also be provided.

ii) Free **board** - 1.5 metre minimum. Higher free board shall be provided if required from the anticipated wave height and from run up point of view.

iii) Side **slopes** - Minimum 2.5 Horizontal to 1 Vertical.
3m wide berms shall be provided for all slopes at about 6 metre height intervals.

iv) Impervious - Bottom of all the pond shall be provided with a Liner minimum of 300 mm thick Impervious Liner **or** by LDPE/HDPE/Geotextile liner

v) Internal drainage arrangement:

a) Sand chimney of minimum 0.5 metre thickness, upto 1.0 m below dyke top.
b) Sand blanket of minimum 0.5m depth.
c) Rock toe at the downstream toe of the embankment. Height of the rock toe should be a minimum 1.2 metre as per provisions of IS 9429. With the above drainage arrangements, the phreatic line is expected to follow the drainage path.

d) The exit gradient of seepage flow near the downstream toe shall be checked by drawing flow nets. The exit gradient shall not exceed about 0.14. If the gradient is more than this value, the dyke slope will have to be flattened to reduce the gradient.

c) Slope protection works

a) On the downstream slopes, where the annual rainfall is less than 200cm. and where there is no existence of water collections, turf soding is sufficient. When the annual rainfall is more than 200cm, downstream slopes shall be protected by minimum 30cm thick stone pitching. Wherever, there are chances of water accumulation on the downstream side, the slope shall be protected by stone pitching of suitable thickness, depending upon the wave height likely to act on the slope, in the region from 1.5 metre above the maximum water level to 1.5 metre below the minimum water level.

b) On the upstream slope, dry fly ash brick packing (brick on flat) shall be provided for the top portion.

c) On the top of the dyke, Water Bound Macadam surfacing shall be made for movement of vehicles, which will also give protection to the earth surface against rain and wind erosion.

d) Cut-off trench

If foundation material is very impermeable, a nominal cut-off trench shall be provided in the portion upstream of sand chimney, to increase the drainage path of any seepage oncoming at the junction between the embankment and its foundation. A minimum bottom width of 4m shall be provided for the cut-off trench to facilitate compaction with rollers. If rock is available at a depth less than 1 metre, the cut-off trench may be stopped at the rock level itself. The effect of cut-off trench is not taken in the design and it is only provided as an

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additional precaution against piping failure in foundation. For more details relevant IS codes may be referred

e) Instrumentation

In order to monitor the performance of ash dyke during construction and operation the following instruments should be installed at an approximate distance of 500 metre along the alignment of the dyke and at critical locations.

a) Piezometers

b) Surface settlement markers

f) Sand Blanket, Chimney and filter

The material for blanket, chimney and sand filters shall consist of clean sound and well graded coarse sand. The materials shall be free from debris, wood, vegetable matter and other deleterious matter. The gradation of sand material shall meet the requirements as per IS 9429.The filter materials shall be suitably compacted to a firm condition to achieve a relative density of 70%.

Chapter 5:

CONSTRUCTION MATERIAL

1.0 Embankment Material

Earth embankments can be built with all kinds of materials ranging from broken rock to silty soils, clays and ash. For a homogeneous section, materials of low permeability and low plasticity are preferable. In zoned section, two broad categories of materials may include many grades of permeability. Even random materials can be accommodated in non-critical portions of the section. The following materials are suitable for homogeneous dykes, considering their permeability, shear strength, compressibility and workability.

The embankment fill material for dyke shall belong to any one of the soil classification namely 'CH', 'CI', 'CL', 'CI-CL', 'MH', 'MI', 'ML-CL', or 'SC'.as per IS 1498-1970

1.1 Suitability of Soils for Construction of Earth Dams

Relative Suitability	Homogeneous Dykes	Zoned Earth Dam		Impervious Blanket
		Impervious Core	Pervious Core	
Very Suitable	GC	GC	SW,GW	GC
Suitable	CL,CI	Cl,CI	GM	CL,CI
Fairy Suitable	SP,SM,CH	GM, GC, SM, SC,CH	SP,GP	CH,SM
Poor	-	ML,MI,MH	-	-
Not suitable	-	OL,OI,OH,Pt	-	-

Cut of trench filling to be done using above fill materials and prepared by blending the soil, with minimum 4 percent bentonite to achieve a permeability not more than $1X10^{-6}$ cm per second.

The above fill material should be free from logs, stumps, roots, rubbish or any other ingredient likely to deteriorate or affect the stability of the dyke.

2.0 Raising by Fly Ash

Ash may be used for construction of embankment in case of raising. Ash to be brought to the site from the ash pond/ location identified. Pond ash to be excavated from a minimum distance of five times height of embankment or 25m from heel of the dyke whichever is more.

For the earth cover (minimum 500 mm) to be provided over ash core, in the case of ash embankments, the soil shall consist of sandy loam free of admixtures of stiff clay, refuse, stumps, roots, rock, brush, weeds or other material which would be detrimental to the proper development of the vegetation growth. The earth should meet following grading analysis.

- Sand 20% to 75%
- Silt 10% to 60%
- Clay 5% to 30%

A suitable grading and thickness of earth cover should be adopted based on design requirement for stability and permeability.

2.1 Fly Ash

The following information on the Fly Ash to be used for dyke raising should be evaluated before commencement of work:

1. Particle size of the material
2. The maximum dry density (MDD) and optimum moisture content (OMC) as per IS Heavy Compaction test (commonly known as modified proctor test), and the graph of density plotted against moisture content, for this test. In general, fly ash of compacted density lower than 1.1 gm/cc shall not be suitable for embankment construction. The design parameters should be rechecked, when fly ash of lower densities is encountered.
3. Shear strength parameters, for evaluation of the stability of proposed slopes and the bearing capacity of foundations located on the fill.
4. Compressibility characteristics, for predicting the magnitude and duration of the fill settlement.
5. Permeability and capillarity are required to assess seepage and to design drainage systems.
6. For typical geotechnical properties of Fly Ash refer Table 1 given under Clause 1 of introduction chapter.

3.0 Drainage/Filter Material

Drainage Filter:

Filters are extremely important in ash dykes and are used to prevent piping and erosion of foundation materials. Filters are constructed in layers, each of which is coarser than the one below it, and for this reason they are often referred to as reversed filters. A filter must comprise granular material fine enough to prevent soil particles being washed through it and yet coarse enough to allow the passage of water and shall be designed as per IS 9429

a) $\frac{D_{50} \text{ of filter}}{D_{50} \text{ of base material}}$ < 25

b) $\frac{D_{15} \text{ of filter}}{D_{15} \text{ of base material}}$ = 6 to 19/>5

c) $\frac{D_{85} \text{ of filter}}{D_{15} \text{ of filter}}$ > 5

(The above equation ensures that the filter layer has permeability several times higher than that of the soil it is designed to protect)

d) $\frac{D_{15} \text{ of filter}}{D_{85} \text{ of base material}}$ < 5

(The requirement of the above equation is to prevent piping within the filter. The ratio D15 (filter)/D85 (base) is known as the *piping ratio.*)

e) The gradation curve of the filter material shall be nearly parallel to the gradation curve of the base material.

f) The filters shall not contain more than 5% by weight of materials finer than 0.075 mm size.

g) The sand filter layer shall be considered as the base material for coarser filter layer.

h) The filter material shall be suitably compacted to a firm condition to achieve a relative density of 70%.

i) In addition to the above, the provisions for filter as given in "IS: 9429-Code of practice for drainage system for Earth and Rock Fill dam", also shall be followed.

For sand- material, the grading shall be decided as per filter criteria specified above, so that the embankment fill material is prevented from being carried away through the blanket, chimney and filters.

4.0 Rock Toe Material

The rock material used for the rock toe shall satisfy the following condition:

a) Specific gravity shall not be less than 2.50 (As per IS 1122)

b) Sulphate soundness- Less than 10% loss of weight after (Five) cycles (As per IS I 120)

c) Aggregate Impact value shall not exceed 16% (As per IS 2380)

d) Water absorption shall not exceed 2.5% (As per IS 2386)

e) In slake durability test (as per IS 10050), the percentage retain after two ten (10) minutes cycles shall be more than 85 %.

Rock toe shall be formed with rock material consisting of sound, durable and well graded broken rock obtained from approved quarries and shall be of approved quality prior to being transported to the area of deposition. The materials shall range in size from 10 to 45 cm. All brush, roots or other perishable materials shall be removed from rock-fill during spreading and shall be transported to a disposal area.

The rock available from the excavation of water escape structure/stripping/drain channel etc. which satisfy the quality requirements specified above. These shall be washed, cleared, and broken into required size and stacked separately.

Similarly, rock materials for rock toe satisfying the quality requirements specified above can also be obtained from rock available within the land acquired for construction of ash pond divide bund, if it is found suitable. The rock will be broken to required size and shape and will be cleaned before utilized.

5.0 GENERAL REQUIREMENTS OF HDPE LINER

i. The HDPE geo-membrane manufactured from first quality virgin resin only to be used. Blending of resins shall not be allowed. No recycled or reworked geo-membrane shall be used except edge trim generated during the manufacturing process (no more than 10%).
ii. The geo-membrane shall be free of plasticizers.
iii. The geo-membrane shall be free of leachable additives.
iv. The geo-membrane shall be free of factory seams.

v. The geo-membrane shall be free from dirt, oil, foreign matter, scratches, cracks, creases, bubbles, blisters, pits, tears, holes, pores, pinholes, voids, un dispersed raw material, any sign of contamination or other defects that may affect serviceability, and shall be uniform in color, thickness and surface texture.
vi. The geo-membrane shall be capable of being seamed in the field to yield seams that areas resistant to waste liquids as the sheeting.
vii. HDPE material to be used shall meet the minimum requirements of GRI Standard GM13.

6.0 GENERAL REQUIREMENTS OF NON WOWN GEOTEXTILE

i. The non-woven geotextile shall be manufactured from first quality virgin resin. Blending of resins shall not be allowed. No recycled or reworked geotextile shall be used except edge trim generated during the manufacturing process (no more than 10%).
ii. The geotextile shall be free of plasticizers
iii. The geotextile shall be free of leachable additives.
iv. The geotextile shall be free of factory seams.
v. The g geotextile shall be free from dirt, oil, foreign matter, scratches, cracks, creases, bubbles, blisters, pits, tears, holes, pores, pinholes, voids, un dispersed raw material, any sign of contamination or other defects that may affect serviceability, and shall be uniform in color, thickness and surface texture.
vi. The geotextile shall be capable of being seamed in the field to yield seams that are as resistant to waste liquids as the sheeting.

Materials

The nonwoven thermally bonded or needle punched or any equivalent geotextile shall be used. The geotextile shall be made of polyethylene or Polypropylene or polyester or similar fibers manufactured through machine made process of heat bonding or needle punching techniques. The mean Values of Geo-textile shall be as shown in Table-3

Table 3. Guide property of non-woven geotextile

Properties	Mean Values	Test Method
i) Mechanical		
Wide width Strip Tensile	5 kN/m	EN ISO 10319
Elongation	30-50 %	EN ISO 10319
CBR Puncture resistance	2500	EN ISO 12236
ii) Hydraulic		

Apparent opening size	85 micron	EN ISO 12956
Permeability	45 l/m2. sec	EN ISO 11058
iii) Physical		
Mass per unit area	150-300 g/sq.m.	
Thickness	1 to 2 mm	

Note: Above properties are indicative and for guidance purpose only.

Chapter 6: CONSTRUCTION AND SEEPAGE CONTROL

1.0 Introduction

Construction is a critical phase in achieving a safe dyke. Modern construction equipment permits to achieve speed with quality. Generally, a starter dyke is constructed and subsequent raising is done by either upstream / inward raising or downstream/ outward raising.

In d/s method the volume of ash to be handled is more. This may add to ash utilization. Depending upon the seismic zone the method of construction may be finalized. In seismic zone V d/s method appears to be a better option than u/s construction. The various methods are shown below in figure 13.

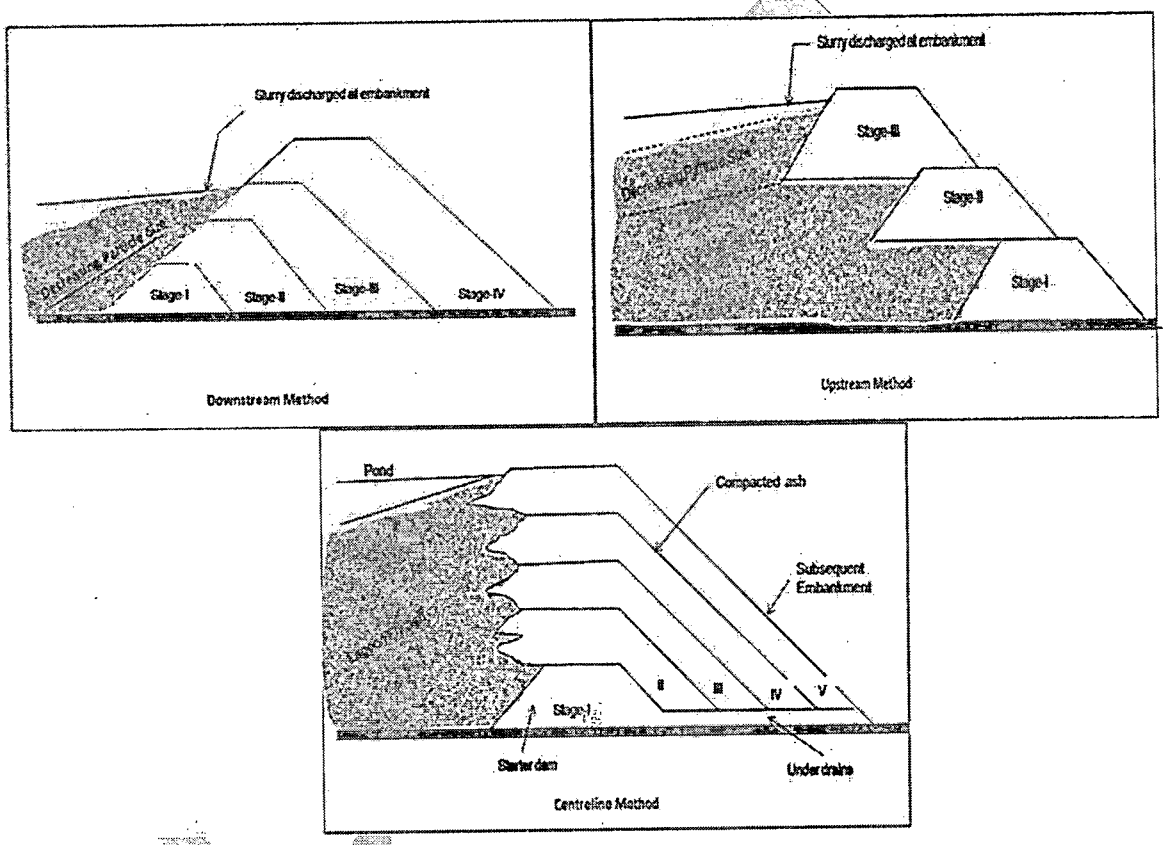


Figure 13: showing methods of dyke construction

2.0 Preparation of Embankment Sub-Surface

2.1 Clearing and Grubbing

This work consists of cutting, removing and disposal of trees, bushes, shrubs, roots, grass, rubbish, etc., from the alignment and within the area of land which will accommodate the embankment, drains and such other areas as specified on the drawings. During clearing and grubbing, adequate precautions against soil erosion, water pollution, etc are required. All trees, stumps, etc., falling within fill area should be cut to at least 500 mm below ground level and pits shall be filled with suitable material and compacted thoroughly so as to make the surface at these points conform to the surrounding area.

The entire area meant to receive the ash and earth filling shall be stripped to a depth of minimum 150 mm. The exact depth of stripping shall be depending upon the nature of topsoil and the vegetation present.

All organic matter, vegetation, roots, stumps, bushes, rubbish, swamp materials, etc. shall be removed from the site. The stripping material and other unsuitable materials as referred above shall be kept far away from the area to be filled up so that these do not get mixed up with filling material and disposed of to an identified.

2.2 Stripping and Storing of Top Soil

When constructing embankment using fly ash, the top soil from all areas to be covered by the embankment foundation should be stripped to specified depth not exceeding 300 mm and stored in stock piles of height not exceeding 2 m, for use in covering the fly ash embankment slopes (if soil is suitable), cut slopes and other disturbed areas where revegetation is desired. Top soil should not be unnecessarily trafficked either before stripping or when in stockpiles. Also, these shall not be surcharged or otherwise loaded and multiple handling should be kept to minimum.

2.3 Setting Out

After the site has been cleared, the limits of embankment should be set out true to lines, curves, slopes, grades and sections as shown on the drawings. The limits of the embankment should be marked by fixing batter pegs on both sides at regular intervals as guides before commencing the construction. The embankment should be built sufficiently wider than the design dimensions so that surplus material may be trimmed, ensuring that the remaining material is of the desired density and in position specified, and conforms to the specified slopes. Bench marks and other stakes should be maintained as long as they are required for the work.

2.4 Dewatering

If the area happens to be waterlogged, ground water table of site shall be lowered by dewatering the same so that proper compaction of fill material at around optimum moisture content can be ensured. If the foundation of the embankment is in an area with stagnant water, it is feasible to remove it, the same should be removed by pumping or any other means, and the area of the embankment foundation should be kept dry. Care should be taken to discharge the drained water so as not to cause damage to works, crops or any other property. Construction of embankments underwater logged conditions shall be governed by provisions of IRC: 36-1970.

2.5 Leveling

All existing undulations, holes, cavities, excavations made for plate load rests and other soil investigations, etc. shall be filled with pond ash having requisite moisture content. The ash thus filled shall be compacted with the help of vibratory rollers so as to achieve Dry Density of not less

than 95% of Maximum Dry Density found out as per I.S – 2720 (Part-VII). This would result in a levelled surface upon which layer wise filling of compacted ash can be done.

3.0 Excavation of Pond Ash From Borrow Area

3.0.1 Borrow Area-location

3.1 Site Clearance

All areas required for borrowing shall be cleared of all trees and stumps, roots, bushes, rubbish and other objectionable material. Particular care shall be taken to exclude all organic matter from the material to be placed in the fill. All materials thus cleared, which can be burnt shall be completely burnt. Balance shall be disposed off as specified. The cleared areas shall be maintained free of vegetation growth during the progress of the work.

3.2 Stripping

Borrow area shall be stripped of top layer by a depth of minimum 150 mm. The exact depth of stripping shall be decided depending upon the nature of top layer and the vegetation present.

3.3 Borrow area watering & dewatering

The natural moisture content of material in the borrow areas as well as the optimum moisture corresponding to the Proctor's maximum dry density for the material in the particular borrow area shall be obtained from laboratory tests. Additional moisture, if required, shall be introduced into the borrow area by watering well in advance of excavation to ensure uniformity of moisture content. If in any borrow area before or during excavation there is excess moisture, steps shall be taken to reduce the moisture by the selective excavation to secure the materials of required moisture content by excavating drainage ditches, by allowing adequate time for drying or by other means. To avoid formation of pools in the borrow areas during excavation operations, drainage ditches from borrow areas to the nearest outlets shall be excavated so as to obtain homogeneous mix. In general, all materials from a particular borrow area shall be a mixture of materials obtained for the full depth of cut.

4.0 Construction of Pond Ash

4.1 Filling the cut off trench / trenches for water escape pipes / impervious core

4.1.1 Cut off trench

The cut off trench shall be filled up in layers not exceeding 300mm in compacted thickness using impervious soils CL or CI type having permeability less than 1 x 10^{-4} cm/sec, to be obtained by the from approved borrow area. The suitability or otherwise of the material shall be determined by laboratory tests. In case clayey soil of the specified

quality is not available, alternatively manufactured impervious soil by blending required quantity bentonite (not less than 4 percent) to available soil to achieve the specified permeability also can be used. Blending of bentonite with earth shall be done in dry form in a concrete mixer. Each layer of earth deposited shall then be compacted to have a dry density not less than 98% of the maximum dry density (standard proctor) for the soil with suitable tractor drawn heavy sheep foot tamping rollers or by any other method approved. The compaction shall 'have to be uniform throughout the length and breadth of each layer. The roller should be made to travel over the entire section of each layer so that the earth is fully compacted and the roller leaves no visible marks on the surface.

4.1.2 Trenches for water escape pipes

Before placing the water escape pipes within the embankment, construction of dyke upto 600 mm above the RCC lining for pipes shall be carried out without actually placing the pipes. Later on, trenches shall be excavated for pipes and lining work, pits for cut-off collars and diaphragm filters. These trenches shall then be filled using naturally available CL-ML type soil (plasticity index 7-20) or with manufactured soil by blending with bentonite to achieve specified plasticity. Earth layers deposited in these trenches shall be compacted with plate compactors to have a dry density not less than 100 percent of the maximum dry density (standard proctor).

4.1.3 Impervious core

The spreading of the next layer shall be carried out only after the underlying layer has been approved. The impervious core of the dyke shall be made with approved clayey soil brought from elsewhere and I or with manufactured soil by blending the available sandy silty soil with bentonite (not less than 2 per cent by volume) to achieve the permeability not more than 1×10^{-6} cm/ sec. The procedure for laying and compaction shall be the same as specified for the shells of dyke.

5.0 Placing the fill material

The materials for embankment shall be obtained from the approved borrow areas and available excavated material to the extent possible. In general, all materials from the particular borrow area shall be a mixture of materials obtained for the full depth of the cut. Some earth material available from the excavation of cut-off trench etc. if found suitable can also be used for the embankment construction.

The distribution and gradation of materials throughout the fill shall be as shown in the approved drawings or as directed. The fills shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The combined excavation and placing operations shall be such that the materials when

compacted in the fill will be blended sufficiently to produce the specified degree of compaction and stability.

No stones, cobbles or rock fragments, having maximum dimensions of more than 10 cm shall be placed in the fill. Such stones and cobbles shall be removed either at the borrow pit or after being transported to the fill but before the materials in the fill are rolled and compacted. The materials shall be placed in the fill in continuous horizontal layers; stretching right across the whole section, not more than 30 cm in compacted thickness and rolled.

During construction a small transverse slope from center towards the edges should be given to avoid pools of water forming due to rains. The surface of materials to be placed thereon, shall be moistened and or worked with harrow, scarifier or other suitable equipment, in an approved manner to a sufficient depth to provide a satisfactory bonding surface before the next layer of fill material is placed. If the rolled surface of any fill is found to be too wet for proper compaction, it shall be raked up, allowed to dry, or shall be worked with a harrow oi any other approved equipment to reduce the moisture content to the required amount and then it shall be re-compacted before the next layer is placed.

When compacting the fill material against steep rock abutment or walls or masonry or concrete structure the construction surface of embankment shall be sloped away from rock or masonry or concrete structures for a distance of 3 m to 4 m at an inclination not steeper than 6 horizontal to 1 vertical. If the foundation surface is too irregular to allow the use of a large roller directly against a structure rock outcrop, the roller shall be used to compact the fill material as close to the structure or the outcrop as possible and the portion of the embankment directly abutting against the rock or the structure shall be compacted with pneumatic hand compactors/tampers In thin layers. The moisture content of the fill material placed against the rock or the structure shall be high enough to allow it to be compacted into all irregularities of the rock or the structure. Care shall be taken in placing the first layer of the fill so that no damage is caused by the hauling machinery to the base grade as this may get concealed by the spread layer or fill. Sheep foot roller shall not be employed for compacting till the thickness of the layers already compacted by other means is greater by 30 cm than the depth of the feet on the roller drum. The material for the first layer shall be at moisture content sufficient to enable bonding of the fill with the rock surface.

5.1 Weather Conditions

Embankment materials shall be placed only when the weather conditions are satisfactory to permit accurate control of the moisture content in the embankment materials.

5.2 Moisture Control

Prior to and during compacting operations, the materials in each layer of fill shall have a moisture content about 2% less than the optimum moisture content, in the case of cohesive soil. In the case of cohesion less material including ash, the placement moisture content may have only little effect on the compaction behavior of the fill and hence appropriate moisture content required from other site considerations such as dust suppression etc, may be adopted. As far as practicable the materials shall be brought to the proper moisture content in the borrow area before excavation. If additional moisture content is required, it shall be added on the embankment by sprinkling water before rolling the layer. Bidder shall make his own arrangements for supply of water. If the moisture content is greater than required, the material shall be spread and allowed to dry before starting rolling. The moisture content shall be uniform throughout the layer of materials.

If the moisture content is more or less than the range of the required practicable moisture content, or if it is not uniformly distributed throughout the layer, rolling shall be stopped and shall be started again only when the above conditions are satisfied.

5.3 Degree of Compaction

While the specification provides that equipment of a particular type is to be deployed and used, compaction shall be done to achieve 95% standard Proctor density by mechanical means. Compacted layer thickness shall be maximum 300 mm.

Tamping (sheep foot) rollers or pneumatic rollers shall be used for compacting cohesive materials and pneumatic rollers and vibratory rollers shall be used for compacting cohesion less materials including ash. Any other suitable type of compaction equipment also can be employed after necessary field trials about their effectiveness.

6.0 Rolling and tamping

6.1 Rolling

When each layer of material has been conditioned so as to have the proper moisture content uniformly distributed throughout the material, it shall be compacted by passing the roller. The exact number of passes shall be decided based on compaction trials to be conducted in the field before start of work. The layers shall be compacted in strips overlapping not less than 0.6 metre. The rollers or loaded vehicles shall travel in a direction parallel to the axis of the dyke. Density tests shall be made after rolling and the dry density attained shall be not less than 95% of maximum dry density (Standard Proctor) obtained in the Laboratory for the type of material used.

6.2 Tamping

Rollers will not be permitted to operate within 1.0 M of concrete and masonry structures. In locations where compaction of the till material by means of the roller is impracticable or undesirable the material shall be specially compacted as specified here in at following locations:

a) Portions of the dyke embankment adjacent to masonry structures.
b) Earth lash in dyke embankment adjacent to steep abutments,
c) Earth lash fill at locations

Fill shall be spread in layers not more than.30 cm. in compacted thickness and shall be moistened to have the required moisture content. When each layer of material has been conditioned to have the required moisture content it shall be compacted to achieve the dry density of not less than 95%of Maximum Dry Density (Standard Proctor) by special rollers, mechanical tampers, hand held vibratory tampers or by other approved methods, and all equipment and methods used shall be subject to approval based on evidence of actual performance. The moisture control and compaction shall-be equivalent to that obtained in the fill material actually placed in the dyke embankment.

7.0 Liner

As per the design requirement either impervious soil liner or geo-membrane or geotextile liner may be provided. The following are the guidelines for the same

7.1 Impervious Liner using Soil

The compacted thickness of liner shall not be less than 300 mm. The suitability or otherwise of the material shall be determined by laboratory tests. In case clayey soil of the specified quality is not available, alternatively soil blended with required quantity of bentonite (not less than 4 percent by volume) to achieve the specified permeability also can be used with the same specified procedure for laying and compaction. Blending shall be done by suitable means. Layer of liner laid shall be compacted to have a dry density not less than 90% of the maximum dry density (standard proctor) for the soil with suitable rollers.

Bentonite is a fine textured colloidal clay. Sodium bentonite shall be used for the work. Laboratory tests shall be conducted to determine the percentage of bentonite needed to achieve the desired permeability of $1x10^{-6}$ cm/sec.Soil to be used for liner shall be free from organic matter, debris etc.

The work broadly involves laying of clayey soil (or) mix of soil & bentonite, mixing of soil & bentonite, spreading the mix, compacting & Testing of Permeability.

7.1.1 Subgrade Preparation for Impervious liner

The subgrade surface should be prepared by minimum 300 mm stripping, grading, watering wherever required, and removing all vegetation, rocks, and other matter which could penetrate the Impervious Liner or decrease the uniformity of the mixture. The prepared surface shall be compacted by at least 2 passes of 8 Ton - 10 Ton roller.

In case earth for formation of dyke is borrowed from inside the lagoon where Impervious liner is to be provided, after borrowing fill material from the lagoon, the excavated surface shall be prepared with compaction by two passes of 8 Ton - 10 Ton roller and slope shall be maintained to 1V:4H.

7.1.2 Mixing, placing & compaction of manufactured impervious soil

For mixing of soil & bentonite, any of the following method can be chosen

7.1.2.1 Mix in Other Place:

Soil & bentonite shall be mixed thoroughly in dry condition in a mixture and water shall be added, once the mix attains uniformity, the mix will be transported to site and spread over the prepared surface of lagoon to get the compacted thickness not more than 300 mm.

7.1.2.2. Mix In Place:

Alternatively soil shall be spread in layers and the required bentonite shall be spread over the soil surface. The bentonite shall be spread uniformly across the accepted subgrade surface at the specified application rate. The bentonite shall be thoroughly mixed and compacted layer thickness of 300mm.

7.2 GEOMEMBRANE LINER

1000 microns LDPE/HDPE liner may be provided on bottom ash pond and inside slopes of the ash dyke.

Inside and bottom surface shall be lined with impermeable LDPE/HDPE lining of thickness minimum 1000 micron with overlap distance of 0.5 m and jointing of LDPE/HDPE lining with robotic 2 Stich welding, to prevent loss 0f water due to seepage. The liner shall be placed over minimum 50 mm thick fine sand. Arrangement for holding the liner in position by providing necessary RCC beam at top level of embankment shall be kept. The liner shall be protected by precast concrete tiles placed over it. Dimensions of precast concrete tiles M30 Grade over LDPE/HDPE sheet shall be 300x 300 x 50mm-laid over 25 mm thick 1:4 cement mortar. The jointing and pointing between tiles shall be done with 1:3 cement mortar.

7.2.1 Cushion Layer below HDPE Liner

The liner shall be laid over a 150 mm thick layer of natural sand/ manufactured crusher sand/ bottom ash. The material shall be clean with little or no fines conforming to IS 1498 unless specified otherwise. The Earthwork contractor shall be responsible for preparing and maintaining the surfaces to be lined prior to placement of the liner. The thickness and other arrangement shall be as per the details given in the drawing.

7.2.2 Field Placement of The HDPE Liner

7.2.2.1General Requirements:

The placement procedure used for the geo-membrane liner shall include the conditions listed below.

1)Weather: Geo-membrane shall not be placed when the air temperature is above 40°C or below 5°C unless it can be demonstrated to the approval of the Purchaser by trial welds that acceptable welds can be made at the prevailing temperature. Geo-membrane shall not be placed when there is any rainfall or snowfall, in the presence of excessive moisture due to fog or dew, in ponded water, on a frozen subgrade, or during high winds.

2)Panel Layout: The panels shall be placed in accordance with the Manufacturer's panel layout drawing to ensure that they are placed in the proper direction for seaming.

3)Panel Deployment: Only the panels that can be anchored and seamed together in one shift shall be unrolled. Unroll and layout panels in as close to the final position as possible. Pulling geo-membrane panels should be minimized to reduce the chance of permanent tension. The methods and equipment used to deploy the panels shall not damage the geo-membrane or the supporting surface. Wrinkles shall be minimized. However, enough slack shall be provided in both directions so that there will be no tension in the geo-membrane at the lowest expected operating temperature.

4) Precautions to Prevent Wind Damage:
If possible, work shall be oriented in the direction of the prevailing wind. Provide adequate temporary loading and/or anchoring of the geo-membrane by the use of sandbags, tires or other means which will not damage the geo-membrane, to prevent uplift of the geo-membrane by wind.

5) Other Precautions to Prevent Damage:
Protection of the geo-membrane from damage due to foot traffic on the slopes shall be provided. Provisions of facilities for safe entrance and egress of employees from sloped depressions is required.

Replacement of Damaged Geo-membrane:

Any area of a panel, which, in the judgment of the Purchaser, becomes seriously damaged (torn, twisted, or crimped permanently), shall be replaced at no additional cost to the Purchaser.

7.2.3 Field Seaming:

i) Method of Seaming: The primary welding procedure for seams shall be double wedge fusion welding. Extrusion welding shall be used only for repairs, detail work, and for seaming where double wedge fusion welding is not possible. The rods used for extrusion welding shall be the same type of resin as the geo-membrane, unless otherwise approved by the Purchaser. The use of solvents or adhesives is not permitted.

ii) General Requirements for Seaming: On slopes steeper than 10 horizontal to 1 vertical, seams shall be oriented parallel to the line of maximum slope (oriented up and down, not across the slope) when possible. No seams oriented across the slope shall be used unless approved by the Purchaser.

a. Seams parallel to the toe of the slope shall be located a minimum of 5 feet (1.5 m) from the toe.
b. Seams parallel to the crest of the slope shall be located a minimum of 2 feet (600 mm) from the crest.
c. Seams on the floor of the pond shall be overlapped so that the upslope sheet is positioned above the down slope sheet.
d. Seaming shall extend to the outside edge of panels to be placed in the anchor trench.
e. Seams at corners of three or four sheets shall be completed with a patch having a minimum dimension of 24 inches (600 mm), and extrusion welded to the parent sheets. All cross seams between the two rows of seamed panels shall be welded during the coolest time of the day to allow for contraction of geo-membrane.

7.2.4 Trial Welds Prior to Beginning Seaming

Trial welds are required for pre-qualification of personnel, equipment and procedures for making seams on identical geo-membrane material under the same climatic conditions as the actual field production seams will be made. Trial welds shall be made as follows:

a) Prior to each seaming period.
b) Every 4 to 5 hours (i.e., at the beginning of the work shift and after the lunch break).
c) Whenever personnel or equipment are changed.
d) When climatic conditions result in wide changes in geo-membrane temperature.

e) When requested by QC & QA (Quality Control & Quality Assurance) Geo-membrane Inspector for any seaming crew or piece of welding equipment if problems are suspected.
f) Once qualified by passing a trial weld, welding technicians shall not change parameters without performing another trial weld.
g) Trial welds shall be made on both double wedge fusion welds and on extrusion welds. A test strip shall be prepared by joining two pieces of geo-membrane; each piece shall be at least 6 inches (150 mm) wide.
h) The length of double wedge fusion welded seams shall be a minimum of 10 feet (3 m) long.
i) The length of an extrusion welded seam shall be a minimum of 4 feet (1.2 m) long.

The QA Geo-membrane Inspector shall witness the fabrication of each test strip. All test welds shall be tested by destructive testing. Testing can be done as soon as the seam cools. If any of the test specimens fail, a new test strip shall be fabricated and the tests repeated for the new strip. If additional specimens fail, the seaming apparatus and the seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and successful trial welds have been achieved. If the specimens pass the tests, production seaming operations can begin.

7.2.5 Preparation for Seaming:

a) Prior to seaming, the surface of the geo-membrane shall be wiped with a clean cloth to ensure that it is clean and free from moisture, grease, dust, dirt, and debris of any kind before seam welding is started.
b) The panels shall be adjusted so that the seams are aligned to eliminate wrinkles and fish mouths. Where necessary, fish mouths and wrinkles shall be cut to achieve flat overlap.

7.2.6 Seaming:

a. Seaming shall be performed in accordance with the Manufacturer's accepted procedure.
b. Double Wedge Fusion Welds:
c. The panels shall be overlapped a minimum of 4 inches (100 mm) prior to welding. Vehicle mounted automated hot wedge welding apparatus shall be used to make the seam.
d. Extrusion Fillet Welding:
e. Geo-membrane overlap shall be a minimum of 3 inches (75 mm) for extrusion welding. Panels shall be temporarily bonded using a hot air device prior to extrusion welding. The edge of the geo-membrane to be fillet welded shall be pre-beveled before heat-tacking the seam in place. The seam overlap shall be ground (abraded) no more than one hour prior to welding. Grinding shall

be performed in accordance with the Manufacturer's instructions in a manner that does not damage the geo-membrane. Grinding shall not extend more than 1/4 inch past the area to be covered with extrudate during welding. All grind marks shall be covered with extrudate.

7.2.7 Non-Destructive Field Testing –membrane:

i) General

a. All non-destructive field testing shall be performed and documented by the
b. Geo-membrane Contractor.
c. The QC & QA Geo-membrane Inspector shall observe all non-destructive test
d. procedures.58 of 144 procedures to check the continuity of the field seams. Non-destructive testing is not meant to qualify seam strength.
e. Air pressure testing shall be performed in accordance with ASTM D5820 and GRI GM6.
f. Vacuum Box testing shall be performed in accordance with ASTM D5641 and as
g. specified herein.
h. Continuity testing shall be performed as seaming progresses or as soon as a suitable
i. length of seam is available, not at the completion of all field seaming.

ii) Double Wedge Fusion Welded Seams:

a) Double fusion welded seams shall be tested using air pressure testing.
b) The procedure for testing shall be as specified in GRI GM 6 for the type and thickness of geo-membrane in use.
c) The leak or suspected leak shall be located and repaired.
d) The repaired seam shall be re-tested as required until all leaks are identified, and repaired, and the seam passes a subsequent air pressure test.
e) When the geometry of a double wedge fusion weld makes air testing impossible or impractical, vacuum testing may be used to test the seam.

iii) Extrusion Welded Seams:

a. Extrusion welded seams shall be tested using vacuum chamber testing in accordance with ASTM D5641.
b. The completed seam shall exhibit no leakage when tested between 4 and 8 psi minimum vacuum for approximately 10 seconds.

c. If leaks are discovered during testing, they shall be located, marked, and repaired.
d. The repaired area shall be re-tested and exhibit no leakage.

7.2.8 Destructive Testing – membrane:

i) Testing:

a. Destructive testing shall be performed by an independent third party laboratory employed by the Geo-membrane Contractor on samples cut from production welds in the field by the Geo-membrane Contractor.

b. Samples shall be taken by the Geo-membrane Contractor to the third party laboratory and tested for shear strength and peel adhesion. For double wedge seam samples, both welds shall be tested for peel adhesion. The third party laboratory that will perform testing shall be identified by the Geo-membrane Contractor with the bid proposal and agreed-to in writing by the Purchaser.

7.2.9 Repair of Defects and Seams –membrane

i) Patching

a. Patching shall be used to repair large holes, tears and destructive sample locations.
b. All patches shall be round, oval, or shall have rounded corners.
c. All patches shall be made of the base geo-membrane material and shall extend a minimum of 3 inches beyond the edges of the defect.
d. Patches shall be extrusion welded to the base sheet.

ii) Grinding and Welding

Grinding and welding shall be used to repair sections of extruded fillet seams with small defects.

iii) Spot Welding:
Spot welding shall be used to repair small tears, pinholes, or other minor localized flaws.

7.2.10 Crest Anchor Trench Excavation and Backfilling of HDPE Liner

The geo-membrane liner shall be anchored in anchor trench at the top and bottom of the slope and at berm locations as shown on the Design Drawings. The excavation for anchor trench shall be done by the contractor to the lines and widths shown on the drawings prior to placement of the liner. Excavated anchor trench shall be filled with fly ash bricks or crushed aggregates carefully so that sufficient anchorage is ensured while laying the HDPE membrane.

7.3 Laying and Installation of Geotextile

7.3.1 Panel Layout:

a) Prior to manufacture and delivery of the geotextile, a panel layout of the surface to be lined shall be made. Each panel to be used for the installation shall be given a numeric or alphanumeric identification number.

b) The panel identification number shall be related in writing to the manufacturing roll number that identifies the resin type, batch number, and date of manufacturer.

c) The panel layout shall be made considering the following requirements:

i. Panel lengths shall include slope gain and anchorage.
ii. Perpendicular tie-ins shall be made a minimum of 5 feet (1.5 m) beyond the toe of the
iii. slope.
iv. A minimum of 6 inch (150 mm) overlap shall be allowed at double fusion welded
seams. All field seams on slopes shall be oriented parallel to the slope (oriented along, not across the slope.
v. The number of seams in corners or odd shaped geometric locations shall be minimized.

7.3.2 Packaging

a. The geotextile shall be delivered to the project site in rolls each wrapped securely with a protective covering installed at the manufacturing facility. The covering shall prevent the entrance of water, vermin and dirt, and shall be adequate for protection against ultraviolet exposure. No material shall be folded.

b. A label shall be attached to each roll of the geotextile identifying the following:

i. Manufacturer.
ii. Product Identification, which can be traced back to the origin of the base material (resin supplier's name, resin production plant, resin brand name type, resin brand number, and production date of the resin).
iii. Date of manufacture of the geotextile.
iv. Roll identification number.
v. Geotextile thickness and type.
vi. Roll dimensions (length and width)
vii. Batch number.
viii. Order number.
ix. Panel number

c. Packaging and transportation shall be the responsibility of the Manufacturer.

7.3.3 Handling of Rolls

The method of off-loading the geotextile at the project site shall not cause any damage.

The rolls shall be placed on a smooth surface free of rocks and standing water.

7.3.4 Storage at the Project Site

Purchaser will provide on-site storage space in a location near where the liner will be placed so that on-site transportation and handling are minimized. The Contractor shall be responsible for protecting the stored material.

7.3.5 Cushion Layer below Geotextile

The Geotextile shall be laid over a 150 mm thick layer of natural sand/ manufactured crusher sand/ bottom ash. The material shall be clean with little or no fines conforming to IS 1498 unless specified otherwise. The Earthwork contractor shall be responsible for preparing and maintaining the surfaces to be lined prior to placement of the liner. The thickness and other arrangement shall be as per the details given in the drawing.

7.3.6 Field Placement of The Liner

General Requirements:

The placement procedure used for the geotextile liner shall include the conditions listed below.

i) Weather:

a. Geotextile shall not be placed when the air temperature is above 40°C or below 5°C unless it can be demonstrated to the approval of the Purchaser by trial welds that acceptable welds can be made at the prevailing temperature. Excessive moisture due to fog or dew, in ponded water, on a frozen subgrade, or during high winds.

ii) Panel Layout:

a. The panels shall be placed in accordance with the Manufacturer's panel layout drawing to ensure that they are placed in the proper direction for seaming.
b. If panels are installed in a location other than indicated on the panel layout drawing, the revised location shall be indicated on an "as-built" layout drawing.

iii) Panel Deployment:

a. Only the panels that can be anchored and seamed together in one shift shall be unrolled.
b. Unroll and layout panels in as close to the final position as possible. Pulling geotextile panels should be minimized to reduce the chance of permanent tension.
c. The methods and equipment used to deploy the panels shall not damage the geotextile or the supporting surface. Wrinkles shall be minimized. However, enough slack shall be provided in both directions so that there will be no tension in the geotextile at the lowest expected operating temperature.

iv) **Precautions to Prevent Wind Damage:**

a. If possible, work shall be oriented in the direction of the prevailing wind.
b. Provide adequate temporary loading and/or anchoring of the geotextile by the use of sandbags, tires or other means which will not damage the geotextile, to prevent uplift of the geotextile by wind.

v) **Other Precautions to Prevent Damage:**

a. Protection of the geotextile from damage due to foot traffic on the slopes shall be provided.
b. Provisions of facilities for safe entrance and egress of employees from sloped depressions is required.

vi) Replacement of Damaged Geotextile:

Any area of a panel, which, in the judgment of the Purchaser, becomes seriously damaged (torn, twisted, or crimped permanently), shall be replaced at no additional cost to the Purchaser.

7.3.7 Crest Anchor Trench Excavation and Backfilling of geotextile

The geotextile liner shall be anchored in anchor trench at the top and bottom of the slope and at berm locations as shown on the Design Drawings. The excavation for anchor trench shall be done by the contractor to the lines and widths shown on the drawings prior to placement of the liner. Excavated anchor trench shall be filled with fly ash bricks or crushed aggregates carefully so that sufficient anchorage is ensured while laying the HDPE membrane.

8.0 Dressing and Trimming of the Slopes

The outer slopes of the embankments shall be neatly dressed to line as the placing of other fill progresses. Compaction shall extend over the full width of the embankment and the material in the slopes shall be compacted as for the rest of structure. To ensure proper compaction at the outer edge, the fill shall be constructed for a minimum of 0.5m extra

width on either edges or the outer edge trimmed to specified width and slope, as per construction drawings, after completion of the dyke section up to top, in different stretches of the alignment. No slope shall be left without trimming to design slope. The trimmed slope surface shall be checked for adequate compaction as specified in the Quality Assurance checklist and under compaction, if any, shall be corrected.

9.0 Provision for Settlement

While forming the embankment, due allowance of 1 percent of the vertical height or as appropriate shall be made to allow for settlement so as to maintain the top of the dyke at designed elevation.

10 Drainage Filter and Rock Toe

10.1 Sand Blanket

Sand blanket shall be laid subsequent to site clearance, stripping and excavation, if any. The foundation area shall be cleared before laying the bottom layer of blanket material.

Filter material shall be laid in layers not exceeding 150 mm. Water as found necessary

shall be sprinkled before compaction. Care shall be taken to ensure that materials of

different layers do not get mixed, both at the time of placing and during compaction.

Extreme care shall be taken when placing materials in the zone to obtain a fill free from lenses, layers and streaks of segregated materials. After the layers of filter blanket

material and intermediate sand layer materials have been laid and compacted earth fill material shall be laid.

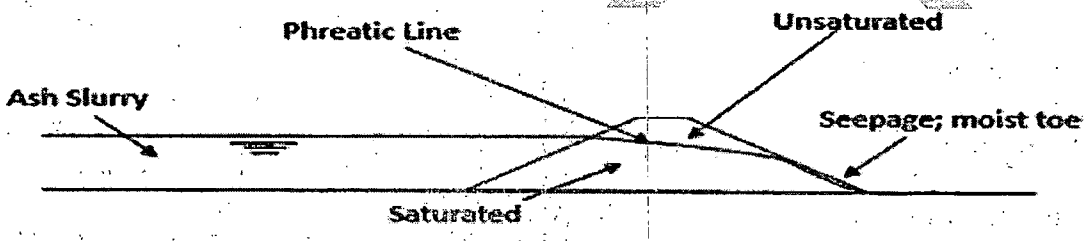
10.2 Sand Chimney

Sand chimney of specified thickness shall be laid at the specified location by excavating and removing the already compacted embankment material exposing sand chimney in the lower layers earlier laid, and refilling the trench with sand with in layers. The layer of sand shall be well watered and rammed. The depth of each layer of chimney to be laid shall not be more than 150 mm. The excavated material can be reused in the embankment area. While excavating the earth for filling sand for chimney drain, the top layer of sand which has been mixed with earth, shall also be removed.

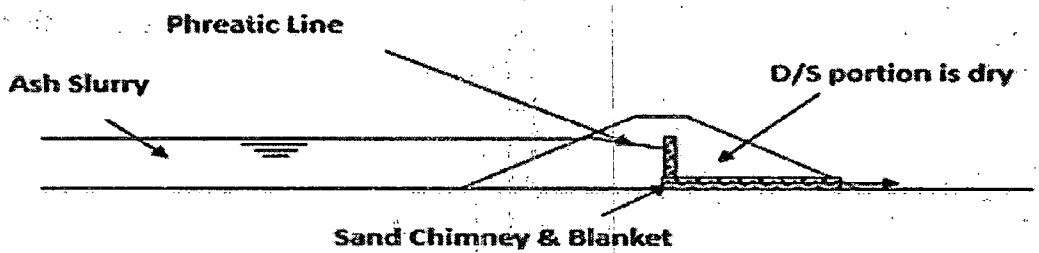
Alternatively, the sand chimney can also be laid in layers simultaneously with the laying of each layer of earth fill. In such case, the top level of sand layer shall always be kept at about 100 cm above earth level on both sides. Each layer of sand shall be well watered and rammed. Care shall be taken to avoid mixing of earth and sand.

10.3 Sand Filter

The sand filter underneath the rock-toe and between rip rap and the bund shall closely follow the levels of the embankment in the area. Sand filter shall be laid subsequent to stripping of foundation and/or trimming of slope of compacted bund. The excavated earth shall be removed from the working area and stockpiled at a place. The surface to receive the sand filter shall be properly cleaned before laying of filter material. The sand filter shall be laid in layers; the thickness of the layers shall not be more than 150 mm. Water as found necessary shall be sprinkled before compaction. The sand layer shall be well watered and rammed. Care shall be taken that materials of different layers do not get mixed, both at the time of placing and during compaction. The sand filter material shall be clean, sound, durable and well graded. No debris, wood, deleterious material etc., shall be permitted. Accumulations of soil caused by contamination shall be removed.



(a) Without Sand Chimney/ Blanket



(b) With Sand Chimney/ Blanket

Fig 14 Typical detail of Sand filters

10.4 Graded coarse aggregate filters

The coarse aggregate material shall consist of durable well graded broken rock of hard stone variety from the specified quarries and shall be approved prior to being transported to the area of deposition. The materials shall range in the size from 10mm to 75mm and shall satisfy the filter criteria.

The rock material used in the aggregate filters shall satisfy the following condition:

a) Specific gravity shall not be less than 2.50. (As per IS: 1122)
b) Sulphate soundness less than 10% loss of weight after 5 (As per IS: 1126) (Five) cycles
c) Aggregate Impact value shall not exceed 30%
d) Water absorption shall not exceed 2.5% (As per IS: 2386)

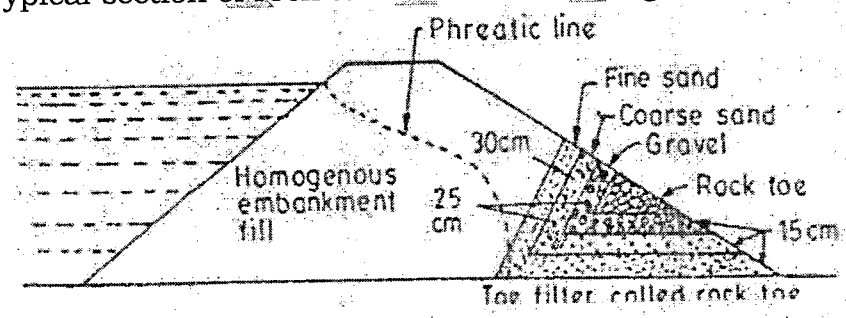
e) In slake durability test (as per IS: 10050), the percentage retained after two ten (10) minutes cycles shall be more than 85%.

10.5 Placing of rock toe

Graded aggregate filters shall be constructed over the trimmed surface of the embankment slope, as indicated in the drawings. The aggregate filters shall be placed in layers of uniform thickness as shown in the drawings and care shall be taken to avoid segregation of coarse and fine materials and formation of pockets.

10.6 Rock toe

The rock material used for the rock toe shall satisfy the quality requirements. Rock toe shall be formed with rock material consisting of sound, durable and well graded broken rock obtained from approved quarries and shall be of approved quality. The materials shall range in size from 10 to 45 cm. All brush, roots or other perishable materials shall be removed from rock-fill during spreading and disposal.
The rock available from the excavation of water escape structure1 stripping drain channel etc. which satisfy the quality requirements specified and found suitable for construction of rock toe may be used. These shall be washed, cleared, and broken into required size and stacked separately.
Similarly, rock materials for rock toe satisfying the quality requirements specified can also be obtained from rock if any available within the land acquired for construction of earthen dyke, if it is found suitable. The rock shall be broken to required size and shape and will be cleaned before utilized.
Typical section of rock toe is shown below fig 15.



Rock Toe.

Figure 15: Typical section of Rock Toe

11.0 Placing of Rock toe

The stone pieces shall be hand placed to obtain a stable, well graded and free draining fill. The rock toe shall be constructed in layers so that the smaller rock fragments shall be placed adjacent to the filter of embankment and the large rock fragments near the outer edge of the rock toe. The rock fill shall be hand placed spread and roughly levelled In layers not greater than 30 cm in thickness in order to maintain a reasonably uniform surface and ensure that

the completed fill will be stable and do not contain any voids having least dimension larger than 50 mm.

(i) Contamination of the rock with finer materials from any other zones shall be avoided. Accumulations of soil caused by contamination shall be removed. Rock materials shall not be dumped directly but shall be hand placed in layers.

11.1 Rip rap on the slope of embankment

Rip rap shall be hand placed on the slopes of the dam embankment as per IS: 8237
"Code of practice for Protection of slope for reservoir embankments". The thickness of the riprap layer shall be as indicated in the drawings. The thickness shall be measured normal to slope of the embankment.
The rock materials used for rip-rap shall satisfy the quality requirements specified.
The rip-rap material shall consist of the most durable rock fragments or approved quality selected for the purpose. The quality of individual rock fragments shall be dense, sound and resistant to abrasion, and shall be free from cracks, seams, shale partings, conglomerate bands and other defects that would tend to increase unduly their susceptibility to destruction by water and weathering action. The shape of the individual rock fragment shall be angular. Fragments having thickness less than 50% of their maximum dimensions shall not be used as rip rap. The stones shall be evenly distributed over the paved area. The average weight of stones shall be 15 Kgs. for 300 thick rip rap and 50 Kgs. for 600 thick rip rap.

These stones shall be placed on the edge with a longer dimension normal to the slope. Rock fragments and spells shall be tightly driven into the interstices to wedge the rip rap in place and close direct opening to underlying slope. The wedging shall be done with the largest chip practicable, each chip being well driven home with a hammer so that no chip can be removed by hand. Stones shall be laid in a compact manner beginning at the bottom of the slope.
Rip rap shall be placed along with the till so that a minimum of break down will occur during placing and spreading.

12.0 QUALITY ASSURANCE

This check list is intended to be an aid in identifying aspects of testing materials and workmanship. All test results must be submitted promptly. The following minimum checks/tests shall be carried out by the contractor for ash and earth at his cost.

12.1 Sampling, Testing and Quality Assurance

Quality of compacted material shall be controlled through periodic checks on fly ash gradation, the compaction process or the end product, singly or in combination as directed. The end product must conform to the specifications.

12.2 Control Test on Borrow Material

If fly ash from more than one source is being used at the project site, monitoring must be done to identify the ash type being placed. The tests required to be conducted on fly ash to be used as borrow material for embankment are indicated below. The frequency of testing indicated refers to the minimum number of tests to be conducted. The rate of testing must be stepped up as found necessary, depending on the compaction methods employed at the project IS Heavy Compaction Test: At the rate of 2 tests per every 3000 m3 of ash, as per IS: 2720 (Part 8)-1983.

Moisture Content: One test for every 250m of ash, as per IS: 2720 (Part2)-1973. The Samples collected for testing moisture content should be representative of the material being placed. Because fly ash may air dry relatively rapidly, samples should not be taken from the surface of the lift, but should represent the overall moisture content.

12.3 Analysis and Acceptance of Density Results

Control shall be exercised on each layer by taking at least one measurement of density for each 1000 square metres of compacted area, or closer as required to yield the minimum number of test results for evaluating a day's work on statistical basis. The determination of density shall be in accordance with IS: 2720 (Part 28)-1974. Test locations shall be chosen by random sampling technique.

QUALITY ASSURANCE CHECK LIST

Item No.	Type of Test	Frequency/Quantum of Check	Ref. Document	Acceptance norms
1. ASH/EARTH BORROW AREA				
A)	Standard Proctor density	Once in 10,000 M^3 Of fly ash/earth Once for every 2,000	IS:2720 (Part- VII)	
B)	Moisture Content	M^3 of borrow area or part there of	IS:2720 (Part- VII)	
2. ASH/EARTH WORK				
A)	In-Situ Dry Density	Once for every 10,000 M^3 in each layer of filing. At least one test shall be done per day irrespective of the progress	IS:2720 (Part-II &XXIX)	Minimum 95% of standard proctor max. Dry density
B)	Moisture Content	-do-	IS:2720 (Part-II)	As per specification

Chapter 7:

Operation and Maintenance of Ash Pond

1. INTRODUCTION

This section of the guidelines outlines the activities for operation and maintenance,
periodic inspection programs that which will ensure safe operation of the dyke.
Preventive measures provide timely repair of dykes. An emergency action plan shall be kept in place so that the site management shall ensure to obtain safe operation of dyke.

2.METHOD OF SLURRY DISCHARGE

The slurry discharge near the water escape structure shall be done in the initial stages
and after filling the area near the wells only slurry shall be discharged at other locations.

3.Decanting System

The Total Suspended Solids of decanted water effluent shall be considered as 100 PPM measured weekly unless specified by State Pollution Control Board otherwise. For this purpose, samples shall be regularly collected and checked for TSS. A register shall be maintained with records of such measurements. In case the TSS is more than the permissible value sufficient, time for decantation shall be maintained. For increasing the decantation time, increasing the height, of spillway may not be a practical solution always.

Only where the wells are provided with precast slabs, the raising of spilling level may be feasible by inserting slabs. However, where the spilling level is fixed at FRL in the
beginning itself, there is not scope for raising the spilling level.

The practical way for efficient decantation is adequate lagoon size commensurate with
the rate of inflow and efficient ash filling management (i.e judicial shifting of slurry
discharge points).

4. Maintenance of Ash Dyke

It is very important to constantly inspect the ash dyke and carryout necessary remedial
measures wherever certain abnormal behaviour is observed/noticed. Following aspects have to be considered during inspection of the dyke:

i) **Design slopes**: The slopes shall be maintained as per the drawings. In case of
deficiency makeup the slopes preferably by similar material.

ii) **Top width**: The top width of the dyke shall be as per drawings. In case of any
deficiency, the same shall be made up immediately.

iii) **Top level of dyke**
Top level of dyke shall be as mentioned in drawings. Any deficiency shall be made
up immediately. Settlement/ sinking if any shall be immediately rectified by additional earth fill.

iii) **Free board**
Free board as mentioned in the drawings shall be maintained. Measuring staff or
any such similar device may be used.

viii) **Earth cover and turfing**
Earth cover on the slopes mentioned in the drawings shall be maintained. Any erosion or deficiency in the slope, the same shall covered with additional earth cover of 0.5 m compacted thickness immediately.

v) **u/s slope protection**
Slope protection shall be maintained as mentioned in drawings/specification.

vi) WBM road, Kerb /dowel wall, slope drains
These shall be as mentioned in the drawings. Defects if any shall be attended.

vii) Rock toe, toe drain, berm, rock pitching and etc.
Rock toe, toe drain, berm, rock pitching and etc. shall be maintained as per the
drawings. Dislodgements/defects if any shall be corrected.

viii) Instrumentation

Piezometers surface settlement marker, shall be maintained in working condition
and protect from cattle crazing or theft. Defective instruments shall be replaced.
Other details like spillway, Water Escape Structure (WES) etc design bed gradient of drains not specifically mentioned but assist in maintaining the safety of dyke shall be attended as required.

ix) To avoid erosion on u/s slope due to discharge points, the discharge points of the

chute be extended inside the lagoon up to 5H from heel of dyke ('H' is the avg height of dyke).

x) From Safety point, provide railing or construct a safety wall of about 1.5m height
around WES wells above envisaged top level of wells using brick masonry.

xi) HCSD system is designed to be operated generally at an ash concentration of 55 to 65%. This ensures drying of HCSD slurry within short period of time. Operating the
HCSD system at lower ash concentration will lead to accumulation of water, which prevents drying of HCSD in the dyke thereby defeating the basic intent of adopting
HCSD System in power plant. So, the operation philosophy of HCSD is to be complied
strictly as per the procedure.

Wet patches/softening on downstream slope

If the wet patches found to appear on the slopes, the area adjacent to downstream of
the rock toe shall also be inspected. Corrective measures shall be taken immediately.

Frequency of inspection

i) As such in fair weather, dyke inspection shall be carried out once in every 15 days and in monsoon season inspection is to be carried out every week or less depending on condition of ash dyke.

All the operating and non-operating dykes shall be inspected practically after events like earthquake, cyclone, heavy rains, high flood in the river, etc. and a report prepared based on the observation, If any damage is noticed, the same shall be rectified as per the guidelines given in this note. If no suitable guidelines are found for the nature of the damage, the designer of the dyke shall be consulted immediately.

ii) Measurements on the instruments such as piezometers and settlement shall be
recorded on monthly basis. Frequency may be increased during monsoon period
and proper records to be maintained.

6.0 Preventive Measures:

The pond area which is under operation shall be inspected on regular basis. If any subsidence, sink holes or crates are noticed on the surface of pond, the downstream side at the same location shall be inspected for any other signs of weakness/abnormality in the nearby area. Immediate preventive measures

shall be taken A site report of such observations shall be recorded if necessary be communicated to the designer.

(i) Breach:

One of the main cause for breach of dyke/distress to the dyke is overtopping. To prevent overtopping, the design free board shall be ensured throughout the operating lagoons. Encroachment into free board must be avoided by advance planning of construction of the dyke raising in the other lagoons. All efforts shall be made to,

a) Ensure that future (next) lagoon shall be kept ready before the ash level reaches
the maximum design fill level.

b) Free board of 1.5m shall be maintained.

(ii) Erosion and Slope Protection:

The erosion beneath / on the dyke slope is responsible for the subsidence and instability of the dyke. Some of the major causes are rain cuts, insufficient soil cover / turfing etc.

Erosion on the u/s and d/s slope can be prevented by ensuring

(a) Compaction to the specified density both in the levelled portion of the dyke as
well as on slopes.
(b) Erosion of u/s slope of soil cover provided on ash embankment shall be prevented by pitching brick on the edge / ash cement mortar lining preferably from the bed
level or heel of the dyke upto the top level.
(c) Erosion of downstream can be prevented by turfing and proper compaction of soil
at sides besides providing slope drains to guide water from the dyke tops. Suitable
geotextile may be used to avoid erosion of slopes.
(d) By providing ripraps on the downstream wherever it is subjected to rainwater.
(e) All the rainwater from the dyke top shall be drained into the slope drains. These
shall be inspected & maintained on regular basis.
(f) Ensure proper gradient for the surface water to be drained through drains on the
slopes.
(g) Connection of dowel bank/wall & drain is maintained for draining surface water
from dyke top into the slope drains.

(h) Trees shall not be allowed to grow on the slopes and on dyke tops.

(i) It is necessary to fill all the gullies/cuts with earth and compact slopes and provide
turfing much ahead of monsoon. Geotextiles may be provided for slope protection.

(iii)Seepage and Piping

Piping or sand boiling is one of the main cause for excessive settlement or instability of the dyke. There are several reasons for this, however one of the main causes is improper drainage. This is primarily due to filter material not meeting the Filter criteria.

Other causes may be due to use of oversized borrow material in the fill, insufficient cover or turfing, improper slope protection on the upstream slopes,
encroachment into free board, rat holes etc.
Improper connection between slope drain and toe drain, connection between the WES and Pipes or the construction jointing WES are also probable causes for seepage and piping. To prevent seepage and piping, the following shall be ensured:

(a) The filter material shall satisfy the filter criteria.
(b) Toe drain shall be clear of any blockages.
(c) The invert of the toe drain should be below the blanket drain.
(d) The discharge/ seepage water shall be monitored for its colours/ suspended
particles.
(e) The cross-drain pipes from the toe drain shall be clear of all blockages.
(f) The construction joints between old and new construction shall be properly keyed.

(iv) Water Logging
In case of pervious foundation, the seepage from ponds can inundate the neighboring fields, causing damage to the fields. Water logging at the downstream shall be avoided to prevent subsidence/instability of the dyke. One of the main cause is improper connectivity from toe drain to natural drain.

To overcome this defect, a seepage barrier may be constructed around the dyke by
means of a grout curtain or by any other suitable seepage barrier. Other suitable
methods like artificial drainage through reverse sand wicks/relief wells, sand blanket
surface loading etc., pumping arrangement may have to be provided. Intermittent
sumps may also be considered in case of highly water logged areas. For details of relief wells refer IS 5050:1992.

(v)Place reverse filter layer

Providing relief wells near the affected area for safe exist of the seepage water. Observe the condition and monitor the outflow from the relief wells. A register shall
be maintained recording rate of flow from each relief well. Such measurements shall
be taken at a frequency of 15 days. If any of the discharge pipes from the relief well
is found to have been blocked, the same shall be cleared for effective relief of the
seepage water.

(vi)Gulley formation

Gulley formation on the downstream face due to surface water flow during rain can be prevented by maintaining grass turfing and by selecting non-erodible earth cover during the dyke construction. Further slope drains at intervals of 25-30 m will also help to avoid gulley formations. If any gully formation is noticed, the same shall be back-filled with cohesive soil and covered with grass turfing.

(vii)Rat holes/animal burrows

During inspection, if any rat holes or animal burrows are noticed, the same shall be plugged immediately using sand compacted by rod and then plug at the top with earth.The holes shall be filled and covered with grass turfing.

(viii)Growth of plants

Plants/trees shall not be allowed on the dyke top or slopes. Only shallow rooted grass shrubs can be allowed. If any plant growth is noticed, the area shall be cleared by removing all the roots, plug the area with selected soil and cover with grass turfing.

(ix)Choking of surface drainage

i) Stagnation of seepage water in the drains is not desirable. This may be due to deposition of soil particles in the drain. All toe drains and surface drains shall be cleaned periodically by removing silt or vegetation for smooth flow. Design bed gradient shall be maintained.

ii) Site/operation shall maintain record of total inflow into the ash dyke thorough various discharge pipes by suitable measuring system. For routine maintenance works of ash dykes like repair of rain cuts/rat holes/gulley's/plugging of wet spots/cleaning of rock toe & peripheral drains, each station shall have Annual maintenance contract for ash dykes.

7.0 MONITORING THE DYKE

To confirm the performance of the dyke as per the design requirements, it is essential
to monitor the performance of the dyke throughout its operation. Instruments commonly provided for such monitoring are listed below:

a) Settlement gauges along the top and slopes of dyke.
b) Piezometers, minimum 3 to 4 nos. at critical sections to check the phreatic line
during various stages of operation to verify the efficiency of internal drains.

c) Suitable device shall be installed at convenient location for Monitoring of free board. All the instruments for monitoring purpose mentioned above shall be protected against damage by the local people and by movement by vehicles and cattle. The measuring instruments shall be kept under safe custody and regularly cleaned to prevent corrosion and malfunctioning. The batteries, if any shall be regularly charged or replaced.

d) A typical Checklist for inspection is placed at **Annexure A**

8.0 OTHER GENERAL RECOMMENDATIONS

Following are necessary for effective operation and maintenance of the ash dyke:

i) Toe drain and surface drain shall be kept clean for smooth water flow and shall be
inspected for non- choking at least once in month.

ii) Unauthorized entry into ash pond area shall be prohibited and display boards shall
be installed at prominent locations. To avoid sabotage security guards for vigilance of the ash dyke area round the clock is preferable.

iii) To facilitate inspection and maintenance the entire dyke perimeter shall have accessible roads with at least WBM topping. All around the dyke alignment there shall be a single lane inspection road at ground level, besides roads on dyke tops in all phases. At least one road (either at the ground level or at the starter dyke (top) shall be bitumen covered and connected to a bitumen covered approach road
in order to ensure an all-weather approach to ash dyke area.

iv) Flood lights on the dyke area as required may be provided for inspection purpose.
These lights need to be turned on only in case of inspection during night and during emergency.

v) A site office / pota cabin may be considered at the ash pond area. The same may be provided with telephone and transport facility. It is desirable to have

an ash management group responsible for inspection and monitoring of the ash dyke and take corrective and preventive measures where required.

vi) One dedicated Vehicle should be allotted for ash dyke maintenance group and for
dyke construction.

vii) AMC shall be separate for stage wise ash dyke.

9.0 Manpower Requirement

Site management shall ensure adequate and complete staff to perform its functions in operation, inspection, and maintenance of dyke safety. It is essential that support
personnel and equipment/facilities are provided to accommodate the needed maintenance activities.

10.0 Emergency action Plan Planning

Despite the guidelines in design, construction, operation and maintenance and inspection, the possibility of dyke failure small or big shall not be completely ruled out.
Pre planning is required to identify condition which could lead to failure. In order to initiate measures to prevent failures is top priority. Measures shall be in place to minimize the effects of such failures.

The Emergency Preparedness plan is given in Annexure B.

11.0 GUIDELINES FOR CONTROL OF FUGITIVE DUST FROM ASH PONDS

Suggested Measures to be adopted for Fugitive Dust Control are as under:

11.1 OPERATIVE LAGOON

Ponding of Water and Maintenance of Freeboard:

In the operative lagoon, ponding of water is essential in the operating lagoon to ensure
proper sedimentation of ash particles. The water cover will also help in spreading ash
deposition to farther distances from inlet points towards water escape structure. In case of any non-uniform deposition of ash along the periphery of the dyke due to insufficient number of discharge points, flexible pipes of HDPE etc. may be utilized for uniform ash deposition, in the ash deficient pockets. The discharge points may be shifted before the ash emerges out of the design water surface. The lighter and flexible pipes may also be used for the farther extensions, deep into the lagoon for which floating supports, made

of any lighter material, viz, thermo-coal, wood etc, may be explored for such pipes, so that the discharge pipe may float just on the ponded water surface. Maintenance of water cover will also eliminate fugitive dust emission from the ash lagoons. A free board of 1.5m from the top of the dyke is kept from various design considerations. As per MOEF&CC guide lines, the operative lagoon is designed in such a way that decant water, before escaping, should cover entire ash surface in the lagoon, by ponding and by maintaining the design free board.

By maintaining the freeboard as mentioned above, the ash settles uniformly under water and till the time ash deposition level is below the design level, i.e., below the overflow level of the water escape structure, the dust emission from the operative lagoon will be under control and can be eliminated by ensuring water cover in the entire lagoon area.

11.2 NON-OPERATIVE LAGOON

In the non-operative lagoon, for the construction of dyke and borrowing ash, the top layer of the ash bed for a depth of about 1.0m to 2.0m, has to be dry so that equipment/machinery can move over the ash bed for the raising activities, viz, ash excavation in the borrow area, transportation and dyke construction. The dry ash, from the surface of the non-operative lagoon, normally flies during strong winds in summer season. The ash flying is more acute locally in the borrow areas due to these raising activities.

11.3 Rolling and Compaction:

The construction activities for raising of dykes and borrowing of ash will usually be going on near the periphery. Hence in the central region of the lagoon and some of the peripheral areas with no construction activities, the ash surface may be rolled and compacted which will reasonably stop the ash particles being lifted away by the mild wind flow over the surface. Rolling and compaction of ash surface with occasional wetting as per requirement, is techno-economically a better option for such undisturbed areas. However, during strong summer winds, the dust emission can be controlled, in such areas, through occasional and controlled slurry/water discharge, so that the ash surface is kept just wet. In such areas, covering the ash surface with thin layer of earth was also an alternative solution but it is a costly proposal and will not be effective without any proper compaction of the overlaying earth.

11.4 Slow/Occasional Discharge of Water/slurry to Wet Ash Surface:

Even in the non-operative lagoon, had the ash filling been stopped before the freeboard of 1.5m is encroached, the dust emission from the ash dyke could be minimized by occasional slurry/water discharge, at a low discharge rate

(i.e., by slow filling) into the non-operative lagoon to just wet the ash surface. The non-operative lagoon shall not be kept dry for long time and raising to be effected at the earliest. Till such time, slow filling to be resorted to. And since the ash surface will be below the designed level, major area of the ash surface can easily be made wet. In case, local ponding is required in some areas, small ponds may be created using small height ash bunds confined with empty cement bags filled with ash.

For the borrow area, used for borrowing ash for dyke construction during ash dyke raising, the dust emission, may be controlled locally by sprinklers, etc and these measures in the borrow areas may also be suitably included in the scope of the contractor, for dyke raising.

11.5 Sprinkling System

Each station shall prepare scheme for controlling fugitive dust emission. If spray is to be done, technical specifications, pipe line layout shall be prepared by station FES based upon typical schematic of sprinkler system as given in this document.

The lagoons especially on the perimeter, where the fugitive dust is severe, swivel type sprinklers are to be provided at every 50 metre. The sprinkler size shall be minimum 65mm.

For providing water to the sprinklers, following arrangement is required:

- A permanent pump house is to be provided near overflow lagoon having 3 nos. 50HP
- horizontal pumps. The capacity of these pumps shall be minimum 220 Cum per hour
- and head shall be 50 (Metre of water Column) MWC. The water from overflow lagoon shall be used for sprinkling purpose.

- Temporary sumps on the ash pond, where the slurry is not being discharged, shall be
- constructed out of brick masonry of 10 m dia and 1.5 m height, in which the water shall
- be pumped. The size of the sump may vary depending on the site requirement. From these sumps, again 2 nos. of 50 HP pumps shall be provided and connected to the sprinklers. The pipe network shall be made using used ash disposal pipes.

- Power supply for the pumps, may be taken from the nearby source whichever is techno-economical. A typical sketch showing the schematic arrangement for the sprinkling system is shown below Figure 16.

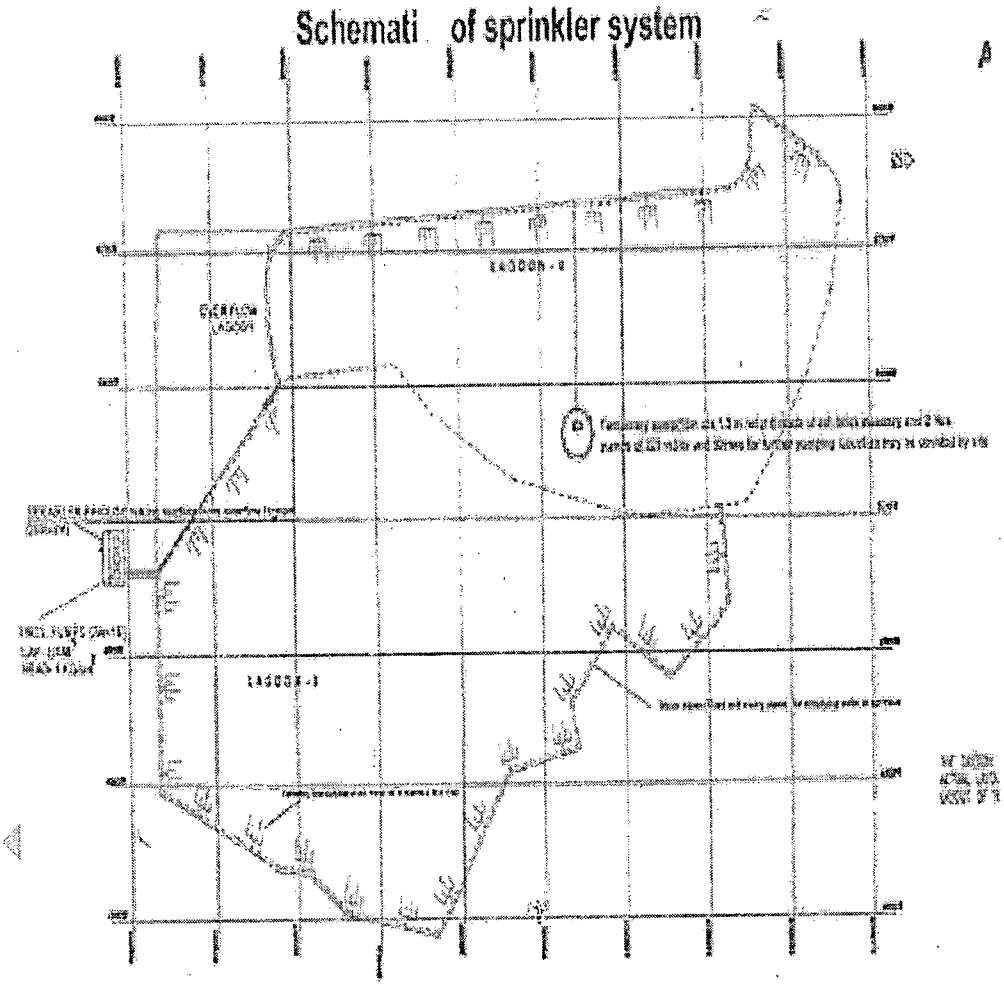


Fig 16: Typical sketch showing the schematic arrangement for the sprinkling system

11.6 Use of lean cement and ash slurry sprinkling.

By laying a very thin layer of lean cement ash slurry (4% -6% cement and 94 -96% ash) by sprinkling system can also be used for control of fugitive dust in non-operative ash dykes. Covering the ash surface with thick HDPE sheets and weighted with stone boulders at intervals.

12.0 Precautions for Overfilling Tendency

It has been observed that to utilize the lagoon storage capacity to the maximum possible extent, some of the project sites tend to overfill the ash ponds up to levels more than the design fill levels. In this regard, it may kindly be noted that during intermediate stages for raisings, overfilling does not enhance the overall storage capacity of the ponds, except that it creates problems of ash flying, as the ash emerges out in the free board area above the design water level. These higher spots, where the ash has emerged above the water surface, contribute to the dust emission, even in the operative lagoon and it will be difficult to wet these higher spots subsequently. Further, in non-operative overfilled pond, there is always a danger of rain water flowing from the higher ash filled area towards the dyke bund during heavy downpours and in the process, may result in the failure of dyke due to overtopping. A free board of 1.5m is normally kept to avoid all such problems and accordingly the invert level of water escape structure is also kept at 1.5m below the top of the dyke, called the designed ash fill level. It is therefore, advisable not to overfill the dykes and to take immediate measures for the areas already overfilled (if any), by suitably guiding the water towards the water escape structure (i.e., away from the peripheral dyke) to stop the rain water from over-topping the dyke.

Annexure-A

CHECK LIST OF ASH DYKE INSPECTION

1) Name of the Project:
2) Inspection Date;
3) Name of the Inspection officer:-
4) Season of Inspection Pre-monsoon/Monsoon/Post-Monsoon:-

Sr no	A) Ash Lagoon Details	LAG 1	LAG 2	Remarks
1.	Water level in the operation lagoon			
2.	TSS of Water effluent (Going outside/for recirculation)			
3.	Whether any ash surface is exposed above water			
4.	If ash surface is exposed above water level whether ash is flying anywhere			
5.	Whether water flowing through all the opening of the WES			
6.	Approximate head of water flow over the well slabs, 150mm			
7.	Approximate depth of water flow over ash surface around/near the operating water scape structure(WES)			
8.	Whether any inter slab leakage of ash of present in the water escape wells			
9.	Whether water flow is obstructed by floating plants or any other floating bodies near the vents in the WES			
B)	**DYKE**	LAG1	LAG2	
a)	Top level of Dyke			
b)	Whether there is any signs of settlement on the top of dyke			
c)	Whether any sign of sinking/Caving-in/bulging/boiling on i) Upstream slopes ii) Downstream slope iii)On the foundation very near to the downstream toe:			
d)	Whether any seepage is observed on i) Upstream slopes ii) Downstream slope iii)On the foundation very near to the downstream toe:			
e)	Whether any wet spots/areas are present i) Downstream slope			

	ii)On the foundation very near to the downstream toe:			
f)	Whether any longitudinal cracks are observed on: i) On the top of dyke ii) The upstream slope iii) The downstream slope			
g)	Whether any transverse cracks are observed in: i) On the top of dyke ii) The upstream slope iii) The downstream slope			
h)	If any cracks are observed on the tip and the slopes i)Whether the cracks on the top & Slopes are continuous. ii) Whether the cracks are lengthening with time iii) Whether the cracks are widening with time if seepage is observed on the slope or near the d/s toe.			
	DUMPING PATTERN IN ASH POND	Lagoon 1:	Lagoon 2	
	SIGNATURE OF INSPECTION OFFICERS			

ANNEXURE B

EMERGENCY PREPAREDNESS REPSONSE PROCEDURE

EPRP

ASH DYKE BREACH

SOURCE OF HAZARD	Escape of Ash slurry into adjacent land
Area & Location where it is being handled	Below the land of ash dyke
Case of emergency	Breach of ash dyke
Emergency Response	
Procedure to tackle	Inform to the Shift-in-charge, Engineer& Fire Station about the breach as soon as it is observed. - Inform higher authorities about the incident. –Ask for help from Maintenance Staff & O&M-Civil deptt. To stop the flow of: - Ash slurry to outside the dyke - Attend to the failed area
Personal safety	First-Aid Kit available i) Operation Control Room ii) CHP Control Room iii) First aid Centre (Plant); iv) CISF Control Room First Aid centre (Plant-"O" Mtr. Service building Ambulance:-"O" Mtr. Service building Hospital : round the clock medical aid available in township
Mitigation	Divert the discharge into other ponds or lower the slurry level. If required lower the invert of water escape structure, spilled ash around Ash Dyke shall be collected and put back into the Ash Dyke. At least 400-500 sand/ash filled bags shall be kept in readiness at site. A truck/tractor shall always be available. At any point of time, availability of local labor of 100 members should be kept in readiness in case of any emergency exists. The annual maintenance contractor/AHP contractors should also be available in case of emergency.
Immediate measure for plugging	Plug the breach section by dumping Sand bags. Once breach is plugged, the section shall be restored to original section of dyke by proper keying the new construction with existing construction.
Testing requirement	Round the clock inspection by Ash Handling Maintenance

Frequency	Monthly by O&M-Civil Ash Handling Maintenance in association with Operation Safety and Fire
RECORDS	a) Mock drill report available with safety, fire b) Actual occurrence report available c) Records as per testing requirement available

SECTION-B

(ENVIRONMENTAL ASPECTS, ANNUAL CERIFICATION, GREEN BELTS)

Chapter 8:

Environmental Aspects of Ash Disposal And Remedial Measures

1.0 General

Coal used in coal fired power plant in India has low calorific value (3500Kcasl/kg) and resulting high ash content.

This occupies large area of useful land for its storage and followed by polluting the atmospheric environment.

1.1 Disposal of Solid Wastes

As a consequence of combustion of coal, larger particles produced through agglomeration in furnace zone, due to heavy weight, do not escape easily into the atmosphere, rather, they settle down into pipeline because of gravitational pull and are termed bottom ash. Bottom ash contains unburned carbon to the extent of 3 – 12 % and it constitutes less than 20 % of the total ash content of the coal. The remainder which enters the connective zones of the boiler is called Fly ash. Ash severely pollutes the atmosphere. Physical and chemical changes in the mineral matter and the variation between coal, fly ash and chemical distribution occurs in fly ash is based on combustion process. Coalescence of minerals during combustion found most dominant process during the transformation of coal minerals to ash. Activation of course fly ash particles showed more adsorption capacity by controlling gasification of the unburned carbon.

1.2 Influence of Fly Ash On Surface Water.

Although, these zeolites are being used in several applications *viz.* As absorbents for removal of heavy metal ions and other.

Since fly ash does not contain any unburnt carbon, it should be treated as separate commodity because the presence of carbon in bottom ash affects its pozzolanic activity if mixed with bottom ash. Further, the pozzolanity of the freshly formed dry ash particles is seriously affected, once the particles get moistened with water.

Ash disposal in setting pond or land fill may influences the aquatic ecosystem through surface runoff and seepage nearby that area and finally result in contamination of ground water by leaching of heavy metals from the CCRs.

The water discharged from the ash pond is likely to contaminate the quality of river, channel, nallah water nearby that area eventually thus contaminating the ground water. Some of the heavy metals, released from ash disposal,

considered as micro nutrients, indeed for biological system, and become detrimental to plant life.

2.0 Environmental Aspect of Fly Ash Disposal:

Following environmental aspects are to be ensured to avoid adverse impact on environment on account of ash disposal in ash dykes.

a) Zero Liquid Discharge (ZLD)

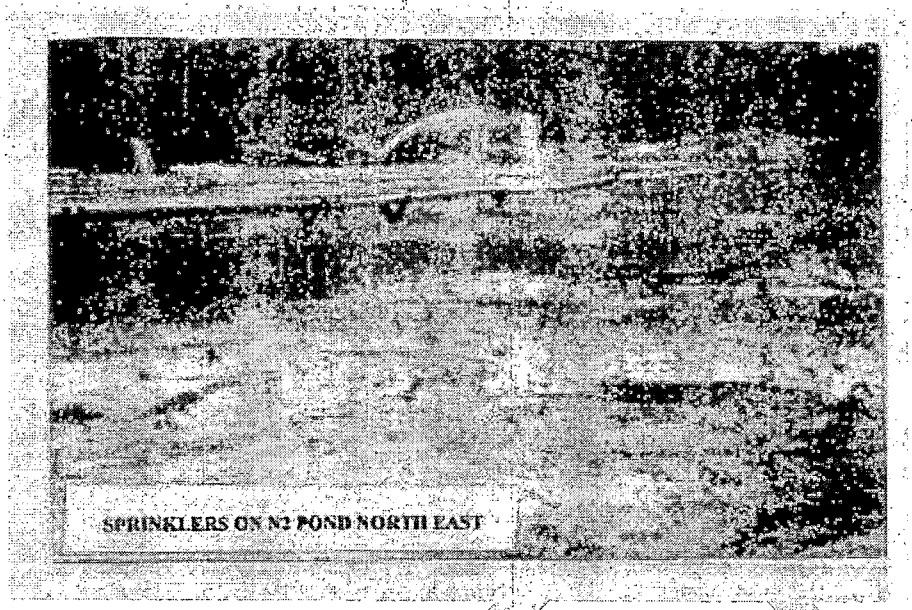
No discharge of liquid effluent from ash dyke into the river or any surface water body to done. The supernatant from the ash dykes are to be recycled back to the plant to ensure ZLD. Further, the water entrapped in deposited ash is to be collected through dyke embankment by intercepting through chimney/blanket filters, in to a toe-drain all around the dyke and recirculated back to the plant through toe-drain water recirculation system.

b) Fugitive Dust control

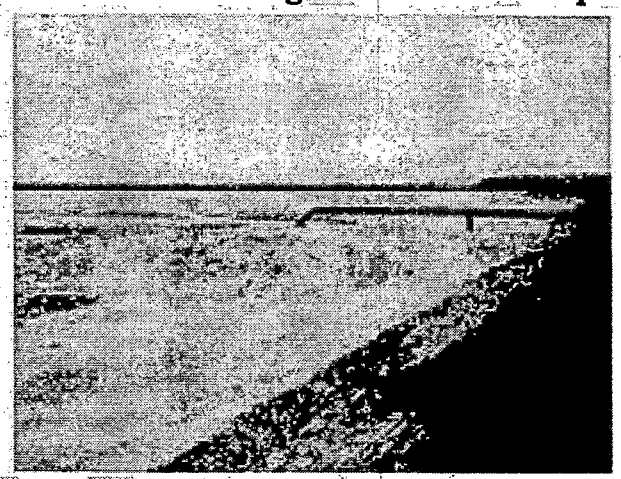
Dry fly ash is readily lifted up by wind due to less cohesive force in the fine solid particles. One of the conditions stipulated by MoEF&CC in environmental clearances is to control fugitive dust emission. The fugitive dust emission could be either from ash pond from

a) operating lagoon,
b) non-operating lagoon
c) abandoned ash pond.

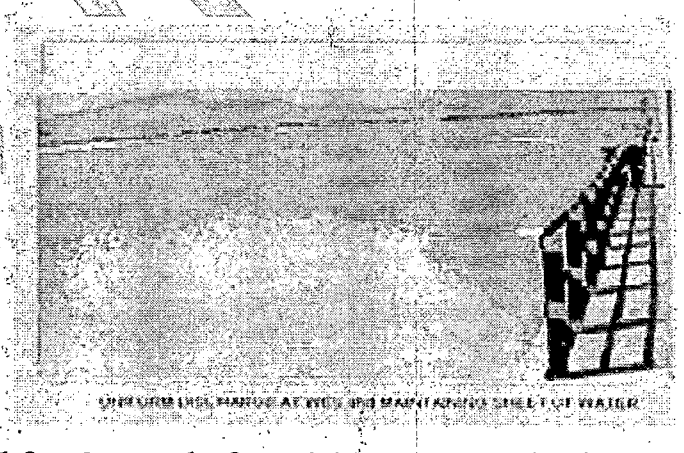
In the operative lagoons, adequate water cover is maintained over the deposited ash to prevent any fugitive dust emission from storage lagoons. However, there may be emission of fugitive dust during evacuation of ash from storage lagoons, which shall be suppressed with proper dust suppression system using water sprinklers. The water available in the OFL may be used for dust suppression system. A typical dust suppression system adopted during raising of dykes is shown in following Fig 17. for reference.



a) Safe Disposal for Control of Fugitive Dust.With Sprinkler



b) Safe Disposal for Control of Fugitive Dust With Uniform Discharge and Free Board



c)Safe Disposal for Control of Fugitive Dust With Sheet of Water

Figures17: Various Dust suppression system

During transportation of ash, the truck mounted water sprinklers may also be used, if fugitive dust emission occurs along in the working areas.

At the time of finally abandoning the ash dyke, to control the dust emission, the final ash surface may be covered with 500 mm thick soil. Apart from controlling the dust emission this would also assist in the growth of vegetation over the abandoned ash dyke area. Depending upon site requirement, the abandoned ash pond area may be used for planting trees or may be put for some other use as shown in figure 18(a) and 18(b). The final abandoned pond level however should be sufficiently lower than the top level of the peripheral ash dyke. So that the area can be properly drained towards the existing water escape structures.

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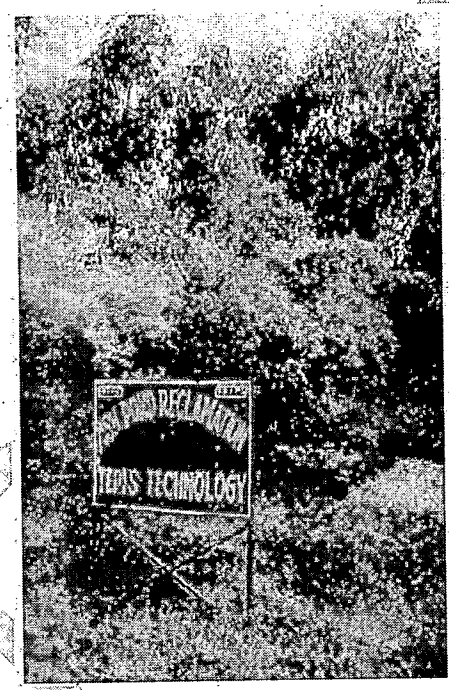


18 (a) Abandoned Dyke – Reclaimed

c)Prevention of Ground Water contamination

The impervious liner as per actual site requirements is to be provided before discharge of ash in ash pond in order to achieve the required imperviousness of permeability not more than 1 x 10^{-7} cm/sec to prevent ground water contamination. Impervious liner (with bentonite-blended soil) may be adopted for the ash dykes in bottom ash lagoons and overflow lagoon (OFL). Where as in flyash lagoon, the high concentration slurry (HCS) being highly viscous and self-hardening with pozzolanic properties achieves the required imperviousness of the bed in lagoon and accordingly, no additional lining may be required in flyash lagoon disposed in HCSD mode. A typical ash dyke section with impervious liner is shown in following Fig 19. for reference.

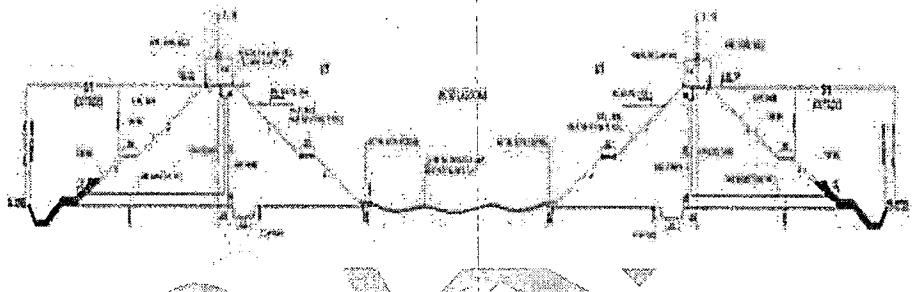


Fig 19: Typical ash dyke section with impervious liner

3.0 Health Hazards of Fly ash disposal

Fly ash disposal poses problems in the form of land use, health hazards, and hazard to entire ecosystems. Toxic trace metals present in the ash may leach out of the ash ponds and contaminate the soil, ground water and surface water, limiting the survival and growth of plants and microbial population. Medical studies have proved adverse effect on human health due to presence of respirable particulate matter <10 µm in size. Finer particles <2.5 µm have much greater impact as they can penetrate deeper into the respiratory system Dispersion of particulate matter to the surrounding environment takes place, especially when ash-handling activities on dumping sites are in progress. The air borne fly ash particles deposit on surfaces of materials and plants.

In order to combat the air pollution due to industries, the Government of India has made it mandatory to have green belt areas around the new as well as existing industries. In this regard comprehensive 'Guidelines for Developing Green Belts' have been compiled by Central Pollution Control Board, Government of India, India.

In the context of environmental pollution abatement, green belt has been defined as "a strip of trees of such species, and such a geometry, that when planted around a source, would significantly attenuate the air pollution by

intercepting and assimilating the pollutants in a sustainable manner." However, green belts also include other vegetation especially shrubs, but still the trees are the mainstays of green belts and often green belt plantation is simply referred as 'trees'

Plants filter pollutants from the air in three ways, viz. absorption by the leaves, deposition of particulate and aerosols on leaf surface, and fallout of particulate on the leeward (downwind) side of the vegetation because of the slowing of the air movement.

Some plants can be incorporated in the green belts near the thermal power plants so that these serve as filters and remove airborne fly ash particles.

Chapter 9

Annual Certification of Ash Ponds and Dykes and Annual Compliance Audit of Ash Generation and Utilization & Disposal

1.0 General

Ash Notification 31.12.2021 mandates power plants to ensure **Annual Certification of ash pond and dykes** on safety of ash ponds and dykes, capacity utilization/availability of ash ponds, water use/recycling and wastewater disposal, and environmental pollution and green belt etc., according to the specification and procedures laid down by CPCB in consultation with CEA, and submit annual implementation report about the compliance of provisions in the notification by the 30th day of April, every year to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC), Central Electricity Authority (CEA), and concerned Integrated Regional Office of Ministry of Environment, Forest and Climate Change by the coal or lignite based thermal power plants.

Ash Notification 31.12.2021 also mandates that **Annual Compliance Audit of Ash Utilization and Disposal** by power plants as well as user agencies shall be conducted by auditors, authorized by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report.

2.0 Annual Certification of ash pond and dykes

Design and construction specifications and operation and maintenance procedures for ash ponds and dykes have been described in previous chapters. Annual certification of ash ponds and dykes shall be carried out by a qualified professional engineer for structural stability and safety assessment and to ensure that the design, construction, operation, and maintenance of the ash pond and ash dykes is consistent with recognized and generally accepted good engineering standards.

1. Annual certification shall be carried out once in every year and annual implementation report about the compliance of provisions in the notification shall be submitted by the 30th day of April, every year

2. Annual certification shall be by a qualified professional geotechnical engineer.

3. TPP shall make available any kind of record/Data etc required at the time of certification.

4. Certifying Expert shall examine the Compulsory Periodic Maintenance Inspection Checklist for the Ash Pond provided by TPP

5. Certifying Expert shall submit the report which shall cover the following:-
   a) Structural stability of the active Ash Pond as per IS 7894
   b) Slope Protection as per relevant IS code
   c) Adequate Spillway Capacity
   d) Dykes compaction
   e) Downstream erosion protection
   f) Check list for Annual Safety Audit and Check list for Fly Ash generation and utilization
   g) Interpretations from the compulsory maintenance inspections check lists on the overall safety of the Ash Pond
   h) Details of the actions taken on the deficiencies noted during the maintenance inspections and annual certification inspection

6. Report of the annual certification shall inter alia include observations on points mentioned in Para A(6) of the notification as well as details of the actions taken on the deficiencies noted during the safety audit.

3.0 Annual Compliance Audit of Ash Generation and Utilization & Disposal

Year wise targets for utilization & disposal of ash in the permitted avenues has detailed in the Ash Notification 31.12.2021 separately for current ash generation from implementation date 01.04.2022 onwards and for legacy ash stored as on 31.03.2022 in Para A(4) and A(5) respectively.

Annual Compliance Audit of Ash Generation and Utilization & Disposal by power plants shall be conducted by auditors authorized by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report.

3.0 Check List for Annual Certification of Ash Ponds and Dykes (for the period 1st April-31st March) to be submitted on or before 30th April

Sr No	Component	Observations/Remarks
1.	**Name of Power Plant**	
2.	**Name of the company**	
3.	**District**	
4.	**State**	
5.	**Postal address for communication:**	
6.	**E-mail:**	
7.	**Power Plant installed capacity (MW):**	
8.	**No. of units generated (MWh):**	
9.	**Total area under power plant (ha): (including area under ash ponds)**	
10.	Method of slurry discharge	.
11.	TSS of decant Water (Going outside/for recirculation)	
12.	Maintenance of Dyke. 1. Top Width 2. Top level of dyke 3. Free board 4. Earth covering and turfing 5. U/S slope protection 6. WBM Road 7. Rock Toe, toe drain, berm, rock, pitching	
13.	Instrumentation a) Piezometer, b) surface settlement	
14.	Wet Patches/softening on down Slope	.
15.	Gully Formation	
16.	Rat holes/ animal burrows	
17.	Growth of plants	
18.	Toe drain and surface drain.	
19.	Facilities for inspection and maintenance of the dyke	
20.	Flooding Lighting.	
21.	Seepage or Leakage	
22.	Monolith Joints –	

Sr No	Component	Observations/Remarks
23.	Foundation should be examined for damage or possible undermining of the downstream toe	
24.	Slope Stability dyke: 1. Dyke Slope stability, as per IS 7894 to be examined and write the results and submit the report. 2. Dyke slopes should be examined for irregularities in alignment and variances from smooth uniform slopes, unusual changes from original crest alignment and elevation, evidence of movement at or beyond the toe, and surface cracks which indicate movement.	
25.	Condition of Drainage Systems	
26.	Condition of Slope Protection	
27.	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcccoalash@gov.in	
28.	Signature of Authorized Signatory	

4.0 Check List for Annual Compliance Audit for Ash generation and utilization & disposal (for the period 1st April-31st March) to be submitted on or before 30th November.

Sr No	Component	Observations/Remarks
1.	**Name of Power Plant**	
2.	**Name of the company**	
3.	**District**	
4.	**State**	
5.	**Postal address for communication:**	
6.	**E-mail:**	
7.	**Power Plant installed capacity (MW):**	
8.	**Plant Load Factor (PLF):**	
9.	**No. of units generated (MWh):**	
10.	**Total area under power plant (ha):** **(including area under ash ponds)**	
11.	Quantity of coal consumption during reporting period (Metric Tons per Annum):	.
12.	Average ash content in percentage (per cent):	
13.	Quantity of current ash generation during reporting period (Metric Tons per Annum): Fly ash (Metric Tons per Annum): Bottom ash (Metric Tons per Annum):	
14.	Capacity of dry fly ash storage silo(s) (Metric Tons) :	
15.	Details of utilization of current ash generated during reporting period (a) Total quantity of current ash utilized (MTPA) during reporting period: (b) Quantity of fly ash utilized (MTPA): Avenue wise break up (separately for fly ash and bottom ash):	.

Sr No	Component	Observations/Remarks
	(i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels) (ii) Cement manufacturing: (iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and fly over embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts; (xiii) Export of ash to other countries: (xiv) Others (please specify): (c) Quantity of bottom ash utilised (MTPA): (i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): (ii) Cement manufacturing: (iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and flyover embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps:	

Sr No	Component	Observations/Remarks
	(xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts: (xiii) Export of ash to other countries: (xiv) Others (please specify), if recommended by the Committee and added in notification as per para A(3): Total quantity of current ash unutilised (MTPA) during reporting period: (i) Current unutilized fly ash: (ii) Current unutilized bottom: Total cumulative quantity of current ash unutilized (MT) after 31.03.2022 as on 31 March:	
16.	Percentage utilisation of current ash generated during reporting period (per cent):	
17.	Details of disposal of ash in ash ponds (a) Total quantity of ash disposed in ash pond(s) (Metric Tons) as on 31st March (excluding reporting period): (b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons): (c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m3): (d) Total number of ash ponds: (i) Active:	

Sr No	Component	Observations/Remarks
	(ii) Exhausted (yet to be reclaimed): (iii) Reclaimed: (e) total area under ash ponds (ha):	
18.	Individual ash pond details Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one) (a) Status: Under construction or Active or Exhausted or Reclaimed (b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY): (c) Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds) (c) area (hectares): (d) dyke height (m): (d) volume (m3): (e) quantity of ash disposed as on 31st March (Metric Tons): (f) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons): (g) expected life of ash pond (number of years and months): (e) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates) (f) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining	

Sr No	Component	Observations/Remarks
	g) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD) (h) Ratio of ash: water in slurry mix (1:___): (i) Ash water recycling system (AWRS) installed and functioning: Yes or No (j) Quantity of wastewater from ash pond discharged into land or water body (m3): (k) Last date when the dyke stability study was conducted and name of the organization who conducted the study: (l) Last date when the audit was conducted and name of the organization who conducted the audit:	
19.	Quantity of legacy ash utilised (MTPA): Avenue wise break up (separately for fly ash and bottom ash: i. Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): ii. Cement manufacturing: iii. Ready mix concrete: iv. Ash and Geo-polymer based construction material: v. Manufacturing of sintered or cold bonded ash aggregate: vi. Construction of roads, road and flyover embankment: vii. Construction of dams: viii. Filling up of low lying area: ix. Filling of mine voids:	

Sr No	Component	Observations/Remarks		
	x. Use in overburden dumps: xi. Agriculture: xii. Construction of shoreline protection structures in coastal districts; xiii. Export of ash to other countries: xiv. Others (please specify) if recommended by the Committee and added in notification as per para A(3): Total cumulative quantity of legacy ash utilized (MT) after 31.03.2022 as on 31 March : Total (depleted) quantity of legacy ash stored (MT) as on 31 March :			
20.	Summary:			
	Details	Quantity generated (MTP)	Quantity utilized (MTP) and (per cent)	Balance quantity (MTP)
	Current ash during reporting period			Current year balance and Cumulative balance after 31.03.2022 as on 31 March both
	Legacy ash	Ash stored in ash pond(s) as on 31st March 2022		Total (depleted) quantity of legacy ash stored (MT) as on 31 March :
	Total	N.A.		

Sr No	Component	Observations/Remarks		
21.	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcccoalash@ gov.in			
22.	Signature of Authorised Signatory			

Chapter 10: Green Belt for Ash Ponds

1.0 INTRODUCTION

The Ministry of Environment, Forest and Climate change (MoEF&CC) insisted to develop green belt for new and existing projects proposing expansion and modernization in their respective Environmental Clearance (EC), in order to minimize the impacts due to air pollution and noise pollution in the environment.

Green belt is plantation of trees for reducing the pollution. Green plants form a surface capable of settling air pollutants and forming sinks for pollutants, it improves the aesthetic value of local environment. Green belts are planned in open spaces and safeguarded from developmental activities such as construction of buildings, factories, any other infrastructural activities; these areas are used only for growing vegetation cover. Green belts in and around urban and industrial areas are important for maintaining ecological health of the region.

For thermal power plants, to mitigate dust pollution, a thick green belt should be developed around the plant and ash pond/dyke area. Green belt shall be developed around the ash pond in addition to the green belt around the plant boundary.

Development of green belt consisting of three tier along the periphery of the project with native species is recommended. Green vegetation cover is beneficial in many ways leading to conservation of biodiversity, and maintaining pleasant climate of the area, providing possible habitats for birds and animals. Green belt minimizes the build-up of pollution levels in urban / industrial areas by acting as pollution sinks. The main advantages of green belt in and around the industry are to control air and noise pollution. Trees help in trapping particulate matter, removing carbon dioxide and other pollutants from air and by release of oxygen into the air thereby improving the air quality. Green belt reduces the intensity of sound by deflect, refract or by absorb sound, it will function as barrier between industry and neighbour-hood. The intensity reduction depends upon the distance sound has to travel from source and width of the greenbelt. Green belt also helps in soil erosion control through improvement of soil quality and binding soil.

2.0 During the Ash Pond reclamation, the following measures are to be undertaken:

i. Storm water drains shall be constructed for channelizing the run-off water away from the disposal site.

ii. A 500 mm thick soil cover shall be provided to promote vegetation growth.

iii. For plantation purpose, preference shall be given to both native species and mixed culture. The species will be selected carefully from the following groups for quick reclamation under the guidance of a taxonomist:

- Tree species for fuel wood and timber
- Forestry type tree species.
- Tree species with dense foliage for shade.
- Native species.

iv. However, fruit bearing species shall be avoided.

3.0 Preconditions for abandoning:

1. Permission from Regulatory authority: Power plant/ land owner/ agency shall obtain statutory permission from regulatory authorities such as SPCB as per the requirement.

2. Prevention of pollution: Suitable methods should be adopted and necessary arrangement should be made to prevent pollution during the complete exercise.

3. Soil Cover on the top of ash fill: The soil required for soil cover shall be excavated from nearby location. Only the minimum quantity of soil required for the purpose of cover shall be excavated from the soil borrow area. The voids so created due to removal of soil shall be filled up with ash with proper compaction and covered at top with soil cover. A 500 mm thick soil layer shall be placed over the ash fill area. This should be done as an integral part of RECLAMATION development work.

The final abandoned pond level however be lower than the top level of the peripheral ash dyke. So that the area can be properly drained towards the existing water escape structures

4.0 Levelling

All existing undulations, holes, cavities and excavations made for plate load rests and other soil investigations, etc. shall be filled with pond ash having requisite moisture content. The ash thus filled shall be compacted with the help of vibratory rollers so as to achieve dry density of not less 95% as per

I.S–2720 (Part-VII). This would result in a levelled surface upon which SOIL COVER can be done.

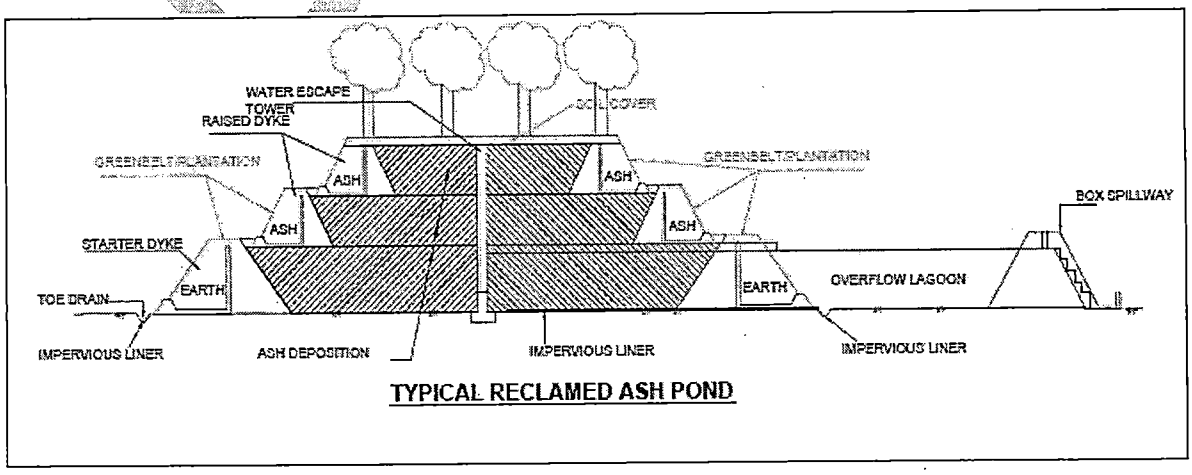
5.0 Placement of earth cover in filing area

Earth cover shall be laid simultaneously with the laying of compacted ash layers and on side slopes. As in the case of ash layers, compacted thickness of earth layers shall not be exceeding 500 mm. As far as top cover of earth is concerned, after the area has been covered with compacted ash up to 500 mm below the required finished level of the area, a compacted layer of 500 mm thickness of suitable earth shall be placed over ash surface. This cover shall be placed in layers each layer shall be of 250 mm in compacted thickness.

The combined excavation and placing operations shall be such that the materials when compacted in the fill will be blended sufficiently to produce specified degree of compaction on stability. No stones, cobbles or rock fragments, having maximum dimensions more than 25 mm shall be placed in the earth cover. Such stones or cobbles shall be removed either at the borrow pit or before it is used as Soil Cover.

6.0 Reclamation of Abandoned Ash Pond

A three tier plantation approach (consisting of large trees, smaller trees and shrubs) will be followed for overall eco-restoration of the area. This will also help in checking the surface run-off, preventing the water from percolation and maintaining the aesthetics beauty of the surrounding in general A conceptual diagram of the reclaimed ash pond is presented below.



TYPICAL RECLAMED ASH POND

7.0 Precautions

The following precautionary measures are required for safe working during the reclamation activity:

(i) Appropriate measures should be taken to prevent entry of cattle/livestock inside the pond area during execution period.

(iii) Water sprinkling for dust suppression during handling of Ash shall be ensured from being air borne.

(iv) After complete reclamation of the site, sign board shall be kept indicating abandoned ash pond has been reclaimed with ash. This will help to propagate the message of provision of green belts ash ponds.

8.0 Annual certification of reclaimed ash ponds and dykes

Power plants shall ensure annual certification of reclaimed ash pond and dykes also in respect of safety, storm water collection and disposal, and environmental pollution and green belt etc. and shall submit report along with the certification report of operational ash ponds and dykes.

Annexures

List of Annexures

I. Fly Ash Notification dated 31.12.2021

Fly ash notification dtd 31st Dec, 2021.pdf

II. MoP Letter dated 22.02.2022

MoP letter 22nd Feb 2022.pdf

III. IS Codes and References