

**IN THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

ORIGINAL APPLICATION NO. 327 OF 2022

IN THE MATTER OF :

Amaravati Fly Ash Bricks Manufacturers Association

...Applicants

Versus

Union of India& Ors.

...Respondents

**COMPENDIUM OF NOTIFICATIONS/ GUIDELINES/REPORTS/OFFICE
MEMORANDUM ETC. GOVERNING USE OF FLY ASH**

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Drawn and filed by:



Ajit Sharma & Saurabh Rajpal

Amicus Curiae

Place: New Delhi

Dated: 23.04.2025

Orders

Annex. P-3

Present:

Mr. Arvind Nigam For the Appellant

Ms. Pratibha M singh for the Respondent –UOI

Dr. M.A. Haque, Additional Director, Ministry of
Environment and forests in Person

C.W.No. 2145 / 99

Respondent is directed to see that the Final Notification is published within a period of two weeks from today.

Such directions are being given because it is necessary to protect the environment, conserve the top soil and prevent the dumping and disposal of the Fly Ash produced by Coal and Lignite based Thermal Plants on land and landfills.

This will also make use of the Fly ash.

List again on 25/08/1999.

Dasti.


TRUE COPY

Chief Justice

S K Mahanjan (Judge)

28/07/1999

Ravindra

Present:

Dr B. L. Wadehra, Petitioner in CW
2048/99 in person.

Mr Rajesh kapur For Mr. Arvind K. Nigam

For the Petitioner in CW 2145 /99.

Mr. Maninder Singh for UOI.

Ms. Rekha Palli for Respondent No. 01 / UOI

Mrs. Rachna Joshi Issar for NTPC.

Ms. Alpana Poddar for the Respondent.

Mr. B. K. Sood with Mr D. K. Vijay for BIS.

CW 2145 / 99

On request of Mr. Maninder Singh adjourned to 26 October,
1999 to enable Union of INDIA to comply with Order dated
28/07/1999 and to see that the Final Notification is published
before that date.

Copy of Order dated 28/07/1999 to be supplied to Mr Maninder
Singh.

August 25, 1999



TRUE COPY

Chief Justice
S K Mahanjan J.

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 14th September, 1999

S.O. 763(E).— Whereas a draft notification containing certain directions was published, as required by sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986 under the notification of the Government of India in the Ministry of Environment and Forests number S.O. 453(E) dated 22nd May, 1998 inviting objections and suggestions from all persons likely to be affected thereby, before the expiry of the period of sixty days from the date on which the copies of the Gazette of India containing the said notification are made available to the public;

And, whereas, copies of the said Gazette were made available to the public on the same date;

And, whereas, the objections and suggestions received from the public in respect of the said draft notification have been duly considered by the Central Government;

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

And, whereas, there is a need for restricting the excavation of top soil for manufacture of bricks and promoting the utilisation of fly ash in the manufacture of building materials and in construction activity within a specified radius of fifty kilometers from coal or lignite based thermal power plants;

And, Whereas, the Hon'ble High Court of Judicature, Delhi vide its order dated 25th August, 1999 in CWP No. 2145/99 Centre for Public Interest Litigation, Delhi v/s Union of India directed that the Central Government to publish the final notification in respect of fly ash on or before 26th October, 1999;

Now, therefore, in exercise of the powers conferred by sub-section (1), read with clause (v) of sub-section (2) of section 3 and section 5 of the Environment (Protection) Act, 1986 (29 of 1986); and in pursuance of the orders of the Hon'ble High Court, Delhi stated above, the Central Government hereby issues the following directions which shall come into force on the date of the publication of this notification, namely:—

1. Use of fly ash, bottom ash or pond ash in the manufacture of bricks and other construction activities.-

- (1) No person shall within a radius of fifty kilometers from coal or lignite based thermal power plants, manufacture clay bricks or tiles or blocks for use in construction activities without mixing atleast 25 per cent of ash (fly ash, bottom ash or pond ash) with soil on weight to weight basis.
- (2) The authority for ensuring the use of specified quantity of ash as per para (1) above shall be the concerned Regional Officer of the State Pollution Control Board or the Pollution Control Committee as the case may be. In case of non-compliance, the said authority, in addition to cancellation of consent order issued to establish the brick kiln, shall move the district administration for cancellation of mining lease. The cancellation of mining lease shall be decided after due hearing. To enable the said authority to verify the actual use of ash, the thermal power plant shall maintain month-wise records of ash made available to each brick kiln.
- (3) In case of non-availability of ash from thermal power plant in sufficient quantities as certified by the said power plant, the stipulation under para (1) shall be suitably modified (waived/relaxed) by the concerned State/Union Territory Government.
- (4) Each coal or lignite based thermal power plant shall constitute a dispute settlement committee which shall include the General Manager of the thermal power plant and a representative of All India Brick and Tile Manufacture's Federation (AIBTMF). Such a committee shall ensure unhindered loading and transport of ash without any undue loss of time. Any unresolved dispute shall be dealt with by a State/Union Territory level committee to be set up by State/Union Territory Government comprising Member Secretary of the State Pollution Control Board/Pollution Control Committee, representatives of Ministry of Power in the State/Union Territory Government and a representative of AIBTMF.

2. Utilisation of ash by Thermal Power Plants.-

All coal or lignite based thermal power plants

shall utilise the ash generated in the power plants as follows:-

[भाग II—खण्ड]

- (1) Every coal or lignite based thermal power plant shall make available ash, for at least ten years from the date of publication of this notification, without any payment or any other consideration, for the purpose of manufacturing ash-based products such as cement, concrete blocks, bricks, panels or any other material or for construction of roads, embankments, dams, dykes or for any other construction activity.
- (2) Every coal or lignite based thermal power plant commissioned subject to environmental clearance conditions stipulating the submission of an action plan for full utilisation of fly ash shall, within a period of nine years from the publication of this notification, phase out the dumping and disposal of fly ash on land in accordance with the plan. Such an action plan shall provide for thirty per cent of the fly ash utilisation, within three years from the publication of this notification with further increase in utilisation by at least ten per cent points every year progressively for the next six years to enable utilisation of the entire fly ash generated in the power plant atleast by the end of ninth year. Progress in this regard shall be reviewed after five years.
- (3) Every coal or lignite based thermal power plant not covered by para (2) above shall, within a period of fifteen years from the date of publication of this notification, phase out the utilisation of fly ash in accordance with an action plan to be drawn up by the power plants. Such action plan shall provide for twenty per cent of fly ash utilisation within three years from the date of publication of this notification, with further increase in utilisation every year progressively for the next twelve years to enable utilisation of the entire fly ash generated in the power plant.
- (4) All action plans prepared by coal or lignite based thermal power plants in accordance with sub-para (2) and (3) of para 2 of this notification, shall be submitted to the Central Pollution Control Board, concerned State Pollution Control Board/Committee and concerned regional office of the Ministry of Environment and Forests within a period of six months from the date of publication of this notification.
- (5) The Central and State Government Agencies, the State Electricity Boards, the National Thermal Power Corporation and the management of the

thermal power plants shall facilitate in making available land, electricity and water for manufacturing activities and provide access to the ash lifting area for promoting and setting up of ash-based production units in the proximity of the area where ash is generated by the power plant.

- (6) Annual implementation report 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/Committee and the concerned Regional Office of the Ministry of Environment and Forests by the coal or lignite based thermal power plants.

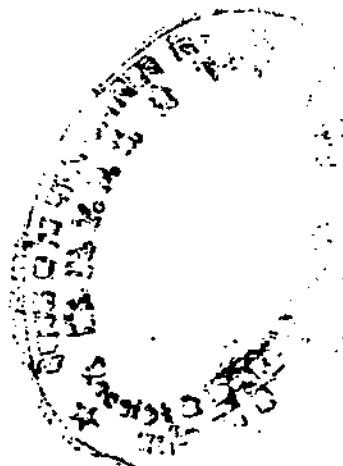
3. Specifications for use of ash-based products.-

- (1) Manufacture of ash-based products such as cement, concrete blocks, bricks, panels or any other material or the use of ash in construction activity such as in road laying, embankments or use as landfill to reclaim low lying areas including back filling in abandoned mines or pitheads or for any other use shall be carried out in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Bureau of Mines, Indian Road Congress, Central Building Research Institute, Roorkee, Central Road Research Institute, New Delhi, Building Materials and Technology Promotion Council, New Delhi, Central Public Works Department, State Public Works Departments and other Central and State Government agencies.
- (2) The Central Public Works Department, Public Works Departments in the State/Union Territory Governments, Development Authorities, Housing Boards, National Highway Authority of India and other construction agencies including those in the private sector shall also prescribe the use of ash and ash-based products in their respective schedules of specifications and construction applications, including appropriate standards and codes of practice, within a period of four months from the publication of this notification.

- (3) All local authorities shall specify in their respective building bye-laws and regulations the use of ash and ash-based products and construction techniques in building materials, roads, embankments or for any other use within a period of four months from the date of publication of this notification.

[F. No. 16-2/95-HSMD]

V. RAJAGOPALAN, Jt. Secy.



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[भाग II—खण्ड 3(ii)]

भारत का राजपत्र : असाधारण

ANNEXURE P-6 7

ख. सड़क या फ्लाई ओवर तटबन्धों, जो भारतीय सड़क कांग्रेस (आई आर सी) द्वारा अधिकथित विनिर्देशों के अन्तर्गत नहीं आते हैं, के लिए आवश्यक विनिर्देश/मार्गदर्शी सिद्धांत बनाएंगे।”।

[फा. सं.16-2/95-एच एस एम डी]

डॉ. बी. राजगोपालन, संयुक्त सचिव

टिप्पणी : मूल अधिसूचना, भारत का राजपत्र, असाधारण, भाग II, खण्ड 3, उपखण्ड (ii) में का.आ. 763(अ) दिनांक 14-9-1999 द्वारा प्रकाशित की गई है।

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 27th August, 2003

S.O. 979(E).—Whereas a draft of certain amendments to the Government of India in the Ministry of Environment and Forests notification number S.O.763 (E) dated 14th September, 1999 (hereinafter referred to as the said notification) which the Central Government proposes to make 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, were published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii) dated the 6th November, 2002 *vide* S.O. 1164 (E), dated the 5th November, 2002 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 amendments were made available to the public.

And, whereas copies of the said Gazette were made available to the public on 27th November 2002;

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, the Central Government hereby makes the following amendments to the said notification, namely: -

AMENDMENTS

1. In the said notification, in the preamble, for the words "fifty kilometers", the words "one hundred kilometres" shall be substituted.

2. In the said notification, in paragraph 1, -

- (a) in sub-paragraph (1), for the words "fifty kilometers", the words "one hundred kilometres" shall be substituted;
- (b) after sub-paragraph (1), the following sub- paragraphs shall be inserted, namely: -

"(1A) Every construction agency engaged in the construction of buildings within a radius of fifty to one hundred kilometres from a coal or lignite based thermal power plant shall use fly ash bricks or blocks or tiles or clay fly ash bricks or cement fly ash bricks or blocks or similar products or a combination or aggregate of them in such construction as per the following minimum percentage (by volume) of the total bricks, blocks and tiles, as the case may be, used in each construction project, namely:-

- (i) 25 per cent by 31st August 2004;
- (ii) 50 per cent by 31st August 2005;
- (iii) 75 per cent by 31st August, 2006; and
- (iv) 100 per cent by 31st August 2007.

In respect of construction of buildings within a radius of 50 kilometres from a coal or lignite based thermal power plant the following minimum per centage (by volume) of use of bricks, blocks and tiles shall apply: -

- (i) 50 per cent by 31st August 2004;
- (ii) 100 per cent by 31st August 2005.

(1B) The provisions of sub-paragraph (1A) shall be applicable to all construction agencies such as Housing Boards and those in the private sector

builders of apartments, hotels, resorts and cottages and the like. It shall be the responsibility of the construction agencies either undertaking the construction or approving the design or both to ensure compliance of the provisions of sub-paragraph (1A) and to submit such returns as may be called for and compliance reports to the State Government or Union territory Administration”:

- (c) for sub-paragraph (2), the following sub-paragraphs shall be substituted, namely: -

“(2) The authority for ensuring the use of specified quantity of ash as per sub-paragraph (1) shall be the concerned Regional Officer of the State Pollution Control Board or the Pollution Control Committee, as the case may be.

(2A) The concerned State Government shall be the enforcing and monitoring authority for ensuring compliance of the provisions of sub-paragraph (1A).”;

- (d) in sub-paragraph (3), for the words, brackets and figure “under para (1)” the words, brackets and figure “under sub-paragraph (1)” shall be substituted;

- (e) after sub-paragraph (3), the following sub-paragraphs shall be inserted, namely: -

“(3A) A decision on the application for manufacture of fly ash bricks, block, and tiles and similar other fly ash based products shall be taken within thirty days from the date of receipt of the application by the competent authority. A decision on consent to establish the brick kiln shall be taken by the Pollution Control Board or the Pollution Control Committee, as the case may be, within a period of thirty days from the date of receipt of application by it.

(3B) In case of non-compliance of the provisions of sub-paragraph (1) of paragraph 1, the competent authority, in addition to cancellation of consent order issued to establish the brick kiln, shall move the district administration for cancellation of the mining lease.

(3C) All authorities sanctioning or renewing any land, soil or clay mining lease shall not grant such lease or extension of lease or renewal to clay brick, block or tile manufacturing unit within a radius of one hundred kilometres of the coal or lignite based thermal power plant in cases where the manufacturer does not mix a minimum of 25 per cent by weight of fly ash or pond ash in the manufacture of bricks or blocks or tiles. The cancellation of mining lease shall be decided by the district administration after giving the holder of such lease an opportunity of being heard. To enable the competent authority to verify the actual use of ash, the thermal power plant shall maintain month-wise records of ash made available to each brick kiln.

(3 D) It shall be sufficient compliance of this notification if within twelve months from the date of issue of this notification, manufacturers of clay bricks, blocks and tiles located within a radius of 50 to 100 kilometres of a coal or lignite based thermal power plant comply with the provisions of sub-paragraphs (1) and (2)."

(f) in sub-paragraph (4), after brackets and letters "(AIBTMF)", the words "or a representative of local brick kiln owners association, federation, group." shall be inserted;

(g) after sub-paragraph (4), the following sub-paragraphs shall be inserted, namely: -

"(5) No agency, person or organization shall, within a radius of 100 kilometres of a thermal power plant undertake construction or approve design for construction of roads or flyover embankments in contravention of the guidelines specifications issued by the Indian Road Congress (IRC) as contained in IRC

specification No. SP: 58 of 2001. Any deviation from this direction can only be agreed to on technical reasons if the same is approved by Chief Engineer (Design) or Engineer-in-Chief of the concerned agency or organization or on production of a certificate of "Pond ash not available" from the thermal power plant(s) (TPPs) located within 100 kilometres of the site of construction. This certificate shall be provided by the TPP within two working days from the date of making a request for ash.

(6) Soil required for top or side covers of embankments of roads or flyovers shall be excavated from the embankment site and if it is not possible to do so, only the minimum quantity of soil required for the purpose shall be excavated from soil borrow area. In either case, the topsoil should be kept or stored separately. Voids created due to soil borrow area shall be filled up with ash with proper compaction and covered with topsoil kept separately as above. This would be done as an integral part of embankment project within the time schedule of the project.

(7) No agency, person or organization shall within a radius of 100 kilometres of a coal or lignite based thermal power plant allow reclamation and compaction of low-lying areas with soil. Only pond ash shall be used for compaction. They shall also ensure that such reclamation and compaction is done in accordance with the bye-laws, regulations and specifications laid down by the authorities mentioned in sub-paragraph (3) of paragraph 3."

3. In the said notification, in paragraph 2,

- (a) for the marginal heading "Utilisation of ash by Thermal Power Plants", the marginal heading "Responsibilities of Thermal Power Plants" shall be substituted;

- (b) for the opening words, "All coal or lignite based thermal power plants shall utilise the ash generated in the power plants as follows: -", "Every coal or lignite based thermal power plant shall take the following steps to ensure the utilisation of ash generated by it, namely: -";
- (c) in sub- paragraph (1), -
- (i) after the words "products such as cement, concrete blocks, bricks, panels", the words "or a combination thereof" shall be inserted;
 - (ii) the following shall be added at the end, namely: -

" The thermal power plants have to ensure availability of fair quantity of ash to each user including brick kilns.";
4. In the said notification, after paragraph 2, the following paragraph shall be inserted, namely: -

"2A. Utilization of fly ash for reclamation of sea.

"Subject to the rules made under the Environment (Protection) Act, 1986. (29 of 1986) reclamation of sea shall be a permissible method of utilization of fly ash."

5. In the said notification, in paragraph 3, the following sub-paragraphs shall be inserted, namely: -

"(2A) All agencies including the Central Public Works Department and State Government agencies concerned with utilization of fly ash for construction purposes shall, within three months from the 1st day of September, 2003 make provisions for the use of fly ash and fly ash based bricks, blocks or tiles or aggregates of them in the schedule of approved materials and rates.

(2B) All agencies undertaking construction of roads or fly over bridges including Ministry of Road Transport and Highways (MORTH), National Highways Authority of India (NHAI), Central Public Works Department (CPWD), State Public Works Departments and other State Government Agencies, shall, within three months from the 1st day of September, 2003 -

- a. make provisions in their tender documents, schedules of approved materials and rates as well as technical documents, including those relating to soil borrow area or pit as per sub-paragraph (7) of paragraph 1; and
- b. make necessary specifications/guidelines for road or fly over embankments that are not covered by the specifications laid down by the Indian Road Congress (IRC)."

[F. No. 16-2/95-HSMD]

Dr. V. RAJAGOPALAN, Jt. Secy.

Footnote:— The principal notification was published in the Gazette of India, Part II, Section 3, sub-section (ii) *vide* S.O.763 (E) dated 14.9.1999.



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MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

ANNEXURE P-7

New Delhi, the 3rd November, 2009

S.O. 2804(E).—WHEREAS, by notification of the Government of India in the Ministry of Environment and Forests number S.O. 763(E), dated the 14th September, 1999 (hereinafter referred to as the said notification) issued under sub-section (1), clause (v) of sub-section (2) of section 3 and section 5 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government, issued directions for restricting the excavation of top soil for manufacture of bricks and promoting the utilisation of fly ash in the manufacture of building materials and in construction activity within a specified radius of one hundred kilometers from coal or lignite based thermal power plants;

AND WHEREAS, the term “fly ash” means and includes all categories or groups of coal or lignite ash generated at the thermal power plant and collected by Electrostatic Precipitator (ESP) or bag filters or other similar suitable equipments; bottom ash is the ash collected separately at the bottom of the boiler; pond ash is the mixture of ESP Fly ash and bottom ash, but, for the purpose of this notification, the term “fly ash” means and includes all ash generated such as Electrostatic Precipitator (ESP) ash, dry fly ash, bottom ash, pond ash and mound ash as the objective is to utilise all the ashes;

AND WHEREAS, there is a need for restricting the excavation of top soil for manufacture of bricks and for other works which involve use of top soil and promoting utilisation of fly ash produced by coal or lignite based thermal power plants including captive power plants and co-generation plants in the manufacture of building materials and construction activity;

AND WHEREAS, it was observed that there was a gradual increase in the use of fly ash in the manufacture of fly ash bricks or products from about 1.5 million tonne in 2002-2003 to 3.19 million tonne in 2006-2007 which needs to be further encouraged for achieving the ultimate objective of conservation of top soil and minimise environmental pollution caused due to fly ash;

AND WHEREAS, it is observed that construction agencies are yet to achieve their targets of utilization of fly ash based products even after the 31st August, 2007, the date prescribed for 100% utilisation of fly ash based products in the said notification of 1999 and it is also observed that many thermal power stations or plants are also yet to achieve the targets drawn up in their action plans;

AND WHEREAS, the representations of the brick kiln owners were considered with regard to transporting of fly ash over a long distance and also the logistics involved including the energy cost;

AND, WHEREAS, the issue has been examined by the Government of India in the Ministry of Environment and Forests;

AND WHEREAS, the Central Government is of the opinion that the said notification should be amended;

AND WHEREAS, clause (a) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986 provides that whenever the Central Government considers that prohibition or restrictions of any industry or carrying on any processes or operation in any area should be imposed, it shall give notice of its intention to do so;

AND WHEREAS, a draft of amendment to the Government of India, Ministry of Environment and Forests notification no. S.O.763 (E), dated the 14th September, 1999 duly amended vide notification No. S.O. 979 (E), dated the 27th August, 2003 (hereinafter referred to as the said notification) which the Central Government proposes to make under subsection (1), 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, were published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii) dated the 6th November, 2008 vide S.O. 2623 (E), 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 amendments were made available to the public.

AND WHEREAS, copies of the said Gazette were made available to the public on the day of 6th November 2008;

AND WHEREAS, the objections and suggestions received from various persons or agencies likely to be affected thereby in respect of the said draft notification have been duly considered by the Central Government in the Ministry of Environment and Forests;

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, the Central Government hereby makes the following amendments to the said notification, namely: -

AMENDMENTS

1. Throughout the said notification, save as otherwise expressly provided and unless the context otherwise requires, for the word "ash" wherever it occurs, the words "fly ash" shall be substituted.

2. In the said notification, in paragraph 1,—

(a) for sub-paragraph (1), the following shall be substituted, namely:-

"(i) use of fly ash based products in construction activities";

(b) for sub-paragraphs (1A) and (1B), the following sub-paragraphs shall respectively be substituted, namely:-

"(1A) Every construction agency engaged in the construction of buildings within a radius of hundred kilometers from a coal or lignite based thermal power plant shall use only fly ash based products for construction, such as: cement or concrete, fly ash bricks or blocks or tiles or clay fly ash bricks, blocks or tiles or cement fly ash bricks or bricks or blocks or similar products or a combination or aggregate of them, in every construction project.

(1B) The provisions of sub-paragraph (1A) shall be applicable to all construction agencies of Central or State or Local Government and private or public sector and it shall be the responsibility of the agencies either undertaking construction or approving the design or both to ensure compliance of the provisions of sub-paragraph (1A) and to submit annual returns to the concerned State Pollution Control Board or Pollution Control Committee, as applicable";

(c) after sub-paragraph (1B), the following sub-paragraph shall be inserted, namely:—

“(1C) Minimum fly ash content for building materials or products to qualify as “fly ash based products” category shall be as given in the Table I below:

Table I

Serial Number	Building Materials or Products	Minimum % of fly ash by weight
(1)	(2)	(3)
1.	Fly ash bricks, blocks, tiles, etc. made with fly ash, lime, gypsum, sand, stone dust etc. (without clay).	50% of total input materials
2.	Paving blocks, paving tiles, checker tiles, mosaic tiles, roofing sheets, pre-cast elements, etc. wherein cement is used as binder.	Usage of PPC (IS-1489: Part-1) or PSC (IS-455) or 15% of OPC (IS-269/8112/12269) content.
3.	Cement.	15% of total raw materials
4.	Clay based building materials such as bricks, blocks, tiles, etc.	25% of total raw materials.
5.	Concrete, mortar and plaster.	Usage of PPC (IS-1489: Part-1) or PSC (IS-455) or 15% of OPC (IS-269/8112/12269) content.

(d) in sub-paragraph (2), for the brackets and number “(1)”, the brackets, number and letter “(1C)” shall be substituted and the number of sub-paragraph (2) shall be substituted by 1(D);

(e) in paragraph (2A), the paragraph 1(A) shall be substituted by 1(A) and 1(B) and the amended paragraph 2(A) is to be numbered as 1(E);

(f) for sub-paragraphs (3) and (3A), the following sub-paragraphs shall respectively be substituted, namely:—

“(3) In case of non-availability of fly ash from thermal power plants in sufficient quantities as certified by the said power plants, within 100 km of the site, the stipulation under sub-paragraph (1A) shall be suitably modified (waived or relaxed) by the concerned State Government or Union territory Government level monitoring committee mentioned elsewhere in this notification.

(3A) A decision on the application for manufacture of fly ash bricks, blocks and tiles and similar other fly ash based products shall be taken within thirty days from the date of receipt of the application by the concerned State Pollution Control Board or Pollution Control Committee.”;

(g) sub-paragraphs (3B), (3C) and (3D) shall be omitted;

(h) for sub-paragraphs (4) and (5), the following sub-paragraphs shall be substituted, namely:—

“(4) Each coal or lignite based thermal power plant shall constitute a dispute settlement committee which shall include the General Manager of the thermal power plant and a representative of the relevant Construction and fly ash Brick Manufacturing Industry Association or Body, as the case may be and such a Committee shall ensure unhindered loading and transport of fly ash in an environmentally sound manner without any undue loss of time. Any unresolved dispute shall be dealt with by the concerned State or Union territory Government level monitoring committee mentioned elsewhere in this notification.

(5) No agency, person or organization shall, within a radius of hundred kilometers of a thermal power plant undertake construction or approve design for construction of roads or flyover embankments with top soil; the guidelines or specifications issued by the Indian Road Congress (IRC) as contained in IRC specification No. SP: 58 of 2001 as amended from time to time, regarding use of fly ash shall be followed and any deviation from this direction can only be agreed to on technical reasons if the same is approved by Chief Engineer (Design) or Engineer-in-Chief of the concerned agency or organisation or on production of a certificate of “fly ash not available” from the thermal power plant(s) (TPPs) located within hundred kilometers of the site of construction and this certificate shall be provided by the TPP within two working days from the date of receipt of a request for fly ash, if fly ash is not available”;

(i) in sub-paragraph (6), for the words “Voids created due to soil borrow area shall be filled up with ash with proper compaction and covered with topsoil kept separately as above and this would be done as an integral part of embankment project within the time schedule of the project”, the words “Voids created at soil borrow area shall be filled up with fly ash with proper compaction and covered with topsoil kept separately as above and this would be done as an integral part of embankment project” shall be substituted;

(j) for sub-paragraph (7), the following sub-paragraphs shall be substituted, namely:—

“(7) No agency, person or organisation shall within a radius of hundred kilometers of a coal or lignite based thermal power plant undertake or approve or allow reclamation and compaction of low-lying areas with soil; only fly ash shall be used for compaction and reclamation and they shall also ensure that such reclamation and compaction is done in accordance with the specifications and guidelines laid down by the authorities mentioned in sub-paragraph (1) of paragraph 3.

(8)(i) No person or agency shall within fifty kilometers (by road) from coal or lignite based thermal power plants, undertake or approve stowing of mine without using at least 25% of fly ash on weight to weight basis, of the total stowing materials used and this shall be done under the guidance of the Director General of Mines Safety (DGMS);

Provided that such thermal power stations shall facilitate the availability of required quality and quantity of fly ash as may be decided by the expert committee referred in sub-paragraph (10) for this purpose.

(ii) No person or agency shall within fifty kilometers (by road) from coal or lignite based thermal power plants, undertake or approve without using at least 25% of fly ash on volume to volume basis of the total materials used for external dump of overburden and same percentage in upper benches of back filling of opencast mines and this shall be done under the guidance of the Director General of Mines Safety (DGMS);

Provided that such thermal power stations shall facilitate the availability of required quality and quantity of fly ash as may be decided by the expert committee referred in sub-paragraph (10) for this purpose.

(9) The provisions contained in clauses (i) and (ii) of sub-paragraph (8) shall be applicable to all mine agencies under Government, public and private sector and to mines of all minerals or metals or items and it shall be the responsibility of agencies either undertaking or approving the external dump of overburden, backfilling or stowing of mine or all these activities to ensure compliance of provisions contained in clauses (i) and (ii) of sub-paragraph (8) and to submit annual returns to the concerned State Pollution Control Board or Pollution Control Committee as applicable.

(10) The Ministry of Coal for this purpose shall constitute an expert committee comprising of representatives from Fly Ash Unit, Department of Science and Technology, Ministry of Science and Technology, Director General of Mines Safety (DGMS), Central Mine Planning and Design Institute Limited (CMPDIL), Ministry of Environment and Forests, Ministry of Power, Ministry of Mines and the Central Institute of Mining and Fuel Research (CIMFR), Dhanbad; the Committee shall also guide and advise the back filling or stowing in accordance with the provisions contained in sub-paragraphs (8) (i), 8 (ii) and (9), and specifications and guidelines laid down by the concerned authorities as mentioned in sub-paragraph (1) of paragraph 3.

(11) The concerned State Government or Union territory Government shall be the enforcing and monitoring authority for ensuring compliance of the provisions of sub-paragraphs (8) (i) and (8) (ii);

3. in the said notification, in paragraph 2,—

(a) for sub-paragraphs (1), (2) and (3), the following sub-paragraphs shall be substituted, namely:—

“(1) All coal or lignite based thermal power stations would be free to sell fly ash to the user agencies subject to the following conditions, namely:—

(i) the pond ash should be made available free of any charge on “as is where is basis” to manufacturers of bricks, blocks or tiles including clay fly ash product manufacturing unit(s), farmers, the Central and the State road construction agencies, Public Works Department, and to agencies engaged in backfilling or stowing of mines.

(ii) at least 20% of dry ESP fly ash shall be made available free of charge to units manufacturing fly ash or clay-fly ash bricks, blocks and tiles on a priority basis over other users and if the demand from such agencies falls short of 20% of quantity, the balance quantity can be sold or disposed of by the power station as may be possible;

Provided that the fly ash obtained from the thermal power station should be utilized only for the purpose for which it was obtained from the thermal power station or plant failing which no fly ash shall be made available to the defaulting users.

(2) All coal and, or lignite based thermal power stations and, or expansion units in operation before the date of this notification are to achieve the target of fly ash utilization as per the Table II given below:

Table II

Serial Number	Percentage Utilization of Fly Ash	Target Date
(1)	(2)	(3)
1.	At least 50% of fly ash generation	One year from the date of issue of this notification.
2.	At least 60% of fly ash generation	Two years from the date of issue of this notification.
3.	At least 75% of fly ash generation	Three years from the date of issue of this notification.

4.	At least 90% of fly ash generation	Four years from the date of issue of this notification.
5.	100% fly ash generation	Five years from the date of issue of this notification.

The unutilised fly ash in relation to the target during a year, if any, shall be utilized within next two years in addition to the targets stipulated for those years and the balance unutilized fly ash accumulated during first five years (the difference between the generation and the utilization target) shall be utilized progressively over next five years in addition to 100% utilization of current generation of fly ash.

(3) New coal and, or lignite based thermal power stations and, or expansion units commissioned after this notification to achieve the target of fly ash utilization as per Table III given below:

Table III

Serial Number	Fly ash utilization level	Target date
(1)	(2)	(3)
1.	At least 50% of fly ash generation	One year from the date of commissioning.
2.	At least 70% of fly ash generation	Two years from the date of commissioning.
3.	90% of fly ash generation	Three years from the date of commissioning.
4.	100% of fly ash generation	Four years from the date of commissioning.

The unutilised fly ash in relation to the target during a year, if any, shall be utilized within next two years in addition to the targets stipulated for these years and the balance unutilized fly ash accumulated during first four years (the difference between the generation and utilization target) shall be utilized progressively over next five years in addition to 100% utilization of current generation of fly ash.”;

(b) in sub-paragraph (4), for the words “six months”, the words “four months” shall be substituted;

(c) for sub-paragraph (6), the following sub-paragraphs shall be substituted, namely:—

“(6) The amount collected from sale of fly ash and fly ash based products by coal and/or lignite based thermal power stations or their subsidiary or sister concern unit, as applicable should be kept in a separate account head and shall be utilized only for development of infrastructure or facilities, promotion and facilitation activities for use of fly ash until 100 percent

fly ash utilization level is achieved; thereafter as long as 100% fly ash utilization levels are maintained, the thermal power station would be free to utilize the amount collected for other development programmes also and in case, there is a reduction in the fly ash utilization levels in the subsequent year(s), the use of financial return from fly ash shall get restricted to development of infrastructure or facilities and promotion or facilitation activities for fly ash utilization until 100 percent fly ash utilisation level is again achieved and maintained.

(7) 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 Committee and the concerned Regional Office of the Ministry of Environment and Forests by the coal or lignite based thermal power plants, and also be made a part of the annual report of the thermal power plant as well as thermal power plant wise information be provided in the annual report of thermal power producing agency owning more than one thermal power plant.”;

4. in the said notification, in paragraph 3,—

(a) in sub-paragraph (2), for the words “schedules of specifications and construction applications, including appropriate standards and codes of practice, within a period of four months from the publication of this notification”, the words “tender documents, schedules of specifications and construction applications including appropriate standards and codes of practice within a period of four months from the publication of this notification” shall be substituted;

(b) for sub-paragraph (2A), the following sub-paragraph shall be substituted, namely:—

“(2A) Building construction agencies both in public and private shall prescribe the use of fly ash and fly ash-based products in their respective tender documents, schedules of specifications and construction applications, including appropriate standards and codes of practice and make provisions for the use of fly ash and fly ash based bricks, blocks or tiles or aggregates of them in the schedule of approved materials and rates within a period of four months from the publication of this notification.”;

(c) for sub-paragraphs (2B) and (3), the following sub-paragraphs shall be substituted, namely:—

“(2B) All agencies undertaking construction of roads or fly over bridges and reclamation and compaction of low lying areas, including Department of Road Transport and Highways (DORTH), National Highways Authority of India (NHAI), Central Public Works Department (CPWD), State Public Works Departments and other State Government Agencies, shall within a period of four months from the publication of this notification:-

(a) make provisions in their tender documents, schedules of approved materials and rates as well as technical documents for implementation of this notification, including those relating to soil borrow area or pit as per sub-paragraph (6) of paragraph 1; and

(b) make necessary specifications or guidelines for road or fly over embankments that are not covered by the specifications laid down by the Indian Road Congress (IRC).

(3) All local authorities shall specify in their respective tender documents, building bye-laws and regulations, the use of fly ash and fly ash-based products and construction techniques in building materials, roads embankments or for any usage with immediate effect.

(4) The Central Electricity Authority and other approving agencies may permit the land area for emergency ash pond or fly ash storage area up to 50 hectares for a 500 MW unit, based on 45% ash content coal, or in the same proportion for units in other capacities taking into account the ash content in coal or lignite to be used.

(5) All Financial institutions and agencies which fund construction activities shall include a clause in their loan or grant document for compliance of the provisions of this notification.

(6) A Monitoring committee shall be constituted by the Central Government with Members from Ministry of Coal, Ministry of Mines, Ministry of Power, Central Pollution Control Board, Central Electricity Authority, Head Fly Ash Unit of Department of Science and Technology and Building Material Technology Promotion Council to monitor the implementation of the provisions of the notification and submit its recommendations or observations at least once in every six months to the Secretary, Ministry of Environment and Forests. Concerned Advisor or Joint Secretary in the Ministry of Environment and Forests will be the convener of this committee.

(7) For the purpose of monitoring the implementation of the provisions of this notification the State Governments or Union territory Government shall constitute a Monitoring Committee within three months from the date of issue of this notification under the Chairmanship of Secretary, Department of Environment with representatives from Department of Power, Department of Mining, Road and Building Construction Department and State Pollution Control Board and this Committee would deal with any unresolved issue by Dispute Settlement Committee as prescribed in sub-paragraph (4) of paragraph 1, in addition to monitoring and facilitating implementation of this notification at the respective State Government or Union territory level and this Committee would also be empowered to suitably modify (waive or relax) the stipulation under sub-paragraph (1) in case of non-availability of fly ash in sufficient quantities from thermal power plant as certified by the said power plants and the Committee will meet at least once in every quarter.

[F. No. 9-8/2005-HSMD]

G. V. SUBRAHMANYAM, Scientist 'G'

Foot Note :—The principal notification was published in the Gazette of India, Part II, Section 3, Sub-section (ii) *vide* notification number S.O. 763(E), dated the 14th September, 1999 and was amended *vide* notification number S. O. 979(E), dated the 27th August, 2003.



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ANNEXURE P-8

- (10) संबद्ध प्राधिकारी सभी सरकारी स्कीमों या कार्यक्रमों में, उदाहरणार्थ महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार गारंटी अधिनियम, 2005 (मनरेगा), स्वच्छ भारत अभियान, शहरी और ग्रामीण आवासन स्कीम, जहां संनिर्मित क्षेत्र एक हजार वर्ग फुट से अधिक है और अवसंरचना संबंधी संनिर्माण में, जिसके अंतर्गत अभिहित औद्योगिक संपदाओं या पार्कों या विशेष आर्थिक जोनों में भवन निर्माण भी है, ऐश आधारित ईटों या उत्पादों के आजापक उपयोग को सुनिश्चित करेंगे।
- (11) कृषि मंत्रालय कृषि क्रियाकलापों में ऐश के मृदा अनुकूलक के रूप में उपयोग का संवर्धन करने पर विचार कर सकेगा।”

5. सभी संबद्ध प्राधिकारियों द्वारा उपरोक्त उपबंधों का अनुपालन करने की समयावधि 31 दिसंबर, 2017 है। कोयला या लिग्नाइट आधारित तापीय विद्युत संयंत्र, उनके द्वारा उत्पादित फ्लाई ऐश के 100 प्रतिशत उपयोग के अतिरिक्त उपरोक्त उपबंधों का अनुपालन 31 दिसंबर, 2017 से पूर्व करेंगे।

[फा. सं. 9-8/2005-एचएसएमडी]

विश्वनाथ सिन्हा, संयुक्त सचिव

टिप्पण:- मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग II, खंड 3, उप-खंड (ii) में अधिसूचना सं. का.आ. 763(अ), तारीख 14 सितंबर, 1999 द्वारा प्रकाशित की गई थी और इसमें पश्चातवर्ती संशोधन अधिसूचना सं. का.आ. 979(अ), तारीख 27 अगस्त, 2003 और का.आ. 2804(अ), तारीख 3 नवंबर, 2009 द्वारा किए गए थे।

MINISTRY OF ENVIRONMENT, FORESTS AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 25th January, 2016

S.O. 254(E).—Whereas a draft of certain amendments to the Government of India in the Ministry of Environment, Forests and Climate Change number S.O. 763(E), dated the 14th September, 1999 (hereinafter referred to as the said notification) which the Central Government proposes to make 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 (ii), *vide* S.O. 1396(E), dated the 25th May, 2015 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 amendments were made available to the public.

And, whereas copies of the said Gazette were made available to the public on 25th May, 2015;

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, the Central Government hereby makes the following amendments to the said notification, namely: —

1. In the said notification, in paragraph 1,-

- in sub-paragraph 1(A), for the words “hundred kilometers”, the words “three hundred kilometers” shall be substituted;
- in sub-paragraph (3), for the figures and letters “100 km”, the words “three hundred kilometers” shall be substituted;
- in sub-paragraph (5), for the words “hundred Kilometers”, the words “three hundred Kilometers” shall be substituted;
- in sub-paragraph (7), for the words “hundred Kilometers”, the words “three hundred Kilometers” shall be substituted.

2. **In the said notification, in paragraph 2:-**

(a) after sub-paragraph (1), the following proviso shall be inserted, namely:-

“provided further that the restriction to provide 20 % of dry ESP fly ash free of cost shall not apply to those thermal power plants which are able to utilise 100 % fly ash in the prescribed manner.”

(b) after sub-paragraph (7), the following sub-paragraphs shall be inserted, namely:-

- “(8) Every coal or lignite based thermal power plants (including captive and or co-generating stations) shall, within three months from the date of notification, upload on their website the details of stock of each type of ash available with them and thereafter shall update the stock position at least once a Month.
- (9) Every coal or lignite based thermal power plants shall install dedicated dry ash silos having separate access roads so as to ease the delivery of fly ash.
- (10) The cost of transportation of ash for road construction projects or for manufacturing of ash based products or use as soil conditioner in agriculture activity within a radius of hundred kilometers from a coal or lignite based thermal power plant shall be borne by such coal or lignite based thermal power plant and the cost of transportation beyond the radius of hundred kilometers and up to three hundred kilometers shall be shared equally between the user and the coal or lignite based thermal power plant.
- (11) The coal or lignite based thermal power plants shall promote, adopt and set up (financial and other associated infrastructure) the ash based product manufacturing facilities within their premises or in the vicinity of their premises so as to reduce the transportation of ash.
- (12) The coal or lignite based thermal power plants in the vicinity of the cities shall promote, support and assist in setting up of ash based product manufacturing units so as to meet the requirements of bricks and other building construction materials and also to reduce the transportation.
- (13) To ensure that the contractor of road construction utilizes the ash in the road, the Authority concerned for road construction shall link the payment of contractor with the certification of ash supply from the thermal power plants.
- (14) The coal or lignite based thermal power plants shall within a radius of three hundred kilometers bear the entire cost of transportation of ash to the site of road construction projects under Pradhan Mantri Gramin Sadak Yojna and asset creation programmes of the Government involving construction of buildings, road, dams and embankments”.

3. **In the said notification, in paragraph 2, sub-paragraph (2A) be read as sub-paragraph (15) and at the end of the said sub-paragraph, the following sub-paragraph shall be added, namely:-**

“and the coal or lignite based thermal power plants located in coastal districts shall support, assist or directly engage into construction of shore line protection measures.”

4. **In the said notification, in paragraph 3, after sub-paragraph (7), the following shall be inserted, namely:-**

- “(8) It shall be the responsibility of all State Authorities approving various construction projects to ensure that Memorandum of Understanding or any other arrangement for using fly ash or fly ash based products is made between the thermal power plants and the construction agency or contractors.
- (9) The State Authorities shall amend Building Bye Laws of the cities having population One million or more so as to ensure the mandatory use of ash based bricks keeping in view the specifications necessary as per technical requirements for load bearing structures.
- (10) The concerned Authority shall ensure mandatory use of ash based bricks or products in all Government Scheme or programmes e.g. Mahatma Gandhi National Rural Employment Guarantee Act, 2005 (MNREGA), SWACHH BHARAT ABIYAN, Urban and Rural Housing Scheme, where built up area is more than 1000 square feet and in infrastructure construction including buildings in designated industrial Estates or Parks or Special Economic Zone.

- (11) The Ministry of Agriculture may consider the promotion of ash utilisation in agriculture as soil conditioner.”
5. **The time period to comply with the above provisions by all concerned authorities is 31st December, 2017. The coal or lignite based thermal power plants shall comply with the above provision in addition to 100 % utilization of fly ash generated by them before 31st December, 2017.**

[F. No. 9-8/2005-HSMD]

BISHWANATH SINHA, Jt. Secy.

Note:- The principal notification was published in the Gazette of India, Extraordinary, Part II, section 3, Sub-section (ii) *vide* notification S.O. 763(E), dated the 14th September, 1999 and was subsequently amended *vide* notification S.O. 979(E), dated the 27th August, 2003 and S.O. 2804(E), dated the 3rd November, 2009.



TRUE COPY

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सत्यमेव जयते

Annex P-9 115

F.No. 9-6/2016-HSMD
Government of India
Ministry of Environment,
Forest and Climate Change

444, Agni Block
Indira Paryavaran Bhawan,
Jorbagh, New Delhi

Date: 14th July, 2016**OFFICE MEMORANDUM**

It has been brought to the notice of the Ministry that there is misinterpretation of the following provisions of the amendment notification on utilization of fly ash issued vide dated 25th Jan, 2016:

As per the notification on fly ash utilization as amended

"All coal or lignite based thermal power stations would be free to sell fly ash to the user agencies subject to the following conditions, namely:—

(i) the pond ash should be made available free of any charge on "as is where is basis" to manufacturers of bricks, blocks or tiles including clay fly ash product manufacturing unit(s), farmers, the Central and the State road construction agencies, Public Works Department, and to agencies engaged in backfilling or stowing of mines.

(ii) at least 20% of dry ESP fly ash shall be made available free of charge to units manufacturing fly ash or clay-fly ash bricks, blocks and tiles on a priority basis over other users and if the demand from such agencies falls short of 20% of quantity, the balance quantity can be sold or disposed of by the power station as may be possible;

Provided that the fly ash obtained from the thermal power station should be utilized only for the purpose for which it was obtained from the thermal power station or plant failing which no fly ash shall be made available to the defaulting users.

provided further that the restriction to provide 20 % of dry ESP fly ash free of cost shall not apply to those thermal power plants which are able to utilise 100 % fly ash in the prescribed manner."

It is clarified that if the Thermal Power Plant (TPP) has its own fly ash based products manufacturing units and is able to utilize entire quantity of fly ash generated, then the TPP need not give 20 % dry fly ash at free of cost.

This issue with the approval of Competent Authority.

[Signature]
Joint Director

[Signature]
(B. Thirunavukkarasu)
Joint Director

To

1. The Joint Secretary, Ministry of Power, Rafi Marg, Sansad Marg Area, New Delhi, Delhi 110001
2. The Member Secretary, SPCBs/PCCs

File No. 9-6/2016-HSM

FR is the communication from Manian Brick, Tamil Nadu. It is stated that M/s NTPL has not been allotting the dry fly ash stating that they achieve 100 % utilization and as per the amendment, if they achieve 100% of dry fly ash, they need not provide fly ash to brick manufactures with free of cost.

As per the notification on fly ash utilization as amended

" All coal or lignite based thermal power stations would be free to sell fly ash to the user agencies subject to the following conditions, namely:—

(i) the pond ash should be made available free of any charge on "as is where is basis" to manufacturers of bricks, blocks or tiles including clay fly ash product manufacturing unit(s), farmers, the Central and the State road construction agencies, Public Works Department, and to agencies engaged in backfilling or stowing of mines.

(ii) at least 20% of dry ESP fly ash shall be made available free of charge to units manufacturing fly ash or clay fly ash bricks, blocks and tiles on a priority basis over other users and if the demand from such agencies falls short of 20% of quantity, the balance quantity can be sold or disposed of by the power station as may be possible.

Provided that the fly ash obtained from the thermal power station should be utilized only for the purpose for which it was obtained from the thermal power station or plant failing which no fly ash shall be made available to the defaulting users.

provided further that the restriction to provide 20 % of dry ESP fly ash free of cost shall not apply to those thermal power plants which are able to utilise 100 % fly ash in the prescribed manner."

Clarification has been sought on the 100% utilization pattern.

It is submitted that if the TPP has its own fly ash based products manufacturing units and is able to utilize entire quantity, then the TPP need not give 20 % free of cost.

An OM may be issued on the above clarification and the OM may be sent to M/o Power, SPCBs and M/s Manian Bricks.

Submitted for kind perusal and approval please.

Dir (SKP)

Submitted for TRUE COPY

Draft on file.

(E. Thirunavukkarasu)
Joint Director

O/o Scientist D (ET)
Dr. No. 237099/2019
Date: 11/11/2019

O/o Secy. 237099/2019
Dr. No. 237099/2019
Date: 11/11/2019

O/o J.S. (BS)
Dr. No. 237099/2019
Date: 11/11/2019

O/o Scientist D (ET)
Dr. No. 237099/2019
Date: 11/11/2019

Subject: Constitution of Expert Committee for effective utilization of Fly Ash.

A meeting was held on 23rd April, 2018 under the Chairmanship of Dr. V.K.Saraswat, Member, NITI Aayog to evolve a strategy for effective utilization of Fly Ash in order to harness the availability and better utilization in order to convert the residual waste into wealth.

2. It was inter alia decided in the meeting that an Expert Committee be constituted for developing, a focused strategy for best utilization of Fly Ash to manufacturing end products. Accordingly, an Expert Committee is being constituted by NITI Aayog. The composition and terms of references of the Expert Committee are as follows :

Committee on Fly Ash :

(a) Joint Secretary, MoEF & CC	Chairman
(b) Joint Secretary, Ministry of Power	Member
(c) Director (Technical), Ministry of Coal	Member
(d) Ministry of Steel	Member
(e) Ministry of Urban Development	Member
(f) Head, Bureau of Indian Standards	Member
(g) Director, Ministry of Road Transport & Highways	Member
(h) NTPC	Member
(i) Indian Road Congress	Member
(j) Coal India Limited / CMPDI	Member
(k) CEO, Dalmia Cement Bharat Limited	Member
(l) Joint Managing Director & CEO, JSW Energy Ltd	Member
(m) Group Head (Environment) Tata Power	Member
(n) Vice President, IMFA	Member
(o) Cement Manufacturers Association	Member
(p) Representative of FICCI	Member
(r) Representative of FIMI	Member
(s) Association of Fly Ash Products Manufacturers	Member
(t) Director General, NCCBM	Member
(u) Director (Business Development), NBCC Ltd	Member
(v) Representative of Minerals Division	Member Convener

Terms of Reference :

- (i) To revisit all the notifications / guidelines issued by Ministry of Environment, Forest & Climate Change (MoEF&CC) by taking into account the enhanced utilization of fly ash in the modern world".

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- (ii) To review and advice on the transportation of fly ash, central ware housing and other mechanism of transportation of fly ash.
 - (iii) To suggest strategy for better utilization of fly ash in the MSME sector, cement and other allied industries.
 - (iv) The app launched by Ministry of Power in strengthening the data base of the fly ash availability in various ash ponds of the country may be utilized by this committee in arriving at the quantum of fly ash to be handled keeping an overview of the environment.
 - (v) To suggest comprehensive guidelines for promoting Ash Parks covering all the aspects like area, environment and pollution norms, logistics, marketing and distribution of fly ash.
 - (vi) To suggest and formulate regulations for completely ceasing the manufacturing, production & distribution of Red bricks and mandatory use of fly ash bricks (Pan India) as mandated by BIS standards, with penal provisions for non-compliance.
 - (vii) To suggest special incentives to be extended to any Government or private entity which can achieve 100% utilization of fly ash within its premises.
 - (viii) To suggest special incentives to any Government or private entity which can (through R & D) further innovate fly ash products with ash content of atleast 75% and established sustainable application of those fly ash products in the industry.
 - (ix) To suggest incentives / special awards to the thermal power plants that innovates new methodology in fly ash disposal keeping all the environment and pollution norms in consideration.
3. The Chairman of the Committee may co-opt other officials or non-official as Members, if considered necessary.
 4. The Headquarter of the Committee shall be at New Delhi.
 5. The expenditure of TA / DA of official members in connection for attending the meetings of the Committee be borne by the respective parent Department / Ministry to which they belong as per the rules applicable to them. Non-official members of this Committee may be paid TA / DA by NITI Aayog as per Supplementary Rules 190 and order issued thereunder.

The Committee will submit its report within three months.

R. Saravanabhavan

(R.Saravanabhavan)

Senior Research Officer

Tel: 23042851

Email: rs.bhavan@gov.in

To: The Chairman & Members of the Committee



TRUE COPY



No. 9/7/2011-S.Th.(Vol. IV)
Government of India
Ministry of Power

'F' Wing, Nirman Bhawan,
New Delhi, 22nd September, 2021

To,

1. CMDs/ MDs of coal / lignite based thermal power plants (Central/ State/ Private)
2. Principal Secretary (Power/ Energy) of All States/ UTs
3. Chairperson, Central Electricity Authority

Subject: Supply of Fly ash to the end users by the power plants to increase fly ash utilization

It is observed that the demand of Fly Ash has been increasing year on year basis contributing to increase in the Fly Ash utilization. Fly Ash is emerging as a valuable commodity. As the end users of Fly Ash like cement plants, brick kilns, road and construction agencies etc. are commercial ventures and all their input costs are accounted for, Fly Ash should invariably be auctioned through a transparent bidding process.

2. All Coal/lignite based power plants are hereby advised to provide fly ash to the end users for all new commitments for supply of fly ash based on the following guidelines:

2.1 The power plants shall provide the Fly Ash to end users through a transparent bidding process only.

2.2 If after bidding/ auction some quantity of Fly Ash still remains un-utilized, then only, as one of the options, it could be considered to be given free of cost on first come first served basis if the user agency is willing to bear transportation cost.

2.3 If ash remains unutilised even after the steps taken in Paras 2.1 and 2.2 above, TPP shall bear the cost of transportation of Fly Ash to be provided free to eligible projects.

2.4 The end users shall be obligated to source the fly ash from the nearest TPPs to reduce the cost of fly ash transportation. If the nearest TPP refuses to do so, the end user project shall approach Ministry of Power for appropriate directions.

2.5 The transportation cost wherever required to be borne as per provisions of MOEF&CC notification by the power plants, shall be discovered on competitive bidding basis only. Thermal Power Plants shall prepare a panel of transportation agencies every

year based on competitive bidding for transportation in slabs of 50km which may be used for the period. The TPPs shall call for bids well in advance so, that a transportation panel is in place as soon as the previous panel expires. There should not be gap between the expiry of one panel and the finalization of the fresh panel.

2.6 The fly ash will be offered to the end users on the competing demand basis, i.e the end users who offer the highest price for fly ash and seek minimum support for transportation cost will be offered the same fly ash on priority. This will reduce the tariff of electricity and burden on the consumers.

2.7 The power plants may offer fly ash subject to their technical restrictions such as all precautions required for Dyke Stability and Safety etc. The power plants having lower ash utilizations shall make all out efforts to increase the fly ash utilization.

3. All concerned are requested to take necessary action in this regard.

4. This issues with the approval of the Hon'ble Minister of Power and NRE.


(Anand Upadhyay)

Deputy Secretary to the Govt. of India

Tel: 23062439

Copy to:

- i. Secretary (MOEF&CC), Government of India
- ii. Secretary (MoRTH), Government of India
- iii. Secretary (MoHUA), Government of India
- iv. Secretary, CERC
- v. Secretaries of all SERCs/ JERCs

Copy for kind information to:

PS to MOP, PS to MOSP, Sr. PPS to Secretary (Power), All Joint Secretaries/ EA/ CE (Thermal), Directors/DS, MOP


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ANNEXURE P-13



भारत का राजपत्र The Gazette of India

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असाधारण
EXTRAORDINARY

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

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

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No. 5075]

नई दिल्ली, शुक्रवार, दिसम्बर 31, 2021/पौष 10, 1943
NEW DELHI, FRIDAY, DECEMBER 31, 2021/PAUSHA 10, 1943

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, केन्द्रीय 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;

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;

अतः 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 II, खंड 3, उप खंड (i) में प्रकाशित का अधिक्रमण करते हुए, कोयला या लिग्नाइट 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;

अतः 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, केंद्रीय सरकार कोयलों या लिग्नाइट 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: ईट 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) सिंटेड 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 प्रमाणा 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, क्रमशः 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 पुनरुद्धार 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 तकनीक विनिर्देश, 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 लिग्नाइट 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 लिग्नाइट 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 लिग्नाइट 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 लिग्नाइट 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 प्रार्थना 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, रूडकी, 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 लिग्नाइट 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 क बैकफिलिंग अथवा स्टोर्विंग (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 निःशुल्क 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 क उपलब्धता को सुकर बनायेंगे और खानों के खाली स्थानों और ढेरों 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, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक खान सुरक्षा और भारतीय खदान ब्यूरो द्वारा निर्धारित दिशानिर्देशों के अनुसार किया जाएगा।

स्पष्टीकरण :- इस उप-पैरा के प्रयोजन के लिए यह भी स्पष्ट किया जाता है कि लागत मुक्त राख और निःशुल्क 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 स्थानों 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 ढेरों 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 प्राधिकरणों सरकारी उपक्रमों, अन्य सरकारी अभिकरणों तथा सभी निजी अभिकरणों) राख की ईटों, टाइल्स, 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 केन्द्रीय 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 स्टेशन) 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) लैग्रेसी 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 लैग्रेसी राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि 10 वर्ष के अंत में लैग्रेसी 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 परिवहकों या वाहन मालिक क जिम्मेदारी है और यदि इसका अनुपालन नहीं किया जाता है, तो अनधिकृत उपयोगकर्ताओं अथवा गैर-अधिकृत उपयोगकर्ताओं को ऐसी मात्रा गलत तरीके से वितरित करने पर 1500 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगायी, इसके अतिरिक्त राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा गैर अनुपालनकर्ता परिवहकों 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 रुपए 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 रुपए प्रति टन की दर से भुगतान करने के लिए उत्तरदायी होंगी।
परंतु भवन निर्माण के संबंध में पर्यावरणीय प्रतिकर निर्मित क्षेत्र के 75 रुपये 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 क 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 (एसईआईए) 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 क 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 आज्ञापक किए गए अनुसार छः महीनों में कम से कम एक बार संगत पणधारी (को) को आमंत्रित करके राख के उपयोग क 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) क 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 विरुद्ध कार्रवाई प्रारंभ करेंगे।

[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) : - फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड/पैनल) : - सीमेंट विनिर्माण : - रेडी मिक्स कंक्रीट : - राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : - सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : - सड़कों, सड़क और फ्लाई ओवर के पुश्तों का निर्माण : - बांधों का निर्माण : - निम्न भू-क्षेत्र का भराव : - खनिज क्षेत्रों का भराव : - अधिभार वाले डम्पों में उपयोग : - कृषि : - तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : - अन्य देशों को राख का निर्यात : - अन्य (कृपया विनिर्दिष्ट करें) : (ग) उपयोग किए गए तल के राख की मात्रा (एमटीपीए) : - फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड या पैनल) : - सीमेंट विनिर्माण : - रेडी मिक्स कंक्रीट : - राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : - सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : - सड़कों, सड़क और फ्लाईओवर के पुश्तों का निर्माण : - बांधों का निर्माण : - निम्न भू-क्षेत्र का भराव : - खनिज क्षेत्रों का भराव : - अधिभार वाले डम्पों में उपयोग : - कृषि : - तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : - अन्य देशों को राख का निर्यात : - 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 (मी³): घ) राख कुण्डों की कुल संख्या: (i) सक्रिय: (ii) खाली किए गए (पुनः भरा जाना है) (iii) पुनः 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 पुनः 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 (मी³): 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 (मी³): 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 (ईट 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 :			
	व्यौरा	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 शेष 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	1 st	2 nd	3 rd -10 th
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 of 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 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.

AnnexureAsh 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 (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 <i>Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one)</i> (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 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: <table><tr><td>Details</td><td>Quantity generated (MTP)</td><td>Quantity utilised (MTP) and (per cent)</td><td>Balance quantity (MTP)</td></tr></table>				Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)
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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भारत का राजपत्र The Gazette of India

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असाधारण
EXTRAORDINARY

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

प्राधिकार से प्रकाशित
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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 30 दिसम्बर, 2022

का.आ. 6169(अ).—पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय में भारत सरकार ने 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 के राजपत्र, असाधारण, भाग II, खंड 3 उप खंड (ii) का.आ. 5481(अ), तारीख 31 दिसम्बर, 2021 द्वारा एक अधिसूचना जारी की थी (जिन्हें इसमें इसके पश्चात् इसे राज के उपयोग से संबंधित अधिसूचना कहा गया है);

और, राज के उपयोग से संबंधित अधिसूचना के उपबंधों के कार्यान्वयन के संबंध में विद्युत मंत्रालय, ताप विद्युत संयंत्रों और विभिन्न हितधारकों से अनुरोध प्राप्त हुए हैं;

और, राज के उपयोग से संबंधित अधिसूचना के कार्यान्वयन में सुचारु परिवर्तन लाने हेतु उक्त अधिसूचना के कतिपय उपबंधों में संशोधन लाना उचित है;

अतः अब, केन्द्रीय सरकार पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (1), (2) और (4) 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, जारी राज के उपयोग संबंधी अधिसूचना में निम्नलिखित संशोधन करती है, अर्थात्:-

जारी राज के उपयोग से संबंधित अधिसूचना में संशोधन -

1. पैरा क में, -

(i) उप पैरा क (4) में, तीसरे परंतुक के पश्चात निम्नलिखित परंतुक अंतर्बिष्ट किया जाएगा, अर्थात् :

"परन्तु, यह भी कि इस अधिसूचना के प्रकाशन की तारीख को अथवा उसके पश्चात् स्थापित नए ताप विद्युत संयंत्र सारणी में यथा विनिर्दिष्ट 60 प्रतिशत से कम ताप विद्युत संयंत्रों के लिए विनिर्दिष्ट अनुपालन चक्र के समान प्रथम अनुपालन चक्र का अनुसरण करेंगे।

टिप्पण : लागू अनुपालन चक्र के अनुसार उपयोग के लक्ष्य 1 अप्रैल, 2022 से प्रभावी होंगे।"

(ii) उप पैरा 5 में, -

(क) आरंभिक पैरा में, "इस अधिसूचना के प्रकाशन की तारीख" शब्दों के स्थान पर "1 अप्रैल, 2022" उक्त अक्षर और शब्द रखे जाएंगे;

(ख) दूसरे परंतुक में, -

(i) "हरित पट्टी या पौधरोपण" के पश्चात, "या उप पैरा (6) में यथा विनिर्दिष्ट केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) द्वारा जारी मार्गदर्शी सिद्धांतों के अनुसार सौर ऊर्जा संभव या पवन ऊर्जा संयंत्र" शब्द कोष्ठकों और अक्षरों को अंतःस्थापित किए जाएंगे;

(ii) "केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) या" शब्द कोष्ठक और अक्षर हटा दिया जाएगा।

(iii) "एक वर्ष" शब्दों के स्थान पर "तीन वर्ष" शब्दों को रखा जाएगा।

(iv) "इस अधिसूचना के प्रकाशन की तारीख" शब्दों के स्थान पर "1 अप्रैल, 2022" उक्त अक्षर और शब्द रखे जाएंगे;

(ग) दूसरे परंतुक के पश्चात निम्नलिखित उपलब्ध अंतःस्थापित किया जाएगा, अर्थात् :

"परंतु कि पैरा क (6) में यथाविनिर्दिष्ट राख के अस्थायी भंडारण हेतु अभिहीत किए गए संचालित राख कुंड या डाइक के सिवाय सभी राख कुंडों या डाइक में संग्रहीत राख में पुरानी राख एकत्रित होगी और या तो इसे पुनःप्राप्त या स्थिर या उपयोग करना होगा।"

(iii) उप पैरा (6) के स्थान, उप पैरा रखा जाएगा, अर्थात्:

"(6) किसी भी नए और साथ ही चालू थर्मल पावर प्लांट को 0.1 हेक्टेयर प्रति मेगा वाट (मेगावाट) के क्षेत्र में राख के अस्थायी भंडारण के लिए परिचालन राख तालाब या डाइक की अनुमति दी जा सकती है। केन्द्रीय विद्युत प्राधिकरण के परामर्श से बनाए गए केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) के दिशा-निर्देशों के अनुसार परिचालन के साथ-साथ स्थिर और पुनः दावा किए गए राख तालाबों या बांधों की तकनीकी विशिष्टताओं के अनुसार होंगे और ये दिशानिर्देश वार्षिक प्रमाणन के लिए एक प्रक्रिया भी निर्धारित करेंगे। परिचालन के साथ-साथ राख तालाब या डाइक को उसकी सुरक्षा, पर्यावरण प्रदूषण, उपलब्ध मात्रा, निपटान के तरीके, पानी की खपत या निपटान में संरक्षण, राख जल पुनर्चक्रण और हरित पट्टी, आदि पर परिचालन के साथ-साथ स्थिर और पुनः प्राप्त किया जाएगा और इस अधिसूचना के प्रकाशन की तारीख से तीन महीने भीतर रखा जाएगा :

परंतु कि 31 दिसंबर, 2021 से पहले चालू किए गए ताप विद्युत संयंत्रों के लिए 1600 मेगावाट से कम या उसके बराबर स्थापित क्षमता वाले दो परिचालन राख तालाबों या डाइकों तक और 1600 से अधिक स्थापित क्षमता वाले ताप विद्युत संयंत्रों के लिए चार परिचालन राख तालाबों या बांधों तक MW, मौजूदा राख तालाबों या बांधों से निर्दिष्ट क्षेत्र के भीतर कई लैगून होने पर, निर्देशांक के साथ स्पष्ट सीमांकन के साथ नामित किया जा सकता है, और केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी)/प्रदूषण को मुचित करेगा। नियंत्रण समिति (पीसीसी) 31 मार्च, 2023 तक :

परंतु आगे कि नए थर्मल पावर प्लांट या मौजूदा थर्मल पावर प्लांट के विस्तार के मामले में केवल एक ऐश पोंड या डाइक की अनुमति दी जाएगी 31 दिसंबर, 2021 को या उसके बाद, जो केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी)/प्रदूषण नियंत्रण समिति (पीसीसी) को कमीशन की तारीख से 3 महीने के भीतर निर्देशांक के साथ सीमांकन के विवरण की सूचना देगा। थर्मल पावर प्लांट या 31 मार्च, 2023 तक, जो भी बाद में हो :

परंतु यह और कि कोयला और लिग्नाइट आधारित तापीय विद्युत संयंत्रों को आगे किसी भी नए कार्यशील राख कुंड या डाइक को स्थापित करने या नाम निर्दिष्ट करने की अनुमति नहीं दी जाएगी।

परंतु यह और कि कार्यशील राख कुंड या डाइक की 0.1 हे./मेगावॉट (एमडब्ल्यू) का विनिर्देशन तारीख 3 नवम्बर, 2009 से पूर्व चालू तापीय विद्युत संयंत्रों पर लागू नहीं होंगे।"

2. पैरा ख में, -

(i) उप पैरा (1) में, "300 कि.मी. के भीतर" शब्दों कोष्ठकों और आंकड़ों के स्थान पर "300 कि.मी. के रेडियस के भीतर" शब्द कोष्ठक और आंकड़े रखे जाएंगे।

(ii) उप पैरा (8) में, उच्चतर "वैकल्पिक उत्पादों के मूल्य से अधिक" शब्दों के स्थान पर "केन्द्रीय लोक कार्य विभाग (सीपीडब्ल्यूडी) या संबंधित लोक कार्य विभाग (पीडब्ल्यूडी) द्वारा विनिर्दिष्ट दरों की अनुसूची में उल्लिखित मूल्य या दरों की अनुसूची के अधीन निर्धारित न होने परल वैकल्पिक उत्पादों का मूल्य" शब्द रखे जाएंगे।

3. पैरा घ में, -

(i) उप पैरा (2) के स्थान, उप पैरा रखा जाएगा, अर्थात्:

"(2) जिन व्यक्तियों या उपयोगकर्ता या एजेंसियों को धर्मल पावर प्लांट के मालिक द्वारा नोटिस दिया गया है, अगर वे राख के उपयोग के उद्देश्य से पहले से ही अन्य एजेंसियों के साथ करार कर चुके हैं तो धर्मल पावर प्लांट को तदनुसार सूचित करेंगे और यदि वे उपयोग नहीं कर सकते हैं कोई राख या कम मात्रा का उपयोग कर सकता है।"

(ii) उप-पैरा (2) के पश्चात्, निम्नलिखित उप-पैरा अंतःस्थापित किया जाएगा, अर्थात्:

"(3) जिन व्यक्तियों या उपभोक्ता अभिकरणों को, यदि वे राख आधारित उत्पादों के उपयोग के उद्देश्य से अन्य अभिकरणों के साथ पहले से जुड़े हुए हैं, ऐश ब्रिक्स या टाइल्स या सिंटेड ऐश ऐग्रीगेट या अन्य राख आधारित उत्पादों के विनिर्माताओं के द्वारा नोटिस दिया गया है तो उन्हें ऐश ब्रिक्स या आइल्स या सिंटेड ऐश ऐग्रीगेट या अन्य राख आधारित उत्पादों के विनिर्माताओं को सूचित करना होगा, तदनुसार, यदि वे राख आधारित उत्पादों का उपयोग नहीं कर सकते या कम प्रमात्रा में उपयोग कर सकते हैं।"

2. यह अधिसूचना राजपत्र में प्रकाशन की तारीख से प्रवृत्त होगी।

[फा. सं. एचएसएम - 9/1/2019- एचएसएम]

नरेश पाल गंगवार, अपर सचिव

टिप्पण: मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग-II, खंड 3, उप-खंड (ii) सं. एस 5481(अ) तारीख 31 दिसम्बर, 2021 के द्वारा में प्रकाशित की गई।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE NOTIFICATION

New Delhi, the 30th December, 2022

S.O. 6169(E).—Whereas, the Government of India, Ministry of Environment, Forest and Climate Change, 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, issued a notification published in the Gazette of India, Extraordinary, Part II, Section 3, sub-section (ii) vide S.O.5481(E), dated the 31st December, 2021 (herein after referred to as the ash utilisation notification);

And whereas, requests have been received from Ministry of Power, thermal power plants and various stakeholders regarding implementation of provisions of the ash utilisation notification;

And whereas, it is expedient to make amendments to certain provisions of the said notification to have smooth transitioning in implementation of the ash utilisation notification;

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 of sub-rule (1), (2) and (4) of rule (5) of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following amendments in the ash utilisation notification namely:-

In the ash utilisation notification,-

(1) in paragraph A,-

(i) in sub-paragraph (4), after the third proviso, the following shall be inserted, namely,-

"Provided also that new thermal power plants commissioned on or after the date of publication of this notification shall follow the first compliance cycle similar to the compliance cycle specified for thermal power plants having utilisation per cent. less than 60 per cent. as specified in the table.

Note: The utilisation targets as per the applicable compliance cycle shall commence from 1st April, 2022."

(ii) in sub- paragraph (5),-

(a) in the opening paragraph, for the words "the date of publication of this notification", the figures, letters and word "1st April, 2022" shall be substituted;

(b) in the second proviso, -

(i) after the words "green belt or plantation", the words, brackets, letters and figure "or solar power plant or wind power plant as per the guidelines issued by the Central Pollution Control Board (CPCB) as specified in sub-para (6)" shall be inserted,

(ii) the words, brackets and letters "Central Pollution Control Board (CPCB) or" shall be deleted,

(iii) for the words "a year", the words "three years" shall be substituted,

(iv) for the words "the date of publication of this notification", the figures, letters and word "1st April, 2022" shall be substituted.

(c) after the second proviso, the following proviso shall be inserted, namely:

"Provided that ash stored in all ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash as specified in sub-para (6) shall constitute the legacy ash and either to be reclaimed or stabilised or utilised."

(iii) for sub- paragraph (6), the following sub-para shall be substituted, namely,-

"(6) Any new as well as operational thermal power plant may be permitted operational ash pond or dyke for temporary storage of ash within an area of 0.1 hectare per Mega Watt (MW). Technical specifications of operational as well as stabilised and reclaimed ash ponds or dykes shall be as per the guidelines of the Central Pollution Control Board (CPCB) made in consultation with the Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the operational as well as stabilised and reclaimed ash pond or dyke on its safety, environment pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt, etc. and shall be put in place within three months from the date of publication of this notification:

Provided that up to two operational ash ponds or dykes for thermal power plants commissioned before 31st December, 2021, having installed capacity less than or equal to 1600 MW, and up to four operational ash ponds or dykes for thermal power plants having installed capacity more than 1600 MW, having multiple lagoons, within the specified area from the existing ash ponds or dykes, may be designated with clear demarcation along with coordinates, and shall inform to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 31st March, 2023:

Provided further that one ash pond or dyke shall be permitted in case of new thermal power plants or expansion of existing thermal power plants commissioned on or after 31st December, 2021, which shall inform the details of demarcation along with coordinates to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) within 3 months from the date of commissioning of thermal power plant or by 31st March, 2023, whichever is later:

Provided also that coal and lignite based thermal power plants shall not be allowed to further establish or designate any new operational ash pond or dyke:

Provided also that specification of 0.1 hectare per Mega Watt (MW) of an operational ash pond or dyke shall not be applicable for the thermal power plants commissioned before 03rd November, 2009."

(2) in paragraph B, -

(i) in sub-paragraph (1), for the words, figures and letters "within 300 kms", the words, figures and letters "within a radius of 300 kms" shall be substituted,

(ii) in sub-paragraph (8), for the words "higher than the price of alternative products", the words, brackets and letters "more than the price mentioned in the Schedule of Rates as specified by Central Public Works Department (CPWD) or concerned Public Works Department (PWD) or price of alternative products, if not mentioned in the Schedule of Rates." shall be substituted.

(3) in paragraph -D, -

(i) for sub-paragraph (2), the following sub-paragraph shall be substituted, namely,-

"(2) Persons or user agencies who have been served notice by owner of thermal power plants, if they have already tied up with other agencies for the purpose of utilisation of ash, shall inform the thermal power plant accordingly, and if they cannot use any ash or may use reduced quantity."

(ii) after sub-paragraph (2), the following sub-para shall be inserted, namely,-

"(3) Persons or user agencies who have been served notice by manufacturers of ash bricks or tiles or sintered ash aggregate or other ash based products, if they have already tied up with other agencies for the purpose of utilisation of ash based products, shall inform the manufacturer of ash bricks or tiles or sintered ash aggregate or other ash based products, accordingly, and if they cannot use ash based products, or may use reduced quantity."

2. This notification shall come into force on the date of its publication in the Official Gazette.

[F. No. HSM-9/1/2019-HSM]

NARESH PAL GANGWAR, Addl. Secy.

Note : The principal notification was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii), dated the 31st December, 2021, vide number S.O.5481 (E), dated the 31st December, 2021.

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भारत का राजपत्र The Gazette of India

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असाधारण
EXTRAORDINARY

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

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 05]

नई दिल्ली, सोमवार, जनवरी 1, 2024/पौष 11, 1945

No. 05]

NEW DELHI, MONDAY, JANUARY 1, 2024/PAUSHA 11, 1945

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 1 जनवरी, 2024

का.आ. 05(अ).—केन्द्रीय सरकार ने 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 उपधारा (1) और उपधारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत के राजपत्र, असाधारण भाग II, खंड 3, उप-खंड (ii) में प्रकाशित संख्या का. आ. 5481(अ), दिनांक 31 दिसंबर, 2021 द्वारा एक अधिसूचना जारी की गई थी;

और, उक्त अधिसूचना के उपबंधों के कार्यान्वयन के संबंध में विद्युत मंत्रालय और अन्य हितधारकों से अनुरोध प्राप्त हुए हैं;

और, पर्यावरण-अनुकूल उद्देश्यों के लिए राख के उपयोग को बढ़ावा देने के लिए उक्त अधिसूचना के कुछ उपबंधों में संशोधन करना समीचीन है, जिसमें राख-आधारित उत्पाद निर्माण में लगे सूक्ष्म और लघु उद्यमों द्वारा निर्मित राख-आधारित उत्पादों में राख का उपयोग सम्मिलित है;

अतः अब, पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (1), उप-नियम (2) और उप-नियम (4) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उपधारा (1) और उपधारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, केन्द्रीय सरकार राख के उपयोग से संबंधित अधिसूचना में निम्नलिखित संशोधन करती है, अर्थात्: -

राख के उपयोग से संबंधित अधिसूचना के,-

(1) पैरा ख में,-

(i) उप-पैरा (1) में, दोनों परंतुकों के स्थान पर, निम्नलिखित परंतुक रखा जाएगा, अर्थात्:-

"परंतु कोयला या लिग्नाइट आधारित थर्मल पावर प्लांट ने ऐसी एजेंसियों को राख उपलब्ध कराने के लिए नोटिस दिया हो, जिसके लिए राख और परिवहन की लागत कोयला या लिग्नाइट आधारित थर्मल पावर प्लांट द्वारा वहन की जाएगी।"

(ii) उप-पैरा (8) में, निम्नलिखित को रखा जाएगा, अर्थात्:

"कोयला या लिग्नाइट आधारित थर्मल पावर प्लांट से 300 किलोमीटर के दायरे में स्थित सभी भवन निर्माण परियोजनाएं (केंद्रीय, राज्य और स्थानीय प्राधिकरण, सरकारी उपक्रम, अन्य सरकारी एजेंसियां और सभी निजी एजेंसियां) राख की ईटों, टाइल्स, सिंटेड राख समुच्चय या अन्य राख आधारित उत्पाद का उपयोग करेंगी, परंतु इन्हें केंद्रीय लोक निर्माण विभाग (सीपीडब्ल्यूडी) या संबंधित राज्य के लोक निर्माण विभाग (पीडब्ल्यूडी) द्वारा निर्दिष्ट दरों की अनुसूची में उल्लिखित कीमत से अधिक कीमत पर उपलब्ध कराया जाएगा या दरों की अनुसूची के अधीन निर्धारित न होने पर वैकल्पिक उत्पादों के मूल्य पर उपलब्ध कराया जाएगा।

परंतु केंद्रीय लोक निर्माण विभाग और संबंधित राज्य के लोक निर्माण विभाग 01 जनवरी, 2024 से छह महीने के भीतर निर्दिष्ट दरों की अनुसूची प्रकाशित करेंगे।"

(iii) उप-पैरा (9) के पश्चात, निम्नलिखित उप-पैरा अंतःस्थापित किया जाएगा, अर्थात्:

"(10) सभी स्थानीय प्राधिकरण राख और राख-आधारित उत्पादों अर्थात् इमारतों, सड़कों, तटबंधों या किसी अन्य संबंधित निर्माण गतिविधि के निर्माण में ईटें, ब्लॉक, टाइलें, सिंटेड या कोल्ड बॉन्डेड राख समुच्चय, फाइबर सीमेंट शीट, पाइप, बोर्ड, पैनल के उपयोग के लिए अपने संबंधित भवन उपनियमों और अन्य सुसंगत विनियमों में उपबंध करेंगे।"

(2) पैरा घ में,-

(i) पैरा (1) के स्थान पर, निम्नलिखित को रखा जाएगा, अर्थात्:

"(1) ताप विद्युत संयंत्रों के मालिक उन व्यक्तियों या एजेंसियों को, जिन्हें पैरा ख के उप-पैरा (1) और (3) के अधीन राख का उपयोग करने की आवश्यकता है, परिवहन की लागत को वहन करते हुए राख की मुफ्त आपूर्ति करने के लिए संबंधित राज्य प्रदूषण नियंत्रण बोर्ड को एक प्रति के साथ एक लिखित नोटिस देंगे।

(1क) राख की ईटों या टाइलों या सिंटेड राख समुच्चय या अन्य राख-आधारित उत्पादों के निर्माता उन व्यक्तियों या एजेंसियों को जिन्हें पेशकश के लिए पैरा ख के उप-पैरा (8) के अधीन राख-आधारित उत्पादों का उपयोग करना आवश्यक है, ऐसे उत्पादों की बिक्री के लिए एक लिखित नोटिस देने सहित संबंधित राज्य प्रदूषण नियंत्रण बोर्ड को उसकी एक प्रति देंगे।"

(ii) उप-पैरा (3) के पश्चात, निम्नलिखित उप-पैरा अंतःस्थापित किए जाएंगे, अर्थात्:

"(4) कोयला या लिग्नाइट आधारित थर्मल पावर प्लांट इस अधिसूचना के अधीन राख का उपयोग करते समय, राख का एक निश्चित प्रतिशत राख आधारित उत्पादों अर्थात् ईटों, ब्लॉकों, टाइलों, सिंटेड या कोल्ड बॉन्डेड राख समुच्चय, फाइबर सीमेंट शीट, पाइप, बोर्ड, पैनल के निर्माण में लगे सभी सूक्ष्म और लघु उद्यमों को केंद्र सरकार के विद्युत मंत्रालय द्वारा जारी दिशानिर्देशों के अनुसार रियायती मूल्य पर या सीमित नीलामी के माध्यम से आपूर्ति के लिए आरक्षित रखेंगे।"

[फा. सं. 09/01/2019-एचएसएमडी]

नरेश पाल गंगवार, अपर सचिव

टिप्पण: मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग II, खंड 3, उप-खंड (ii) में संख्या का.आ. 5481 (अ), दिनांक 31 दिसंबर, 2021 द्वारा प्रकाशित की गई थी और संख्या का.आ. 6169 (अ) दिनांक 30 दिसंबर, 2022 द्वारा अंतिम संशोधन किया गया था।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 1st January, 2024

S.O. 05(E).—Whereas, the Central Government 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, issued a notification published in the Gazette of India, Extraordinary, Part II, Section 3, sub-section (ii) vide number S.O.5481(E), dated the 31st December, 2021,

AND WHEREAS, requests have been received from Ministry of Power and other stakeholders regarding implementation of provisions of the said notification;

AND WHEREAS, it is expedient to amend certain provisions of the said notification to promote use of ash for eco-friendly purposes, including use of ash in ash-based products manufactured by micro and small enterprises engaged in ash-based product manufacturing;

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 of sub-rule (1), (2) and (4) of rule (5) of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following amendments in the ash utilisation notification, namely:-

In the ash utilisation notification,-

(1) In paragraph B,-

(i) in sub-paragraph (1), for both the provisos, the following proviso shall be substituted, namely: -

“Provided that the coal or lignite based thermal power plant has given a notice to such agencies for making available ash to such agencies for which cost of ash and transportation shall be borne by the coal or lignite based thermal power plant.”

(ii) in sub-paragraph (8), the following shall be substituted, namely:

“All building construction projects (Central, State and Local authorities, Govt. undertakings, other Govt. agencies and all private agencies) located within a radius of 300 kms 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 more than the price mentioned in the Schedule of Rates as specified by the Central Public Works Department (CPWD) or Public Works Department (PWD) of the State concerned or price of alternative products, if not mentioned in the Schedule of Rates.

That the Central Public Works Department and Public Works Department of the State concerned shall publish the Schedule of Rates specified within six months from the 1st January, 2024.”

(iii) after sub-paragraph (9), the following sub-paragraph shall be inserted, namely:

“(10) All local authorities shall make provisions in their respective building bye-laws and other relevant regulations for the use of ash and ash-based products, such as bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre cement sheets, pipes, boards, panels in construction of buildings, roads, embankments or for any other related construction activity.”

(2) In paragraph D,-

(i) for paragraph (1), the following shall be substituted, namely:

“(1) The owner of thermal power plants shall give a written notice to persons or agencies who are required to utilise ash under sub-paragraph (1) & (3) of paragraph B for offering the supply of ash free of cost and bearing cost of transportation, with a copy to concerned State Pollution Control Board.

(1A) The manufacturers of ash bricks or tiles or sintered ash aggregate or other ash-based products shall give a written notice to persons or agencies who are required to utilise ash-based products under sub-paragraph (8) of paragraph B for offering for sale of such products with a copy to concerned State Pollution Control Board.”

(ii) after sub-paragraph (3), the following sub-paragraphs shall be inserted, namely:

“(4) The coal or lignite based thermal power plants, while utilising ash under this notification shall reserve certain percentage of ash for supply to all micro and small enterprises engaged in ash-based product manufacturing namely, bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre

cement sheets, pipes, boards, panels for sale at concessional price or through limited auction in accordance with the guidelines issued by the Central Government in the Ministry of Power.”

[F. No. 09/01/2019—HSMD]

NARESH PAL GANGWAR, Adml. Secy.

Note : The principal notification was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii), *vide* number S.O.5481 (E), dated the 31st December, 2021 and last amended, *vide* number S.O. 6169 (E) dated the 30th December, 2022.

Action Plan for Fly Ash Utilization Received from Thermal Power Plants and Other Industries

S. No.	Recommendation of Joint Committee	Responsibility	Action Plan Submitted by the unit
1.	The unit should immediately take required measures to stop the discharge of ash pond overflow into the Rihand reservoir.	M/s NTPC Limited Shakti Nagar Sonbhadra (NTPC Singrauli)	- 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 m³/hr is installed. - Long-term: Augmentation of AWRS capacity by installing another pump (2000 m³/hr. capacity).
	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.
	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.
	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.

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	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.
	The process of installation and commissioning of the FGD system needs to be expedited in 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.
	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.
	The unit shall take 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.
	The committee recommends for imposing environmental compensation (EC) of Rs 27,60,000/- for discharging ash pond overflow water into the Rihand reservoir.	CPCB/ SPCB	
2.	The unit may be asked to ensure that the CAAQMS is connected to the	M/s NTPC Limited Rihand Super Thermal Power	CAAQMS are already connected to the servers of CPCB/SPCB

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	CPCB/SPCB server at the earliest.		
	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
	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
3.	The unit may be asked to submit a time-bound action plan for 100% fly ash utilization at the earliest	M/s NTPC Limited Vindhyachal Super Thermal Power Plant	Action plan attached as Annexure-A
4.	The unit can be asked to submit time bound action plan for controlling the fire in the coal stock yard	M/s Northern coalfield Ltd. (NCL Bina Project, Bina, Sonbhadra)	- At present, fire in coal stock yard has been cancelled at Bina project by taking following measures: - A new fire tender has been commissioned at Bina project as additional firefighting equipment. - There is a specific team (properly trained) working under Fire Fighting Officer (FFO- Bina) to tackle fire hazard in Bina mine. - Fire hydrant pipeline is provided at coal stock yard no.1 covering the periphery of coal stock yard.

			• Truck mounted mist spraying guns along with mobile sprinkler (70 KI and 28 KI) are provided to control fire hazards • 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 addition to this, another fire hydrant pipeline along with pumping arrangement will be provided near coal stock yard no.2 by June 2022.
	• 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.		• A log hook 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.
	• 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 transporter. Further stringent action will be taken against any default transporter. This is being complied.
	• The unit can be asked to provide effective tyre washing facility for transport vehicles. • The unit can be asked to ensure proper treatment and		• The estimate for wheel washing facility has been approved and presently under tendering process and will be completed by October 2022. • Currently all MSW generated from residential colony is being collected door to door and stored at earmarked place within the colony premises. Further estimate has been

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	disposal of MSW generated in their residential colony. 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.		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. - The last five-year overburden and coal production figure of NCL Bina Project are as follows: <table border="1"> <thead> <tr> <th>Year</th><th>Coal Production (Tonnes)</th><th>Overburden removal (Million m³)</th><th>Stripping ratio</th></tr> </thead> <tbody> <tr> <td>2020-21</td><td>8.413</td><td>36.35</td><td>4.32</td></tr> <tr> <td>2019-20</td><td>7.500</td><td>38.42</td><td>3.12</td></tr> <tr> <td>2018-19</td><td>7.500</td><td>29.73</td><td>3.96</td></tr> <tr> <td>2017-18</td><td>7.500</td><td>25.89</td><td>3.45</td></tr> <tr> <td>2016-17</td><td>7.500</td><td>29.78</td><td>3.97</td></tr> </tbody> </table> 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 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.	Year	Coal Production (Tonnes)	Overburden removal (Million m ³)	Stripping ratio	2020-21	8.413	36.35	4.32	2019-20	7.500	38.42	3.12	2018-19	7.500	29.73	3.96	2017-18	7.500	25.89	3.45	2016-17	7.500	29.78	3.97
Year	Coal Production (Tonnes)	Overburden removal (Million m ³)	Stripping ratio																								
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2016-17	7.500	29.78	3.97																								

			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.
	The unit can be asked to take corrective action so that the site of CAAQMS could be open from all the direction.		This being complied. Trees within the close vicinity of CAAQMS have been trimmed to minimize hindrance at the site.
5.	The unit should ensure regular operations of ETP and proper utilization of the treated effluent to achieve zero discharge.	NCL Dudhichuwa Project, Sonbhadra	- Proper O&M of ETP is done by the department. Copy of active (work order enclosed). - Zero discharge is being maintained. Treated effluent from is effectively being used in Water sprinklers, firefighting and Washing of HEMMs. - Proposal for relocation of ETP has been initiated vide E-581788 dt: 27.09.2021. Location has been finalized in March, 2022.
	The coal mine should ensure that no treated/untreated effluent will be discharged into the Balia Nalla which finally meets the Rihand reservoir.		- Zero discharge is maintained. Treated effluent is used for dust suppression, firefighting and washing of HEMM and Discharge from STP is within limits. Zero discharge is being maintained. - Treated effluent from STP 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. - 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.

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	- 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. - The unit can be asked to strengthen the vigilance mechanism to identify the default transporters and take stringent action against them - The unit can be asked to provide effective tire washing facility for transport vehicles. - The unit can be asked to ensure proper treatment and disposal of MSW generated in their residential colony.		- Proper silt cleaning is done to arrest flow of silt every year (work order enclosed). - 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. - 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. - 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. - Residential colony of Dudhichuwa 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 receipt as proof for reference) where wet waste is turned into compost. Wet waste is also send to Nagar Nigam Depo (copy Enclosed).

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	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 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". - 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. - 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. - 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. Target date of completion is 30.09.2022.
	Committee recommends for imposing environmental compensation (EC) of Rs. 1,36,80,000/- for constantly discharging untreated effluent into the Balia Nalla.	CPCB/ SPCB	
6.	The coal mine should ensure that no treated or untreated effluent will be discharged into the Rihand reservoir through the drain.	M/s NCL Kakri Project, Sonbhadra	- Alternate mine water point has been strategically erected in the mines to recycle sump water. - Further, capacity storage of siltation pond, where excess treated water is being stored, is being enhanced (Work Order attached as Annexure 1).

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			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.
	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.
	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). manning of default truck for certain period is being implemented.
	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.		Monitoring of fugitive emissions inside the mines is being done through CMPDIL each fortnightly, and the report of the same is being communicated to UPPCB quarterly. CC"1"V have been installed at strategic positions in mines and monitoring of fugitive emissions through CCTV is being considered.
	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.
	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- 22ETN-43 on 07.03.2022 in 'coalindia.nic.in'.

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			The tender would be finalized by June 2022.
	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.		Study on applicability of utilization of 25% fly ash along with Over-Burden 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.
	The unit can be asked to take corrective action so that the site of CAAQMS could be open from all the direction		Trees in the close vicinity of CAAQMS, which were pointed out by the h CI"1 Oversight committee in their last visit, have been trimmed to minimize hindrance for horizontal movement of wind.
	The committee recommends for imposing environmental compensation (EC) of Rs. 27,60,000/- for discharging untreated/treated effluent into the Rihand Reservoir	CPCB/ SPCB	
7.	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 in to the environment.	M/s NCL Khadia Project, Sonbhadra	- 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.

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47	The unit can be asked to ensure the proper and regular operation of the water spraying system for effective control of fugitive dust emissions.		- 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, 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 emissions. - 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. 01 additional truck mounted mist spray machine is under process of hiring.
	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.
	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.
	The unit can be asked to ensure proper treatment and		MSW is being collected and dumped in low lying area within the premises. In order to further strengthen the overall

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	disposal of MSW generated in their residential colony.		MSW management, a new scheme has been prepared and is under approval.
	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 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: - "It is advisable not to dump the fly ash on external dump in Khadia OCP." "as per mine closure plan the fly ash is not advisable to be dumped in internal dump." "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.
	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.
	The committee recommends for imposing environmental compensation (EC) of Rs. 27,60,000/- for discharging	CPCB/ SPCB	

	untreated/treated effluent into the Rihand Reservoir.		
8.	- 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. - The unit can be asked to strengthen the vigilance mechanism to identify the default transporters and take stringent action against them. - The unit can be asked to provide effective tyre washing facility for transport vehicles. - The unit can be asked to ensure proper treatment and disposal of MSW generated in their residential colony.	M/s NCL Krishna Shila Project	- 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. - 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-1). Strict action are being taken against the uncovered trucks if found (copy of letter enclosed as Annexure-11). - 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. Date of completion is 31.12.2022 - Tender for the management of solid waste for Krishnashila B, C & D type quarters in Bina Colony for collection, segregation and 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-11D). Date of completion 30.09.2022.

	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 filling of fly ash in mine void. Action plan of the same would be submitted on the basis of recommendations of the above mentioned study.										
9.	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.	M.P. Power Generating Co. Ltd. (MPPGCL)	<table><tr><th>Name of TPS</th><th>Name of Expert agency</th><th>Year of study</th><th>Recommendation of Expert agency</th><th>Remark</th></tr><tr><td>SGTPS , Birsina hour</td><td>IIT, Indore</td><td>2019</td><td>Ash dykes are proper & scientifically designed and present status is good for technical soundness, structural strength, stability, safety and is</td><td>Report submitted to MPPCB vide no. 2235 dated: 10/12/2019. To comply with NGT order dated: 18/01/2022, directives for frequency to carry out stability test being obtained from MPPCB. Instruction of expert as</td></tr></table>	Name of TPS	Name of Expert agency	Year of study	Recommendation of Expert agency	Remark	SGTPS , Birsina hour	IIT, Indore	2019	Ash dykes are proper & scientifically designed and present status is good for technical soundness, structural strength, stability, safety and is	Report submitted to MPPCB vide no. 2235 dated: 10/12/2019. To comply with NGT order dated: 18/01/2022, directives for frequency to carry out stability test being obtained from MPPCB. Instruction of expert as
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						structurall y sustainabl e and safe for adequacy for handling of fly ash generated from TPSs.	regard of ash bund of SSTPP, Khandwa being complied.
				ATPS, Chacha i	IIT, Indore	2019	
				STPS, Sami	IIT, Indore	2019	
				SSTPP , Khand wa	IIT, Indore	2019	Suggeste d to carry out regular maintena nce of the slope due to erosion during monsoon season. Advised to monitor the performa nce of the dyke using geotechni cal

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					instrumen tation.		
• 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.			

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ANNEXURE P-16



No. 9/7/2011-St. Th. (Vol. IV)

Government of India

Ministry of Power

'F' Wing, Nirman Bhawan,
New Delhi, 22nd February, 2022

To,

- i. CMD/MD of coal/lignite based Thermal Power Plants(Central/State/Private)
- ii. Principal Secretary (Power/Energy) of All States/UTs
- iii. Chairperson, Central Electricity Authority,

Sub: Supply of Ash to the prospective user agencies as stipulated in the MoEF&CC Notification dated 31.12.2021 by the power plants to increase Ash utilization generated by Thermal Power Plants (TPPs).

Sir,

Ministry of Environment, Forest & Climate Change in super-session of the erstwhile Ministry of Environment and Forest Notification S.O. 763(E), dated the 14th September 1999 issued under the Environment (Protection) Act, 1986 has now issued a new Notification S.O. 5481(E) dated 31st December, 2021 on ash utilization from coal or lignite based Thermal Power Plants.

2. As per the relevant clause B(1) of the said Notification dated 31.12.2021 (**copy attached**), thermal power plants may charge for ash cost and transportation, in case the thermal power plant is able to dispose the ash through other means. The provisions of ash free of cost and free transportation is to be applicable; only if the thermal power plant serves a notice on the construction agencies/mine owner for the same.

3. It is pertinent to note that the objective of the Government is to provide **affordable power to consumers**. Any Extra costs without making efforts to monetize disposal of ash by TPPs lead to increase in electricity tariff, which is to be borne by the consumers.

4. Ash is emerging as a valuable commodity and so giving it free, and also meeting the transportation costs will **lead to malpractices**. Therefore, providing such a valuable commodity through bidding process would help in providing the cheaper power to the consumers. In order to maintain transparency and to restrict malpractices, competitive bidding process is the most suitable method to **determine** the rate of supply of goods and services. Therefore, it is necessary to streamline the procedure to dispose off the ash by TPPs in a transparent manner and also to monetize the sale of ash so as to reduce the tariff burden on the consumers.

5. In view of above, all coal/lignite based TPPs are hereby **advised** to provide Ash to the prospective user agencies for all new commitments for supply of Ash as per following guidelines which have been framed in accordance with MoEF&CC Notification dated 31.12.2021:-

Procedure to be followed to dispose of ash:

5.1 The Power plants shall provide ash to user agencies as stipulated in the MoEF&CC Notification dated 31.12.2021 through a transparent bidding process only.

5.2 If after bidding/ auction, some quantities of ash still remains un-utilized, then only, as one of the options, it could be considered to be given free of cost on first come first serve basis, if the user agency is willing to bear the transportation cost.

5.3 If ash remains un-utilized even after the steps taken in paras 5.1 and 5.2 above, TPP shall bear the cost of transportation of ash to be provided free to the eligible projects/mine owners.

5.4 Even after steps taken in Paras 5.1 to 5.3 above, if the ash remains un-utilized, TPPs shall serve notice on the construction agencies/mine owners located within 300 kms from TPPs to use ash mandatorily in their projects /filling of mine voids.

5.5 The Ash shall be offered to the prospective user agencies as stipulated in the MoEF&CC Notification dated 31.12.2021 on competing demand basis, i.e. user agency who offers the highest price and meets the transportation cost will be offered the ash on priority. This will reduce the tariff of electricity and burden on the consumers. It will also be in accordance with sound vigilance practices.

5.6 The power plant may offer Ash subject to their technical restrictions such as precautions required for Dyke stability and safety etc. The power plants having lower Ash utilization shall make all efforts to increase its Ash Utilization.

5.7 In case, ash is provided free of cost and free transportation; prospective consumers shall be obliged to source the Ash from the nearest TPPs, to reduce the cost of ash transportation. If the nearest TPP refuses to do so, the prospective consumers shall approach Ministry of Power for appropriate directions.

Procedure to be followed for transportation cost to be borne by TPPs:

5.8 The transportation cost wherever required to be borne by the TPPs, shall be discovered on a competitive bidding process basis only. TPPs shall prepare a panel of transportation agencies every year based on competitive bidding for transportation in slabs of 50 Kms, which may be used for the period. The TPPs shall call for bids well in advance, so that the transportation panel is in place as soon as the previous panel expires. There should be no gap between the expiry of existing panel and the finalization of the fresh panel.

5.9 TPPs are advised to invite open bids by keeping a lower bid threshold of minimum 50 tonnes so that even small and medium commercial enterprises can also take part in the bid process.

6. The Appropriate Commission shall scrutinize any expenses regarding ash utilization proposed to be passed through in tariff by the Generation Company in accordance with these guidelines to ensure that the least possible burden is passed on to electricity consumers and full transparency is ensured by Generating Company as envisaged in these Guidelines.

7. **Applicability of this Advisory:** This advisory may be followed by every coal or lignite based TPP (i.e including captive or co-generating stations or both), mentioned at para A(1) of the MOEF&CC notification dated 31.12.2021. Further, it is clarified that above guidelines apply **prospectively**. TPPs are **advised** to honour their existing commitments of selling/ transportation of fly ash on the basis of rates arrived through a transparent competitive bidding/ State Schedule of rates only, till the expiry of their existing commitment. For the remaining quantity and new commitments, both fly ash and pond ash shall invariably be disposed off through a transparent bid process.

8. This letter supersedes the earlier letters issued in this regard vide File No 9/7/2011-S.Th (Vol. IV) dated 22.09.2021 and File No 9/7/2011-S.Th(Vol. IV) dated 08.11.2021.

9. All concerned are requested to take necessary action in this regard.

10. This issues with the approval of Hon'ble Minister for Power, New & Renewable Energy.

Enclosed: As above



(Aravind Kumar)

Deputy Secretary to the Govt. of India

Tel: 2371 4367

Copy to:

- i. Secretary (MoEF&CC), Government of India
- ii. Secretary (MoRTH), Government of India
- iii. Secretary (MoHUA), Government of India
- iv. All Chief Secretaries of States/ Union Territories
- v. Secretary, CERC
- vi. Secretaries of all SERCs/JERCs

Copy for kind information to:

PS to MoP& NRE, PS to MoSP, Sr PPS to Secretary (Power), All Additional Secretaries/Joint Secretaries/E.A./CE(Thermal), Directors/DS, MoP



TRUE COPY



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

अध्यक्ष और पदेन सचिव
भारत सरकार



Ghanshyam Prasad
Chairperson & Ex-officio Secretary
to the Government of India

केंद्रीय विद्युत् प्राधिकरण
विद्युत् मंत्रालय
सेवा भवन, आर.के.पुराम
नई दिल्ली - 110066

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

September, 2022

(Anil Jain)

Chief Engineer (CD)

DRAFT

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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.

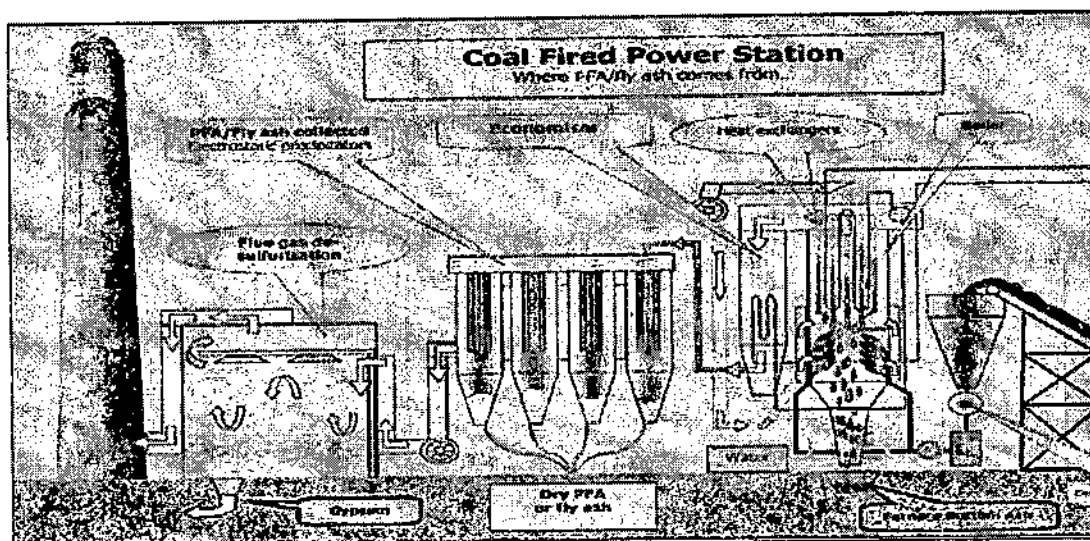


Fig 1. Schematic view of a thermal plant indicating the process of generation of fly ash and bottom ash

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 0.1038 m^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 (SiO ₂)	70.0	73.2
Alumina(Al ₂ O ₃)	24.4	21.3
Iron Oxide (Fe ₂ O ₃)	2.50	2.50
Calcium Oxide (CaO)	0.50	0.60

Magnesium Oxide (MgO)	1.1	1.0
Sulphur Oxide(SO ₃)	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 through 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

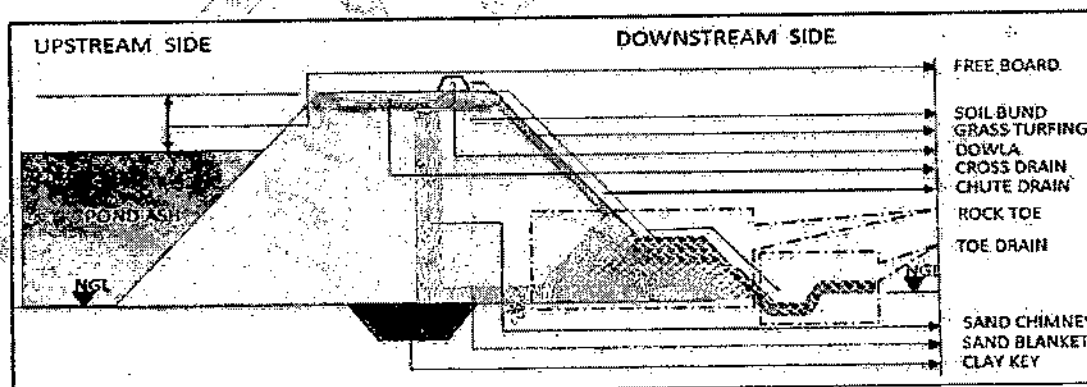


Fig 2. Typical section of Ash dyke

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.

1923

SECTION-A**(Siting, Design and Engineering Standard)**

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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.

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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/m³ 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 located in 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.

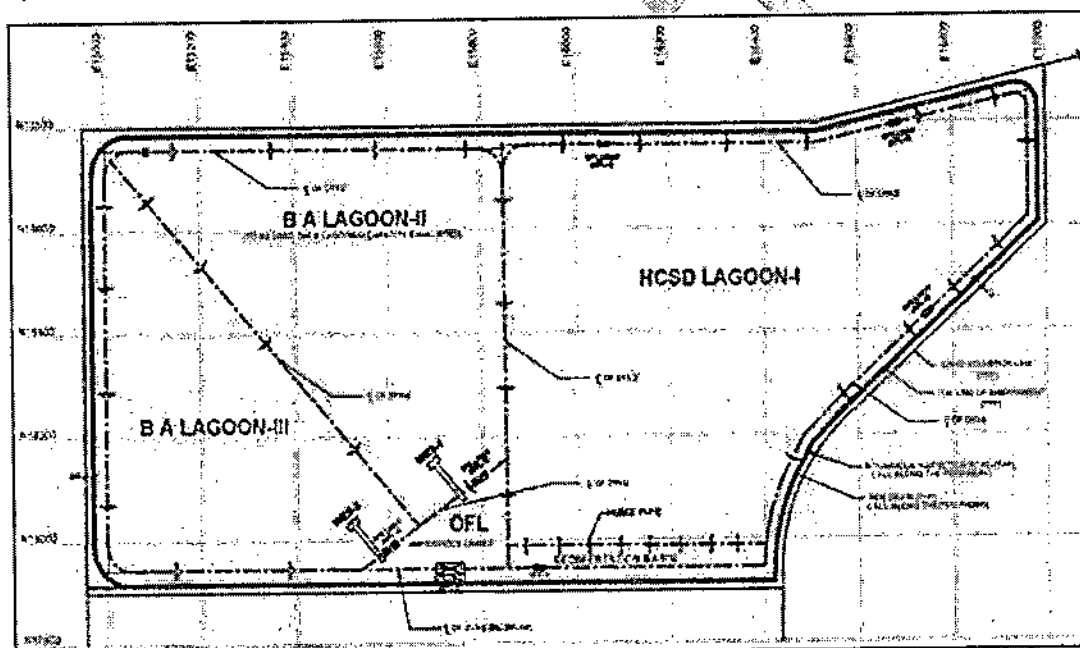


Figure 7: Typical layout of ash pond

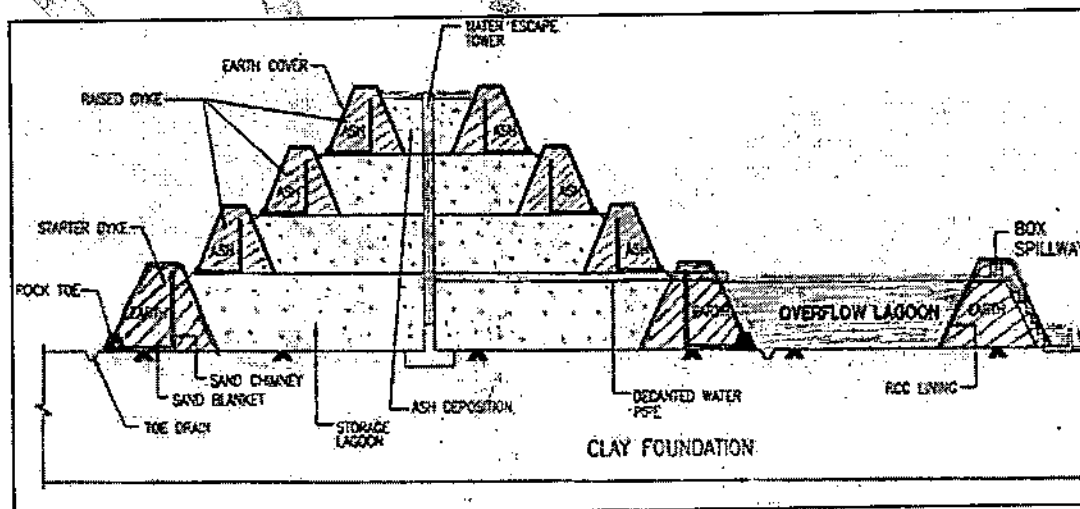


Figure 8: Typ Section of storage lagoon and OFL

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 acres, 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.

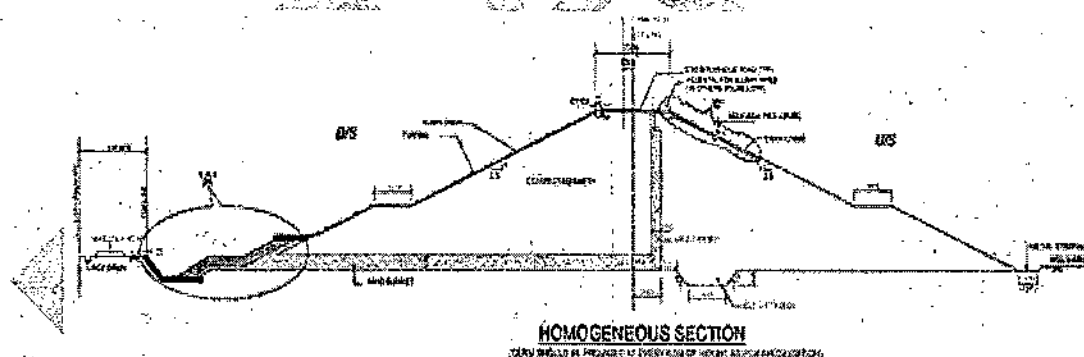


Fig 9. Typical homogeneous ash dyke section

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.

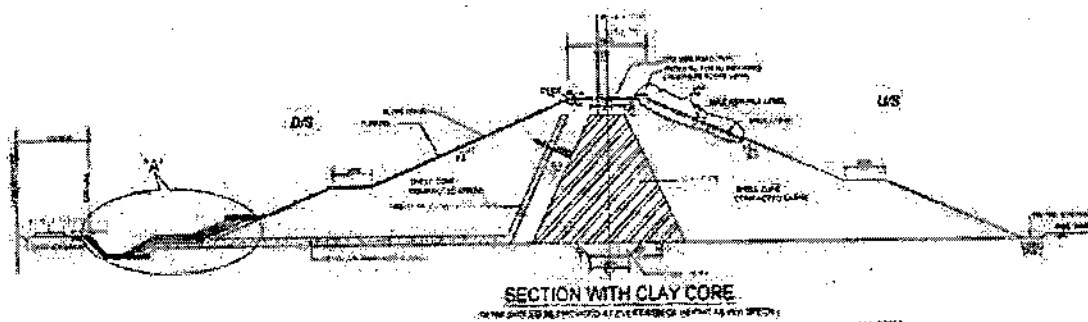


Fig 10. Typical zoned ash dyke section

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.

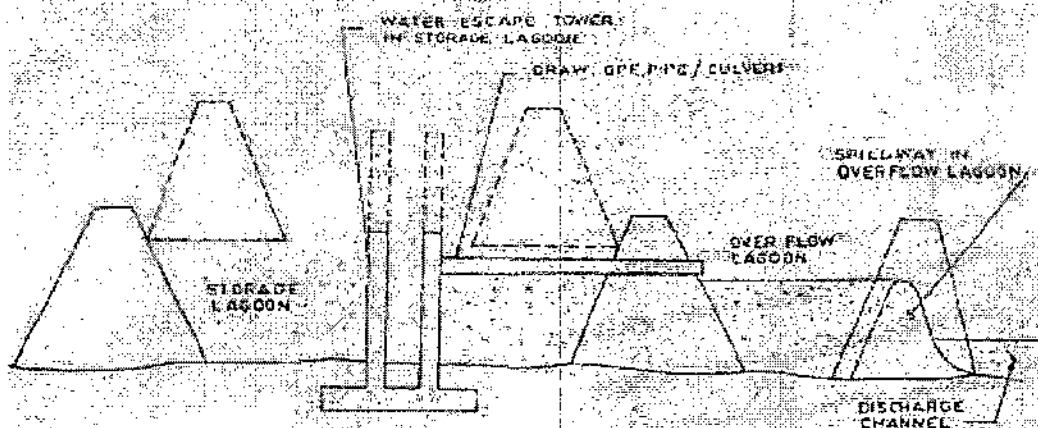


FIG 3. TYPICAL WATER ESCAPE STRUCTURE

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.

DRAFT

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

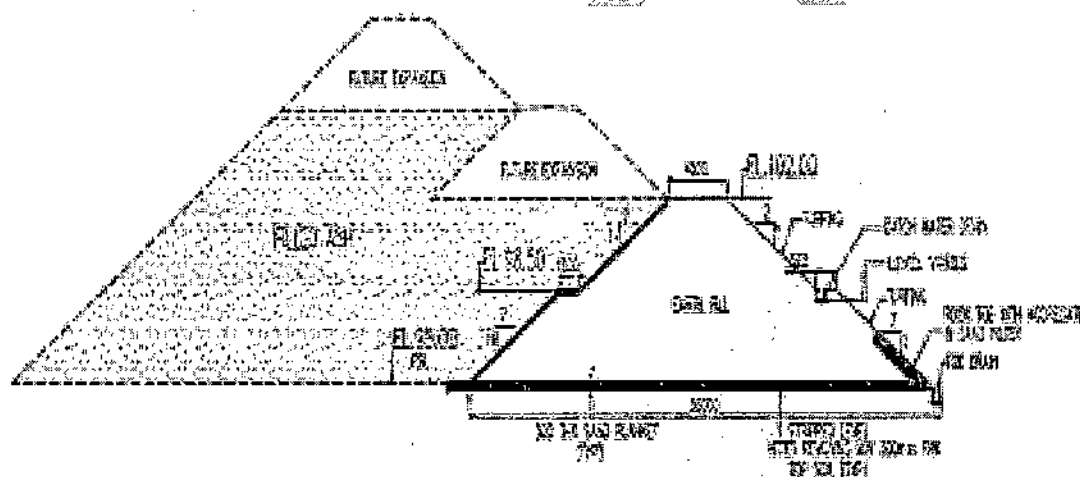


Fig 12 Typical section of Ash Pond

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 founding 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	RS	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	As given in 5.4.2 of IS 7894	RS	1.3
		Downstream	As given in 5.4.5 of IS 7894	RS	1.3
IV	Steady seepage with reservoir full	Downstream	As given in 5.5.2 of IS 7894	RS	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	As given in case IV	RS	1.0
		Upstream	As given in Case II	RS	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 through 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 sodding 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

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
Fairly 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 1×10^{-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) $\frac{D_{15} \text{ of filter}}{D_{15} \text{ of base material}} = 6 \text{ to } 19 / > 5$
- 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 $D_{15} \text{ (filter)} / D_{85} \text{ (base)}$ 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/m ² . 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.

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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.

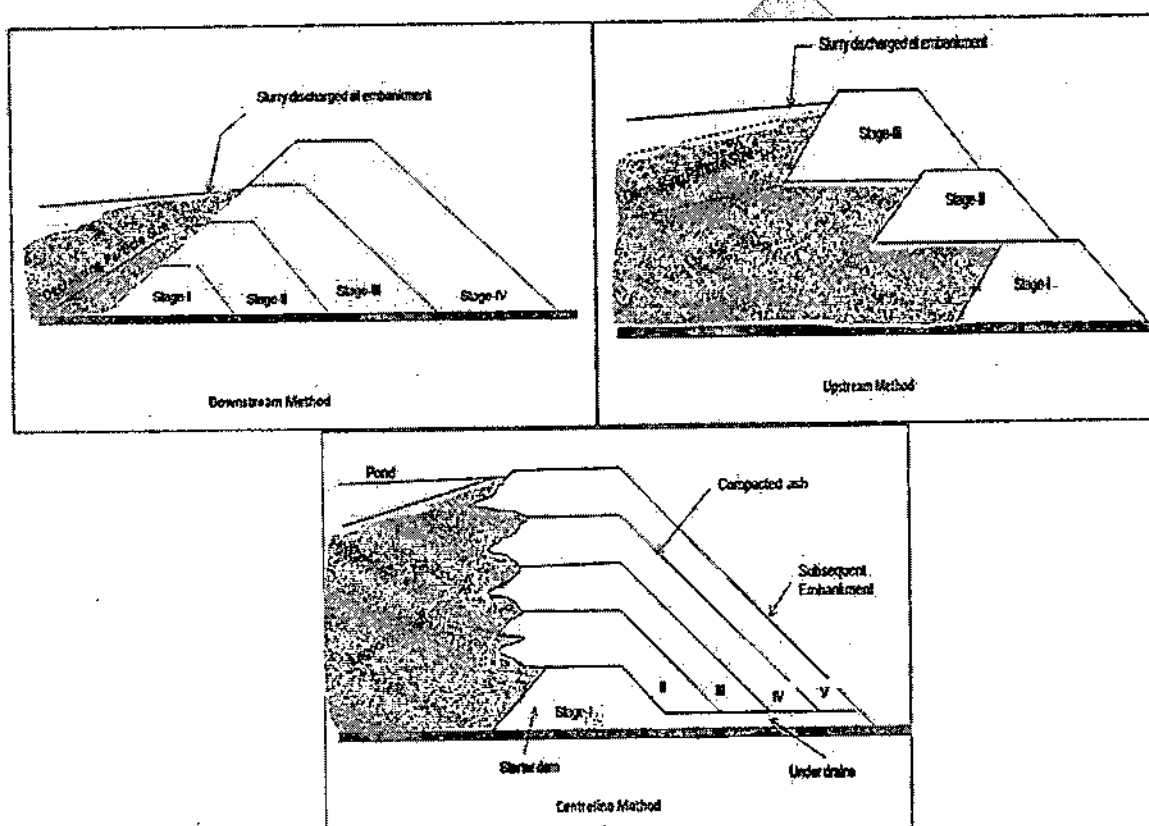


Figure 13: showing methods of dyke construction

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 1×10^{-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 1 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 or 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 geomembrane 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 1×10^{-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 of 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

7.2.2.1 General 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.

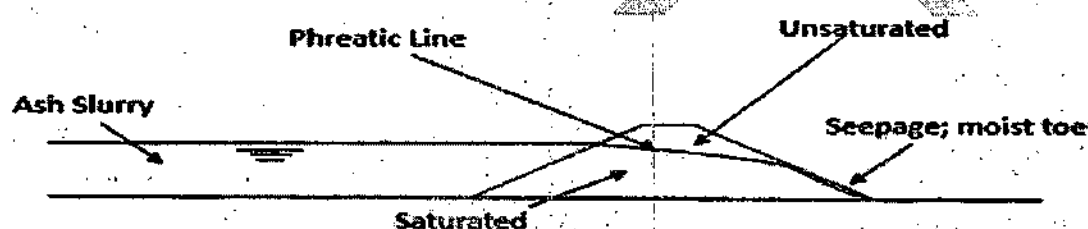
10.2 Sand Chimney

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.

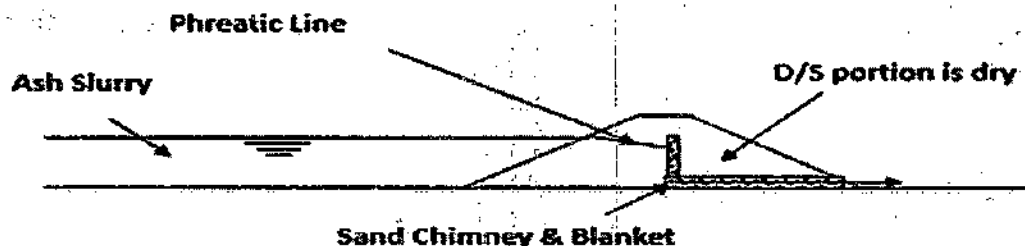
Alternatively, the sand chimney can also be laid in layers simultaneously with the laying of each layer of earth fill. In such case, the top level of sand layer shall always be kept at about 100 cm above earth level on both sides. Each layer of sand shall be well watered and rammed. Care shall be taken 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:

- Specific gravity shall not be less than 2.50. (As per IS: 1122)
- Sulphate soundness less than 10% loss of weight after 5 (As per IS: 1126) (Five) cycles
- Aggregate Impact value shall not exceed 30%
- 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.

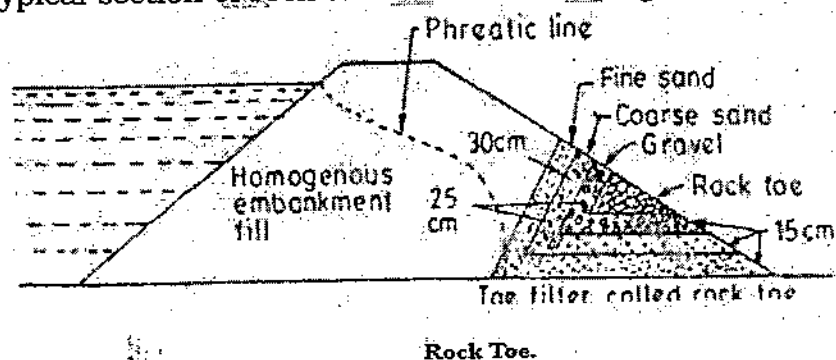


Figure 15: Typical section of Rock Toe

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 250m³ of ash, as per IS: 2720 (Part 2)-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 filling. 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.

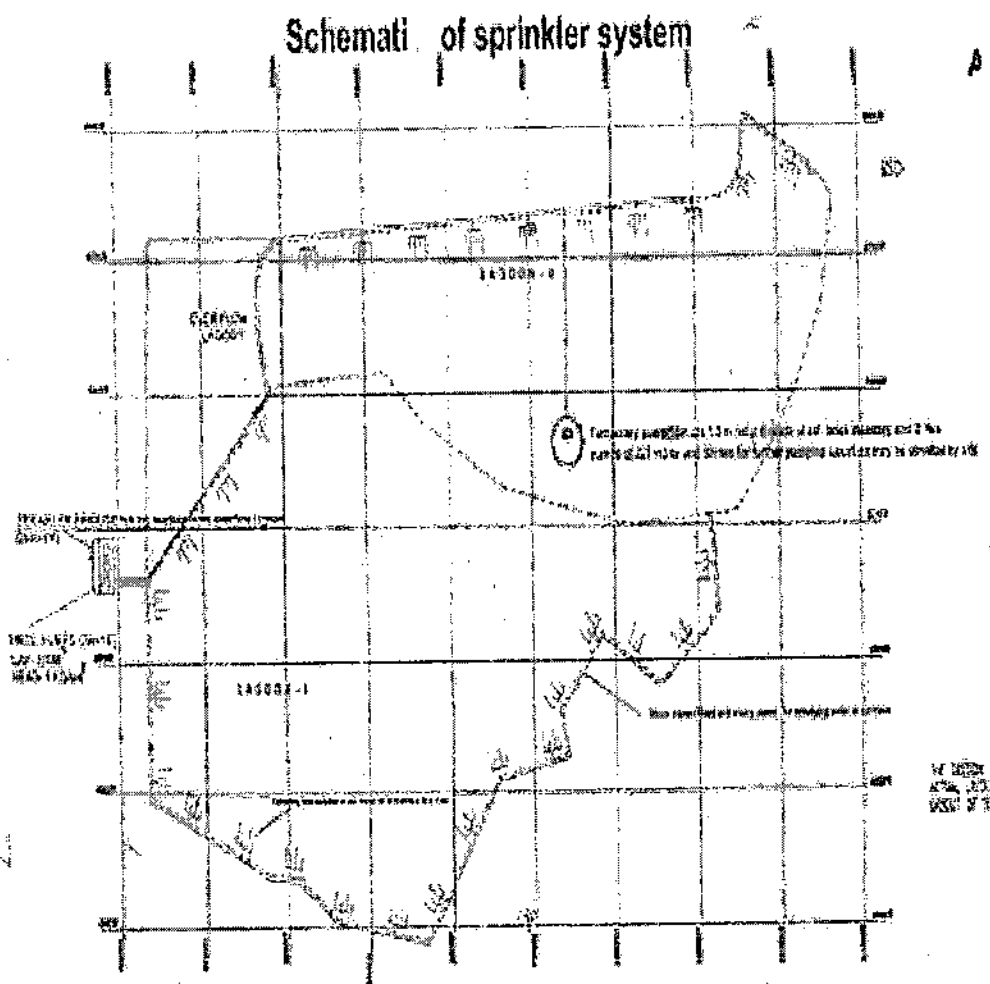


Fig 16: Typical sketch showing the schematic arrangement for the sprinkling system

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 RESPONSE 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

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SECTION-B
**(ENVIRONMENTAL ASPECTS, ANNUAL
CERIFICATION, GREEN BELTS)**

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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 (3500Kcal/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 coarse 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 pozzolanicity 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)

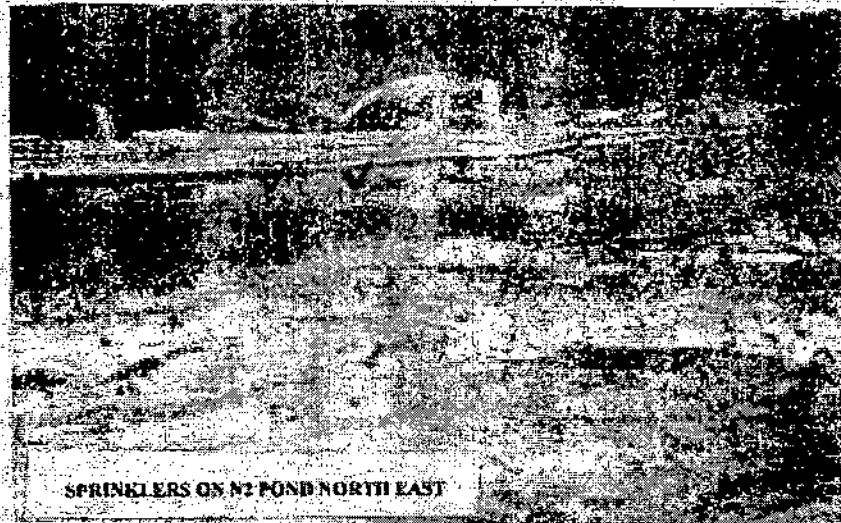
No discharge of liquid effluent from ash dyke into the river or any surface water body to be done. The supernatant from the ash dykes are to be recycled back to the plant to ensure ZLD. Further, the water entrapped in deposited ash is to be collected through dyke embankment by intercepting through chimney/blanket 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.



18 (a) Abandoned Dyke - Reclaimed



18 (b) Abandoned Dyke-Vegetation

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 1×10^{-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.

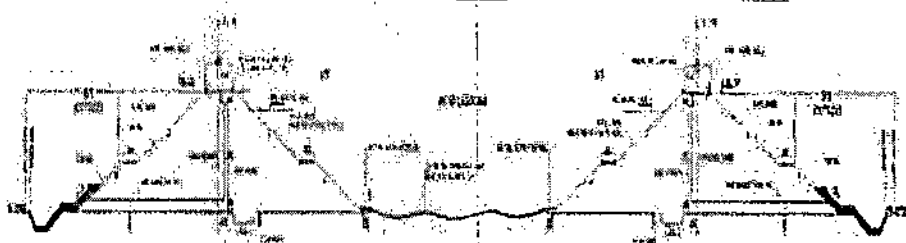


Fig 19: Typical ash dyke section with impervious liner

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 $<10 \mu\text{m}$ in size. Finer particles $<2.5 \mu\text{m}$ 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.

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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			

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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 neighbourhood. 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.

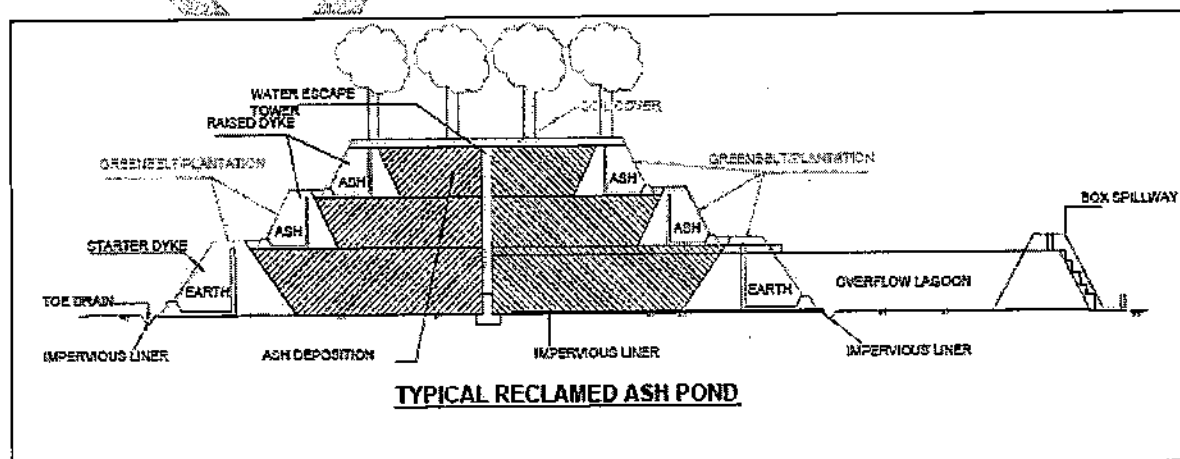
5.0 Placement of earth cover in filling area

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.



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

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Annexure

No. 9/8/2024-St. Th.
 Government of India
 Ministry of Power

Shram Shakti Bhawan, Rafi Marg,
 New Delhi, 15th March, 2024

To,

- i. CMDs/MDs of coal/lignite based Thermal Power Plants (Central/State/Private)
- ii. Principal Secretary/Additional Chief Secretary (Power/ Energy) of all States/UTs
- iii. Chairperson, Central Electricity Authority

Sub: Guidelines for coal or lignite based Thermal Power Plants (TPPs) to utilise ash by providing it to the 'user agencies' as stipulated in the MoEF&CC Notification dated 31.12.2021 and its subsequent amendments.

Sir/Madam,

Ministry of Environment, Forest & Climate Change (MoEF&CC) vide its Notification No. S.O. 5481(E) dated 31st December 2021 issued a Notification on utilization of ash by coal or lignite based Thermal Power Plants. The Notification was issued by MoEF&CC in supersession of all its previous Notifications issued in this regard. The MoEF&CC Notification dated 31.12.2021 is further amended on 30.12.2022 and 01.01.2024.

2. Ministry of Power had issued an Advisory to all Thermal Power Plants on 22.02.2022 which was in line with the MoEF&CC Notification dated 31.12.2021, the primary objective of which is to maintain transparency, prevent malpractices and ensure 100% utilisation of ash with least burden on the electricity consumers to provide affordable power to consumers.

3. The ash disposal is being done by coal or lignite Thermal Power Plants as per the Ministry of Power advisory dated 22.02.2022. Now, MoEF&CC vide Notification No. S.O. 05 (E) dated 01.01.2024 has further amended its Notification dated 31.12.2021, which makes it necessary to further streamline the procedure for TPPs and amend the advisory dated 22.02.2022 in such a manner that the primary objective of the Government to ensure 100% utilisation of ash with least burden on the electricity consumers, can be achieved.

15/3/24

4. The MoEF&CC amendment dated 01.01.2024 has also stipulated that the coal or lignite based thermal power plants, while utilising ash under the notification shall reserve certain percentage of ash for supply to all micro and small enterprises engaged in ash-based product manufacturing namely, bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre cement sheets, pipes, boards, panels for sale at concessional price or through limited auction **in accordance with the 'Guidelines' issued by the Central Government in the Ministry of Power.**

5. In view of the above, all coal and lignite based thermal power plants (Central/State/Private) are hereby advised to provide ash to the user agencies for all their new commitments as per the following guidelines in accordance with MoEF&CC Notification dated 31.12.2021 and its amendments on 30.12.2022 and 01.01.2024.

Procedure for disposal of ash by TPPs:

A. General Procedure for disposal of ash:

- i. **Issuable ash per annum** means the quantity of ash available for issue by a TPP in a year, subject to technical restrictions, safety and current/future ash generation. This quantity shall be declared by TPPs prior to start of the annual ash disposal process.
- ii. The Power Plant shall provide ash to user agencies for eco-friendly purpose as stipulated in the MoEF&CC Notification dated 31.12.2021 as amended on 30.12.2022 and 01.01.2024 through a transparent bidding process.
- iii. TPPs are advised to invite bids on annual basis or for longer period but not more than three years specifying Issuable Quantity on per annum basis. The TPPs shall start the bidding process well in advance (at least 4 months before the end of current financial year) so that all tie-ups are available before the commencement of the next financial year.
- iv. TPPs shall conduct the 'Limited Auction' for Micro and Small Enterprises and the 'Open auction' for all users of ash separately.
- v. For Micro and Small Enterprises the bid threshold shall be 50 tonnes.
- vi. For Open Auction the bid threshold may be higher.

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B. Procedure for 'Limited Auction' for sale of Dry Fly Ash to Micro and Small Enterprises engaged in ash based product manufacturing:

- i. **Reserve Quantity:** The 'Reserved Quantity' shall be 1.10 (one point one zero) times of the highest quantity issued up to previous three years to these Micro and Small Enterprises by the TPP. If there is no previously issued quantity available, TPP shall reserve 20% (twenty per cent) of issuable quantity for first year of limited auction.
- ii. **Floor Price:** The 'Floor Price' (Reserved Price) for the limited auction for Micro and Small Enterprises shall be 50 % of the lowest price of the ash discovered by the TPP in the last 'Open Auction' of the dry fly ash among all users subject to a minimum floor price (Reserved Price) of Rs 1.00 (one) per Metric Tonne (MT).
- iii. Based on the Reserved Quantity as per para 5 B(i) and the Floor Price (Reserved Price) as per para 5 B(ii) TPPs shall conduct limited auction annually exclusively for Micro and Small Enterprises engaged in ash-based product manufacturing namely bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre cement sheets, pipes, boards, panels, as per para D(4) inserted to the MoEF&CC Notification dated 31.12.2021 amended on 01.01.2024.
- iv. Limited auction of Reserved Quantity shall be conducted among Micro and Small Enterprises having valid "Consent to Operate"(CTO) issued by CPCB/SPCBs if applicable or with a valid MSE registration.
- v. The Concerned Pollution Control Board shall verify that ash issued to Micro and Small Enterprises is being utilized to make ash-based products as per the MoEF&CC Notification.
- vi. The balance quantity, if any, left untied in the limited auction shall be included in the quantity for open auction for all users.

C. Procedure for 'Open Auction' for sale of Ash (Dry Fly Ash, Bottom Ash and Pond Ash) among all users of ash as per MoEF&CC Notification:

- i. The balance dry fly ash quantity arrived after excluding the reserved quantity at para B(i) above, and including the untied quantity at para B(vi) above, bottom ash and pond ash shall be put up for open auction process among all user agencies as per the MoEF&CC Notification.

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- ii. If after auction some quantities of ash still remains un-utilized, then it shall be offered through open Expression of Interest (EOI) for lifting ash on 'as is where is' basis, to be given free of cost on first come first serve basis, if the user agency is willing to bear transportation cost.
- iii. Even after the steps taken in Para 5(C)(i) to 5(C)(ii) above, if the ash remains unutilised, the TPPs shall serve notices (as per MoEF&CC Notification dated 31.12.2021 and its amendment on 30.12.2022 and 01.01.2024) to the nearest user agencies engaged in construction activities such as road laying, road and fly over embankments, shoreline protection structures in coastal districts and dams and the mine owners located within 300 kms radius from TPPs to use ash mandatorily in their projects/back filling of mine voids and deliver ash free of cost and the cost of transportation shall be borne by TPPs. In case of refusal by the nearest user agencies upon which notice has been served and ash quantity still remains unutilised, the TPP shall serve notice to the next nearer user agency within 300 km radius as per the MoEF&CC Notification. A copy of this communication is also to be marked to the State Pollution Control Board concerned as per the MoEF&CC Notification.
- iv. Even after steps taken in Para 5(C)(i) to 5(C)(iii) above, if the ash remains un-utilized and the TPPs assess that it may not be able to comply with the MoEF&CC target timelines on ash utilisation and have to pay Environment compensation on the unutilised ash, the TPPs may apply their best business practices/financial prudence in assessing at their plant level to give the ash on mutually agreed terms to the user agencies in transparent manner to comply with the extant provisions of the MoEF&CC Notification to meet full utilisation of ash.
- v. In case, ash is provided free of cost and with free transportation; the user agency shall be obliged to source the ash from the nearest TPPs to reduce the cost of ash transportation. If the nearest TPP refuses to do so, the user agency shall approach Ministry of Power for appropriate directions.

D. Procedure to be followed for transportation cost to be borne by TPPs:

Thermal Power Plants shall prepare a panel of transportation agencies every year based on competitive bidding for transportation to Road Projects/Embankments/mines etc. in slabs of 50 Kms, which may be used for the period. The TPPs shall call for bids well in advance so, that the transportation panel is in place as soon as the previous panel

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expires. There should be no gap between the expiry of existing panel and the finalization of the fresh panel.

6. The Appropriate Commission shall scrutinize any expenses regarding ash utilization proposed to be passed through in tariff by the Generation Company (GENCO) in accordance with these guidelines to ensure that the least possible burden is passed on to electricity consumers while Generating Company fully complies with MoEF&CC notification dated 31.12.2021 and its amendments on 30.12.2022 and 01.01.2024 and full transparency is ensured by Generating Company as envisaged in these Guidelines.

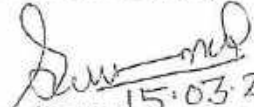
7. Applicability of Guidelines:

These guidelines are in super-session of guidelines issued on 22.02.2022 and shall be followed by every coal or lignite based thermal power plant (i.e. including captive or co-generating stations or both), mentioned at para A (1) of the MoEF&CC notification dated 31.12.2021 and its amendments on 30.12.2022 and 01.01.2024. These guidelines apply prospectively. TPPs are advised to honour their existing commitment of selling/transportation of fly ash on the basis of rates arrived through a transparent competitive bidding/ State Schedule of rates etc., till the expiry of their existing commitment. For remaining quantity and new commitments, dry fly ash, bottom ash and pond ash shall invariably be disposed through a transparent step-wise process as stated at para 5 of this Guidelines.

8. The Enforcement, Monitoring, Audit and Reporting of these Guidelines shall be as para-E of the MoEF&CC Notification dated 31.12.2021 and its amendments on 30.12.2022 and 01.01.2024.

9. All concerned are directed to take necessary action in this regard.

10. This issues with the approval of Hon'ble Minister of Power & NRE.


15.03.2024
(Satish Kumar)
Director (Thermal)
Tele: 011-23738817

Copy to:

- i. Secretary Ministry of Environment, Forest & Climate Change.
- ii. Secretary, Ministry of Coal.
- iii. Secretary, Ministry of Road Transport and Highways.

- iv. Secretary, Ministry of Housing and Urban Affairs.
- v. Secretary, Ministry of Micro, Small and Medium Enterprises.
- vi. Secretary, Ministry of Mines.
- vii. Chairman, Central Pollution Control Board
- viii. Chairman, National Highways Authority of India.
- ix. All Chief Secretaries of States/ Union Territories.
- x. Secretary, CERC.
- xi. Secretaries of all SERCs/JERCs.

Annexure-1		
DATA in respect of Para 10 of NGT Order dated 15-12-2022 (Amaravati Bricks Vs Union of India) (Period 1.1.2022 to 31.12.2022)		
Sub Para No. of Para 10	Description	Quantity
a.	Numbers of TPPs as on 31.12.2022	177
b.	The installed capacity (MW) as on 31.12.2022	208702.50
c.	Coal consumed (in million tons) during the period from 01.01.2022 to 31.12.2022	761.73
d.	Fly Ash generated (in million tons) during the period from 01.01.2022 to 31.12.2022	284.44
e.	Quantum of fly Ash (in million tons) utilized/disposed of during the period from 01.01.2022 to 31.12.2022 with mode of utilization/disposal.	213.14
i)	Bricks/Blocks Tiles Etc (in million tons)	29.76
ii)	Cement Industries (in million tons)	74.02
iii)	Highways & Roads/Flyovers (in million tons)	50.41
iv)	Replacement in Cement Concrete (in million tons)	6.03
v)	Hydro Power RCC work (in million tons)	4.19
vi)	Ash Dyke Raising (in million tons)	0.00
vii)	Reclamation of Low lying area (in million tons)	24.02
viii)	Mine Filling (in million tons)	18.83
ix)	Agriculture and wasteland (in million tons)	0.15
x)	Others (in million tons)	5.73
f.	Quantum of legacy fly Ash (in million tons) stored in Ash dykes/ponds upto 31.12.2022.	256.13
g.	The period of storage of fly Ash in Ash Dykes/ponds in the past and reasons for prolonging future storage of fly Ash in Ash Dykes / Ponds for period extending upto ten years	Will be replied by MoEF & CC
h.	Recommendations, if any, of any Committee appointed or study made for finding out methods of early utilization/disposal of fly Ash and assessing comparative cost of adverse impact of prolonged storage and advantages of early disposal for making informed policy decisions in this regard.	Will be replied by MoEF & CC



तरुण अग्रवाल/TARUN AGARWAL
उप निदेशक/Deputy Director
केन्द्रीय विद्युत प्राधिकरण/C.E.A.
विद्युत मंत्रालय/Ministry of Power
भारत सरकार/Govt. of India
नई दिल्ली/New Delhi-66

DATA in respect of Para 10 of NGT Order dated 15-12-2022 (Amaravati Bricks Vs Union of India) (Period 1.1.2022 to 31.12.2022)		
Sub Para No. of Para 10	Description	Quantity
i.	Quantum of legacy fly Ash (in million tons) utilized/disposed out of legacy fly Ash stored in Ash dykes / ponds of during the period from 01.01.2022 to 31.12.2022 with mode of utilization/disposal.	106.99
i)	Bricks/Blocks Tiles Etc (in million tons)	11.77
ii)	Cement Industries (in million tons)	4.56
iii)	Highways & Roads/Flyovers (in million tons)	17.99
iv)	Replacement in Cement Concrete (in million tons)	1.76
v)	Hydro Power RCC work (in million tons)	3.16
vi)	Ash Dyke Raising (in million tons)	0.00
vii)	Reclamation of Low lying area (in million tons)	7.88
viii)	Mine Filling (in million tons)	5.27
ix)	Agriculture and wasteland (in million tons)	1.46
x)	Others (in million tons)	53.14
j.	Quantum of (a) fly Ash generated and (b) legacy fly ash (in million tons) disposed of by way of (i) bidding (tender/contracts mutually agreed upon between the TPP and the users), (ii) giving free of cost to the consumer with stipulation for bearing of cost of transportation by such consumer and (iii) given free of cost to the consumer with stipulation for bearing of cost of transportation by the TPP during the period from 01.01.2022 to 31.12.2022.	(a) 284.44 (in million tons) 112.02 (in million tons) 47.27 (in million tons) 103.57 (in million tons) b(i) b(ii) b(iii)
k.	The extent of land (in ha) occupied by the fly Ash dykes/ponds in all the TPPs in the country, the area of land (in ha) to be released (year wise) by utilization/disposal of legacy fly Ash and financial (year wise) by utilization/disposal of legacy fly Ash and financial (year wise) by utilization/disposal of legacy fly Ash and financial benefits to accrue from use/utilization for other purposes	Extent of Land occupied = 23781.62 Ha Released and to be released Land = 1741.83 Ha


 तरुण अग्रवाल/TARUN AGARWAL
 उप निदेशक/Deputy Director
 केन्द्रीय विद्युत प्राधिकरण/C.E.A.
 विद्युत मंत्रालय/Ministry of Power
 भारत सरकार/Govt. of India
 नई दिल्ली/New Delhi-66

F. No. 22-13/2019-IA.III

Government of India

Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan
Aliganj, Jorbagh Road
New Delhi-110 003Dated: 28th August, 2019**Office Memorandum****Sub: Change in conditions stipulated in the Environmental Clearances of Thermal Power Plants and Coal Mines in line with the Fly Ash Notification and subsequent amendments - reg.**

The Environment Impact Assessment (EIA) Notification, 2006 under the Environment (Protection) Act, 1986 mandates the requirement of prior environmental clearance to the projects/activities listed in the schedule to the said Notification. These projects/activities have been categorized under category A or B and require appraisal/and approval by the respective regulatory authorities (MoEF&CC/SEIAAs) at the Central/State level.

2. As per the provisions of the EIA Notification, 2006, read with subsequent amendments, mining of minerals is covered under Category A/B of the Schedule to the EIA Notification, 2006 based on their areal extent, and thus requiring prior environmental clearance from the concerned regulatory authority.

3. Based on the proposals submitted by the project proponent and recommendations of the sectoral Expert Appraisal Committee, mining projects and thermal power plants were granted Environmental Clearance by the Ministry/State Environment Impact Assessment Authorities (SEIAAs) from time to time, subject to compliance of certain terms and conditions as environmental safeguards necessitated at that stage, which also included the condition for backfilling of mines voids, use/disposal of fly ash in low lying areas, etc.

4. In order to address the environmental concerns of fly ash and to improve its utilization, MoEF&CC has issued a Notification on 14th September, 1999 and subsequent amendments issued vide Notifications dated 27th August, 2003, 3rd November, 2009 and 25th January, 2016 from time to time.

The Fly Ash Notification issued vide S.O.2804 (E) dated 3rd November, 2009 provides for mandatory use of fly ash in the external overburden dump, backfilling or stowing of mines. The main concern is poor fly ash utilization by the pithead power plants mainly because of limited potential in cement industries/road projects and non-utilization of fly ash in stowing and overburden in coal mines.

5. An Expert Committee was constituted for developing a focussed strategy for best utilization of flyash to manufacture end products. The Committee has made recommendations for enhanced utilization of flyash in various sectors viz. mines, roads, bricks manufacturing, cement manufacturing, etc. During an Inter-ministerial consultation held on 21st January, 2019 under the Chairmanship of Secretary (EF&CC), recommendations of the Expert Committee were accepted, which *inter-alia* included the following:-

- a) MoEF&CC should revisit the conditions stipulated in the existing environmental clearances of Thermal Power Plants for flyash utilization and modify them in consonance with the flyash notification.
- b) Appropriate conditions need to be incorporated in the environmental clearances for utilization of flyash in mines backfilling/stowing.

6. The matter has been examined in the Ministry. Further, the matter has been also been referred to the EAC (Thermal Power Projects) in its meeting held on 28.5.2019 and 12.7.2019. The EAC mentioned that though the Flyash Notification, 1999 and subsequent amendments allow the unrestricted use of flyash in abandoned mines, low lying areas, soil conditioner in agriculture, there are no specific guidelines/methodology available for safe disposal of flyash so as to minimize the damage to the environment. In absence of methodology, EAC has been examining the proposals on case to case basis and recommending for disposal of flyash in abandoned mines. Further, the EAC has also expressed the concerns over the long term impacts of flyash disposal on groundwater, soil quality and impact on associated flora and fauna. Now, the guidelines for disposal of fly ash utilisation in low lying areas and mine voids have been prepared by the Central Pollution Control Board and placed before the EAC (Thermal Power and Coal Mining) in its meeting held on 12.7.2019.

7. In view of the recommendations of the EAC (Thermal Power) in its meeting held on 12.7.2019, after careful examination of the matter and to meet the objectives of the Fly Ash Notification, 1999 & its amendments, the Ministry hereby stipulates the following conditions in the existing Environmental Clearances of Thermal Power Plants and Coal mines which have valid Environmental Clearance accorded by the Ministry/SEIAA, that will replace the existing conditions (Specific & General) which prohibited the use of fly ash in abandoned mines/low lying areas/soil conditioner in agriculture:

- i. The guidelines prepared by CPCB for disposal of flyash for reclamation of low lying areas and in stowing/backfilling of abandoned mines/quarries shall be followed during disposal of ash in abandoned or working mines, as annexed.
- ii. There should at least be clearance of 500 m of safe distance be maintained from River and water body in case of ash disposal in abandoned mines to prevent embankment failures and flyash flowing into the nearby water body.
- iii. The top layer of the flyash disposal area in the abandoned mines shall be kept moist during disposal.
- iv. Top layer of the disposed area should have 70 cm overburden or gravels/stones and then 30 cm sweet soil cover. Subsequently, the vegetation shall be raised on the soil cover.
- v. Bioaccumulation and bio-magnification tests shall be conducted on surrounding flora and fauna (tree leaves, vegetation, crop yields and cattle population) during pre-monsoon and post monsoon to find out any trace metals escaped through groundwater or runoff.
- vi. Surface runoff and supernatant water, in any case shall not be let into the surrounding areas. It shall be collected by providing adequate drains around the mine. The supernatant water along with surface runoff shall be treated and re-used for mixing ash and plant operations.
- vii. To the extent possible, only decanted water from mine, make up water from treated effluents such as cooling tower blow down and treated sewage water shall be used for making ash slurry.

- viii. Flyash to be used as soil conditioner in agriculture needs and to be applied in controlled manner to limit excessive application so as to prevent soil degradation. The optimize proportion of ash to be applied which is to be certified by the State Agricultural Universities/Colleges based on the soil testing.
 - ix. Approval from DGMS shall be obtained before disposing the ash in the mine voids.
 - x. Technology for conversion of fly ash into coarse granules for stowing in the underground mines to be explored.
 - xi. All the power plants should install different silos for dry collection of flyash.
 - xii. Records pertaining to details of month-wise quantity of flyash disposed and water consumption along with nature/source of water shall be maintained and submitted to Ministry/Regional Office annually.
 - xiii. Before starting the disposal of ash into mine voids, the NOC/Permission from the mine owner is to be obtained incase the mine closure activities are not completed or State Government incase the mine has been handed over to the State Govt. after its closure. A copy of such NOC/Permission is to be submitted to the Ministry and its Regional Offices.
8. This issues with the approval of the Competent Authority.


(Dr. S. Kerketta)
Director, IA Division

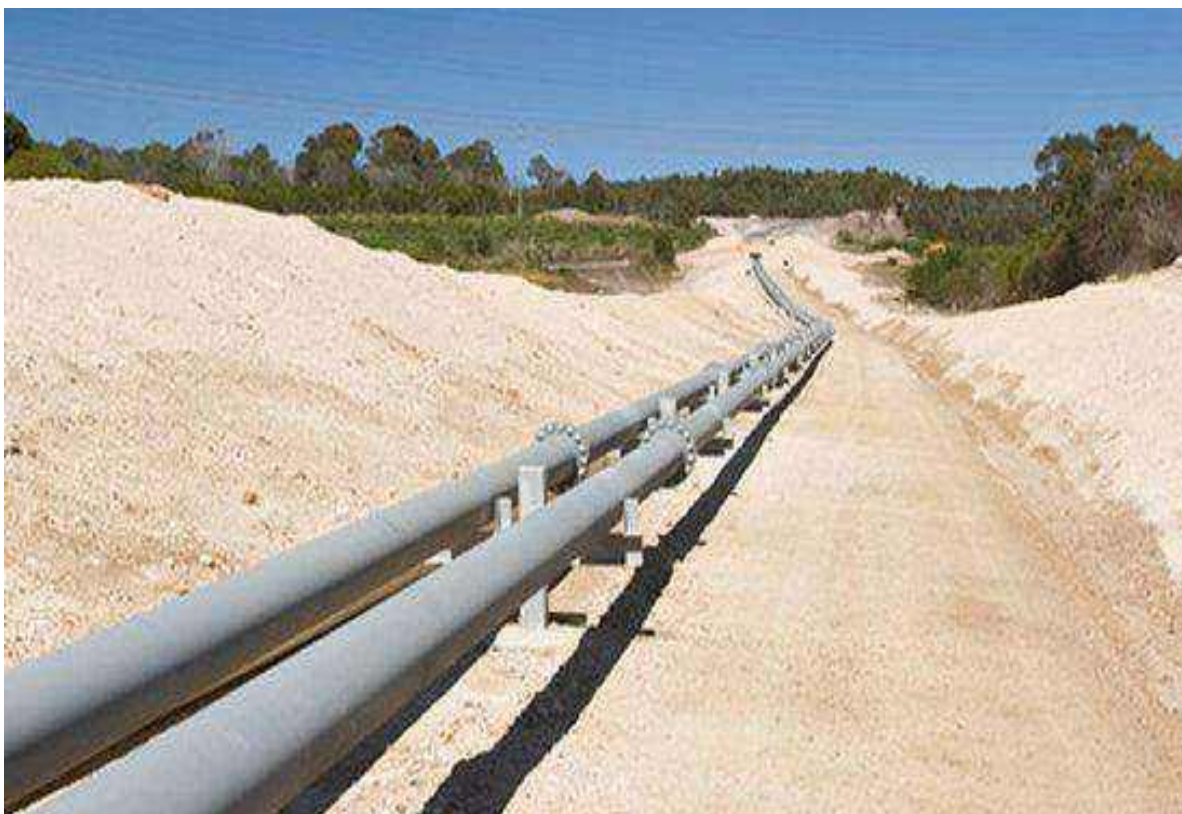
To

1. The Chairman, Central Pollution Control Board (CPCB)
2. The Chairman/Member Secretaries all the Expert Appraisal Committees
3. The Chairman /Member Secretaries of all the SEIAAs/SEACs
4. The Chairman/Member Secretaries of all SPCBs/UTPCCs
5. All the Power Plant Operators/ Coal Mining Operators who were accorded Environmental Clearance.
6. All the ROs of MoEF&CC.
7. All the Officers of I.A. Division

Copy for information to:

1. PS to Hon'ble Minister for Environment, Forest and Climate Change
2. PS to Hon'ble MoS (EF&CC)
3. PPS to Secretary(EF&CC)
4. PPS to SS(AKJ) / AS (RSP)
5. Sr.PPS to JS (GM)/ JS(NK)
6. Website of MoEF&CC.
7. Guard file.

**Guidelines for disposal/utilisation of Fly Ash for
reclamation of Low Lying Areas and in stowing of
Abandoned mines/Quarries**



**Central Pollution Control Board
March, 2019**

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Appendix	Guidelines for disposal of flyash in open cast mines along with Over Burden (OB)
References	1.Guidelines for Reclamation of Low Lying Areas and Abandoned Quarries with Ash , August 2017, Odisha Pollution control board

- 2.Guidelines for Low Lying area development using Ash, ash Policy 2015, NTPC Ltd.
- 3.Permission of DGMS to M/s JSPL & JPL for disposing ash in coal mines

Guidelines for disposal/utilisation of flyash for reclamation of Low Lying Areas and in stowing of Abandoned mines/Quarries

1.0 Introduction:

Management of huge quantity of ash (fly ash, bottom ash and pond ash) generated from coal fired Thermal Power Plants (TPPs) is a serious environmental challenge. Ash generation from coal or lignite based thermal power plants, has increased from 40 Million tonne per year in 1993-94, to more than 200 Million tonne per year in 2017-18 and is projected to increase to 275 Million Tons / year by 2032.

The ash generation in coal and lignite based thermal power plants in various forms such as dry ash, bottom ash, pond ash and mound ash that are required to be managed in such a manner that it does not affect the environment. Utilisation of ash for reclamation of low lying areas and abandoned quarries is recognised as an alternate option and therefore, MoEF&CC has issued a notification to address utilisation of ash for various purposes including these two options

The Ministry of Environment, Forest and Climate Change (MoEF&CC) issued the Fly Ash notification on 14th September, 1999, which has subsequently been amended in 2003, 2009 and 2016. The Fly Ash notification (1999) mandates the use of fly ash for the purpose of manufacturing ash-based products such as cement, concrete blocks, bricks, panels or any other material and for construction of roads, embankments, dams or for any other construction activity within a radius of 300 km from thermal power stations (TPPs). Besides, it also mandates use of fly ash in mines backfilling or stowing of mines within a distance of 50 km.

2.0 Status of fly ash utilisation:

Since 1999 when flyash utilisation was made mandatory, the utilization of fly ash has increased from 6.64 million-ton in 1996-97 to 147.7 million-ton in 2017-18. Fly ash generation and utilization in 2017-18 from 182 coal/lignite based TPPs of various power utilities in the country was 220.7 and 147.7 million-ton, respectively. The percentage of fly ash utilization during 2017-18 has been 66.9%. During 2017-18, out of total fly ash generation, 35.6 % of total fly ash was used in the cement sector, followed by 14.28 % in making bricks & tiles, 11.57 % stored in ash dyke raising,

7.99% in mine filling, 16.85 % in reclamation of low lying area, 5.43 % in roads & embankments, 1.34% in concrete making, 0.21 % in agriculture, 6.73 % in others and 33.1% remained as unutilized fly ash.

Mine reclamation represents a potential beneficial use of flyash that has been receiving increased attention in recent years. Coal mining operations have produced both open pits and deep underground mine voids that can be filled by flyash. Placement of flyash into deep mines can provide structural support to abate subsidence, and placement of flyash in surface mines or other open pits can aid in restoring mined land to beneficial use. The use of flyash as mine backfill may provide the additional benefit of limiting impacts of acid mine drainage (AMD). Mostly flyashe is alkaline material that can neutralize acidic water and/or inhibit production of acid. Placement of fly ash may also reduce the permeability of mine strata and divert water away from acid-generating materials. Although flyash possess these beneficial physical and chemical properties, there are concerns regarding potential for release of toxic chemicals in the leachates from the fly ash. Therefore, scientifically sound fly ash management is needed so that environmental concerns can be adequately and reliably identified and addressed.

3.0 Need of Guidelines:

Ministry of Environment and Forests and Climate Change (MoEF&CC) vide Notification No. S.O. 763 (E) dated 14th September 1999, last amended on 25th January, 2016 issued following directions for reclamation low lying area and stowing of mines;

- i. No agency, person or organization shall within a radius of three hundred Kilometres of a coal or lignite based thermal power plant undertake or approve or allow reclamation and compaction of low-lying areas with soil; only ash shall be used for compaction and reclamation.
- ii. Soil required for top or side covers of embankments of roads or flyovers shall be excavated from the embankment site and if it is not possible to do so, only the minimum quantity of soil required for the purpose shall be excavated from soil borrow area. In either case, the topsoil should be kept or stored separately. Voids created at soil borrow area shall be filled up with fly ash with proper compaction and covered with topsoil kept separately as above and this would be done as an integral part of embankment project.

- iii. No person or agency shall within fifty kilometers (by road) from coal or lignite based Thermal Power Plants, undertake or approve stowing of mine without using at least 25 % of fly ash on weight to weight basis, of the total stowing materials used and this shall be done under the guidance of the Director General of Mines Safety (DGMS).
- iv. No person or agency shall within fifty kilometers (by road) from coal or lignite based Thermal Power Plants, undertake or approve external dump of mining Over Burden (OB) without using at least 25 % of ash on volume to volume basis of the total materials used for external dump of overburden and same percentage in upper benches of back filling of opencast mines and this shall be done under the guidance of the Director General of Mines Safety (DGMS);
- v. All agencies undertaking construction of roads of flyover bridges and reclamation and compaction of low lying areas, including Department of Road Transport and Highways (DORTH), National Highways Authority of India (NHAI), Central Public Works Department (CPWD), State Public Works Department and other State Government Agencies, shall within a period of four months from the publication of this Notification " make provisions in their tender documents, schedules of approved materials and rates as well as technical documents for implementation of this Notification, including those relating to soil borrow area or pit".
- vi. The pond ash should be made available free of any charge as is as where basis to manufacturers of bricks, blocks, tiles including clay flyash bricks production manufacturer's units, farmers, central and the state road construction agencies, Public Works Department and to agencies engaged in backfilling or stowing of mines.

Though, flyash utilisation has gained momentum progressively over the years, further efforts are required to explore new areas of ash utilisation. With suitable safeguards, mine backfilling including disposal of flyash in abandoned quarries and road construction specially in the construction of National Highways and Expressways could be the major mode of flyash utilisation in the near future as these areas have vast potential. It would perhaps be desirable that the concerned Ministries should take steps in sorting out the bottlenecks such as declaring a list of abandoned mines, making adequate provisions in respective schedules for flyash utilisation by the Indian Road Congress & construction agencies etc.

MoEF & CC vide letter dated 01.03.2019 asked CPCB to come out with guidelines based on Odisha Pollution Control Board experience for reclamation of low lying areas and abandoned quarries with ash as recommended by the Expert Committee that was constituted by Niti Aayog vide O.M. No. 25 (11)/2014-Minerals dated 12.06.2018 for developing a focus strategy for best utilisation of fly ash to manufacture end products recommended.

The scope of guidelines covers transportation and disposal of flyash in low lying areas and abandoned quarries in an environmentally friendly manner.

4.0 Loading/unloading and transportation of flyash

4.1 Current Practice for Handling & Disposal of Flyash & Bottom ash (within the power plant)

Flyash is collected in dry form from ESP hopper and disposed either in dry form or through wet slurry form. While, bottom ash collected at the bottom of boiler and is disposed in wet slurry form into the ash ponds.

Following technologies are conventionally used for handling & disposal of flyash and bottom ash collected from ESPs hoppers and boiler bottom respectively within the plant or upto the ash pond area:

- I. Dry Pneumatic conveying
- II. Dry (moist) Conveying system through belt conveyor/tube belt conveyor
- III. High concentration slurry disposal system
- IV. Medium concentration slurry disposal system
- V. Lean concentration slurry disposal system

Amongst the above technologies, Dry Pneumatic conveying, Medium concentration slurry disposal system, High concentration slurry disposal system, and Dry (moist) Conveying system through belt conveyor/tube belt conveyor are preferable as compared to Lean concentration slurry disposal system.

The dry ash is typically conveyed pneumatically from the ESP or filter fabric hoppers to storage silos where it is kept dry, pending utilization or further processing, or to a system where the dry ash is mixed with water and conveyed (sluiced) to an on-site storage pond. Fly ash is stored in silos, domes and other bulk storage facilities. Fly ash can be transferred using air

slides, bucket conveyors and screw conveyors, or it can be pneumatically conveyed through pipelines under positive or negative pressure conditions.

Dry fly ash collected is also be suitably moistened with water and wetting agents, as applicable, using specialized equipment (conditioned) and hauled in covered dump trucks for special applications such as structural fills. Water conditioned fly ash can also be suitably stockpiled at jobsites. Exposed stockpiled material must be kept moist or suitably covered to prevent fugitive emission.

The dry bottom ash removal and its transportation is certainly more environment friendly, compared to that of wet ash removal and transport system.

4.2 Guidelines for loading, unloading, storage, transportation of flyash

The power plants need to maximise dry collection of fly ash & bottom ash and also adopt adequate measures to prevent fugitive dust emission during loading, unloading, storage, transportation and various uses of dry as well as ash bottom ash and pond ash. Following guidelines are, therefore, suggested for prevention of pollution and augmentation of flyash utilisation

4.2.1 Maximise dry collection of fly ash and bottom ash

- a. Coarse fly ash from first field of ESP hoppers need to be collected and stored separately.
- b. Fine fly ash from second field onwards of ESP Hoppers should be collected separately. For some specific usage, fine fly ash may be passed through Classifier for further separation of fine fly ash and stored in separate silo.
- c. Bottom ash which is not utilised presently could also be collected in dry form and converted into a valuable resource if processed to match the end use specification. Wet collection & disposal of bottom ash should be minimised as far as possible

4.2.2 Loading, Unloading and Storage

Installation of Bag Filters with dry flyash collection and storage in Silos at loading and unloading points are standard practices at both locations i.e loading at power plant site as well as at the unloading point at user's site. Suggestions for further improvement in existing practices are as under:

- a. Current practice of loading of fly ash in Bulklers/Tankers requires improvement at the stage of loading of fly ash in Tankers. The opening of telescopic chutes at the loading end should be air tight and confined to avoid fugitive dust emission.
- b. The Pollution Control Equipment / Cascade Filters, attached with fly ash loading chute should be periodically cleaned along with regular scheduled maintenance of bag filter to avoid choking and malfunctioning of Bag Filter. It would mitigate the dust emission during loading of fly ash.
- c. Malfunctioning of level sensors can be avoided, with regular maintenance, to prevent over filling of fly ash in Tankers .
- d. The Weigh Bridge to be installed under fly ash loading chute to fill just the required quantity of fly ash in tankers so that overflow/spillage of fly ash in open areas is avoided which otherwise results in heavy fugitive emission all around.
- e. Opening of tankers need to be properly locked during transportation of fly ash. Automatic opening / closing system need to be installed without fail.
- f. Current practice of unloading of fly ash from tanker to storage hopper through pneumatic system is fairly good. Otherwise, the leakage of fly ash will occur at bends and joints of transportation pipe line. The fly ash being abrasive in nature causes damage at bends and joint locations. Fly ash should, therefore be transported through PVC coated pipes to avoid abrasion otherwise it may lead to leakage of flyash. The mechanical unloading system should be envisaged to avoid high pressure and dust leakage from unloading pipe lines. As far as possible, number of bends should be minimised.
- g. The fly ash storage silo should be of or coated with anti-abrasive or anti-corrosive material. It is better to provide concrete silo/hopper to avoid leakages.

- h. Proper functioning of all the level sensor of Storage Hopper to be ensured to avoid any possible spillage from Hopper opening.
- i. The Bag Filter made of anti-abrasive material/cloth be provided with telescopic chute.
- j. Dumping of ash in Ash pond should be done mechanically in moist condition so that ash does not get air borne and pose fugitive dust problem.
- k. The bottom ash discharged from boiler bed, may be transported pneumatically in dry form / in slurry form to the ash pond

4.2.3 Transportation

Fly ash transportation has many challenges like distance to be transported, form of ash i.e. dry or wet ash, user's requirement, economic feasibility, requirement of surrounding vicinity and many other site specific issues. In any case, control of dust emission during transportation is prime concern and more challenging being a non-point source of pollution and larger area coverage due to movement from one place to other passing through various receptors. As flyash is used by different users for different purposes such as cement manufacturing, brick manufacturing, mine back filling, road construction and filling of low lying area, the handling and transportation have to accordingly decided. Following modes of transportation and precautions are suggested for mine back filling and development of low lying areas by disposal of flyash or bottom ash to avoid fugitive dust emission:

a. Transportation for abandoned mine back filling

- I. Pipe conveyors, wherever feasible, based on the topography of the area should be used.
- II. Tankers/ railway wagons/ bulkers or mechanically designed covered trucks need to be used
- III. Thermal Power Plants using wet ash disposal, if permitted can transport ash slurry directly to abandoned mine through ash slurry pipe line.

b. Transportation for filling of low lying area

- I. Tankers/ bulkers or mechanically designed covered Trucks need to be used.

In no case, flyash or bottom ash shall be transported by open trucks / trollies irrespective of distance or end use. Thermal power plants and fly ash user agency shall collectively ensure that fly ash or bottom ash is transported in environmentally sound manner by following the guidelines mentioned in para 4.2.3 & 4.2.4.

4.2.4 General Code of Practices for Maintenance of roads, vehicles and conditioning of flyash

- a. Roads inside power plant and that of flyash user agency should be paved and plantation of adequate width should be done at both sides. Mechanised road sweepers should be deployed. In addition, adequate arrangements for water sprinkling should be made to suppress fugitive dust emission, if any.
- b. Thermal power plants and user agencies should make arrangements (two stages) for washing of wheels of the vehicles (bulkiers/trucks) before deployed for fly ash transportation.
- c. Pond ash to be transported should be conditioned with water to maintain minimum of 15% moisture at the disposal point so that ash does not get air borne and cause fugitive emission.
- d. Adequate free board in trucks should be kept to avoid overflow/spillage during transportation.
- e. In case of any spillage enroute during transportation of fly ash, the agency shall ensure that spilled ash is collected and transported to the disposal/usage site immediately.
- f. All the bulkiers and trucks responsible for carrying fly ash should be with valid Pollution Under Control certificates.
- g. Provision should be preferably made for weighing of fly ash loaded into tankers/ railway wagons/bulkiers etc under the silo.
- h. The speed limit of vehicles carrying flyash should be strictly enforced and it should not exceed 40 km per hour.

- i. State Pollution Control Boards shall clearly indicate mode of transportation and method of loading and unloading while granting the consent.
- j. Transportation of flyash through thickly populated areas should be avoided as far as possible.
- k. General awareness/ training programmes be organised regularly for tanker operating staff like drivers and cleaners on the impact of hazards of fly ash.

5.0 Reclamation of Low Lying area using Ash

Filling of Low lying areas inside the plant premises and outside within 300 km. of power plant may be taken up using ash. Low lying area reclamation with ash should be taken up adopting standard practices as per 2015 technical specification mentioned in NTPC Policy. Following steps should be taken up prior to initiate low lying area developmental activities.

5.1 Preconditions:

- 5.1.1 **Consent from land owner:** Consent/ permission should be obtained in writing from the land owner before start of work.
- 5.1.2 **Permission from Regulatory authority:** Power plant/ land owner/ agency shall obtain statutory permission from regulatory authorities such as SPCB as per the requirement.
- 5.1.3 **Prevention of pollution:** Suitable methods should be adopted and necessary arrangement should be made to prevent pollution during excavation of pond ash at ash pond, filling area and during transportation of ash.
- 5.1.4 **Soil Cover on the top of ash fill:** As per the MOEF&CC gazette notification of ash utilization dated 14-09-1999 and as amendment on dated 27-08-2003 and 03-11-2009, the soil required for soil cover shall be excavated from land fill site itself and kept separately before taking for ash filling. If it is not possible to do so, 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. About 300-500 mm thick soil layer shall be placed over the ash fill area. This should be done as an integral part of low lying area development work.

5.1.6 Restrictions :

Reclamation of area by ash shall not be permitted in the following areas :

- i. Flood plain area/Ecologically Sensitive Areas.
- ii. Agriculture land / area.
- iii. Reclamation of Forest land / area is permissible only if clearance from MoEF&CC as per Forest Conservation Act, 1980 is available.
- iv. Gochar Kisan Land.

5.2 Preparation of filling area

5.2.1 The entire area meant to receive the ash and earth filling shall be stripped by minimum 150 mm. The exact depth of stripping shall be decided by the Engineer-in-Charge depending upon nature of top soil 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 away from the area to be filled up so that these do not get mixed up with filling material and disposed off to a place as decided by the Engineer-in-Charge.

5.2.2 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 layer wise filling of compacted ash can be done.

5.2.3 Protection of pond or water body adjoining or within the working site: If any pond or water body exists within or adjoining the low lying area /quarry then an earthen embankment of the cross-section as given in the Figure below be constructed around the pond or water body to protect it from
spilling of ash or ingress of surface runoff into it.



Cross- section of water body protection embankment

The soil used for the embankment should neither be granular nor black cotton soil. It should be of good quality for geo-technical application. Soil should be compacted to 95% proctor by Vibratory Roller of 15 T minimum capacity, in the layers of 25-30 cm and the optimum moisture content determined before execution of work. After attaining the desired height, the disposal area should be thoroughly compacted, graded followed by soil cover at least 15 cm thickness for proper reclamation of the land by grass turving or appropriate plantation.

5.3 Excavation of pond ash from borrow area

5.3.1 Borrow Area-location

The location and permissible depth of excavation of the Borrow areas for pond ash shall be got specifically approved from concerned Thermal Power Station. The boundaries and permissible depth of excavation so approved shall be strictly followed and no deviation shall be allowed. Similarly, routes for movement of all ash transportation vehicles, water tankers, equipment, etc. shall be got approved from Thermal Power Station. These shall be strictly followed and no deviation shall be allowed.

The excavation surfaces and surface of waste materials shall be left in a reasonably smooth and even condition. All the excavations within the ash pond shall be at a minimum slope of 4 (Horizontal): 1(Vertical)

5.3.2 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 ash to be placed in the fill. The cleared areas shall be maintained free of vegetation growth during the progress of the work.

5.3.3 Stripping

Borrow area shall be stripped of top layer by a depth of minimum 150 mm. The exact depth of stripping shall be decided by the Engineer-in-charge depending upon nature of top layer and the vegetation present.

5.3.4 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 mixture of materials obtained for the full depth of cut.

5.3.5 Earth cover in Borrow Area

It shall be the responsibility of Thermal Power plant to arrange sweet soil from approved external borrows areas. The earth cover material shall consist of sandy loam free of admixture of stiff clay, refuse, stumps, roots, rock, bushes, weeds or any other material which would be detrimental to the proper development of vegetation growth. It shall not contain stone of size 25 mm and over. The loamy top soil shall be of healthy crops, grass or other plant growth, that is of good quality and reasonably free draining. Other specifications for Borrow area e.g. site clearance, stripping, Borrow area watering/De-watering etc. shall be as per relevant clauses of Borrow area for ash as outlined above i.e clause nos. 5.3.1 to 5.3.4.

5.4 Filling with pond ash

5.4.1 Placement

After the area has been prepared and levelled, pond ash excavated from Borrow areas having required moisture content shall be placed in layers not exceeding 300 mm in compacts thickness. The placing operations shall be such that in strips of 10-15 m of the material when compacted in the fill will be blended sufficiently to produce specified degree of compaction and stability. No stones, cobbles or rock fragments, having maximum dimensions more than 100 mm shall be placed in the fill. Stones and

cobbles shall be removed either at the borrow pit site before it is used as soil cover.

5.4.2 Procedure

The material shall be placed in the fill in continuous horizontal layers, stretching right across the whole section, not more than 300 mm in compacted thickness and rolled as herein specified. The length of one layer shall not exceed 150 meters at one stretch. The layers shall be compacted in strips overlapping not less than 600 mm, 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 or any other approved equipment to reduce the moisture content to the required amount and then it shall be re-compacted before the next layer of ash is placed. Ash surfaces are likely to become dry in short intervals especially during hot and dry weather and hence enough moisture shall be added between difference passes to ensure proper compaction

5.4.3 Compaction

The compaction of each layer shall be carried out so as to achieve maximum in-situ dry density 95% of maximum dry density (MDD) of the material found out as per I.S 2720 (Part VII). To achieve maximum compaction level use of vibratory rollers shall be made. Required number of passes shall be made so as to achieve desired compaction. Number of passes required shall be verified through trials tests before actual execution of work. The broad specifications of vibratory rollers required for the purpose is as follows:

- a) Static Weight = 6 to 10 t
- b) Static Linear Load = 20 – 35 kg/cm
- c) Frequency = 18 – 30 Hz (1100 to 1800 vibrations/ minute)
- d) Amplitude of vibrations = 0.5 mm to 1.5 mm

5.4.4 Moisture control

So far as practicable, the materials shall be brought to the proper moisture content in the borrow area before excavation. If additional moisture is required, it shall be added at the fill site by sprinkling water before rolling the layer. Thermal Power Plant shall make arrangements for supply of water to the borrow areas as well as to the fill area. If the moisture content is more than requirement, the material shall be spread and allowed to dry

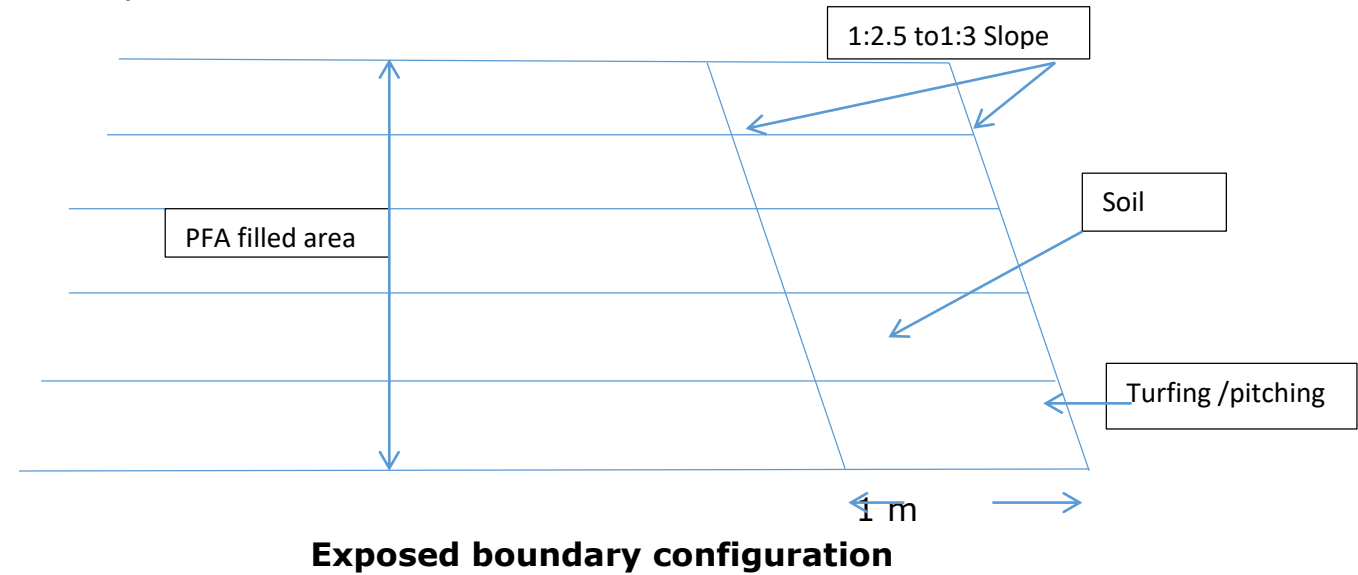
before rolling. The moisture content shall be at most uniform throughout the layer of material and ploughing or other methods of mixing to obtain uniform distribution. If the moisture content is more or less than the range of the required moisture content, or if it is not uniformly distributed throughout the layer, rolling shall be stopped, and shall be started again only when the above conditions are met with.

Fill materials shall be placed only when the weather conditions are satisfactory to permit accurate control of the moisture content in the materials.

5.4.5 **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 300 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.



Other requirements of earth cover laying shall be similar to those of ash laying i.e. as outlined in 5.4.1 to 5.4.4 above.

5.5 Prevention of Pollution

It shall be responsibility of thermal power plant or his contractor that no air borne and water borne pollution shall occur during all stages of operations such as in Borrow areas, during transportation of ash/ earth, during placement of fill material etc. All measures such as water sprinkling covering moist ash/ earth with tarpaulins in open trucks, etc., shall be taken to done care of above.

6.0 Disposal of flyash in voids of abandoned mines

As per notifications 1999 and 2009, power plant shall undertake or approve stowing of mines without using at least 25% of fly ash on weight to weight basis, of the total stowing materials used. Mine void filling on pilot basis is being carried out at the power plants of NTPC Ltd., Bhushan Steel and NALCO in Odisha with prior permission from MoEF & CC and OSPCB. Based on their experience and study conducted by CMPDIL, Ranchi for NTPC Talcher, following methodology is suggested for filling of mine voids with flyash.

6.1 The power plant authority shall carry out following study prior to taking up ash disposal activities in mine void to ensure no change/damage/deterioration in water quality and hydrology in and around the proposed area:

- Ash Characterisation and Leachate Study (Table 1.1)
- Techno-Economic Feasibility Study for disposal of ash into the Quarry
- Topographical Survey of Pipeline Corridor & Mine Void area
- Feasibility of transportation of ash to mine void
- Geotechnical study of the Pipeline Corridor & Mine Void area
- Pre and post filling mine water quality including leachability of metals (Table 1.1)

6.2 Mode of ash transportation to mine void area

One of flowing mode of transport actions of flyash shall be used depending upon the topography of the area:

1. Pipeline using pneumatic conveying system

2. Dumpers/ Trucks
3. Merry Go Round (MGR) System
4. Belt Conveyors in case of dry ash disposal
5. Wet ash (lean slurry or high concentration slurry) through pipeline

6.3 Monitoring:

6.3.1 Regular environmental monitoring to be undertaken during the period of disposal of ash into mine void as well as after the reclamation of mine void. The detailed monitoring programme is given in Tables below:

Table 1.1 : Proposed Monitoring Programme during Disposal of Ash

Samples	Parameters to be Analysed	Frequency
Ash Samples	Chemical Parameters (%): SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , K ₂ O, TiO ₂ , CaO, MgO, Na ₂ O, P ₂ O ₅ , SO ₃ Trace Elements (mg/kg, using TCLP Test): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn Radio-activity (Bq/kg): ²³⁸ U, ²³⁶ Ra, ²³² Th, ²²⁸ Ra, ²³⁰ Pb, ⁴⁰ K, ¹³⁷ Cs	Once before initiation of filling
Ash Leachate Analysis	Trace Elements (mg/kg, using TCLP Test): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn	Once a year
Piezometer Water Samples	Chemical Parameters (mg/l, except, pH and EC): pH, EC, TDS, Total Alkalinity, Ca, Mg, Na, K, Cl, SO ₄ , NO ₃ , PO ₄ , Trace Elements (mg/l): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn	Monthly
Mine Water Sample	Same as above	Monthly
Ground Water	Same as above	Twice a year - Pre-monsoon and Post-monsoon
Surface Water Samples	Same as above	Twice a year - Pre-monsoon and Post-monsoon
Soil Samples	Texture, type, pH & cation exchange capacity. Trace Elements (mg/l): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn	Once a year

Survey of Flora and Fauna	• Listing of Flora (herbs, shrubs and trees) and Fauna (soil invertebrates and other animals) based on field observations and review of information available • Analysis of trace elements in plants (herbs, shrubs and trees), the invertebrates • Analysis of trace elements in aquatic fauna from the mine void filled with fly ash • Bio-accumulation and Bio-magnification tests	Once in two years

Table 1.2: Proposed Monitoring Programme After Reclamation of Mine void

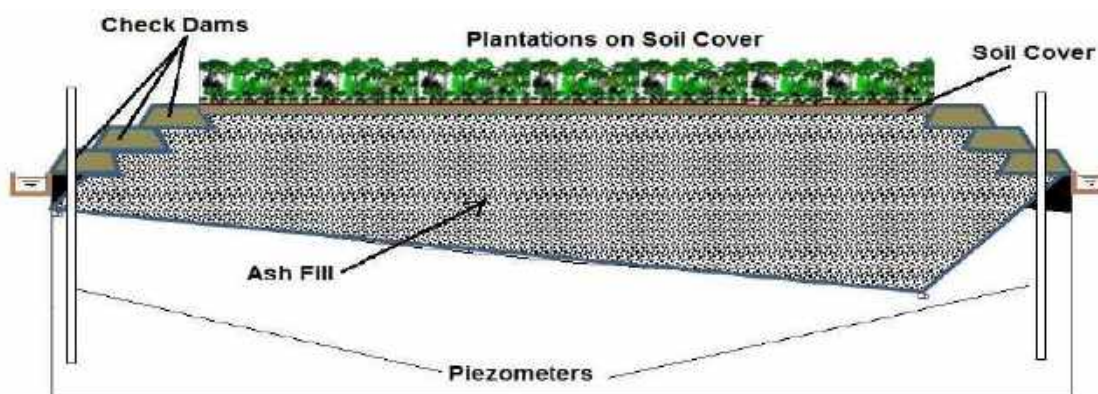
Samples	Parameters to be Analysed	Frequency
Piezometer Water Samples	Chemical Parameters (mg/l, except, pH and EC): pH, EC, TDS, Total Alkalinity, Ca, Mg, Na, K, Cl, SO ₄ , NO ₃ , PO ₄ , Trace Elements (mg/l): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn	Twice a year - Pre-monsoon and Post-monsoon
Ground Water Samples	Same as above	Once a year - Pre-monsoon
Surface Water Samples	Same as above	Once a year - Pre-monsoon
Survey of Flora and Fauna	• Listing of Flora (herbs, shrubs and trees) and Fauna (soil invertebrates and other animals) based on field observations and review of information available • Analysis of trace elements in plants (herbs, shrubs and trees), the invertebrates • Analysis of trace elements in aquatic fauna from the mine void filled with fly ash • Bio-accumulation and Bio-magnification tests	Once in five years

In the event of deterioration of environmental quality, the same will be reported to concerned SPCB immediately and suitable preventive/corrective action will be undertaken.

6.4 Reclamation of Land filled site

After the quarry is filled to the permitted height as per DGMS, the same shall be provided with a soil cover and plantation shall be done with local fast growing species (preferably trees), to make it a part of the overall

post-mining land use pattern envisaged in the mine closure plan. The design of surface contours and land profile will be in consonance with the surrounding features. 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 mine void is presented below.



**Conceptual Plan for Reclamation of Mine Void
(Drawing not to Scale)**

During the mine void 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 30 cm 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.

7.0 Precaution

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 disposal area during execution period.
- (ii) Care shall be taken to avoid any kind of nuisance / inconvenience to the public due to such dumping / filling activities.
- (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 the low lying land / abandoned quarry has been reclaimed with ash. This will help to propagate the message of mine void using ash.

8.0 Regulatory Procedure for Processing the Application for consideration of grant of permission for Reclamation of Low Lying Areas / Abandoned Quarries :

8.1 The activity of reclamation of Low Lying Areas / Abandoned Quarries will be regulated under the provisions of Water (Prevention and Control of Pollution) Act, 1974 and Air Water (Prevention and Control of Pollution) Act, 1981. The stipulations specified in this guideline is consistent with the provisions of Fly Ash Notification, 1999 and amended thereafter which should be a special condition mentioned in consent order issued under the Water (Water (Prevention and Control of Pollution) Act, 1974 and the Air Water (Prevention and Control of Pollution) Act, 1981. Thereafter any deviations from the guidelines shall be treated as violation of both Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 and action as deemed proper shall be taken under Consent Administration by the Board.

8.2 Necessary clearances shall be obtained from the concerned agencies such as DGMS, SPCB, IBM, MoC, etc .

Appendix

Guidelines for disposal of flyash in open cast mines along with Over Burden (OB)

As per notifications 1999 and 2009, "No person or agency shall within fifty kilometres (by road) from coal or lignite based Thermal Power Plants, undertake or approve without using at least 25 % of ash on volume to volume basis of the total materials used for external dump of overburden (OB) and same percentage in upper benches of back filling of opencast mines and this ***shall be done under the guidance of the Director General of Mines Safety (DGMS).***

The methodology as approved by Directorate General of Mine Safety (DGMS) in case of M/s JSPL & JPL (RGR/JPL/P-98(1) &(3)/Flyash/18/2014/1518 dated 31.07.2014) may be referred for filling ash in coal mines. **However, for each case separate approval of methodology from DGMS shall be sought.** Following methodology for disposal of flyash in open cast mines along with Over Burden in case of JSPL was approved by DGMS.

- 1.1 Distance of the internal/overburden dump area from the working faces of mine shall not be less than 100 m.
- 1.2 The area of filling ash shall be specifically earmarked and the same shall be marked on the plan and dumping fly ash shall be carried out accordingly.
- 1.3 Height of each deck shall not be more than 30 m and the total height of the dump shall not exceed 90 m.
- 1.4 The road leading to the dump site for transportation of fly ash shall be independent from the main haul road for transporting OB to the dump site from the mine.

1.5 Method of dumping fly ash

- 1.5.1 The fly ash shall be dumped in alternate layers/stages, of height not exceeding 5.0 m in each layer/stage.

1.5.2 Initially a row of OB dumps not less than 15.0 m width shall be dumped having height of 5.0 m all around the area proposed for ash dump over a deck (of 30.0 m height) of only overburden dump adequately compacted. A number of such areas shall be formed in a layer/stage wherein the fly ash shall be dumped so that one dump of fly ash is separated by another with 15 m wide over burden dump.

1.5.3 Thereafter, fly ash (25%) and overburden shall be dumped within the area surrounded by such OB dumps. In this manner, the dumping shall be laid in the section/layer of 5.0 m height containing both over burden as well as fly ash so as to form a deck of height not more than 30.0 m , distance between two consecutive decks shall not be less than 30.0 m.

1.5.4 In the next section i.e. immediately above bottom section/stage, only OB dumping shall be made to ensure that the Ash is totally covered and protected from the OB dumps all around.

1.5.5 In the same manner as explained above the alternate layer/section of the over burden and over burden with fly ash shall be dumped. Each layer/stage shall be adequately compacted by dozing.

1.5.6 At the top of the dump i.e. at the final stage, the dump shall be covered with 2.0 m thick soil and adequately compacted by dozing. Adequate precaution against rain fall shall be taken by way of plantation, geo-synthetic, or jute/coir reinforcement and formation of gully drains along the slope of the dump and formation of toe walls and peripheral drains as suggested by the scientific agency conducting geo-technical study. The precaution measures shall periodically be checked for its efficacy.

1.5.7 Plan and section in suitable scale (1:2000) shall be maintained showing the details of the dump both external and interval, height of each deck and dump, distance between the dumps containing fly ash and also the distance from the active working faces, plantation done, gully drains, peripheral drains, toe walls, etc. Such plan shall be signed by the Surveyor and countersigned by the Manager as prescribed in the statute.

1.5.8 Code of practices for transportation, dumping compaction of fly ash as mentioned in para 5(4.2.3 & 5.4.3 of main guidelines), shall be implemented.

1.5.9 **1.6 Dump slope management**

1.6.1 The sides of the OB dumps shall be kept benched and height thereof shall not exceed 30.0 m at an angle of slope not exceeding the angle of repose of the dumped material or 28° whichever is less.

1.6.2 Width of the OB dump shall not be less than 40.0 m which shall also be compacted. The benches shall be laid in such a manner that the overall slope of the dump shall not exceed 21° from horizontal.

1.6.3 The toe of the OB dumps shall be protected or armored in such a manner that the sludge does not flow down into the working faces.

1.6.4 A geotechnical study shall be conducted to assess the stability of the dump and the monitoring of various parameters during the course of dumping and also thereafter till the mine is closed permanently.

1.7 Dust control measures: The fly ash dumping including the OB dumps shall be kept moist all the time to prevent ash getting airborne. The quality of the Ash shall be chemically and physically tested at least once in every quarter.

1.8 Surface and ground water quality monitoring

1.8.1 The surface and ground water measurement (Chemical Parameters (mg/l): pH, EC, TDS, Total Alkalinity, Ca, Mg, Na, K, Cl, SO₄, NO₃, PO₄, Trace Elements (mg/l): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn) shall be carried out once in a year (post monsoon) in consultation with the State Pollution Control Board in order to ensure that no harmful heavy metals or any other chemicals pollute the surface or ground water sources or any other water sources present in the area.

1.9 Provision of check drains Proper Check Drains/garland drains having width of adequate size and section shall be made around the OB dumps to ensure that the sludge or waste materials along with the ash does not go into any river, nullah, water streams or any other surface water bodies.

1.10 Impact assessment of flora, fauna, aquatic lives and habitat, water & air quality:

1.10.1 A scientific study shall be carried out by an independent scientific organization to study the impact of Ash filling on Flora, Fauna, Aquatic Life and Habitation (once during the filling and at the end of filling).

1.10.2 The Monitoring of all the aforementioned parameters shall be carried out through any accredited institute/organization/Labs and monitoring report shall be submitted to SPCB and DGMS.

1.10.3 A dedicated team of qualified persons headed by senior officer at the level of General Manager shall be established in the mine level, who shall be responsible for the entire ash filling operation, conducting different studies and shall maintain all records as prescribed.

1.10.4 Record of every analysis and study shall be maintained in a bound page register kept for the purpose and the same shall be signed by the person in-charge of the operation and countersigned by the manager of the mine. Records shall also be maintained showing the details about the slope of each dump, quantity of ash filled, quantity of overburden removed, etc.

1.10.5 Risk Analysis about the risk arising out of ash filling operation shall specifically be conducted at regular intervals and Safety Management Plan including the control mechanism shall be prepared as per the guideline contained in DGMS(Tech)(S&T) Circular No.13 of 2002 dated 31.12.2002 and implemented and the same shall be reviewed time to time

1.10.6 In case, any adverse impact is observed, it should be brought to the notice of the DGMS and also to the State Pollution Control Board including the Environment and Forest Ministries of the State and Central Government. No further use of fly ash shall be done in the mine till permitted in writing afresh from DGMS.



सत्यमेव जयते

GUIDELINES ON DESIGN, CONSTRUCTION, O&M and ANNUAL CERTIFICATION of COAL ASH PONDS

Central Pollution Control Board

Central Electricity Authority

**Ministry of Environment, Forest
and Climate Change
Government of India**

**Ministry of Power
Government of India**

June 2023



**विद्युत मंत्रालय
MINISTRY OF
POWER**



Ministry of Environment, Forest
and Climate Change



CPCB



भारत 2023 INDIA
वसुधैव कुटुम्बकम्
ONE EARTH • ONE FAMILY • ONE FUTURE



Issued by:**Central Pollution Control Board**

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Disclaimer

These guidelines have been prepared solely for the benefit of thermal power plants in India. No liability is accepted with respect to its use. This disclaimer shall apply notwithstanding that these guidelines may be used by other persons for any application.

Acknowledgement

CPCB and CEA extends thanks to all the power utilities and the thermal power stations for furnishing the data and information for bringing out these guidelines on ash ponds and their annual certification.

We are grateful to the Chairperson-CEA, Chairperson-CPCB, Member (Hydro)- CEA and Member Secretary-CPCB for the valuable support and guidance in preparation of these guidelines.

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Sh. Amit Kumar, Director, CD Division, CEA

Ms. Manisha, Sr. Manager-NTPC posted in CEA

for first hand compilation of the basic material for the Guidelines and overall co-ordination.

घनश्याम प्रसाद

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GHANSHYAM PRASADChairperson & Ex-officio Secretary
To the Government Of India

केन्द्रीय विद्युत प्राधिकरण

भारत सरकार

विद्युत मंत्रालय

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**FOREWORD**

Indian coal fired thermal plants generates approximately 270.82 million metric tonnes of ash every year on an average from burning of coal. The utilization of ash has increased from about 9.63 % in 1996-97 to a level of 95.95% in 2021-22 on all India basis.

MoEF&CC estimates that ash dumps occupy nearly 40,000 hectares of land. The ash ponds are metres high and are prone to leaking and breaching, posing serious ecological and public security dangers.

The Ministry of Environment & Forests and Climate Change (MoEF&CC) has issued Notifications on ash utilization dated 31st December 2021 and its amendment dated 30th December, 2022 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 and the same was also highlighted in the notification.

I wish to express my appreciation 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 guideline would be useful for all the stakeholders and shall help in better ash management, design and construction and aid in country's climate goal.

(Ghanshyam Prasad)

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केन्द्रीय प्रदूषण नियंत्रण बोर्ड
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
CENTRAL POLLUTION CONTROL BOARD
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA



Acknowledgement

Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India has issued Notification No. S.O. 5481 (E) dated 31 December, 2021 (and amended it by Notification No. S.O. 6169 (E) dated 30th December, 2022) that mandates coal and lignite thermal power plants in the country to achieve 100% ash utilization in every three year cycles and further mandates utilisation of legacy ash in ten years from its implementation date 01 April 2022 provided the un-operational ash ponds are not stabilised and reclaimed within three years.

Further, in order to prevent ash spilling accidents and breaches of ash ponds embankments/dykes the Notification prescribes in Para A(6) that 'the technical specifications of operational as well as stabilized and reclaimed ash ponds or dykes shall be as per the guidelines of the Central Pollution Control Board (CPCB) made in consultation with the Central Electricity Authority (CEA)' and that 'these guidelines shall also lay down a procedure for annual certification of the operational as well as stabilized and reclaimed ash pond or dyke on its safety, environment pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt, etc.'

I would like to place on record my appreciation of the efforts made by the officers of Civil Design Division of CEA and IPC-II Division of CPCB in preparation of these guidelines as per Para A(6) of the Notification and extend by thanks to them and also their senior officers who guided them in this task.


(Tanmay Kumar)



M. A. K. P. Singh
Member (Hydro)



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PREFACE

With great pleasure and pride I present the comprehensive guidelines on the design, construction, maintenance and operation of pond ash. These guidelines have been developed with an objective to provide engineers, practitioners and stakeholders a valuable resource that will aid them in the efficient and sustainable management of pond ash.

Management of 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 further to meet the target of achieving 100% utilization of Ash in a time bound manner, as prescribed in MoEF&CC Notification of 31st December, 2021 and its amendment dated 30th December, 2022. The land acquisition for creating ash dykes for ash disposal facilities at thermal power plants is becoming difficult. Disposal of ash, if not managed well, will become serious environmental issue.

I am confident that these guidelines will also be useful to all the stakeholders involved in ash management in the country for planning, design, construction as well as operation and maintenance the ash pond.

I would also like to place on record my appreciation of the efforts made by the officers and staff of Civil Design Division, CEA. Any suggestions/views as well as intimations for any unintended errors observed in this document may kindly be sent to:

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Acknowledgement

Pond ash, a by-product of coal combustion, has gained increasing recognition as a valuable material in various engineering applications. This document would serve as a roadmap for professionals involved in the design, construction, maintenance, and operation of projects involving ash.

The development of these guidelines has been a collaborative effort, bringing together a diverse team of experts from within our organization and beyond. I would like to extend my appreciation to all the officers & staff of CD Division who have contributed to these guidelines.

Thanks are also extended to all the Power Utilities and the Thermal Power Stations for furnishing the data and information for bringing out these guidelines on ash ponds and its annual certification.

I am thankful to the Chairperson-CEA, Chairperson-CPCB, Member (Hydro), CEA and Member Secretary, CPCB for their support, worthy suggestions and guidance in the preparation of these guidelines.

In particular, acknowledgements and thanks are extended to the following contributors:

Sh. Gulshan Raj, Chief Engineer-CD Division, CEA

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(C.K.L. DAS)

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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: The ash stored in all the ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash before 1st April 2022.

Ash Dyke: Ash Dyke/Ash ponds are well engineered structures used for storage of bottom ash and fly Ash generated at Thermal Power Stations. A single ash dyke/ash pond may contain multiple lagoons for ash storage based on operational requirements, and other associate structures such as Overflow lagoons/Silting basins etc.

CHAPTER 1

INTRODUCTION

1. 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 gases 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 precipitated 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.

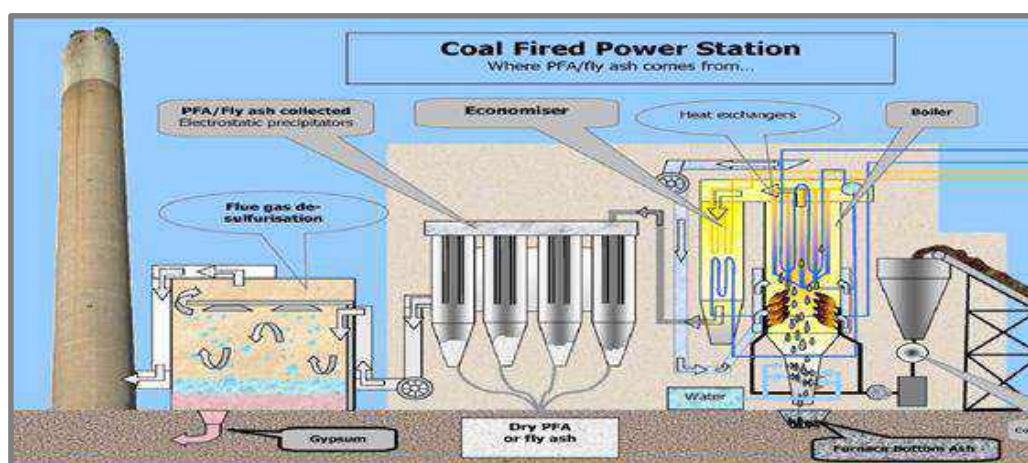


Fig 1. Schematic view of a thermal plant indicating the process of generation of fly ash and bottom ash

Presently in India, more than 40,000 hectares 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 near 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 $0.1038\text{m}^2/\text{gm}$. 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(pulverized fly ash)
Clay	0	0
Silt	15-40	60-90
Sand	50-80	05-20
Gravel	0	0
Specific Gravity	1.58-2.24	1.58-2.2
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 (SiO ₂)	70.0	73.2
Alumina(Al ₂ O ₃)	24.4	21.3
Iron Oxide (Fe ₂ O ₃)	2.50	2.56
Calcium Oxide (CaO)	0.50	0.60
Magnesium Oxide (MgO)	1.1	1.0
Sulphur Oxide(SO ₃)	0.5	0.5

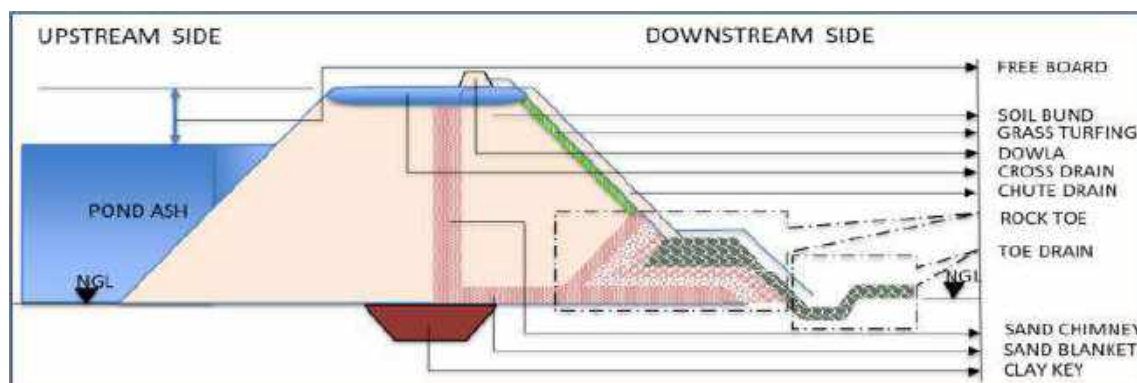
Note The values given in the table are tentative values only for guidance exact values shall be as per actual field tests.*

1.2 Ash Pond/ Dykes

Ash Dykes Ash Dyke/Ash ponds are well engineered structures used for storage of bottom ash and fly Ash generated at Thermal Power Stations. A single ash dyke/ash pond may contain multiple lagoons for ash storage based on operational requirements, and other associate structures such as Overflow lagoons/Silting basins etc. 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 through outlet structure.

The dyke around the ash disposal area is constructed in multi-stage. Initially a starter 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



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1.3 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. Further an amendment to this notification was issued vide Notification No. S.O. 6169 (E) dated 30th December, 2022. The notification as published and its amendment is placed at Annexure-I, II for reference.

The notification mandates 100% ash utilization. The relevant clauses of the notification after incorporation of amendments are reproduced here for reference:

A(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:

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

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 per cent 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.

Provided also that new thermal power plants commissioned on or after the date of publication of this notification shall follow the first compliance cycle similar to the compliance cycle specified for thermal power plants having utilization per cent less than 60 per cent. as specified in the table.

Note: The utilization targets as per the applicable compliance cycle shall commence from 1st April, 2022.

(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 1st April, 2022 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.

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

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 or solar power plant or wind power plant as per the guidelines issued by the Central Pollution Control Board (CPCB) as specified in sub-para (6) 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 State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be carried out within a three years from 1st April, 2022. 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.

Provided that ash stored in all ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash as specified in sub-para (6) shall constitute the legacy ash and either to be reclaimed or stabilised or utilised.

(6) Any new as well as operational thermal power plant may be permitted operational ash pond or dyke for temporary storage of ash within an area of 0.1 hectare per Mega Watt (MW). Technical specifications of operational as well as stabilized and reclaimed ash ponds or dykes shall be as per the guidelines of the Central Pollution Control Board (CPCB) made in

consultation with the Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the operational as well as stabilized and reclaimed ash pond or dyke on its safety, environment pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt, etc. and shall be put in place within three months from the date of publication of this notification:

Provided that up to two operational ash ponds or dykes for thermal power plants commissioned before 31st December, 2021, having installed capacity less than or equal to 1600 MW, and up to four operational ash ponds or dykes for thermal power plants having installed capacity more than 1600 MW, having multiple lagoons, within the specified area from the existing ash ponds or dykes, may be designated with clear demarcation along with coordinates, and shall inform to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 31st March, 2023:

Provided further that one ash pond or dyke shall be permitted in case of new thermal power plants or expansion of existing thermal power plants commissioned on or after 31st December, 2021, which shall inform the details of demarcation along with coordinates to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) within 3 months from the date of commissioning of thermal power plant or by 31st March, 2023, whichever is later Provided also that coal and lignite based thermal power plants shall not be allowed to further establish or designate any new operational ash pond or dyke:

Provided also that specification of 0.1 hectare per Mega Watt (MW) of an operational ash pond or dyke shall not be applicable for the thermal power plants commissioned before 03rd November, 2009.

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.

SECTION-A
(Siting, Design and Engineering Standard for
New Ash Ponds)

CHAPTER 2

ASH CONVEYANCE FROM PLANT TO ASH POND

2. 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.

2.1 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.

2.2 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 point 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.

2.3 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.

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 preferred if disposal area is near to plant

2.4 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. The Existing plants shall carry out feasibility study to switch over to high concentration slurry disposal system and submit the report and time bound action plan for construction to SPCBs.
3. In case of ash mounds, dry ash disposal system which is a requirement of the process shall be used.

CHAPTER 3

PLANNING OF ASH POND

3. 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) **Dry Disposal:** Ash collected in the ESP Hoppers is removed in dry form by using either vacuum system or pressure system and is conveyed to a buffer hopper. The ash is transported in dry form by pneumatic conveying to the storage site. Ash is spread in layers which are amenable to adequate compaction. To facilitate compaction additional water is added into the ash.
- (2) **Wet Disposal:** Fly and bottom ashes are mixed with suitable proportion of water and pumped out from the TPPs as slurry in the ash pond. It is the most commonly used as it is less expensive ash management practice worldwide. The mixed fly and bottom ashes in ash pond is called pond ash.

3.1 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.

3.2 Parameters for Design and Construction of Ash Pond

3.2.1 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.

3.2.2 Storage Volume

In-situ dry density of pond ash varies from 0.78 to 1.05 gm /cc, specific gravity refer table 1 chapter-1 page 4 of the guidelines. In absence of the site specific data, average density of 1.00 tons/m³ 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.

3.2.2.1 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.

3.3 Land Requirement

As per clause no A(6) of MOEF&CC notification (Dec,2021) and its amendment dated 30th December,2022- *Any new as well as operational thermal power plant may be permitted operational ash pond or dyke for temporary storage of ash within an area of 0.1 hectare per Mega Watt (MW).* However, from storage point of view the area required could be less considering ash utilization as per MOEF notification.

3.4 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 be obtained for taking precautions design. 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.

3.5 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) The ash ponds should be located at least 500 m away from the HFL/ FRL of the Rivers/ Reservoirs
- iii) Site should not be located in wetland.
- iv) 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.
- v) Site should not be located in seismic impact zones unless it is demonstrated that all structural components including liners, Ash Water collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.
- vi) 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.

3.6 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. 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

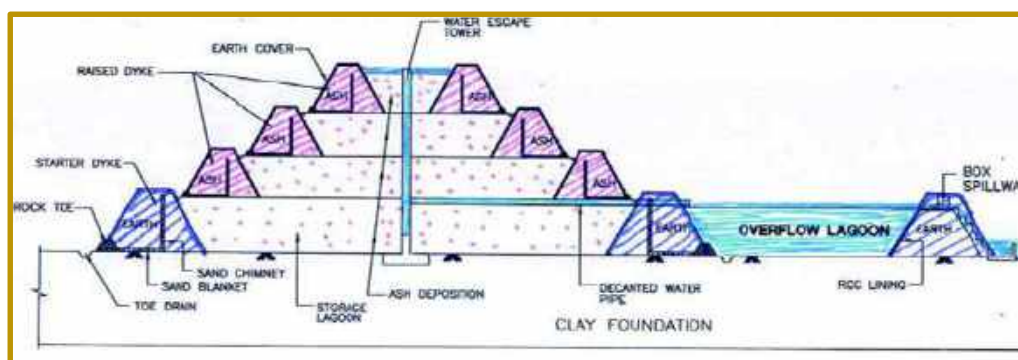


Figure 8: Typ Section of storage lagoon and OFL

3.7 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
- III. Earth and Rock Fill Embankment

3.7.1 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 figure 9.

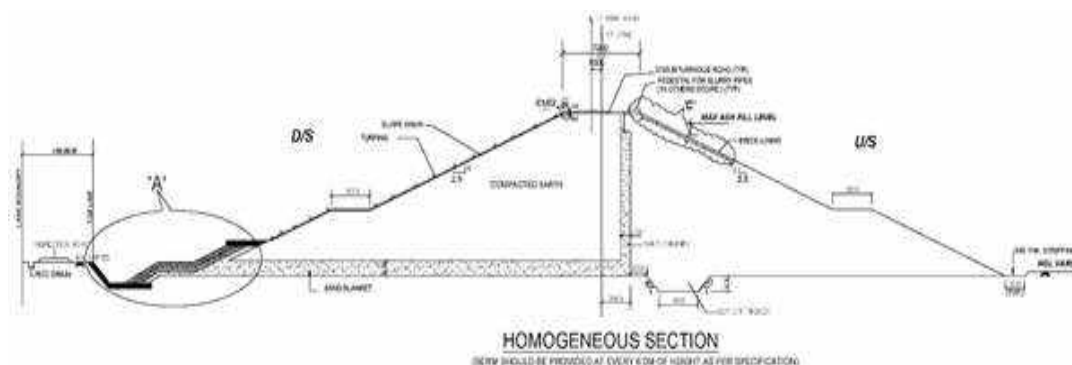


Fig 9. Typical homogeneous ash dyke section

3.7.2 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.

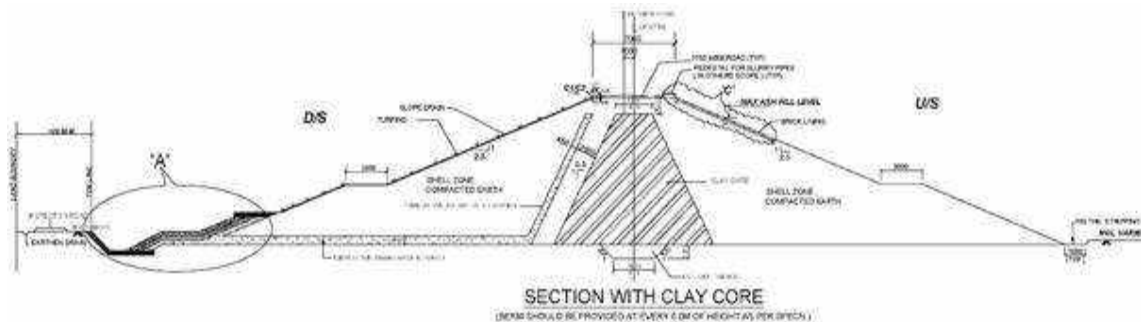


Fig 10. Typical zoned ash dyke section

3.7.3 Earth and Rock Fill Embankment

An earth and rock fill embankment consist of an earthen embankment “core” covered with large rock fill on the upstream or downstream slope, or on both. The earth-fill portion of the embankment may be zoned with two or more layers of soil or by graded filter layer. The selection of rockfill is governed by the availability of material and consideration of economy and structural stability. This configuration is normally avoided unless good construction soil is not readily available at the ash disposal site.

3.8 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.

3.9 Water Escape Structure (WES)

Construction of well type Water Escape Structure (WES) in each bottom ash lagoon with intermediate openings with provision of closing when ash level rises 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 optimum 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. Preferably a single pipe shall be provided in case of new construction of Ash dyke. However the actual requirement of number of pipes shall be as per detailed design. Cut off collar and diaphragm, filter may also be provided in the pipe embedment inside the dyke body.

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.

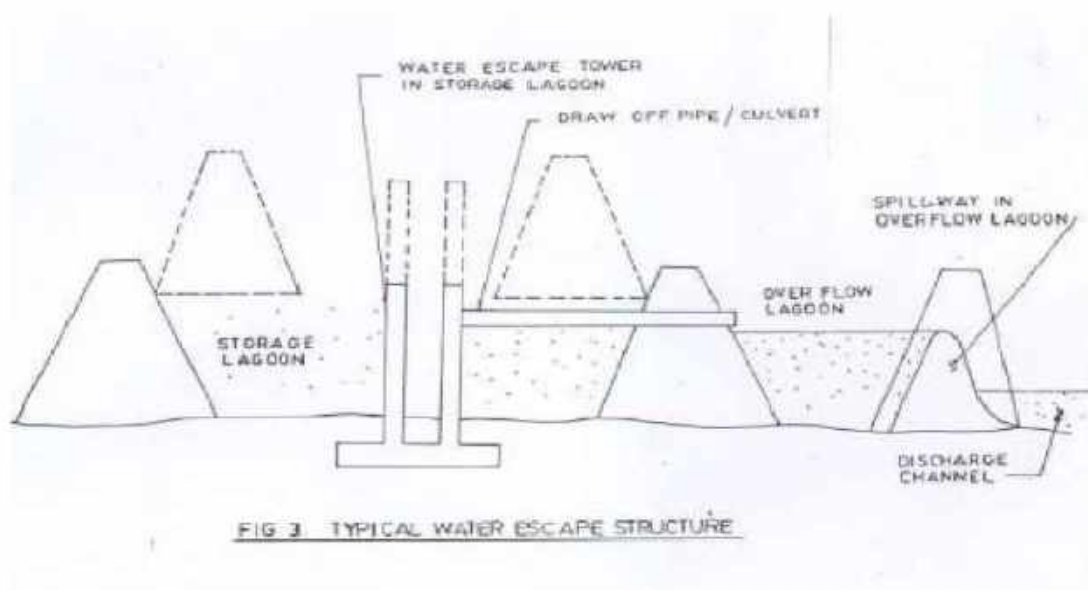


Fig 11: Typical Water Escape Structure (WES)

3.10 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.

3.11 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) Inspection/ Service and dyke top road all along the periphery of ash dyke may be provided.
- 2) The WBM road on the dyke shall be designed for heavy loads at least 40 MT as per IRC guidelines.
- 3) It is advisable that along with WBM, minimum 100mm thickness of BM (Bituminous macadam) and 40 mm thickness of BC (Bituminous concrete) is to be provided for smooth movement of inspection/maintenance vehicles.
- 4) Top width of the dyke shall be 6 m to accommodate a Single lane road of about 3.75 m width with shoulder on both sides on the top of dyke throughout the length of lagoons having provisions for the overtaking zone of 10 m width.
- 5) Provision of guard wall/posts along edge on either side of ramp with fluorescent white & black colors stripe paints may be made, wherever feasible.
- 6) 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.
- 7) 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.
- 8) 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.
- 9) At the junctions between approach road & dyke top, the kerb shall be replaced by suitable hump as per site conditions. Provision of Safety poster and required road safety signage at each side of Dyke road for ensuring safe transportation.

3.12 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 5H (H is the Height of the embankment) shall be maintained from the heel of the embankment. The discharge shall also ensure that ash surface is not exposed anywhere above the water level.

3.13. 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.

3.14. 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/solar or wind power plants or other purposes as allowed under Ash Utilization Notification.

CHAPTER 4

DESIGN PROCEDURE FOR ASH POND

4. 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

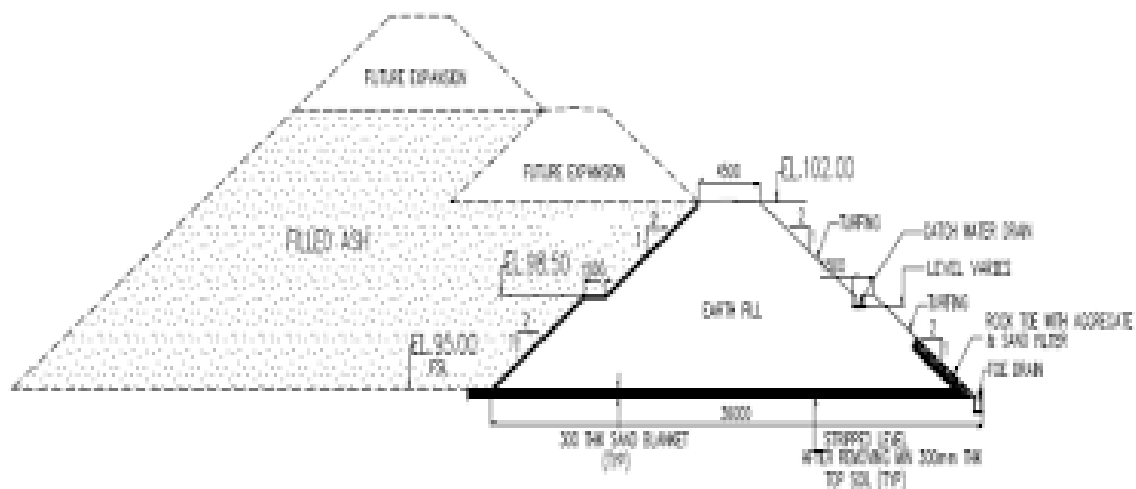


Fig 12 Typical section of Ash Pond

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.

4.1 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 safety against internal erosion
- c) base design and Ash water collection to prevent infiltration
- d) run-on control and runoff control & collection

4.2 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 10635.
- 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.

4.3 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 founding 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) Tri-axial 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.

4.4 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 Ash Water collection system to prevent infiltration. Design should ensure run-on control and runoff collection and disposal. 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. Hence no liner is necessitated in HCSD System.

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	As given in 5.4.2 of IS 7894	R S+ +	1.3
		Downstream	As given in 5.4.5 of IS 7894	R S+ +	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	R S+ +	1.3
VI	Earthquake condition: a) Steady Seepage b) Reservoir full	Downstream	As given in case IV	R S+ +	1.0\$
		Upstream	As given in Case II	R S+	1.0\$

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
				+	

Q-Unconsolidated Undrained Test, R-Consolidated Undrained Test, S-Consolidated drained Test

*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 through 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).

Note: These factors of safety are applicable for the methods of analysis mentioned in this standard.

4.5 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 encased 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 for earthen/ash embankment or as per design whichever is gentler. 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 (bentonite mixed soil or HCSD layer)/LDPE/HDPE 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

- i. On the downstream slopes, where the annual rainfall is less than 200cm. and where there is no existence of water collections, turf sodding is sufficient.
- ii. 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 below the toe of the dyke embankment 1.5 metre above the maximum water level to 1.5 metre minimum water level.

- iii. On the upstream slope, dry fly ash brick packing (brick on flat) shall be provided for the top portion or use sand bags, tyres (or any other method if lining is provided) for a vertical height of 3 mts from the dyke top considering 1.5 m free board.
- iv. 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 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/bottom ash 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%. Bottom ash meeting filter criteria shall be used in lieu of sand as filter material based on availability.

CHAPTER 5

CONSTRUCTION MATERIAL

5. 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

5.0.1 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	CI,CI	GM	CL,CI
Fairly 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 1×10^{-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.

5.2 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 proposed embankment of upstream & centre-line raising 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.

5.2.1 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 code specified 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.

5.2 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

- i. $\frac{D_{50} \text{ of filter}}{D_{50} \text{ of base material}} < 25$
- ii. $\frac{D_{15} \text{ of filter}}{D_{15} \text{ of base material}} = 6 \text{ to } 19 / > 5$
- iii. $\frac{D_{85} \text{ of filter}}{D_{15} \text{ of filter}} > 5$

(The above equation ensures that the filter layer has permeability several times higher than that of the soil it is designed to protect)

- iv. $\frac{D_{15} \text{ of filter}}{D_{85} \text{ of base material}} < 5$

(The requirement of the above equation is to prevent piping within the filter. The ratio $D_{15} \text{ (filter)} / D_{85} \text{ (base)}$ is known as the *piping ratio*.)

- v. The gradation curve of the filter material shall be nearly parallel to the gradation curve of the base material.
- vi. The filters shall not contain more than 5% by weight of materials finer than 0.075 mm size.
- vii. The sand filter layer shall be considered as the base material for coarser filter layer.
- viii. The filter material shall be suitably compacted to a firm condition to achieve a relative density of 70%.
- ix. 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.

5.3 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 5 (Five) cycles (As per IS 1126)
- c) Aggregate Impact value shall not exceed 30% (As per IS 2386)
- 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.

5.4 GENERAL REQUIREMENTS OF HDPE/LDPE 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/LDPE material to be used shall meet the minimum requirements of GRI Standard GM13.

5.5 GENERAL REQUIREMENTS OF NON WOVEN 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 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/m ² . 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

6. 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.

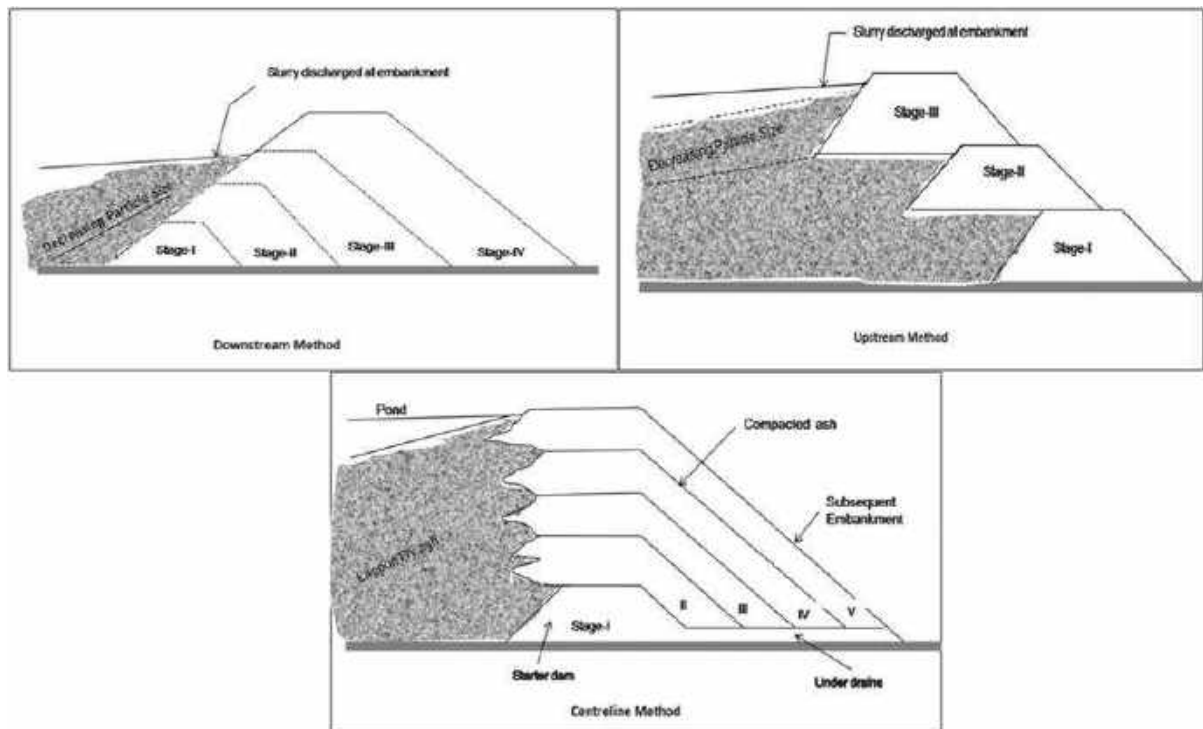


Figure 13: Showing methods of dyke construction

6.1. Preparation of Embankment Sub-Surface

6.1.1 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 area.

6.1.2 Stripping and Storing of Top Soil

When constructing embankment using 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.

6.1.3 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.

6.1.4 Dewatering

Compaction of fill material at around optimum moisture content should 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, 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

6.1.5 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 at optimum moisture content as per IS – 2720 (Part-VII). This would result in a levelled surface upon which layer wise filling and compaction of ash can be done.

6.2 Excavation of Pond Ash from Borrow Area

6.2.1 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.

6.2.2 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.

6.2.3 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.

6.3 Construction of Pond Ash

6.3.1. Filling of 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 1×10^{-6} cm/sec, to be obtained 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. 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.

6.3.2 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).

6.3.3 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 4 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.

6.4 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. 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 or 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.

6.4.1 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.

6.4.2 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. 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.

6.4.3 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. Thickness of each compacted layer 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.

6.5 Rolling and tamping

6.5.1 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.

6.5.2 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 ash in dyke embankment adjacent to steep abutments,
- c) Earth ash fill at locations specifically designated.

Fill shall be spread in compacted 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.

6.6 Liner

Ash Pond lining is used to minimize any damage to the groundwater resource due to leaching of metals from fly ash. Liners can be classified depending upon their functional arrangement or type of material (clay, geo-synthetic etc) .As per the design requirement impervious soil liner or geo-membrane or geotextile liner may be provided. The following are the guidelines for the same

6.6.1 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 not more than 1×10^{-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.

6.6.2 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.

6.6.3 Mixing, placing & compaction of manufactured impervious soil

For mixing of soil & bentonite, any of the following method can be chosen

6.6.3.1 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 each compacted thickness not more than 300 mm.

6.6.3.2 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 to get each compacted layer thickness not more than 300mm.

6.7 GEOMEMBRANE LINER

LDPE/HDPE liner may be provided on bottom of ash pond of the ash dyke as per requirement and to be anchored at heel of ash dyke.

Impermeable LDPE/HDPE lining of thickness minimum 1000 micron with permeability of 1×10^{-6} cm/sec and jointing of LDPE/HDPE lining with double wedge fusion welding, to prevent 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 geotextile (250 GSM) overlain by 50 mm thick Plain Cement concrete of Grade (M20).

6.7.1 Cushion Layer below HDPE/LDPE Liner

The liner shall be laid over a minimum 50 mm thick layer of natural sand/ manufactured crushers and/ bottom ash. The material shall be clean with little or no fines conforming to IS1498 unless specified otherwise. The thickness and other arrangement shall be as per the details given in the drawing.

6.7.1.1 Field Placement of The HDPE/LDPE Liner

a) General Requirements:

The placement procedure used for the geo-membrane liner shall include the conditions listed below.

- i. **Weather:** Geo-membrane shall not be placed when the air temperature is above 40°C or below 5°C unless it can be 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.
- ii. **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.
- iii. **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.
- iv. **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.
- v. **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.

b) Field Seaming:

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 of the same

type of resin as the geo-membrane. The use of solvents or adhesives is not permitted.

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.

- i. Seams parallel to the toe of the slope shall be located a minimum of 5 feet (1.5 m) from the toe.
- ii. Seams parallel to the crest of the slope shall be located a minimum of 2 feet (600 mm) from the crest.
- iii. Seams on the floor of the pond shall be overlapped so that the upslope sheet is positioned above the down slope sheet.
- iv. Seaming shall extend to the outside edge of panels to be placed in the anchor trench.
- v. 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.

c) 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:

- i. Prior to each seaming period.
- ii. Every 4 to 5 hours (i.e., at the beginning of the work shift and after the lunch break).
- iii. Whenever personnel or equipment are changed.
- iv. When climatic conditions result in wide changes in geo-membrane temperature.
- v. 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.
- vi. Once qualified by passing a trial weld, welding technicians shall not change parameters without performing another trial weld.
- vii. 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.

- viii. The length of double wedge fusion welded seams shall be a minimum of 10 feet (3 m) long.
- ix. 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.

d) Preparation for Seaming:

- i. 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.
- ii. 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.

e Seaming:

- i. Seaming shall be performed in accordance with the Manufacturer's accepted procedure.
- ii. Double Wedge Fusion Welds:
- iii. 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.
- iv. Extrusion Fillet Welding:
- v. 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.

6.7.2 Non-Destructive Field Testing :

i) General

- a. All non-destructive field testing shall be performed and documented by the Geo-Membrane Contractor.
- b. The QC & QA Geo-membrane Inspector shall observe all non-destructive test procedure one hundred (100) percent of the seam length shall be tested using nondestructive procedures to check the continuity of the field seams.
- c. Non-destructive testing is not meant to qualify seam strength.
- d. Air pressure testing shall be performed in accordance with ASTM D5820 and GRI GM6.
- e. Vacuum Box testing shall be performed in accordance with ASTM D5641 and as specified herein.
- f. Continuity testing shall be performed as seaming progresses or as soon as a suitable 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)
- 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.

6.7.3 Destructive Testing :

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 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.

6.7.4 Repair of Defects and Seams

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.

6.7.5 Heel Anchor Trench Excavation and Backfilling of HDPE Liner

The geo-membrane liner shall be anchored at heel. 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. Refer for Typical detail showing LPDE/HDPE liner works figure 14.

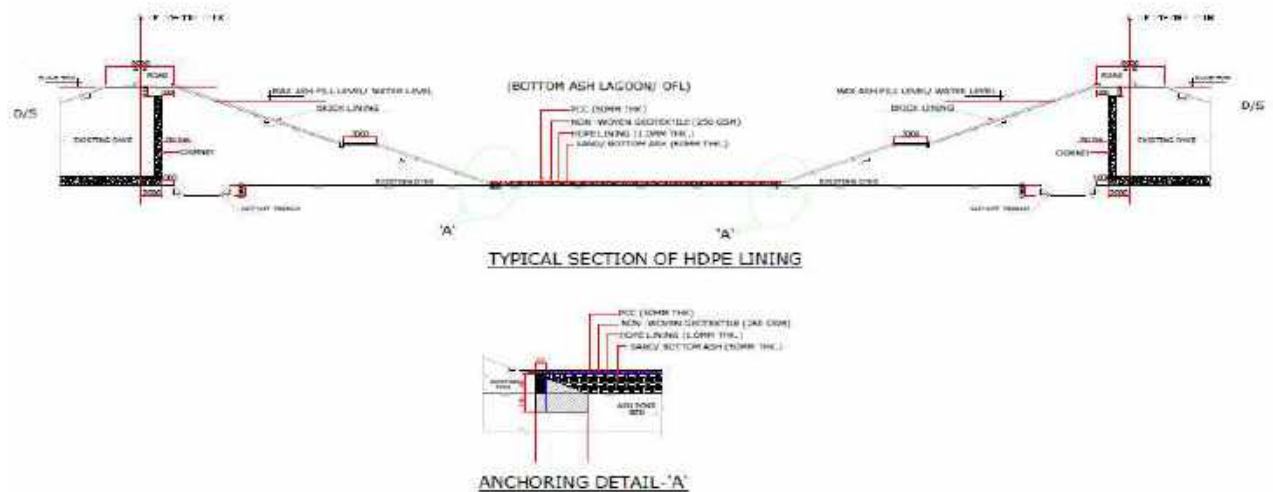


Figure 14: Typical detail showing LDPE/HDPE liner works

6.7.6 Laying and Installation of Geotextile

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 slope.
 - iii. 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).
 - iv. The number of seams in corners or odd shaped geometric locations shall be minimized.

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.

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.

4) 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 thickness and other arrangement shall be as per the details given in the drawing.

6.7.7 Field Placement of the Liner

General Requirements:

The placement procedure used for the geotextile liner shall include the conditions listed below.

i) Weather:

Geotextile shall not be placed when the air temperature is above 40°C or below 5°C unless it can be demonstrated 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 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.

6.7.8 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.

6.8 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.

6.9 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.

6.10 Drainage Filter and Rock Toe

6.10.1 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 500 mm. Water as 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.

6.10.2 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 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 500 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.

6.10.3 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 500 mm. Water as 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. Refer figure 15 for typical details below.

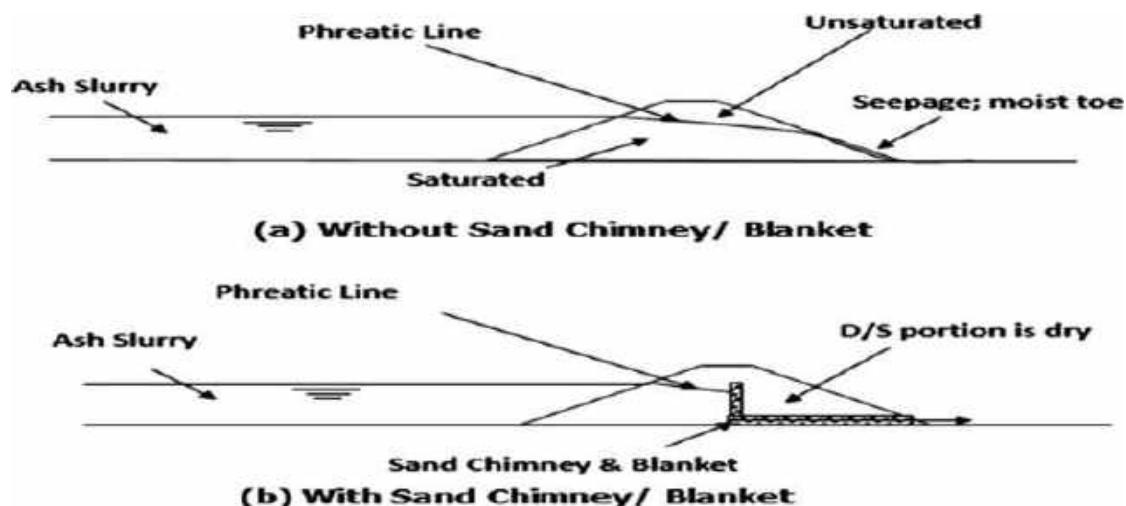


Fig 15 Typical detail of Sand filters

6.10.4 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%(IS 2386)
- 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%.

6.10.5 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 structure 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 16.

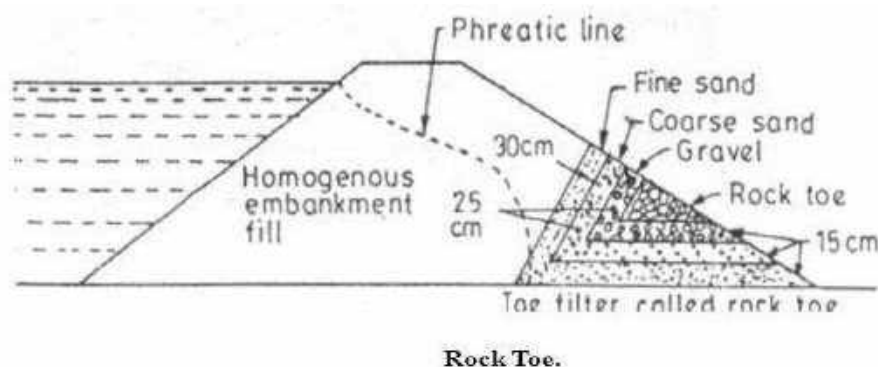


Figure 16: Typical section of Rock Toe

6.11. 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.

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.

6.11.1 Rip rap on the slope of embankment

Rip rap shall be hand placed on the upstream 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.

6.12. 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.

6.12.1 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.

6.12.2 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 IN Quality Assurance checklist table provided. 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.

Moisture Content: Frequency of testing shall be as per Quality Assurance Checklist Table provided below. 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.

6.12.3 Analysis and Acceptance of Density Results

Analysis and Acceptance of Density Results shall be as specified under Quality Assurance Checklist Table below. 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 20,000 M ³ Of fly ash/earth	IS:2720 (Part- VII)	
B)	Moisture Content	Same as 1A) above	IS:2720 (Part- VII)	
2. ASH/EARTH WORK				
A)	In-Situ Dry Density	Once for every 2,000 M ³ or part thereof of ash & earth in each layer	IS:2720 (Part-II & XXIX)	Not less than 95% of Standard Proctor Dry Density

B)	Moisture Content	-do-	IS:2720 (Part-II)	As per specification

CHAPTER 7

OPERATION AND MAINTENANCE OF ASH POND

7. INTRODUCTION

This section of the guidelines outlines the activities for operation and maintenance, and periodic inspection programs 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.

7.1. 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 slurry shall be discharged at other locations.

7.2. Decanting System

The Total Suspended Solids of decanted water effluent shall be 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).

7.3. Maintenance of Ash Dyke

It is very important to constantly inspect the ash dyke and carryout necessary remedial measures wherever certain abnormal conditions are observed/noticed. Following aspects have to be monitored and recorded 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. The reason for any abnormal change in settlement shall be investigated
- 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. The reason for any abnormal settlement shall be investigated.
- iv. Free board**
Freeboard as mentioned in the design shall be maintained.
- v. 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 be restored with earth-cover of 0.5 m compacted thickness immediately.
- vi. u/s slope protection**
Slope protection shall be maintained as mentioned in drawings/specification.
- vii. WBM road, Kerb /dowel wall, slope drains**
These shall be as mentioned in the drawings. Defects if any shall be attended immediately.

viii. 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 immediately.

ix. Instrumentation

Piezometers surface settlement marker shall be maintained in working condition and protected from cattle grazing 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 properly.

- x.** 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).
- xi.** 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.
- xii.** 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.

7.4 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 maintenance guidelines. 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 etc during inspections shall be recorded. Frequency may be increased during monsoon period and proper records to be maintained.

7.5 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) Freeboard as mentioned in the design 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 design 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 design 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 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 and 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.
- iii) 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.

7.6 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.

A typical Checklist for inspection is placed at *Annexure A*

7.7 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.

7.8 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.

7.9 Emergency action Plan Planning

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. There shall Provision of Emergency management plan of Ash Dyke breach defining the roles & responsibilities of each individual and thereby escalating its effectiveness by Mock Drill practice

The Emergency Preparedness plan is given in *Annexure B*.

7.10 GUIDELINES FOR CONTROL OF FUGITIVE DUST FROM ASH PONDS

Suggested Measures to be adopted for Fugitive Dust Control are as under:

7.11 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 /extended before the ash emerges out of the design water surface depending on availability of safe access. 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 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. Free board is kept from various design considerations and it should meet the IS. Freeboard as mentioned in the design shall be maintained. 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 freeboard.

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.

7.11.1 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 is also an alternative solution but it will not be effective without any proper compaction of the overlaying earth.

7.11.2 Slow/Occasional Discharge of Water/slurry to Wet Ash Surface:

Even in the non-operative lagoon, had the ash filling been stopped before the design freeboard 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. 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.

7.11.3 Sprinkler 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 TPP's 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) A permanent pump house is to be provided near overflow lagoon having adequate pumping capacity and head to meet requirement. The water from overflow lagoon shall be used for sprinkling purpose.
- b) 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 depth, in which the water shall be pumped. The size of the sump may vary depending on the site requirement. Near these sumps, pumps of adequate pumping capacity and head may be installed to meet sprinkling requirement. The pipe network shall be made using used ash disposal pipes.
- c) Power supply for the pumps, may be taken from the nearby source. Flexible portable Sprinkling system with suitable pumps may also be adopted as a convenient dust suppression technique from embankments under raising, inoperative lagoons & also on localized high deposition of ash in operative lagoons. A typical sketch showing the schematic arrangement for the sprinkling system is shown below Figure 17

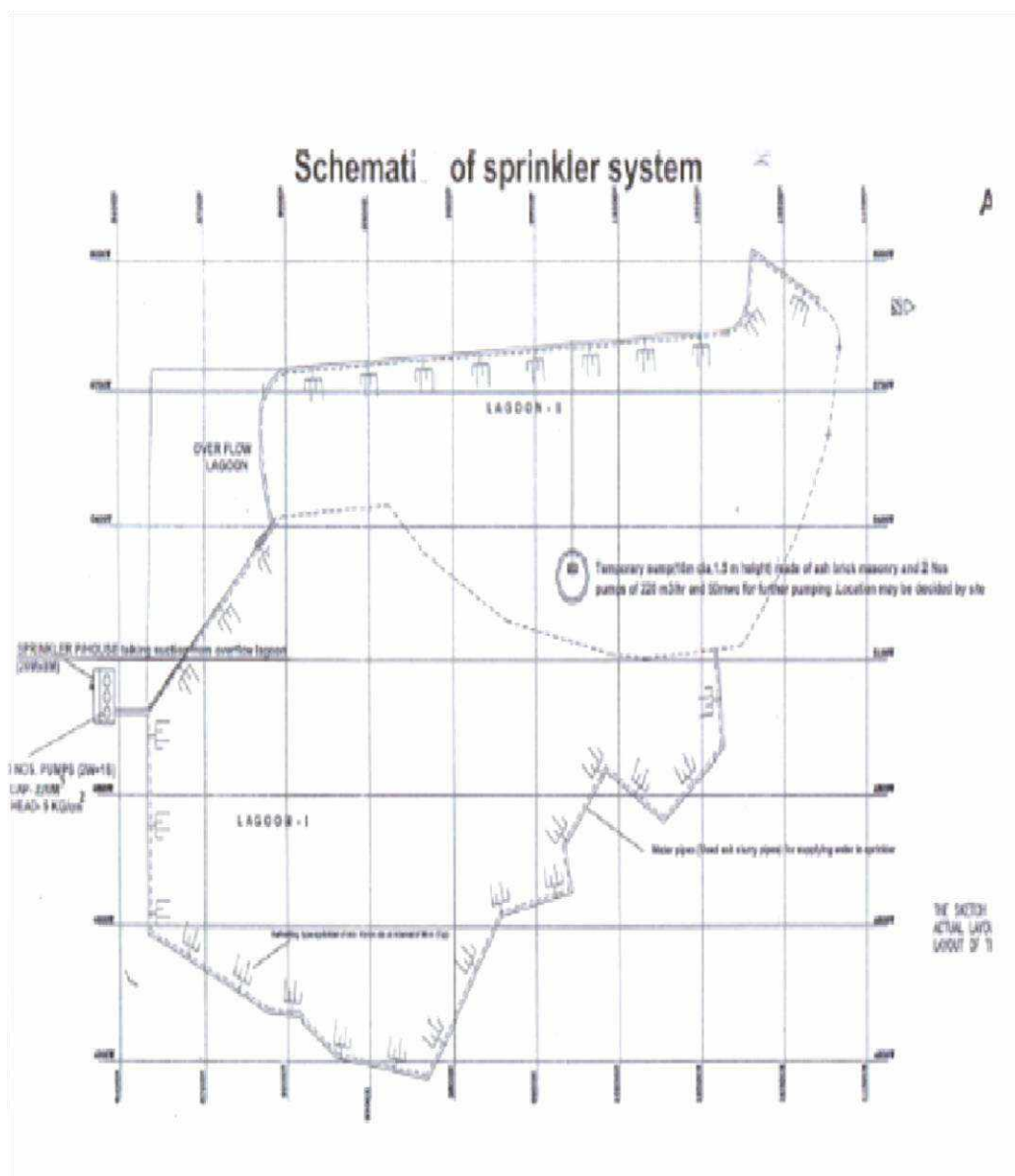


Fig 17: Typical sketch showing the schematic arrangement for the sprinkling system

7.12. 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 upto levels more than the design fill levels.

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 freeboard 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.

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 freeboard of 1.5 m is normally kept to avoid all such problems and accordingly the invert level of water escape structure is also kept 1.5m below the top of the dyke, called the design 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 RESPONSE PROCEDURE (EPRP) FOR
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 Provision of Display of Emergency Contact Numbers in the ash dyke.
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	Yearly 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, STABLIZATION AND
RECLAMATION FOR OPERATIONAL AND
NEW ASH PONDS)**

CHAPTER 8

ENVIRONMENTAL ASPECTS OF ASH DISPOSAL AND REMEDIAL MEASURES

8. General

Coal used in coal fired power plant in India has low calorific value (3500Kcal/kg) and resulting high ash content.

This occupies large area of useful land for its storage and followed by polluting the atmospheric environment.

8.1 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 coarse fly ash particles showed more adsorption capacity by controlling gasification of the unburned carbon.

8.2 Influence of Fly Ash On Surface Water.

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 fly ash. Further, the pozzolanicity 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, become detrimental to plant life.

8.3 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) 100% recirculation of ash pond overflow and underflow

No discharge of liquid effluent from ash dyke into the river or any surface water body to be done. The supernatant from the ash dykes are to be recycled back to the plant to ensure 100% recirculation of ash pond overflow and underflow. 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.

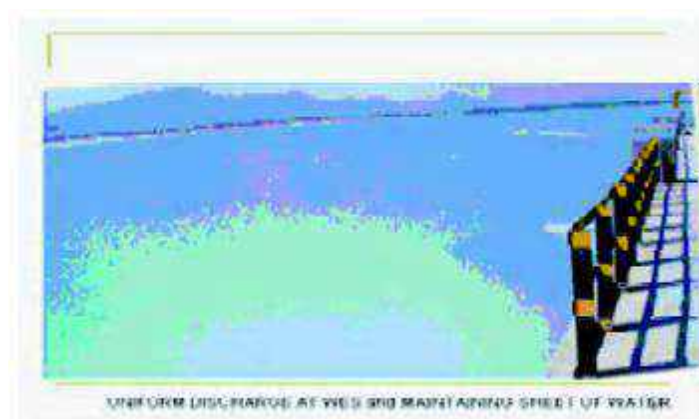
In the operative lagoons, adequate water cover is maintained over the deposited ash to prevent any fugitive dust emission from storage lagoons. However, there may be emission of fugitive dust during evacuation of ash from storage lagoons, which shall be suppressed with proper dust suppression system using water sprinklers/any other method to maintain the wetness of ash in ponds. 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 18. 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
Figures 18: 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 300 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 per latest fly ash utilisation notification. 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.



19(a) Abandoned Dyke – Reclaimed



19 (b) Abandoned Dyke–Vegetation

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 1×10^{-6} 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 fly ash 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 fly ash lagoon disposed in HCS mode. A typical ash dyke section with impervious liner is shown in following Fig 20. for reference.

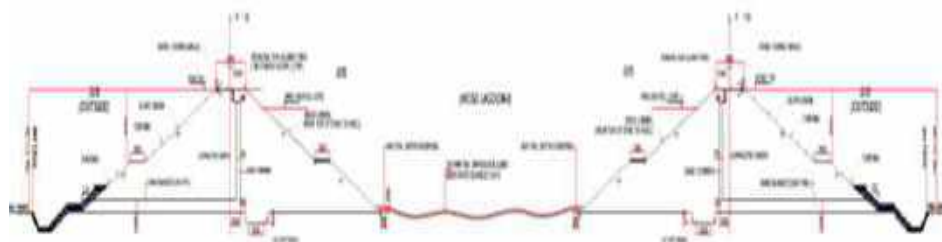


Fig 20: Typical ash dyke section with impervious liner

8.4 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 $<10 \mu\text{m}$ in size. Finer particles $<2.5 \mu\text{m}$ 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, UTILIZATION & DISPOSAL

9. General

Ash Notification 31.12.2021 (as amended by amendment notification 30.12.2022) mandates power plants to ensure **Annual Certification of the operational as well as stabilized and reclaimed ash pond and dyke** on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling 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.

9.1 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 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 as per IS 7894 construction drawings, quality control documents, monitoring reports etc., to establish that the constructed ash dykes are technically sound and structurally sustainable.
 - b) Slope Protection as per relevant IS code
 - c) Adequate Spillway Capacity
 - d) Dykes compaction
 - e) Downstream erosion protection
 - f) Environmental pollution,
 - g) Available volume
 - h) Mode of disposal, water consumption or conservation in disposal, ash water recycling
 - i) Green belt
 - j) Check list for Annual Safety Audit and Check list for Fly Ash generation and utilization
 - k) Interpretations from the compulsory maintenance inspections check lists on the overall safety of the Ash Pond
 - l) 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.

9.2 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.

9.3 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 water consumption or conservation in disposal, ash water recycling	
11.	TSS of decant Water (Going outside/for recirculation)	
12.	Maintenance of Dyke.	

Sr No	Component	Observations/Remarks
	1. Top Width 2. Top level of dyke 3. Adequate Spillway Capacity 4. Free board 5. Available volume 6. Earth covering and turfing 7. U/S slope protection 8. WBM Road 9. Rock Toe, toe drain, berm, rock, pitching 10. Dyke compaction 11. D/S erosion control	
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 drainage system.	
19.	Facilities for inspection and maintenance of the dyke	
20.	Flooding Lighting.	
21.	Seepage or Leakage	
22.	Monolith Joints –	
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: Dyke structural stability to be examined as per construction drawings, quality control documents,	

Sr No	Component	Observations/Remarks
	monitoring reports etc 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.	Environmental Pollution	
28.	Green belt	
29.	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	
30.	Signature of Authorized Signatory	

9.4 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:	.

Sr No	Component	Observations/Remarks
	(c) Quantity of fly ash utilized (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 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 utilized (MTPA): (i) Fly ash based products (bricks or blocks or tiles or fiber cement sheets or pipes or boards or panels): (ii) Cement manufacturing:	

Sr No	Component	Observations/Remarks
	(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), if recommended by the Committee and added in notification as per para A (3): Total quantity of current ash unutilized (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:	

Sr No	Component	Observations/Remarks
16.	Percentage utilization 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: (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	

Sr No	Component	Observations/Remarks
	completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds) (d) area (hectares): (e) dyke height (m): (f) volume (m³): (g) quantity of ash disposed as on 31st March (Metric Tons): (h) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons): (i) expected life of ash pond (number of years and months): (j) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates) (k) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining l) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD) (m) Ratio of ash: water in slurry mix (1:____): (n) Ash water recycling system (AWRS) installed and functioning: Yes or No (o) Quantity of wastewater from ash pond discharged into land or water body (m³): (p) Last date when the dyke stability study was conducted and	

Sr No	Component	Observations/Remarks
	name of the organization who conducted the study: (q) Last date when the audit was conducted and name of the organization who conducted the audit:	
19.	Quantity of legacy ash utilized (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: 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	

Sr No	Component	Observations/Remarks		
	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 (MTPA)	Quantity utilized (MTPA) and (per cent)	Balance quantity (MTPA)
	Current ash during reporting period			Current year balance and Cumulative balance after 31.03.2022 as on 31 March both
	Legacy ash	The ash stored in all the ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash.		Total (depleted) quantity of legacy ash stored (MT) as on 31 March:
	Total			
21.	Any other information: Soft copy of the annual			

Sr No	Component	Observations/Remarks		
	compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcccoalash@gov.in			
22.	Signature of Authorized Signatory			

CHAPTER 10

STABILIZATION AND RECLAMATION OF ASH PONDS

10. INTRODUCTION

Despite best efforts during the last few decades' huge quantity of fly ash is disposed of in ash ponds which is posing a serious problems of land utilization.

An ash pond of 10 KM² size for a 500 MW power plant gets filled up with Ash up to 10m height within a period of 5 years. In many ash ponds the total depth of ash has crossed over 30 metres. These ash ponds are subsequently abandoned. It is estimated that about more 40,0000 hectares of land is under the cover of abandoned fly ash ponds in the country. These abandoned ash fly ashes are generally left as such with suitable soil cover. There is a strong need to develop reclamation for such abandoned fly ash ponds.

MOEF& CC latest Ash utilization notifications dated 31.12.21 read in conjunction with amendment to the notification dated 30.12.22 says that ash pond or dyke which has been stabilized and, the reclamation has been done with **greenbelt or plantation or solar power plant or wind power plant**

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.

10.1. 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 300 mm thick soil layer shall be placed over the ash fill area. This should be done as an integral part of RECLAMATION development work.
- 4) 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.

10.2 Reclamation of Ash Disposal Facility

Following steps are required for reclamation of a site.

1. Complete dewatering

It is necessary to determine whether dewatering of the abandoned disposal is complete or has receded to required levels. As water table falls, stresses are increased on lower layers of the deposit which has detrimental effect on ash strength. As an initial planning, the design of the hydraulic fill may include provisions to accelerate dewatering once filling is complete. The degree of effectiveness of dewatering can be accessed using piezometers over a period of time.

2. Surface regrading and Site preparation

Generally, deposition of the material in a hydraulic fill is not level, but will be sloping from the discharge inlet to the point where water escapes from the pond. 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.

3. Placement of earth cover

Once the abandoned pond has been graded to approximate final configuration, it is necessary that the area to be covered with native soil and vegetated to prevent future erosion. The ash surface shall be covered with a minimum of compacted layer of 300 mm thickness of suitable earth. The thickness shall be as per design recommendations in rain prone area. Earth cover shall be laid simultaneously with the laying of compacted ash layers on side slopes. As in the case of ash layers, compacted thickness of earth layers shall not be exceeding 300 mm. The soil material used for plant cover shall be non-erodible and capable of supporting vegetation and plantation. 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.

10.3 Ash Pond reclamation with soil cover and green belt/plantation

Green capping is one of the popular methods to re-vegetate abandoned ash ponds of coal based thermal power plants thereby lowering the risk of contamination to the surrounding environment. It has innumerable advantages such as prevention of dust emission, checking soil erosion, stabilizing the surface areas of ash, preventing potential ground water contamination, and finally, adding native vegetation cover, which is very vital in the long term. The following measures are to be undertaken while reclamation of ash pond with green belt.

- i. Storm water drains shall be constructed for channelizing the run-off water away from the disposal site.
- ii. A 300 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.

10.3.1 Plantation for green belt

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 in figure 21

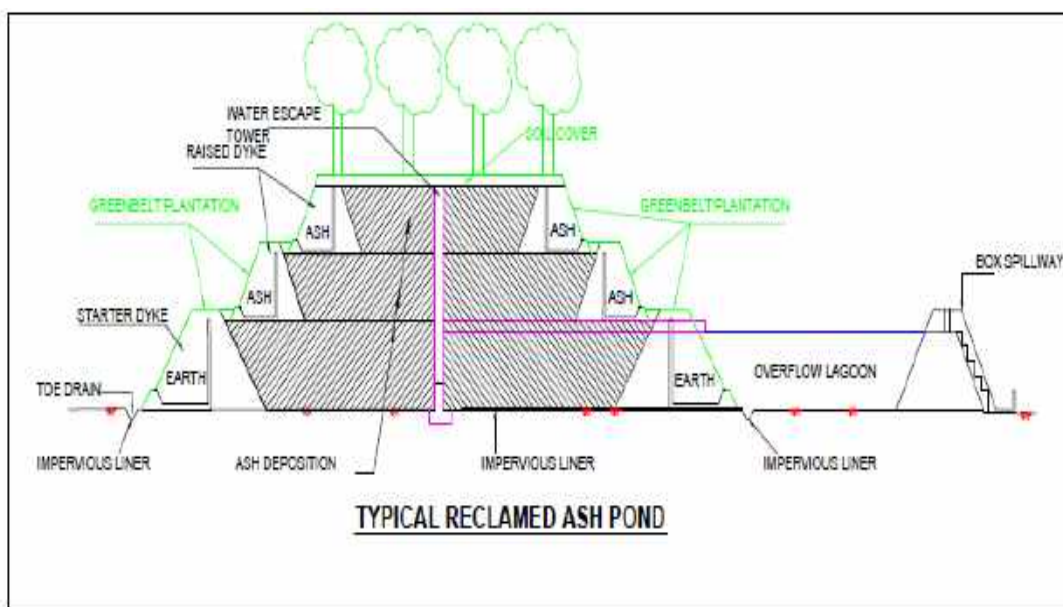


Figure 21 Typical reclaimed Ash pond

10.4 Reclamation of Abandoned Ash Pond with solar power plant or wind power plant.

Now a day there is a substantial socio economic pressure to become more environmentally aware of how we receive our power. Solar and wind power is becoming prevalent as a clean source of power. An ash pond which has been closed if can be used to generate energy in a clean way plus having financial impacts also is a need of the hour. Amendment to Fly ash utilization notification was issued vide Notification No. S.O. 6169 (E) dated

30th December, 2022 which allows reclamation of ash ponds by green belts / plantations or solar power plant or wind power plant.

The power plant shall be required to undertake detailed feasibility study for provision of solar or wind power plant on the abandoned ash dyke. The design, construction and operations of the same shall be done in accordance with the recommendations of the same. Necessary statutory clearances shall be obtained by the TPP.

Proper measures shall be taken to prevent surface erosion and air and water pollution. To facilitate drainage, surface slope and surface water drains shall be provided to carry the surface run off away from the ash pond / dykes.

10.5 Precautions during reclamation activity

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.
- (ii) Water sprinkling for dust suppression during handling of Ash shall be ensured from being air borne.
- (iii) After complete reclamation of the site, sign board shall be kept indicating abandoned ash pond has been reclaimed. This will help to propagate the message of provision of green belts on ash ponds and other uses such as solar power and wind power.

10.6 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. Fly Ash Amendment Notification dated 30.12.2022



Flyash amendment Notification dated 30th December, 2022-1.pdf

- III. IS Codes and References



भारत का राजपत्र The Gazette of India

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CG-DL-E-01012022-232336

असाधारण
EXTRAORDINARY

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

प्राधिकार से प्रकाशित
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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, केन्द्रीय 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;

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;

अतः 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 II, खंड 3, उप खंड (i) में प्रकाशित का अधिक्रमण करते हुए, कोयला या लिग्नाइट 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;

अतः 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 लिग्नाइट 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: ईट 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) सिंटेड 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 प्रमाणा 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, क्रमशः 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 पुनरुद्धार 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 विनिर्देश, 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 लिग्नाइट 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 ऐहित्यात 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 लिग्नाइट 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 लिग्नाइट 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 लिग्नाइट 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 प्रार्थना 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, रूडकी, 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 लिग्नाइट 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 स्टोर्विंग (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 निःशुल्क 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 ढेरों 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, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक खान सुरक्षा और भारतीय खदान ब्यूरो द्वारा निर्धारित दिशानिर्देशों के अनुसार किया जाएगा।

स्पष्टीकरण :- इस उप-पैरा के प्रयोजन के लिए यह भी स्पष्ट किया जाता है कि लागत मुक्त राख और निःशुल्क 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 स्थानों 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 ढेरों 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 प्राधिकरणों सरकारी उपक्रमों, अन्य सरकारी अभिकरणों तथा सभी निजी अभिकरणों) राख की ईटों, टाइल्स, 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 केन्द्रीय 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 स्टेशन) 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) लैग्रेसी 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 लैग्रेसी राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि 10 वर्ष के अंत में लैग्रेसी 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 परिवहकों या वाहन मालिक की जिम्मेदारी है और यदि इसका अनुपालन नहीं किया जाता है, तो अनधिकृत उपयोगकर्ताओं अथवा गैर-अधिकृत उपयोगकर्ताओं को ऐसी मात्रा गलत तरीके से वितरित करने पर 1500 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगायी, इसके अतिरिक्त राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा गैर अनुपालनकर्ता परिवहकों 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 रुपए 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 रुपए प्रति टन की दर से भुगतान करने के लिए उत्तरदायी होंगी।
परंतु भवन निर्माण के संबंध में पर्यावरणीय प्रतिकर निर्मित क्षेत्र के 75 रुपये 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 (एसईआईए) 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 आज्ञापक 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 विरुद्ध कार्रवाई प्रारंभ करेंगे।

[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) : - फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड/पैनल) : - सीमेंट विनिर्माण : - रेडी मिक्स कंक्रीट : - राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : - सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : - सड़कों, सड़क और फ्लाई ओवर के पुश्तों का निर्माण : - बांधों का निर्माण : - निम्न भू-क्षेत्र का भराव : - खनिज क्षेत्रों का भराव : - अधिभार वाले डम्पों में उपयोग : - कृषि : - तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : - अन्य देशों को राख का निर्यात : - अन्य (कृपया विनिर्दिष्ट करें) : (ग) उपयोग किए गए तल के राख की मात्रा (एमटीपीए) : - फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड या पैनल) : - सीमेंट विनिर्माण : - रेडी मिक्स कंक्रीट : - राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : - सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : - सड़कों, सड़क और फ्लाईओवर के पुश्तों का निर्माण : - बांधों का निर्माण : - निम्न भू-क्षेत्र का भराव : - खनिज क्षेत्रों का भराव : - अधिभार वाले डम्पों में उपयोग : - कृषि : - तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : - अन्य देशों को राख का निर्यात : - 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 (मी³): घ) राख कुण्डों की कुल संख्या: (i) सक्रिय: (ii) खाली किए गए (पुनः भरा जाना है) (iii) पुनः 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 पुनः 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 (मी³): 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 (मी³): 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 (ईट 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 :			
	व्यौरा	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 शेष 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	1 st	2 nd	3 rd -10 th
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 of 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 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.

AnnexureAsh 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 (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 <i>Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one)</i> (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 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): - Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): - Cement manufacturing: - Ready mix concrete: - Ash and Geo-polymer based construction material: - Manufacturing of sintered or cold bonded ash aggregate: - Construction of roads, road and flyover embankment: - Construction of dams: - Filling up of low lying area: - Filling of mine voids: - Use in overburden dumps: - Agriculture: - Construction of shoreline protection structures in coastal districts; - Export of ash to other countries: - Others (please specify):					
20.	Summary: <table border="1"> <tr> <td>Details</td><td>Quantity generated (MTP)</td><td>Quantity utilised (MTP) and (per cent)</td><td>Balance quantity (MTP)</td></tr> </table>	Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)	
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			



भारत का राजपत्र The Gazette of India

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असाधारण
EXTRAORDINARY

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

प्राधिकार से प्रकाशित
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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 30 दिसम्बर, 2022

का.आ. 6169(अ).—पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय में भारत सरकार ने 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 के राजपत्र, असाधारण, भाग II, खंड 3 उप खंड (ii) का.आ. 5481(अ), तारीख 31 दिसंबर, 2021 द्वारा एक अधिसूचना जारी की थी (जिन्हें इसमें इसके पश्चात इसे राख के उपयोग से संबंधित अधिसूचना कहा गया है);

और, राख के उपयोग से संबंधित अधिसूचना के उपबंधों के कार्यान्वयन के संबंध में विद्युत मंत्रालय, ताप विद्युत संयंत्रों और विभिन्न हितधारकों से अनुरोध प्राप्त हुए हैं;

और, राख के उपयोग से संबंधित अधिसूचना के कार्यान्वयन में सुचारू परिवर्तन लाने हेतु उक्त अधिसूचना के कतिपय उपबंधों में संशोधन लाना उचित है;

अतः अब, केन्द्रीय सरकार पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (1), (2) और (4) 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, जारी राख के उपयोग संबंधी अधिसूचना में निम्नलिखित संशोधन करती है, अर्थात्:-

जारी राख के उपयोग से संबंधित अधिसूचना में संशोधन –

1. पैरा क में, -

(i) उप पैरा क (4) में, तीसरे परंतुक के पश्चात निम्नलिखित परंतुक अंतर्विष्ट किया जाएगा, अर्थात् :

“परन्तु, यह भी कि इस अधिसूचना के प्रकाशन की तारीख को अथवा उसके पश्चात् स्थापित नए ताप विद्युत संयंत्र सारणी में यथा विनिर्दिष्ट 60 प्रतिशत से कम ताप विद्युत संयंत्रों के लिए विनिर्दिष्ट अनुपालन चक्र के समान प्रथम अनुपालन चक्र का अनुसरण करेंगे।

टिप्पण : लागू अनुपालन चक्र के अनुसार उपयोग के लक्ष्य 1 अप्रैल, 2022 से प्रभावी होंगे।”

(ii) उप पैरा 5 में, -

(क) आरंभिक पैरा में, “इस अधिसूचना के प्रकाशन की तारीख” शब्दों के स्थान पर “1 अप्रैल, 2022” उक्त अक्षर और शब्द रखे जाएंगे;

(ख) दूसरे परंतुक में, -

(i) “हरित पट्टी या पौधरोपण” के पश्चात, “या उप पैरा (6) में यथा विनिर्दिष्ट केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) द्वारा जारी मार्गदर्शी सिद्धांतों के अनुसार सौर ऊर्जा संभव या पवन ऊर्जा संयंत्र” शब्द कोष्ठकों और अक्षरों को अंतःस्थापित किए जाएंगे;

(ii) “केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) या” शब्द कोष्ठक और अक्षर हटा दिया जाएगा।

(iii) “एक वर्ष” शब्दों के स्थान पर “तीन वर्ष” शब्दों को रखा जाएगा।

(iv) “इस अधिसूचना के प्रकाशन की तारीख” शब्दों के स्थान पर “1 अप्रैल, 2022” उक्त अक्षर और शब्द रखे जाएंगे;

(ग) दूसरे परंतुक के पश्चात निम्नलिखित उपलब्ध अंतःस्थापित किया जाएगा, अर्थात् :

“परंतु कि पैरा क (6) में यथाविनिर्दिष्ट राख के अस्थायी भंडारण हेतु अभिहीत किए गए संचालित राख कुंड या डाइक के सिवाय सभी राख कुंडों या डाइक में संग्रहीत राख में पुरानी राख एकत्रित होगी और या तो इसे पुनःप्राप्त या स्थिर या उपयोग करना होगा।”

(iii) उप पैरा (6) के स्थान, उप पैरा रखा जाएगा, अर्थात्:

“(6) किसी भी नए और साथ ही चालू थर्मल पावर प्लांट को 0.1 हेक्टेयर प्रति मेगा वाट (मेगावाट) के क्षेत्र में राख के अस्थायी भंडारण के लिए परिचालन राख तालाब या डाइक की अनुमति दी जा सकती है। केन्द्रीय विद्युत प्राधिकरण के परामर्श से बनाए गए केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) के दिशा-निर्देशों के अनुसार परिचालन के साथ-साथ स्थिर और पुनः दावा किए गए राख तालाबों या बांधों की तकनीकी विशिष्टताओं के अनुसार होंगे और ये दिशानिर्देश वार्षिक प्रमाणन के लिए एक प्रक्रिया भी निर्धारित करेंगे। परिचालन के साथ-साथ राख तालाब या डाइक को उसकी सुरक्षा, पर्यावरण प्रदूषण, उपलब्ध मात्रा, निपटान के तरीके, पानी की खपत या निपटान में संरक्षण, राख जल पुनर्चक्रण और हरित पट्टी, आदि पर परिचालन के साथ-साथ स्थिर और पुनः प्राप्त किया जाएगा और इस अधिसूचना के प्रकाशन की तारीख से तीन महीने भीतर रखा जाएगा :

परंतु कि 31 दिसंबर, 2021 से पहले चालू किए गए ताप विद्युत संयंत्रों के लिए 1600 मेगावाट से कम या उसके बराबर स्थापित क्षमता वाले दो परिचालन राख तालाबों या डाइकों तक और 1600 से अधिक स्थापित क्षमता वाले ताप विद्युत संयंत्रों के लिए चार परिचालन राख तालाबों या बांधों तक MW, मौजूदा राख तालाबों या बांधों से निर्दिष्ट क्षेत्र के भीतर कई लैगून होने पर, निर्देशांक के साथ स्पष्ट सीमांकन के साथ नामित किया जा सकता है, और केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी)/प्रदूषण को सूचित करेगा। नियंत्रण समिति (पीसीसी) 31 मार्च, 2023 तक :

परंतु आगे कि नए थर्मल पावर प्लांट या मौजूदा थर्मल पावर प्लांट के विस्तार के मामले में केवल एक ऐश पोंड या डाइक की अनुमति दी जाएगी 31 दिसंबर, 2021 को या उसके बाद, जो केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी)/प्रदूषण नियंत्रण समिति (पीसीसी) को कमीशन की तारीख से 3 महीने के भीतर निर्देशांक के साथ सीमांकन के विवरण की सूचना देगा। थर्मल पावर प्लांट या 31 मार्च, 2023 तक, जो भी बाद में हो :

परंतु यह और कि कोयला और लिग्नाइट आधारित तापीय विद्युत संयंत्रों को आगे किसी भी नए कार्यशील राख कुंड या डाइक को स्थापित करने या नाम निर्दिष्ट करने की अनुमति नहीं दी जाएगी।

परंतु यह और कि कार्यशील राख कुंड या डाइक की 0.1 हे./मेगावॉट (एमडब्ल्यू) का विनिर्देशन तारीख 3 नवम्बर, 2009 से पूर्व चालू तापीय विद्युत संयंत्रों पर लागू नहीं होंगे।”

2. पैरा ख में, -

(i) उप पैरा (1) में, “300 कि.मी. के भीतर” शब्दों कोष्ठकों और आंकड़ों के स्थान पर “300 कि.मी. के रेडियस के भीतर” शब्द कोष्ठक और आंकड़े रखे जाएंगे।

(ii) उप पैरा (8) में, उच्चतर “वैकल्पिक उत्पादों के मूल्य से अधिक” शब्दों के स्थान पर “केन्द्रीय लोक कार्य विभाग (सीपीडब्ल्यूडी) या संबंधित लोक कार्य विभाग (पीडब्ल्यूडी) द्वारा विनिर्दिष्ट दरों की अनुसूची में उल्लिखित मूल्य या दरों की अनुसूची के अधीन निर्धारित न होने परल वैकल्पिक उत्पादों का मूल्य” शब्द रखे जाएंगे।

3. पैरा घ में, -

(i) उप पैरा (2) के स्थान, उप पैरा रखा जाएगा, अर्थात्:

“(2) जिन व्यक्तियों या उपयोगकर्ता या एजेंसियों को थर्मल पावर प्लांट के मालिक द्वारा नोटिस दिया गया है, अगर वे राख के उपयोग के उद्देश्य से पहले से ही अन्य एजेंसियों के साथ करार कर चुके हैं तो थर्मल पावर प्लांट को तदनुसार सूचित करेंगे और यदि वे उपयोग नहीं कर सकते हैं कोई राख या कम मात्रा का उपयोग कर सकता है।”

(ii) उप-पैरा (2) के पश्चात्, निम्नलिखित उप-पैरा अंतःस्थापित किया जाएगा, अर्थात्:

“(3) जिन व्यक्तियों या उपभोक्ता अभिकरणों को, यदि वे राख आधारित उत्पादों के उपयोग के उद्देश्य से अन्य अभिकरणों के साथ पहले से जुड़े हुए हैं, ऐश ब्रिक्स या टाइल्स या सिंटेड ऐश ऐग्रीगेट या अन्य राख आधारित उत्पादों के विनिर्माताओं के द्वारा नोटिस दिया गया है तो उन्हें ऐश ब्रिक्स या आइल्स या सिंटेड ऐश ऐग्रीगेट या अन्य राख आधारित उत्पादों के विनिर्माताओं को सूचित करना होगा, तदनुसार, यदि वे राख आधारित उत्पादों का उपयोग नहीं कर सकते या कम प्रमात्रा में उपयोग कर सकते हैं।”

2. यह अधिसूचना राजपत्र में प्रकाशन की तारीख से प्रवृत्त होगी।

[फा. सं. एचएसएम - 9/1/2019- एचएसएम]

नरेश पाल गंगवार, अपर सचिव

टिप्पण : मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग-II, खंड 3, उप-खंड (ii) सं. एस 5481(अ) तारीख 31 दिसम्बर, 2021 के द्वारा में प्रकाशित की गई।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 30th December, 2022

S.O. 6169(E).—Whereas, the Government of India, Ministry of Environment, Forest and Climate Change, 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, issued a notification published in the Gazette of India, Extraordinary, Part II, Section 3, sub-section (ii) *vide* S.O.5481(E), dated the 31st December, 2021 (herein after referred to as the ash utilisation notification);

And whereas, requests have been received from Ministry of Power, thermal power plants and various stakeholders regarding implementation of provisions of the ash utilisation notification;

And whereas, it is expedient to make amendments to certain provisions of the said notification to have smooth transitioning in implementation of the ash utilisation notification;

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 of sub-rule (1), (2) and (4) of rule (5) of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following amendments in the ash utilisation notification namely:-

In the ash utilisation notification,-

(1) in paragraph A,-

(i) in sub-paragraph (4), after the third proviso, the following shall be inserted, namely,-

“Provided also that new thermal power plants commissioned on or after the date of publication of this notification shall follow the first compliance cycle similar to the compliance cycle specified for thermal power plants having utilisation per cent. less than 60 per cent. as specified in the table.

Note: The utilisation targets as per the applicable compliance cycle shall commence from 1st April, 2022.”.

(ii) in sub- paragraph (5),-

(a) in the opening paragraph, for the words “the date of publication of this notification”, the figures, letters and word “1st April, 2022” shall be substituted;

(b) in the second proviso, -

(i) after the words “green belt or plantation”, the words, brackets, letters and figure “or solar power plant or wind power plant as per the guidelines issued by the Central Pollution Control Board (CPCB) as specified in sub-para (6)” shall be inserted,

(ii) the words, brackets and letters “Central Pollution Control Board (CPCB) or” shall be deleted,

(iii) for the words “a year”, the words “three years” shall be substituted,

(iv) for the words “the date of publication of this notification”, the figures, letters and word “1st April, 2022” shall be substituted.

(c) after the second proviso, the following proviso shall be inserted, namely:

“Provided that ash stored in all ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash as specified in sub-para (6) shall constitute the legacy ash and either to be reclaimed or stabilised or utilised.”.

(iii) for sub- paragraph (6), the following sub-para shall be substituted, namely,-

“(6) Any new as well as operational thermal power plant may be permitted operational ash pond or dyke for temporary storage of ash within an area of 0.1 hectare per Mega Watt (MW). Technical specifications of operational as well as stabilised and reclaimed ash ponds or dykes shall be as per the guidelines of the Central Pollution Control Board (CPCB) made in consultation with the Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the operational as well as stabilised and reclaimed ash pond or dyke on its safety, environment pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt, etc. and shall be put in place within three months from the date of publication of this notification:

Provided that up to two operational ash ponds or dykes for thermal power plants commissioned before 31st December, 2021, having installed capacity less than or equal to 1600 MW, and up to four operational ash ponds or dykes for thermal power plants having installed capacity more than 1600 MW, having multiple lagoons, within the specified area from the existing ash ponds or dykes, may be designated with clear demarcation along with coordinates, and shall inform to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 31st March, 2023:

Provided further that one ash pond or dyke shall be permitted in case of new thermal power plants or expansion of existing thermal power plants commissioned on or after 31st December, 2021, which shall inform the details of demarcation along with coordinates to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) within 3 months from the date of commissioning of thermal power plant or by 31st March, 2023, whichever is later:

Provided also that coal and lignite based thermal power plants shall not be allowed to further establish or designate any new operational ash pond or dyke:

Provided also that specification of 0.1 hectare per Mega Watt (MW) of an operational ash pond or dyke shall not be applicable for the thermal power plants commissioned before 03rd November, 2009.”.

(2) in paragraph B,-

(i) in sub- paragraph (1), for the words, figures and letters “within 300 kms”, the words, figures and letters “within a radius of 300 kms” shall be substituted,

(ii) in sub- paragraph (8), for the words “higher than the price of alternative products”, the words, brackets and letters “more than the price mentioned in the Schedule of Rates as specified by Central Public Works Department (CPWD) or concerned Public Works Department (PWD) or price of alternative products, if not mentioned in the Schedule of Rates.” shall be substituted.

(3) in paragraph -D, -

(i) for sub- paragraph (2), the following sub- paragraph shall be substituted, namely,-

“(2) Persons or user agencies who have been served notice by owner of thermal power plants, if they have already tied up with other agencies for the purpose of utilisation of ash, shall inform the thermal power plant accordingly, and if they cannot use any ash or may use reduced quantity.”.

(ii) after sub- paragraph (2), the following sub-para shall be inserted, namely,-

“(3) Persons or user agencies who have been served notice by manufacturers of ash bricks or tiles or sintered ash aggregate or other ash based products, if they have already tied up with other agencies for the purpose of utilisation of ash based products, shall inform the manufacturer of ash bricks or tiles or sintered ash aggregate or other ash based products, accordingly, and if they cannot use ash based products, or may use reduced quantity.”.

2. This notification shall come into force on the date of its publication in the Official Gazette.

[F. No. HSM-9/1/2019-HSM]

NARESH PAL GANGWAR, Addl. Secy.

Note : The principal notification was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii), dated the 31st December, 2021, *vide* number S.O.5481 (E), dated the 31st December, 2021.

Annexures-III**Codes and References**

- 1) IS 1498 - 1970 (Reaffirmed 2007): Classification and Identification of Soils for General Engineering Purposes.
- 2) IS 7894- 1975 (Reaffirmed 2002): Code of Practice for stability Analysis of Earth Dams.
- 3) IS 8237-1895 (Reaffirmed 2002): Code of Practice for Protection of Slopes for Reservoir Embankment.
- 4) IS 8816-1978 (Reaffirmed 2002): Guidelines for design of large Earth and Rock filled Dams.
- 5) IS 9429-1999: Code of Practice for drainage system for Earth and Rock fill Dams.
- 6) IS 12169-1987(Reaffirmed 1997): Criteria for design of small embankment dams
- 7) IS10635-2014(Reaffirmed2020): Freeboard requirements in embankment dams – Guidelines
- 8) Earth and Rock fill Dams by Bharat Singh. H.D Sharma
- 9) USBR: Design of Small Dams
- 10) USBR: Earth Manual
- 11) MoEF&CC- “Gazette notification, SO no.5481(E) 31st Dec.,2021 Part-II, section -3, Sub-section-ii” Ministry of Environment and Forests, Govt.of India, New Delhi.
- 12) MoEF&CC -Ammendment, SO no.6169(E) 30th Dec.,2022 Part-II, section -3, Sub-section-ii” Ministry of Environment and Forests, Govt.of India, New Delhi.
- 13) Naresh D.N., 2008 “Management of ash disposal”, Indian Geotechnical Conference – 2010, GEO trendz December 16–18, 2010 IGS Mumbai Chapter & IIT Bombay.

- 14) ENVIRONMENTAL IMPLICATIONS OF FLY ASH DISPOSAL P. Asokan, Mohani Saxena*, and Shyam R. Asolekar Centre for Environmental Science and Engineering Indian Institute of Technology – Bombay Powai, Mumbai 400 076
- 15) NTPC 2007: Guidelines for ash disposal management in NTPC stations 2005- Corporate Engineering Division, NTPC.
- 16) Guidelines for Management of Ash dyke- Corporate Engineering Division, NTPC Ltd.
- 17) Reclamation potential of ash ponds and future prospects in 2nd International conference on fly ash disposal and utilization. Organized by the Central Board of Irrigation and Power and Fly Ash Mission, Technology, Information Forecasting and Assessment Council, New Delhi, India, 2–4 February 2000.
- 18) Green Belt Requirement for New and Expansion Projects for Obtaining Environmental Clearance in India -V.Vijay Kumar, S.Swathy, R.Radhika, M.A.Fasi Khan and Dr.B.Chakradhar-International Journal of Applied Environmental Sciences ISSN 0973-6077 Volume 14, Number 5 (2019), pp. 475-487 © Research India Publications.
- 19) Geo Environmental Design Practice in Fly Ash Disposal and utilization-Umesh Dayal & Rajiv Sinha



केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

EMAIL & SPEED POST

IPC-II/TPP/CP-11/76/2022/ 5520-5550

October 14, 2024

To,

The Member Secretary
State Pollution Control Board
(As per the list enclosed)

Sub: Directions under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 for ensuring effective implementation and monitoring of the Ash Notification No. S.O. 5481 (E) dated 31.12.2021 by the coal or lignite-based thermal power plants (including captive or co-generating stations or both).

WHEREAS, amongst others, under Section 17 of the Water (Prevention and Control of Pollution) Act, 1974, one of the functions of the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs), constituted under the Water (Prevention and Control of Pollution) Act, 1974, is to plan a comprehensive program for prevention, control and abatement of pollution of streams and wells located in the State/U.T. and to secure the execution thereof; and

WHEREAS, amongst others, under Section 17 of the Air (Prevention and Control of Pollution) Act, 1981, one of the functions of the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs), constituted under Water (Prevention and Control of Pollution) Act, 1974, is to plan a comprehensive program for prevention, control and abatement of air pollution in the State/U.T. and to secure the execution thereof; and

WHEREAS, by notification of the Government of India in the erstwhile Ministry of Environment and Forests vide S.O.763 (E), dated the 14.09.1999, as amended from time to time, the Central Government, issued directions for 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, in super-session of the aforesaid notification the Central Government has issued Notification No. S.O. 5481 (E) dated 31.12.2021, which has been subsequently amended on 30.12.2022 and 01.01.2024, to ensure more effective implementation of 100 percent fly ash utilisation/disposal by the coal or lignite-based thermal power plants in various permitted avenues/uses. In this regard, Central Pollution Control Board (CPCB) vide **letter dated 09.11.2022** requested all SPCBs to take necessary action for enforcement of the provisions of the Ash Notification by the coal or lignite based thermal power plants and monitoring of compliance by the SPCBs (copy enclosed for ready reference); and

WHEREAS, as per Para A(1) of the Ash Notification dated 31.12.2021, "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)"; and

‘परिवेश भवन’ पूर्वी अर्जुन नगर, दिल्ली-110032

Parivesh Bhawan, East Arjun Nagar, New Delhi - 110032

दूरभाष/Tel: 43102030, 22305792, वेबसाइट/Website : www.cpcb.nic.in

WHEREAS, as per Para A(2) of the Ash Notification dated 31.12.2021, the ash generated from coal or lignite based thermal power plants shall be utilised only for the eco-friendly purposes prescribed at A(2) (i) to (xi) (it doesn't include "ash dyke raising" or "disposal of ash into the operational ash ponds/dykes"). Further, the utilization avenue mentioned under Para A(2)(xi) of the notification i.e. *"Any other eco-friendly purpose as notified from time to time"* is not applicable as of now, as any additional avenue has not been notified by the Central Government; and

WHEREAS, as per Para A(4) of the Ash Notification dated 31.12.2021, *"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 (first compliance cycle of four/five year is prescribed for specific cases with exemption from minimum 80 per cent annual ash utilization target for initial 1/2 years). In this regard, CPCB vide letter dated 20.02.2024* circulated the status of compliance of the Ash Notification dated 31.12.2021 by the independent thermal power plants across the country during the first compliance cycle i.e. FY 2022-23 to the concerned SPCBs requesting to take appropriate action in the matter (copy enclosed for ready reference); and

WHEREAS, as per Para A(5) of the Ash Notification dated 31.12.2021, *".... 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 or solar power plant or wind power plant as per the guidelines issued by the Central Pollution Control Board (CPCB) as specified in sub-para (6) 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 State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be carried out within three years from 1st April, 2022 (i.e. by 31st March 2025). The ash remaining in all other ash ponds or dykes shall be utilised in progressive manner as per the above mentioned timelines. Provided that ash stored in all ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash as specified in sub-para (6) shall constitute the legacy ash and either to be reclaimed or stabilised or utilised"*; and

WHEREAS, as per Para A(6) of the Ash Notification dated 31.12.2021, *".... Provided that up to two operational ash ponds or dykes for thermal power plants commissioned before 31st December, 2021, having installed capacity less than or equal to 1600 MW, and up to four operational ash ponds or dykes for thermal power plants having installed capacity more than 1600 MW, having multiple lagoons, within the specified area from the existing ash ponds or dykes, may be designated with clear demarcation along with coordinates, and shall inform to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 31st March, 2023". In this regard, Central Pollution Control Board (CPCB) and Central Electricity Authority (CEA) have issued "Guidelines on Design, Construction, O&M and Annual Certification of Coal Ash Ponds, June 2023" for coal or lignite based thermal power plant (copy enclosed for reference); and*

WHEREAS, as per Para A(7) of the Ash Notification dated 31.12.2021, *"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"; and

WHEREAS, as per Para A(8) of the Ash Notification dated 31.12.2021, *"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".* In this regard, the aforesaid CPCB's **letter dated 20.02.2024** to the concerned SPCBs also highlighted the non-compliance of the said provision of the Ash Notification dated 31.12.2021 by a large number of thermal power plants; and

WHEREAS, as per Paras A(9) and E(2) of the Ash Notification dated 31.12.2021, all coal or lignite-based thermal power plants shall upload monthly information regarding ash generation and utilisation by 5th of the next month and ash pond details on yearly basis on the web portal developed by the CPCB for the benefit of actual user(s). In this regard, CPCB in association with NTPC and CEA, has developed **Ash Portal (<https://coalash.cpcb.gov.in/>)** for this purpose; and

WHEREAS, CPCB vide **letters dated 18.07.2023, 02.08.2023 and 25.08.2023** requested all concerned SPCBs to obtain the SPCB's login credentials for the **Ash Portal** and to issue necessary directions/instructions to all Captive Power Plants (CPPs) in the State to ensure immediate registration and regular uploading of ash data on the **Ash Portal**, along with ensuring regular uploading of ash data on the **Ash Portal** by all coal or lignite-based thermal power plants (including captive or co-generating plants or both) in the State; and

WHEREAS, CPCB issued **directions under Section 18(1)(b)** of the Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act, 1981, to all concerned SPCBs vide **dated 13.09.2023 a) To issue necessary directions/instructions to coal or lignite-based CPPs (including co-generating plants) in the State to ensure registration on the Ash Portal developed by CPCB (<https://coalash.cpcb.gov.in/>) immediately and uploading monthly information regarding ash generation and utilisation by 5th of the next month, and ash pond details on yearly basis, and b) To ensure regular uploading of ash data on the Ash Portal by all coal or lignite-based thermal power plants (including captive or co-generating stations or both) in the State; and**

WHEREAS, CPCB vide **letters dated 19.01.2024 and 29.08.2024** circulated to all concerned SPCBs the status of registration of the coal or lignite-based CPPs on the Ash Portal along with the state-wise lists with further instructions to SPCBs to ensure compliance of the directions dated 13.09.2023 (**copies enclosed** for ready reference); and

WHEREAS, as per Para B(5)(ii) of the Ash Notification dated 31.12.2021, *"Thermal power plants or mines shall not wait for disposal of ash till the identification is done by the above mentioned committee [under Para B(5)(i)], to meet the utilisation targets mandated as above [under Para A(4) and A(5)]".* In this regard, as per the decisions of the committee constituted under Para B(5)(i) taken during 1st and 3rd meeting held on 01.08.2022 and 06.10.2023, CPCB vide **letter dated 08.09.2022 (and 20.10.2023)** and has requested all

SPCBs/PCCs to constitute District Level Working Groups for deciding allocation of non-coal mines (major and minor minerals) for ash disposal to the coal or lignite based power plants, with Regional Officers, SPCB as the nodal agency (**copies enclosed** for ready reference); and

WHEREAS, as per Para B(6) of the Ash Notification dated 31.12.2021, "*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*". In this regard, CPCB has laid down "*Guidelines for disposal/utilisation of Fly Ash for reclamation of Low Lying Areas and in stowing of Abandoned mines/Quarries, 2019*" which were issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India vide O.M. dated 28.08.2019; and

WHEREAS, as per Para C(4) of the Ash Notification dated 31.12.2021, "*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)*"; and.

WHEREAS, as per Para C(5) of the Ash Notification dated 31.12.2021, "*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)*"; and

WHEREAS, as per Para D(4) of the Ash Notification dated 31.12.2021, "*The coal or lignite based thermal power plants, while utilising ash under this notification shall reserve certain percentage of ash for supply to all micro and small enterprises engaged in ash-based product manufacturing namely, bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre cement sheets, pipes, boards, panels for sale at concessional price or through limited auction in accordance with the guidelines issued by the Central Government in the Ministry of Power*". In this regard, the Ministry of Power, Government of India has issued guidelines on the aforesaid subject vide dated 15.03.2024 to all coal or lignite based thermal power plants and concerned State Governments (**copy enclosed** for reference); and

WHEREAS, as per Para E(4) of the Ash Notification dated 31.12.2021, "*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*"; and

WHEREAS, as per Para E(5) of the Ash Notification dated 31.12.2021, "*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". In this regard, CPCB vide O.M. dated 09.09.2024 (earlier O.M. dated 06.03.2023 and 17.07.2023) has issued the list of authorized auditors to undertake the compliance audit for ash disposal by the coal or lignite based thermal power plants and the users as per Ash Notification No. 5481(E) dated 31.12.2021 (copy enclosed for ready reference); and

WHEREAS, the Ash Notification dated 31.12.2021 designates SPCBs as the enforcing and monitoring authority in their States for ensuring compliance of various provisions of the Ash Notification on quarterly basis [Para E(1)];

NOW, THEREFORE, in exercise of the powers under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981, and with the approval of the Chairman, Central Pollution Control Board (CPCB), the (as per list enclosed) State Pollution Control Board is hereby directed as follows:

- a) To ensure effective enforcement and monitoring of compliance of the various provisions of the Ash Notification by all coal or lignite-based thermal power plants (including captive or co-generating stations or both) in the State on quarterly basis,
- b) To ensure immediate registration and regular uploading of monthly ash generation and utilisation data by 5th of the next month, and ash pond details on yearly basis on the Ash Portal by all coal or lignite-based thermal power plants (including captive or co-generating stations or both) in the State,
- c) To ensure that the ash generated from coal or lignite based thermal power plants (including captive or co-generating stations or both) shall be utilised only for the eco-friendly purposes prescribed at A(2) (i) to (x) of the Ash Notification,
- d) To ensure stabilisation, reclamation and certification of un-operational ash ponds/dykes and operational ash ponds/dykes beyond the permitted numbers (two for plants with installed capacity up to 1600 MW and four for plants with installed capacity above 1600 MW) by 31.03.2025 if the plant has not decided to utilise ash from such ash ponds/dykes in a progressive manner within 10 years as per the Ash Notification,
- e) To ensure and periodically monitor the compliance of the "Guidelines on Design, Construction, O&M and Annual Certification of Coal Ash Ponds, June 2023" (issued by CPCB and CEA) by the coal or lignite-based thermal power plants (including captive or co-generating stations or both) in the State,
- f) To ensure that the 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 by all coal or lignite-based thermal power plants (including captive or co-generating stations or both) in the State,
- g) To ensure the installation of dedicated dry fly ash silos for storage of at least 16 hours of ash based on installed capacity by all coal or lignite-based thermal power plants (including captive or co-generating stations or both) in the State and periodic inspection of the same,

- h) To ensure that the filling of low lying areas with ash shall be carried out only with prior permission of the SPCB and for approved projects complying with the CPCB's guidelines and the SPCB shall publish approved sites, location, area and permitted quantity annually on its website,
- i) To ensure that the transporters or vehicle owner deliver ash to authorised purchaser or user agency only, and take appropriate action for the non-compliant cases as per the provisions of the Ash Notification, which include imposition of environmental compensation and prosecution of such non-compliant transporters by SPCB,
- j) To ensure compliance of the guidelines dated 15.03.2024 issued by the Ministry of Power, Government of India regarding reserving certain percentage of ash for supply to all micro and small enterprises engaged in ash-based product manufacturing namely, bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre cement sheets, pipes, boards, panels for sale at concessional price or through limited auction,
- k) To ensure effective mechanism for resolving disputes between thermal power plants and users of ash or manufacturer of ash based products, through the State Level Committee under the Chairman, SPCB, and
- l) To ensure submission of the annual implementation report and annual compliance audit report by 30th April and 30th November every year, respectively, by the coal or lignite based thermal power plants in the State to the concerned authorities and take appropriate action against the non-compliant thermal power plants as per the provisions of the Ash Notification dated 31.12.2021.

The SPCB shall submit the latest status/action taken report on the above mentioned directions within one month from the receipt of these directions, and ensure regular compliance of the above mentioned directions and submission of annual status report by 31st December every year from December 2024 onward.


(Bharat Kumar Sharma)
Member Secretary



Copy to:

1. Additional Secretary (HSM Division)
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Aliganj,
Jor Bagh Road, **New Delhi – 110 003**
2. The Joint Secretary (Thermal)
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg,
New Delhi
3. The Regional Directors : For follow-up with the concerned SPCBs.
Central Pollution Control Board,
(As per the list enclosed)
4. The Divisional Head - IT, CPCB, Delhi : For uploading the directions on the website.


(Bharat Kumar Sharma)
Member Secretary



* Enclosures sent via email.

List of State Pollution Control Boards

1. The Member Secretary,
Andhra Pradesh Pollution Control Board
D. No. 33-26-14 D/2, Near Sunrise Hospital,
Pushpa Hotel Centre, Chalamalavari Street,
Kasturibaipet, **Vijayawada – 520 010**
2. The Member Secretary,
Pollution Control Board- Assam,
Bamunimaidam, **Guwahati – 781 021**, Assam
3. The Member Secretary,
Bihar State Pollution Control Board
Parivesh Bhawan, Plot No. NS-B/2,
Paliputra Industrial Area, Patliputra,
Patna – 800 023, Bihar
4. The Member Secretary,
Chhattisgarh Environment Conservation Board,
Paryavas Bhavan, North Block Sector-19,
Atal Nagar, **Raipur – 492 002**, Chhattisgarh
5. The Member Secretary,
Gujarat Pollution Control Board
Paryavaran Bhavan, Sector 10-A,
Gandhi Nagar - 382 010, Gujarat
6. The Member Secretary,
Goa State Pollution Control Board
Nr. Pilerne Industrial Estate, Opp. Saligao
Seminary, Saligao – Bardez, **Goa – 403 511**
7. The Member Secretary,
Haryana State Pollution Control Board
C-11, Sector-6, **Panchkula- 134109**, Haryana
8. The Member Secretary,
Jharkhand State Pollution Control Board,
T.A. Bldg., HEC, P. O. Dhurwa,
Ranchi – 834 004, Jharkhand
9. The Member Secretary,
Karnataka State Pollution Control Board
"Parisara Bhavan", #49,4th & 5th Floor,
Church Street, **Bangalore 560 001**
10. The Member Secretary,
Madhya Pradesh Pollution Control Board,
Paryavaran Parisar, E-5, Arera Colony,
Bhopal – 462 016, Madhya Pradesh

11. The Member Secretary,
Maharashtra Pollution Control Board,
Kalpataru Points, 3rd & 4th Floor,
Road No. 8, Sion Circle, Opp. PVR Theatre,
Mumbai – 400 022, Maharashtra
12. The Member Secretary,
Meghalaya State Pollution Control Board,
“ARDEN”, Lumpynggad,
Shillong – 793 014, Meghalaya
13. The Member Secretary,
Odisha State Pollution Control Board,
Paribesh Bhawan, A-118, Nilakantha Nagar,
Unit - VIII, **Bhubaneswar – 751 012, Odisha**
14. The Member Secretary,
Punjab Pollution Control Board
Vatavaran Bhawan, Nabha Road
Patiala 147 001, Punjab
15. The Member Secretary,
Rajasthan Pollution Control Board,
A-4, Institutional Area, Jalana Dungri,
Jaipur 302 004, Rajasthan
16. The Member Secretary,
Tamil Nadu Pollution Control Board
76, Anna Salai, Guindy Industrial Estate,
Race View Colony, Guindy,
Chennai – 600 032, Tamil Nadu
17. The Member Secretary,
Telangana State Pollution Control Board,
Paryavaran Bhawan, A-III, Industrial Estate,
Sanathnagar, **Hyderabad – 500 018**
18. The Member Secretary,
Uttar Pradesh Pollution Control Board,
H. No. TC-12 V, Vibhuti Khand, Gomti Nagar,
Lucknow - 226 010, Uttar Pradesh
19. The Member Secretary,
Uttarakhand Pollution Control Board,
Gaura Devi Bhawan, 46 B, IT Park,
Sahastradhara, **Dehradun – 248 001, Uttarakhand**
20. The Member Secretary,
West Bengal Pollution Control Board,
Paribesh Bhawan, 10A, Block-LA, Sector-III,
Bidhannagar, **Kolkata-700 106, West Bengal**

List of CPCB Regional Directorates

1. The Regional Director,
Central Pollution Control Board,
1st & 2nd Floors, Nisarga Bhawan, A-Block,
Thimmaiah Main Road, 7th D Cross,
Shivanagar, **Bengaluru - 560 079**
2. The Regional Director,
Central Pollution Control Board,
Parivesh Bhawan, Paryavaran Parisar,
E-5, Arera Colony, **Bhopal - 462 016**,
Madhya Pradesh
3. The Regional Director,
Central Pollution Control Board,
BSNL Telephone Exchange, 2nd Floor,
Sector -49 C, **Chandigarh - 160 059**
4. The Regional Director,
Central Pollution Control Board,
2nd Floor, 77-A, South Avenue Road,
Ambattur Industrial Estate,
Chennai - 600 058, Tamil Nadu
5. The Regional Director,
Central Pollution Control Board,
South End Conclave, Block 502, 5th & 6th Floor
1582, Rajdanga Main Road, **Kolkata - 700 107**
6. The Regional Director,
Central Pollution Control Board,
Survey No. 110, Dhankude Multi-Purpose Hall,
Baner Road, Baner, **Pune - 411 045**, Maharashtra
7. The Regional Director,
Central Pollution Control Board,
Parivesh Bhawan, Opp. VMC Ward No. 10 Office
Subhanpura, **Vadodara - 390 023**
8. The Regional Director,
Central Pollution Control Board,
PICUP Bhawan, Ground Floor,
Vibhuti Khand, Gomti Nagar,
Lucknow - 226 010
9. The Regional Director,
Central Pollution Control Board,
Opp. Government Press, BSNL NE-I,
Ground Floor, CTO Building,
Shillong - 793 001



IPC-II/TPP/CP-11/76/2022/406

September 09, 2024

OFFICE MEMORANDUM

Sub: Updated list of authorized auditors to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the users as per Ash Notification No. 5481(E) dated 31.12.2021.

Central Pollution Control Board (CPCB) issued the first list of authorized auditors to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies vide O.M. No. IPC-II/TPP/CP-11/76/2022/1252 dated 06.03.2023 and the updated list vide O.M. No. IPC-II/TPP/CP-11/76/2022/285 dated 17.07.2023, as per Para E(5) of the Ash Notification No. S.O. 5481(E) dated 31.12.2021 issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India (amended by notifications dated 30.12.2022 and 01.01.2024).

Subsequently, it has been observed that more authorized auditors will be required for annual compliance audit of coal or lignite based independent thermal power plants as well as captive power plants to ensure timely auditing and reasonable audit charges.

In view of the above, CPCB invited further nominations of experts as per the revised eligibility criteria from Council of Scientific & Industrial Research (CSIR), Indian Institutes of Technology/Science (IITs), National Institutes of Technology (NITs), other Institutes of National Importance, and other Central and State Government institutions related to Science/Technology/Research and Environment for authorization of more auditors to undertake the compliance audit of the thermal power plant as per Para E(5) of the Ash Notification (and subsequent amendments).

Accordingly, the nominated experts from the aforesaid institutes which are found to be fulfilling the prescribed eligibility criteria as per the attached list are authorized to undertake the annual compliance audit of ash disposal by the coal and lignite based thermal power plants and the users as per Para E(5) of the Ash Notification (and subsequent amendments). The scope of work shall be as per the O.M. dated 06.03.2023 (attached).

The authorization of the auditors shall be valid till their engagement with the institutes.

Thermal power plants shall approach the authorized auditors through the concerned organization/institute for undertaking the compliance audit. The auditor shall submit the compliance audit report directly to the concerned SPCB/PCC and CPCB.

(Bharat Kumar Sharma)
Member Secretary

To,

Divisional Head - IT, CPCB : For updating the document on webpage "Fly Ash Management and Utilization" for information of SPCBs and TPPs.

Copy to:

1. The Additional Secretary (HSM Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
New Delhi - 110 003
2. The Additional Secretary (Thermal),
Ministry of Power,
Shram Shakti Bhawan,
Rafi Marg, New Delhi
3. PA to CCB

Updated list of auditors authorised to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No. 5481(E) dated 31.12.2021

Part A: Authorized auditors to undertake compliance audit of thermal power plants of 'All Capacity'						
Sl. No.	Name	DOB	Designation	Department	Organization/ Institute	Central/ State Institute
1	S. Bhaskar	10-10-1969	Chief Scientist	Advanced Materials Laboratory	CSIR-SERC, Chennai	Central
2	P.S. Ambily	09-05-1979	Principal Scientist	Advanced Materials Laboratory	CSIR-SERC, Chennai	Central
3	T. Hemalatha	24-11-1976	Principal Scientist	Advance Concrete Testing & Evaluation Laboratory	CSIR-SERC, Chennai	Central
4	Manish Mudgal	18-07-1969	Chief Scientist Head	Centre for Advanced Radiation Shielding & Geopolymeric Materials	CSIR-AMPRI, Bhopal	Central
5	Sujit Kumar Mandal	04-11-1964	Chief Scientist	Mine, Planning & Economics Mine Survey & Subsidence Mine Back Filling	CSIR-CIMFR, Dhanbad	Central
6	Jai Krishna Pandey	05-09-1965	Chief Scientist	Mine Fire Ventilation and Miners' Health	CSIR-CIMFR, Dhanbad	Central
7	Santosh Kumar Ray	01-01-1967	Chief Scientist	Mine Fire, Ventilation, Miners' Health	CSIR-CIMFR, Dhanbad	Central
8	Prashant	06-04-1972	Sr. Principal Scientist	Mine Back Filling	CSIR-CIMFR, Dhanbad	Central
9	Arka Jyoti Das	16-10-1989	Sr. Scientist	Geomechanics & Numerical Simulation	CSIR-CIMFR, Dhanbad	Central
10	Santosh Kumar Behera	10-05-1990	Senior Scientist	Mine Back Filling Research Group	CSIR-CIMFR, Dhanbad	Central
11	Anil Kumar Sinha	01-08-1967	Sr. Principal Scientist	Geotechnical Engineering	CSIR-CRRI, New Delhi	Central
12	Manojit Samanta	25-04-1986	Principal Scientist	Geotechnical Engineering	CSIR-CBRI, Roorkee	Central
13	Dinakar Pasla	05-07-1976	Professor	School of Infrastructure	IIT Bhubaneswar	Central
14	Rajesh Roshan Dash	30-06-1977	Professor	School of Infrastructure	IIT Bhubaneswar	Central
15	B. Hanumantha Rao	01-05-1979	Associate Professor	School of Infrastructure	IIT Bhubaneswar	Central
16	Remya Neelancherry	30-05-1982	Associate Professor	School of Infrastructure	IIT Bhubaneswar	Central
17	Prabhat Kumar Singh Dikshit	15-08-1971	Professor & Head	Civil Engineering	IIT-BHU Varanasi	Central
18	Arun Prasad	10-10-1964	Professor	Civil Engineering	IIT-BHU Varanasi	Central
19	Anurag Ohri	07-08-1977	Associate Professor	Civil Engineering	IIT-BHU Varanasi	Central
20	Suresh Kumar	01-11-1976	Assistant Professor	Civil Engineering	IIT-BHU Varanasi	Central
21	Supriya Mohanty	01-01-1988	Assistant Professor	Civil Engineering	IIT-BHU Varanasi	Central
22	Suprakash Gupta	01-01-1969	Professor & Head	Mining Engineering	IIT-BHU Varanasi	Central
23	Sanjay Kumar Sharma	05-01-1966	Professor	Mining Engineering	IIT-BHU Varanasi	Central
24	Rajesh Rai	03-10-1978	Associate Professor	Mining Engineering	IIT-BHU Varanasi	Central
25	Amrendra Kumar	15-05-1976	Associate Professor	Mining Engineering	IIT-BHU Varanasi	Central
26	G.S.P. Singh	23-11-1971	Associate Professor	Mining Engineering	IIT-BHU Varanasi	Central
27	Tarun Verma	05-02-1983	Assistant Professor	Mining Engineering	IIT-BHU Varanasi	Central
28	D. N. Singh	28-06-1965	Professor	Civil Engineering	IIT Bombay	Central
29	Ashish Juneja	15-07-1971	Professor	Civil Engineering	IIT Bombay	Central
30	Munish K. Chandel	27-11-1976	Professor	Environmental Science and Engineering	IIT Bombay	Central
31	Abhishek Chakraborty	15-04-1984	Assistant Professor	Environmental Science and Engineering	IIT Bombay	Central
32	Arya V.	07-12-1988	Assistant Professor	Civil Engineering	IIT Delhi	Central
33	Shailesh R. Gandhi	19-08-1955	Visiting Professor	Civil Engineering	IIT Gandhinagar	Central
34	Amit Balasaheb Shelke	23-07-1984	Associate Professor	Civil Engineering	IIT-Guwahati	Central
35	Sarat Kumar Das	24-06-1968	Professor	Civil Engineering	IIT(ISM) Dhanbad	Central
36	D.P. Mishra	09-06-1975	Chair Professor & Head	Mining Engineering	IIT(ISM) Dhanbad	Central
37	R.K. Sinha	15-12-1973	Associate Professor	Mining Engineering	IIT(ISM) Dhanbad	Central
38	B.S. Choudhary	01-12-1975	Associate Professor	Mining Engineering	IIT(ISM) Dhanbad	Central

Updated list of auditors authorised to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No. 5481(E) dated 31.12.2021

Part A: Authorized auditors to undertake compliance audit of thermal power plants of 'All Capacity'						
Sl. No.	Name	DOB	Designation	Department	Organization/ Institute	Central/ State Institute
39	K. V. Harish	28-11-1981	Assistant Professor	Civil Engineering	IIT-Kanpur	Central
40	Brajesh Kumar Dubey	18-09-1974	Professor	Civil Engineering	IIT Kharagpur	Central
41	Aditya Kumar Patra	11-06-1970	Associate Professor	Mining Engineering	IIT Kharagpur	Central
42	Basanta Kumar Prusty	31-07-1973	Associate Professor	Mining Engineering	IIT Kharagpur	Central
43	Kranthi Kumar Kuna	06-08-1988	Assistant Professor	Civil Engineering	IIT Kharagpur	Central
44	Rajnish Sharma	11-06-1980	Associate Professor	Civil and Environmental Engineering	IIT Mandi	Central
45	Dericks P Shukla	02-01-1982	Associate Professor	Civil and Environmental Engineering	IIT Mandi	Central
46	Deepak Swami	23-06-1984	Associate Professor	Civil and Environmental Engineering	IIT Mandi	Central
47	Subrata Hait	25-10-1980	Associate Professor	Civil and Environmental Engineering	IIT-Patna	Central
48	Vaibhav Singhal	21-01-1983	Associate Professor and Head	Civil and Environmental Engineering	IIT-Patna	Central
49	Amarnath Hegde	07-04-1984	Assistant Professor	Civil and Environmental Engineering	IIT-Patna	Central
50	A. A. Kazmi	27-03-1972	Professor	Civil Engineering	IIT Roorkee	Central
51	Sudipta Sarkar	22-07-1972	Associate Professor	Civil Engineering	IIT Roorkee	Central
52	Bhanu Prakash Vellanki	06-01-1985	Associate Professor	Civil Engineering	IIT Roorkee	Central
53	Naveen James	25-08-1984	Assistant Professor	Civil Engineering	IIT Ropar	Central
54	Suresh Jain	12-07-1975	Professor	Civil and Environmental Engineering	IIT Tirupati	Central
55	Rakesh Chandra Vaishya	10-05-1962	Professor	Civil Engineering	NIT Allahabad	Central
56	Ram Pal Singh	01-03-1962	Professor	Civil Engineering	NIT Allahabad	Central
57	Kumar Venkatesh	07-07-1972	Associate Professor	Civil Engineering	NIT Allahabad	Central
58	Goutam Ghosh	05-07-0977	Associate Professor	Civil Engineering	NIT Allahabad	Central
59	Nekram Rawal	07-09-1977	Associate Professor	Civil Engineering	NIT Allahabad	Central
60	P.R. Pal	26-12-1977	Associate Professor	Civil Engineering	NIT Allahabad	Central
61	Shalineer Shukla	25-04-1978	Associate Professor	Civil Engineering	NIT Allahabad	Central
62	Anupam Rawat	14-11-1986	Associate Professor	Civil Engineering	NIT Allahabad	Central
63	Vijay Kumar	12-02-1982	Assistant Professor	Civil Engineering	NIT Allahabad	Central
64	Vishwajeet Pratap Singh	15-07-1983	Assistant Professor	Civil Engineering	NIT Allahabad	Central
65	S. Chandrakaran	11-02-1959	Professor (HAG)	Civil Engineering	NIT Calicut	Central
66	Santosh G Thampi	18-03-1963	Professor (HAG) & Head	Civil Engineering	NIT Calicut	Central
67	Kodi Ranga Swamy	04-06-1973	Associate Professor	Civil Engineering	NIT Calicut	Central
68	George K. Varghese	17-09-1975	Associate Professor	Civil Engineering	NIT Calicut	Central
69	Sathish Kumar D	30-01-1979	Associate Professor	Civil Engineering	NIT Calicut	Central
70	Ajay Kumar	05-06-1978	HOD and Associate Professor	Civil Engineering	NIT Delhi	Central
71	Kapil Kumar	21-04-1981	Assistant Professor	Civil Engineering	NIT Delhi	Central
72	Mahender Choudhary	04-01-1976	Professor & Head	Civil Engineering	NIT Jaipur	Central
73	Sudhir Kumar	05-02-1968	Professor	Civil Engineering	NIT Jaipur	Central
74	Mahesh Kumar Jat	15-12-1972	Professor	Civil Engineering	NIT Jaipur	Central
75	Sumit Khandelwal	05-08-1976	Professor	Civil Engineering	NIT Jaipur	Central
76	Amit Kumar	15-07-1981	Assistant Professor	Civil Engineering	NIT Jaipur	Central
77	Subhadeep Metya	28-06-1987	Assistant Professor	Civil Engineering	NIT Jamshedpur	Central
78	Susmita Sharma	27-05-1985	Assistant Professor	Civil Engineering	NIT Meghalaya	Central
79	Anirban Mandal	07-01-1976	Professor	Civil Engineering	NIT Nagpur	Central
80	Rahul V. Ralegaonkar	25-09-1976	Professor	Civil Engineering	NIT Nagpur	Central
81	Anjan Patel	14-06-1982	Associate Professor	Civil Engineering	NIT Nagpur	Central
82	A. B. Mirajkar	25-06-1979	Associate Professor	Civil Engineering	NIT Nagpur	Central
83	Mangesh V. Madurwar	20-07-1982	Associate Professor	Civil Engineering	NIT Nagpur	Central
84	Amit Padade	05-10-1985	Assistant Professor	Civil Engineering	NIT Nagpur	Central

Updated list of auditors authorised to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No. 5481(E) dated 31.12.2021

Part A: Authorized auditors to undertake compliance audit of thermal power plants of 'All Capacity'						
Sl. No.	Name	DOB	Designation	Department	Organization/ Institute	Central/ State Institute
85	Karthik Balasundaram	29-02-1984	Assistant Professor	Civil Engineering	NIT Nagpur	Central
86	Swapnil P. Wanjari	25-07-1975	Assistant Professor	Civil Engineering	NIT Nagpur	Central
87	Manoj Pradhan	30.06.1964	Professor	Mining Engineering	NIT Raipur	Central
88	Suresh Prasad Singh	08-05-1964	Professor & Head	Civil Engineering	NIT Rourkela	Central
89	C. R. Patra	25-02-1962	Professor	Civil Engineering	NIT Rourkela	Central
90	Rabi Narayan Behera	03-06-1982	Assistant Professor	Civil Engineering	NIT Rourkela	Central
91	Pradip Sarkar	31-10-1975	Professor	Civil Engineering	NIT Rourkela	Central
92	Mahabir Panda	02-06-1961	Professor	Civil Engineering	NIT Rourkela	Central
93	Amit Kumar Gorai	01-01-1977	Professor & Head	Mining Engineering	NIT Rourkela	Central
94	Manoj Kumar Mishra	29-09-1962	Professor	Mining Engineering	NIT Rourkela	Central
95	Singam Jayanthu	20-04-1964	Professor	Mining Engineering	NIT Rourkela	Central
96	Himanshu Bhusan Sahu	01-07-1974	Professor	Mining Engineering	NIT Rourkela	Central
97	Upendra Kumar	02-02-1972	Professor	Civil Engineering	NIT Silchar	Central
98	Shakeel Ahmad Waseem	27-08-1989	Assistant Professor	Civil Engineering	NIT Srinagar (J&K)	Central
99	R. A. Christian	31-08-1961	Professor & Head	Civil Engineering	NIT Surat	Central
100	M. M. Ahammed	18-01-1967	Professor	Civil Engineering	NIT Surat	Central
101	K. D. Yaday	29-11-1974	Professor	Civil Engineering	NIT Surat	Central
102	Bhaven Tandel	14-04-1974	Associate Professor	Civil Engineering	NIT Surat	Central
103	Namrata Jariwala	05-03-1975	Associate Professor	Civil Engineering	NIT Surat	Central
104	Arun Kumar Thalla	29-07-1978	Professor	Civil Engineering	NIT Surahthal	Central
105	T. Palanisamy	17-05-1977	Associate Professor	Civil Engineering	NIT Surahthal	Central
106	Aruna Mangalpaday	17-05-1971	Professor	Mining Engineering	NIT Surathkal	Central
107	Karra Ram Chandar	05-12-1976	Professor	Mining Engineering	NIT Surathkal	Central
108	Kranti Jain	15-09-1977	Associate Professor	Civil Engineering	NIT Uttarakhand	Central
109	Aditya Kumar Anupam	03-02-1985	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
110	Amardeep	13-08-1985	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
111	Smita Kaloni	02-07-1988	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
112	Shashi Narayan	13-12-1989	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
113	Shashank Bhatra	25-11-1991	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
114	Bibhash Kumar	25-10-1992	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
115	P. Rathish Kumar	20-01-1969	Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
116	P. Venkateswara Rao	06-05-1978	Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
117	Ajey Kumar Patel	07-11-1977	Associate Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
118	P. Hari Prasad Reddy	19-06-1980	Associate Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
119	Sridhar	20-10-1982	Assistant Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
120	Chinthala Sumanth	04-08-1986	Assistant Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central

Updated list of auditors authorised to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No. 5481(E) dated 31.12.2021						
Part B: Authorized auditors to undertake compliance audit of thermal power plants of 'Total Installed Capacity < 100 MW'						
Sl. No.	Name	DOB	Designation	Department	Organization/ Institute	Central/ State Institute
1	M. Chandra Sekhar	28-11-1963	Director & Professor (HAG)	Civil/Environmental Engineering	Rajiv Gandhi Univ. of Knowledge Tech.	State
2	Manjeet Bansal	29-02-1972	Professor	Civil Engineering	Maharaja Ranjit Singh Punjab Tech. Univ.	State
3	N. Raveendhar	03-08-1959	Consultant (Technical)	EEM&EQM	EPTRI Hyderabad	State
4	Shaik Allavali	18-12-1980	Environmental Engineer	EEM	EPTRI Hyderabad	State

IPC-II/TPP/CP-11/76/2022/1252

March 06, 2023

OFFICE MEMORANDUM

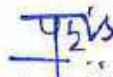
Sub: Authorization of auditors to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No.5481(E) dated 31.12.2021.

Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India has issued Notification No. S.O. 5481(E) dated 31.12.2021 regarding ash utilisation from coal or lignite based thermal power plants which has been amended by notification dated 30.12.2022. The permitted areas of ash utilizations are mentioned in Para A (1)&(2), the permitted storage conditions in operational and un-operational ash ponds are mentioned in Para A (6)&(8), and the requirement of submitting annual implementation report to CPCB, concerned SPCB/PCC, CEA and concerned IRO of MoEF&CC by 30th April, with information in the prescribed Annexure, is mentioned in Para E(2) of the Notification.

Further, as per Para E(5) of the notification, *"the compliance audit for ash disposal by the thermal power plants and the user agency 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"*.

CPCB invited nominations of experts from Council of Scientific & Industrial Research (CSIR), Indian Institutes of Technology (IITs) and National Institutes of Technology (NITs) for authorization of auditors to undertake the compliance audit of the thermal power plant as per Para E(5) of the notification. The nominated experts from the aforesaid organizations/institutes which are found to be fulfilling the eligibility criteria as per list attached (Annexure-I) are authorized as auditors to undertake the annual compliance audit of the thermal power plants as per Para E(5) of the notification.

Thermal power plants shall approach authorized auditors through concerned organization/institute for undertaking the audit as per Para E(5) of the notification. Scope of Work to carry out the audit as per Para E(5) of the notification is attached. The auditor shall submit the audit report directly to CPCB and SPCB/PCC.


(Prashant Gargava)
Member Secretary

देशीय प्रदूषण नियंत्रण बोर्ड
निर्माण
दिनांक 06/03/2023

0/c

To,

Divisional Head - IT, CPCB :

For uploading on webpage "Fly Ash Management and Utilization" for information of SPCBs and TPPs.

Copy to:

1. The Additional Secretary (HSM Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
New Delhi - 110 003
2. The Additional Secretary (Thermal),
Ministry of Power,
Shram Shakti Bhawan,
Rafi Marg, New Delhi
3. PA to CCB

Scope of Work to carry out the audit as per Para E(5) of the Ash Notification 31.12.2021

1. Verification of ash generation data pertaining to the financial year based on inspection of records of coal receipt/consumption and average ash content in coal and comparison of this data with the information provided by the power plant in the annual implementation report / prescribed Annexure.
2. Verification of fly ash and bottom ash utilization data pertaining to the financial year based on inspection of records of ash supplied to the user agencies covered under permitted uses/avenues, and comparison of this data with the information provided by the power plant in the annual implementation report / prescribed Annexure
3. Verification of net ash disposal into ash ponds data pertaining to the financial year (i.e. difference of ash generation and ash utilization, as above), and comparison of this data with the information provided by the power plant in the annual implementation report / prescribed Annexure.
4. Assessment of total ash storage in operational and un-operational ash ponds and available storage capacity for further disposal at the end of financial year based on details and drawings of ash ponds provided by the power plant and ground verification of the information provided, and comparison of the storage and available storage capacity with the information provided by the power plant in the annual implementation report / prescribed Annexure.
5. Assessment of ash slurry disposal and ash water re-circulation system used during the financial year, in respect ratio of water in the ash disposed to ash ponds, water used for ash slurry disposal to ash ponds, ash water recycled through AWRS, and ash water discharged into environment, based on inspection of records provided by the power plant and ground verification, including the condition of surrounding environment in respect of ash released or breached, and comparison of the ground situation with the information provided by the power plant in the annual implementation report / prescribed Annexure.

SOP for allocation of Mines for Fly Ash
filling (Both UG/OC)

SOP for allocation of Mines for Ash filling

*As per MoEFFC notification on 3rd November 2009, "fly ash" means and includes all categories or groups of coal or lignite ash generated at the thermal power plant and collected by Electrostatic Precipitator (ESP) or bag filters or other similar suitable equipments; bottom ash is the ash collected separately at the bottom of the boiler; pond ash is the mixture of ESP Fly ash and bottom ash, but, for the purpose of this notification, **the term "fly ash" means and includes all ash generated such as Electrostatic Precipitator (ESP) ash, dry fly ash, bottom ash, pond ash and mound ash as the objective is to utilise all the ashes.***

1. As per the Central Level Working Group (CLWG) deliberations, the following mines shall be considered for allotment for the purpose of fly ash filling/stowing:

- i. Closed or abandoned open cast mines.
- ii. Closed or abandoned voids of the working open cast mines.
- iii. Closed underground mine or working underground mine where the proposed extraction of coal is by stowing method.

2. The coal companies shall identify the mines that are suitable/available for the disposal of fly ash and the mines that will be available in the next 03 years. The Coal companies (CIL/SCCL/NLC) shall compile the list of suitable/available/ to be available mines and share the list of the mines so identified, with the Ministry of Coal by 10th of every month. In case no mines are available to be offered, a NIL report shall be sent.

3. The TPPs shall identify the suitable mines and make their requests for the allocation of the respective mine for the purpose of fly ash filling to the Central Electricity Authority (CEA). The format for the application to CEA is attached as Annexure 1. The requests shall be sent to CEA by 10th of every month.

4. CEA shall examine, compile and forward the requests to the Ministry of Coal along with its comments on the same.

5. For the request made by the TPPs for the allocation of Captive/commercial coal blocks allotted by the Ministry of Coal, a copy of the request shall also be sent to the Ministry of Coal for examining the same with the concerned coal block owner.

6. A Central Level Working Group (CLWG) meeting shall be organized by the Ministry of Coal on or after 20th of every month for the purpose of allocation of the mines to TPPs to dispose the fly ash.

7. The thermal power plants that have been allotted mines for the disposal of fly ash shall have responsibilities, with respect to safety related to

environment, transport and other administrative-related matters as per **Annexure-2**.

8. The Coal Companies shall have the responsibilities as specified in the **Annexure-3** for the safe disposal of fly ash and other administrative-related matters.

9. In case where the mine and TPP belong to the same owner, there shall be no need for the allocation by CLWG.

10. MoU shall be concluded by the Coal company and the TP within 3 months of publication of the minutes having the allocation of the same, failing which, the same shall be deemed cancelled and will be considered for further allocation, unless the request for extension is agreed by the Chairman, CLWG.

Annexure 1**Format of the request to CEA by TPPs for the allocation of the Mines**

A	List of Identified mines:						
	Name of the TPP	Name of the mines	Distance (km)	Void space available	Void space required (L cum.)	Tentative time required for dumping	Proposed mode of transport
1.							
2.							
3.							
.							
.							
.							
	Total void space available/required					--	--
C.	Details of past allotments to the company						
	Name of the TPP	Name of the mines	Date of allotment	Status of MoU and operation			Remarks
1.							
2.							
3.							
.							
.							
D	Suggestions/grievances etc.						

Annexure 2Responsibilities of TPPs

- i. All the regulatory compliances, safety and environmental & operational issues associated with fly ash disposal into mine voids will rest with the TPPs.
- ii. TPPs should do scientific study as per OM dated 28.08.2019 issued by MoEF&CC and CPCB guidelines and amendment thereof. The TPPs should obtain NoC from concerned State Pollution Control Boards.
- iii. The TPPs shall be responsible for complying with the requirements of OM dated 28.08.2019 issued by MoEF&CC including. However, if need arises to obtain requisite permission from DGMS, the Coal Companies shall, on behalf of the TPPs apply for the same at DGMS but the follow up works shall be done by the TPPs. Transport, handling and disposal of ash to prevent surface and sub surface water pollution shall be the sole responsibility of TPPs.
- iv. Fly ash disposal & monitoring shall be as per OM dated 28.08.2019 issued by MoEF&CC by TTP on regular basis. In case of any adverse impact, the fly ash filling shall be stopped and appropriate remediation measures shall be taken.
- v. The closure of the mine void site after fly ash disposal up to permitted height should be associated with blanketing with top soil as per study but not less than minimum 30 cms thickness and ecological restoration of the site through suitable landscaping and plantation of native species.
- vi. Alternatively, installation of ground mounted solar or other re-purposing activities may be explored.
- vii. During post-closure, garland drains should be provided around the site to ensure that there is no ingress of water into the disposal site.
- viii. In the case of UG mines submission of details for design, drawing location etc. of the Stowing plant will be assisted by the mine owner. The cost of supply, erection and commission of the Stowing plant, borehole as well as the cost of laying pipelines and other infrastructure

for the fly ash filling purpose both above & below ground shall be borne by TPPs.

- ix. The reclamation of filled in mine site and post closure monitoring shall be done by TPPs accordance with the directive issued by MoEFCC vide O.M. dated 29/08/2019 before handing over the site to coal transportation.
- x. TPPs in consultation with the Coal Companies shall prepare a Hazard identification and Safety Management plan.
- xi. Scientific studies, if required, shall be done in consultation with the Coal Companies before commencement of fly ash filling and all the recommendation made in the scientific study shall be complied with. The monitoring shall be carried out for at least for two monsoon seasons after completion of fly ash filling in the OC voids.
- xii. Monitoring by TPPs or agencies for entire ash disposal operation, conducting different studies and maintaining all records as prescribed, are to be certified by concerned coal company as per OM of MoEFCC dated 28.8.2019. After closure of the site, it shall be ensured by TPPs that the disposal site has been suitably reclaimed through plantation of native tree species and other measures in accordance with the prescribed guidelines/statutes.
- xiii. In case of any adverse report/notice by the regulatory agency for the non-compliance/damage to environment, the mine owner shall have liberty to cancel the MoU and stop the fly ash operations. Fly ash filling will resume after mitigation measures are taken and clearance from the regulatory authority is obtained.
- xiv. Since the Coal Companies remain the custodians of the land as per CB Act, 1957, the liability in terms of legal, environmental and safety issues shall lie with the TPPs, in accordance with the mutually agreed MoU, starting from preparation of the site and fly ash disposal up to the time of closure of the site.
- xv. Lease rent which has been paid to the State Government by Coal Companies is to be recovered from TPPs. Further policy guidelines for the use of land acquired under the Coal Bearing Areas (A&D) Act, 1987, vide MoC OM no. 43022/1/2020-LAIR dt: 22-04-2022 may be followed.
- xvi. The guidelines issued by MOC regarding responsibility of mine owners and TPPs after the site is handed over to TPPs for fly ash disposal, shall apply.

Annexure 3Responsibilities of the Coal Companies

- i. The Coal Companies shall examine all the clearances, studies and permissions obtained by the Thermal Power Plant vis-à-vis OM dated 28.8.2019 by MoEF&CC and various decisions taken in the Fly Ash Management and Utilisation Mission meeting organized from time to time by MoEF&CC. If found satisfactory, coal companies will communicate to the concerned TPP or agency to enter into a MoU and also related formalities for the disposal of fly ash.
- ii. In the case of working UG mine, the concerned subsidiary of Coal Company/ Coal company shall be associated with TPPs for all the works below the surface (laying of pipelines, barricading etc). For the closed/old underground workings, the coal company shall facilitate the TPPs for drilling of boreholes and laying of surface pipeline for filling of fly ash slurry.
- iii. The guidelines issued by MOC regarding responsibility of mine owners and TPPs after the site is handed over to TPPs for fly ash disposal, shall apply.

SOP for carrying out feasibility studies for mixing of ash with OB/ backfilling in operational mines in case of opencast/underground mines, as the case may be

1.The matter of filling of fly ash in the voids of working areas of opencast mines has been examined by different coal companies in consultation with various stakeholders such as CMPDIL, CIMFR, DGMS etc. Accordingly, the same was deliberated in the Central Level Working Group (CLWG). With regards to fly ash dumping in the working open cast mines, it was concluded that mixing of OB and Fly ash in specified proportions is very difficult and if it is not mixed in specified proportion, it possesses the problem of factor of safety. This is in addition to the problems faced by the coal companies to accommodate their own OB. Therefore, duly considering the safety and practicality aspects of the working areas of opencast mines, it is concluded that these mines will not be allocated for dumping of fly ash in the working areas of opencast mines by mixing it with OB. However, if any mine owner is proposing for dumping the fly ash in the working areas of opencast mines by mixing it with the OB, received from its own TPP (both the mine and the TPP belong to the same company/owner), same may be allowed.

2. Closed open cast mines and the closed or abandoned voids of the working open cast mines, subject to the condition that it is isolated and fly ash dumping is not interfering/ affecting the general working of the mines, are considered for allocation for fly ash dumping.

3. In case of the working underground mines, where the proposed extraction of coal is by caving, the filling of fly ash, in general, may not be possible. However, if the coal companies / TPPs desire to undertake a scientific study to this effect, the same shall be allowed.

4. In case of the working underground mines, where the proposed extraction of coal is by stowing, the same shall be allowed. In this respect, the TPPs shall make a provision to provide the coal companies with bottom ash, if demanded by the coal companies.

5.Scientific studies for filling of ash in mine voids of working UG and Opencast mines is under the scope of the TPPs to which the void has been allotted. This shall be undertaken in accordance with applicable guidelines issued by MoEFCC/CPCB/SPCB and other agencies. The fly ash disposal should comply with the requirement of OM dated 28.08.2019 issued by MoEFCC including obtaining requisite permission from DGMS, which will be obtained by TPPs.

6.In case of the working U/G mines, the transport of fly ash from the TPP to the mine facility should be the responsibility of the concerned TPP. The mine owner shall be responsible for the filling/ stowing of the ash from the mine facility to the underground. The safety aspect with respect to the stowing of the fly ash shall be the responsibility of the Mine Owner.

**SOP for signing MOU between identified mines
and TPPs (Both UG/OC)**

1. MoU shall be concluded by the Coal company and the TPP within 3 months of publication of the minutes having the allocation of the same, failing which, the same shall be deemed cancelled and will be considered for further allocation, unless the request for extension is agreed by the Chairman, CLWG.
2. Both the parties- the concerned Coal company and the respective TPPs shall inform the Ministry of Coal, the Ministry of Environment Forest & Climate Change, the Ministry of Power and the COMMITTEE about the date of signing of the MoU.
3. The MoU shall be framed in such a way that it covers all the safety, environmental, administrative, regulatory compliant and arbitration-related matters. It should be consistent with the guidelines of MoEFCC, read with the MoP Guidelines dated 15.03.2024, Central Pollution Control Board and other Central Govt. guidelines.
4. Consultancy Contract for the submission of design, drawing and location etc. shall be in the scope of the respective TPPs.
5. The guidelines issued by MoC regarding responsibility of Mine owners and TPPs after the site is handed over to TPPs, shall apply for fly ash disposal in mine voids.
6. A template of the MoU is attached in **Annexure 1**. The concerned parties shall be free to incorporate any other relevant points that are necessary for safety, regulatory compliance and are environment-friendly.

Annexure-1**Template of the MoU**

1. The MoU shall cover all the safety, environmental, regulatory, administrative and arbitration requirements, before commencement of fly ash filling, during fly ash filling and post completion of fly ash filling, to be ensured by Thermal Power Plant and Concerned mine.
2. The status regarding the entitlement of the of the land.
3. The TPPs shall be responsible for the transportation, storage, filling of fly ash per relevant guidelines of MoEF&CC, MoP, CPCB and DGMS.
4. All the Statutory Permissions/Clearances/Approvals/NOCs/Consents and compliances thereof as per CPCB Guidelines, March 2019 and subsequent guidelines issued should be done by TPP.
5. Plans and Proposals: Before taking up back filling operations of allotted mine void, TPPs shall have to prepare a Comprehensive Plan for back filling of allotted mine void with fly ash generated from its thermal power station which shall include but not limited to:
 - i. Methodology of Back Filling & Reclamation.
 - ii. Transportation of Fly Ash.
 - iii. Air & Water Pollution Mitigation Plan etc.
 - iv. Action Plan w.r.t mitigation of Leachate.
 - v. Mine Water Management.
 - vi. Safety Management Plan.
 - vii. Site Closure and Post Closure monitoring
6. All the safety and precautionary measures shall be taken up by TPPs.
7. There shall be an arbitration clause, in case any ambiguity arises between the parties.
8. The MoU shall include the proposed monitoring programme for the fly ash disposal which shall include the parameters to be analysed and the frequency of monitoring.
9. The MoU shall include the facilities that shall be provided by the Coal Companies for the purpose of the disposal of the fly ash.
10. For the assigned part of the TPP and in relation to reclamation activities, "In case the Mine Authority makes any payment to the Government towards statutory Obligations of the Owner as per the Act(s), then the TPP undertakes

to Indemnify and reimburse the Mine Authority of any such statutory payments, fines, penalty, losses, compensation, damages etc.

11. Any kind of payment/wages/remuneration etc. payable to the labor/workman /manager/supervisor or any other person engaged by the TPPs for backfilling operations, or any other work related thereto in the lease hold area/mine of CIL shall be the sole responsibility of the TPPs. If supervision/ watch and ward is provided by CIL, subsidiaries suitable mechanism for recovery of employee cost to be borne by the TPPs will be determined.

12. The escrow amount for the area of fly ash filling part shall be assessed. The BG, if any, shall be decided by the concerned subsidiary/ coal company.



IPC-II/TPP/CP-11/76/2022/

May 25, 2022

OFFICE ORDER

Sub: Constitution of the committee for monitoring the implementation of the provisions of Notification No. 5481(E) dated 31.12.2021 regarding ash utilisation from coal or lignite based thermal power plants.

In supersession of the Notification No. S.O. 763 (E), dated the 14th September, 1999, except as respect things done or omitted to be done before such supersession, Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt. of India has issued Notification No. S.O. 5481(E) dated 31.12.2021 regarding ash utilisation from coal or lignite based thermal power plants.

As per Para E(3) of the notification, a committee is to be constituted under the chairmanship of the Chairperson, Central Pollution Control Board (CPCB) comprising of representatives from Ministry of Environment, Forest and Climate Change (MoEF&CC), Ministry of Power (MoP), Ministry of Mines (MoM), Ministry of Coal (MoC), Ministry of Road Transport and Highways (MoRTH) and Department of Heavy Industry (DHI) for monitoring the implementation of the provisions of notification No. 5481(E) dated 31.12.2021.

Accordingly, with the approval of Chairperson CPCB, a committee is constituted for monitoring the implementation of the provisions of Notification No. 5481(E) dated 31.12.2021, as below:

Composition of the Committee

1. Chairperson, CPCB	Chairperson
2. Representative(s) of MoEF&CC, Govt. of India	Member
3. Representative(s) of Ministry of Power, Govt. of India	Member
4. Representative(s) of Ministry of Coal, Govt. of India	Member
5. Representative(s) of Ministry of Mines, Govt. of India	Member
6. Representative(s) of Ministry of Road Transport and Highways, Govt. of India	Member
7. Representative(s) of Department of Heavy Industry	Member

Terms of Reference

- Monitoring the implementation of the provisions of Notification No. 5481(E) dated 31.12.2021. 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.
- The committee shall hold stakeholder consultations for monitoring of ash utilisation as mandated by the 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 (MoEF&CC).

IPC-II Division of CPCB will look after the work related to the above committee in CPCB under supervision of Member Secretary, CPCB.


(Prashant Gargava)
Member Secretary



IPC-II/TPP/CP-11/76/2022/

May 25, 2022

OFFICE ORDER

Sub: Constitution of the committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, as per Notification No. 5481(E) dated 31.12.2021 regarding ash utilisation from coal or lignite based thermal power plants.

In supersession of the Notification No. S.O. 763 (E), dated the 14th September, 1999, except as respect things done or omitted to be done before such supersession, Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt. of India has issued Notification No. S.O. 5481(E) dated 31.12.2021 regarding ash utilisation from coal or lignite based thermal power plants.

As per Para B(5)(i) of the notification, a committee is to be constituted under the chairmanship of the Chairperson, Central Pollution Control Board (CPCB) comprising of representatives from Ministry of Environment, Forest and Climate Change (MoEF&CC), Ministry of Power (MoP), Ministry of Mines (MoM), Ministry of Coal (MoC), Director General of Mine Safety (DGMS) and Indian Bureau of Mines (IBM) 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.

Accordingly, with the approval of Chairperson CPCB, a committee is constituted for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, as per Notification No. 5481(E) dated 31.12.2021, as below:

Composition of the Committee

1	Chairperson, CPCB	Chairperson
2	Representative(s) of MoEF&CC, Govt. of India	Member
3	Representative(s) of Ministry of Power, Govt. of India	Member
4	Representative(s) of Ministry of Coal, Govt. of India	Member
5	Representative(s) of Ministry of Mines, Govt. of India	Member
6	Representative(s) of Director General of Mine and Safety	Member
7	Representative(s) of Indian Bureau Mines	Member

Terms of Reference

- (i) 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, as per Para B(5)(i) of the notification.
- (ii) 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.

IPC-II Division of CPCB will look after the work related to the above committee in CPCB under supervision of Member Secretary, CPCB.

(Prashant Gargava)
 Member Secretary



IPC-II/TPP/CP-11/76/2022/

May 25, 2022

OFFICE ORDER

Sub: Constitution of the committee to examine, and review and recommend the eco-friendly ways of utilisation of ash, as per Notification No.5481(E) dated 31.12.2021 regarding ash utilisation from coal or lignite based thermal power plants.

In supersession of the Notification No. S.O.763 (E), dated the 14th September, 1999, except as respect things done or omitted to be done before such supersession, Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt. of India has issued Notification No. S.O. 5481(E) dated 31.12.2021 regarding ash utilisation from coal or lignite based thermal power plants.

As per Para A(3) of the notification, a committee is to be constituted under the chairmanship of the Chairperson, Central Pollution Control Board (CPCB) comprising of representatives from MoEF&CC, Ministry of Power (MoP), Ministry of Mines (MoM), Ministry of Coal (MoC), Ministry of Road Transport and Highways (MoRTH), Department of Agricultural Research and Education (DARE), Indian Roads Congress (IRC) and National Council for Cement and Building Materials (NCCBM) to examine, and review and recommend the eco-friendly ways of utilisation of ash.

Accordingly, with the approval of Chairperson CPCB, a committee is constituted to examine, and review and recommend the eco-friendly ways of utilisation of ash, as per Notification No. S.O. 5481(E) dated 31.12.2021, as below:

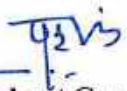
Composition of the Committee

1. Chairperson, CPCB	Chairperson
2. Representative(s) of MoEF&CC, Govt. of India	Member
3. Representative(s) of Ministry of Power, Govt. of India	Member
4. Representative(s) of Ministry of Coal, Govt. of India	Member
5. Representative(s) of Ministry of Mines, Govt. of India	Member
6. Representative(s) of Ministry of Road Transport and Highways, Govt. of India	Member
7. Representative(s) of Department of Agricultural Research and Education	Member
8. Representative(s) of Indian Roads Congress	Member
9. Representative(s) of National Council for Cement and Building Materials	Member

Terms of Reference

- 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 the eco-friendly ways of utilisation of ash as mentioned in Sub-paragraph (2) of the notification based on technological developments and requests received from stakeholders - as per Para A (3) of the notification.
- 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.

IPC-II Division of CPCB will look after the work related to the above committee in CPCB under supervision of Member Secretary.


(Prashant Gargava)
Member Secretary

**F.No. 11/3/2018-HSM
Government of India
Ministry of Environment, Forest and Climate Change
Hazardous Substances Management Division**

6th Floor, Jal Wing,
Indira Paryavaran Bhawan,
Jorbagh Road,
New Delhi-110 003

Dated: 9 March, 2022

OFFICE ORDER

Sub: Constitution of Fly Ash Management and Utilization Mission for scientific management and utilization of fly ash-reg.

The Government of India, Ministry of Environment, Forest and Climate Change had notified the fly ash notification, 1999, which was subsequently amended in 2003, 2009 and 2016. The notification vide S.O. 5481(E) dated 31.12.2021 has superseded the 1999 notification and the subsequent amendments thereof.

2. In pursuance of the Order dated 18.01.2022 of Hon'ble National Green Tribunal (Principal Bench) in Original Application No. 164 of 2018 in the matter of Ashwani Kumar Dubey v. Union of India & Ors. (tagged along with other connected matters), the Ministry of Environment, Forest and Climate Change may hereby constitute the Mission on Fly Ash Management and Utilisation—

- i) Secretary, Ministry of Coal
- ii) Secretary, MoEF&CC
- iii) Secretary, Ministry of Power
- iv) Chief Secretary, State of U.P.
- v) Chief Secretary, State of M.P.
- vi) Chairman, CPCB
- vii) ACSs/PSs, Power, UP and MP
- viii) ACSs/PSs Industries, UP and MP
- ix) Additional Secretary, HSMD
- x) CMDs of all power projects, coal mines other industries in Singrauli and Sonebhadra industrial regions.
- xi) Any other person(s) as nominated

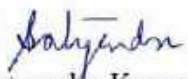
3. The Terms of Reference of the Mission would be as under-

- i. To coordinate and monitor issues relating to handling and disposal of fly ash as well as all associated issues in light of the Joint Committee's recommendations for all the Thermal Power Plants and other industries in Singrauli and Sonebhadra industrial regions.

- ii. To prepare an action plan as per the recommendations of the Joint Committee (as per Para 15 of the NGT Order dated 18.01.2022).
- iii. To prepare resolutions and quarterly progress reports for information of stakeholders and inhabitants in the Singrauli and Sonebhadra industrial areas.
- iv. The Mission will be free to interact with the concerned Government Departments/ Expert institutions/ individuals/other stakeholders.
- v. The Mission may in its first meeting require voluntary financial contribution by all the projects in the proportion of the financial capacity of the projects out of CSR funds or otherwise.
- vi. The contribution, along with compensation which may be collected may be credited to a separate environment restoration account for restoration of environment and relief to the victims of damage to the environment in such manner as may be found necessary by the Mission.
- vii. Any victim or aggrieved party will be free to approach the Mission for providing such relief.
- viii. The Mission may also consider the safeguards laid down in the Notification dated 31.12.2021, particularly for safety audits of the ash dykes which should be conducted particularly for structural stability, as far as possible within six months.
- ix. The Mission may consider on site and off site crisis management plan with respect to fly ash ponds and dykes.
- x. The Mission may evolve mechanism for interaction with stakeholders, including associations of brick kiln owners.
- xi. Public health and risk impact assessment in the areas of operation of TPPs and generators of fly ash may be got conducted.
- xii. Guidelines be also issued for siting, design and engineering standards for the location, disposal, maintenance and regulation of Ash Ponds as breach of a fly ash ponds result in great disaster.
- xiii. The Mission may monitor scientific management and utilization of fly ash by power projects outside Singrauli and Sonebhadra, in coordination with Chief Secretaries of concerned States and adopting safety measures for ash dykes, installing devices to control air pollution, (including FGDs, OCEMS) in a time bound manner and restoration of environment and public health.
- xiv. The Mission may consider use of beneficiated coal.
- xv. The Mission may draw a roadmap for utilization and disposal of entire legacy fly ash for Singrauli and Sonebhadra industrial areas as well as for all the Power Plants located in clusters or standalone with tagging the sources to utilize fly ash on voluntary and compulsion mode for which required mechanism is to be laid down.
- xvi. The Mission may take up any other matter towards meeting the overall objectives.

3. The Mission is to hold its first meeting within one month to take stock of the situation and to prepare action plan. Thereafter, it may meet at least once in a month for one year to review the progress.

4. The resolutions of the Mission and quarterly progress may be placed on the website of MoEF&CC for information of the stakeholders and inhabitants in the area.


Satyendra Kumar
Director

satyendra.kumar07@nic.in

To

All Members (As per the list)



केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार
MINISTRY OF ENVIRONMENT FOREST & CLIMATE CHANGE GOVT OF INDIA

IPC-II/TPP/CP-11/76/2022

April 29, 2024

Notice inviting nomination of experts for authorization as auditors to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Notification No. 5481(E) dated 31.12.2021

Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India issued Notification No. S.O. 5481(E) dated 31.12.2021 regarding ash utilisation from coal and lignite based thermal power plants which has been amended by notifications dated 30.12.2022 and 01.04.2024. As per Para E (2) (i) of the notification, thermal power plants are required to submit annual implementation report to CPCB, concerned SPCB/PCC, CEA and concerned IRO of MoEF&CC by 30th April, with information in the prescribed format.

Further, as per Para E (5) of the notification, *"the compliance audit for ash disposal by the thermal power plants and the user agency 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"*.

Accordingly, CPCB invited nominations of experts from Council of Scientific & Industrial Research (CSIR), Indian Institutes of Technology (IITs) and National Institutes of Technology (NITs) for authorization as auditors, and issued the lists of authorized auditors to undertake the compliance audit of the thermal power plants and the user agencies as per Para E (5) of the notification vide Office Memorandum Nos. IPC-II/TPP/CP-11/76/2022/1252 dated 06.03.2023 and IPC-II/TPP/CP-11/76/2022/285 dated 17.07.2023.

In order to increase the number of authorized auditors, CPCB invites nominations of the interested experts from the Institutes of National Importance (IITs/ IISc/ NITs etc.), CSIR institutes, and other Central and State institutions related to Science/Technology/Research and Environment, fulfilling the following eligibility criteria:

1. Professor/ Associate Professor/ Assistant Professor of Civil / Mining Engineering Department or Scientist qualified in Civil or Mining Engineering having minimum 5-year experience (on these posts) in Institutes of National Importance (IITs/ IISc/ NITs etc.) and CSIR institutes (for auditing TPPs with total installed capacity ≥ 100 MW),

‘परिवेश भवन’ पूर्वी अर्जुन नगर, दिल्ली-110032

Parivesh Bhawan, East Arjun Nagar, Delhi-110032

दूरभाष/Tel : 43102030, 22305792, वेबसाइट/Website : www.cpcb.nic.in

2. Professor/ Associate Professor/ Assistant Professor of Civil / Mining Engineering Department or Scientist qualified in Civil or Mining Engineering having minimum 5-year experience (on these posts) in other Central and State institutions related to Science/Technology/Research and Environment (for auditing TPPs with total installed capacity < 100 MW).

The nominations of the interested experts may be sent in the enclosed format to power.cpcb@nic.in / nazim.cpcb@nic.in through the Director or Head of the Institutions within one month of issue of this notice.


(Bharat Kumar Sharma)
Member Secretary


Distribution (by email):

1. The Member Secretary : May circulate among the relevant
All State Pollution Control Boards/ institutions in your States/UTs.
Pollution Control Committees
2. The Divisional Head - IT, CPCB : For uploading the document on CPCB's
website.

Details required for forwarding nominations of interested experts fulfilling the following eligibility criteria, for authorization as auditors to undertake the compliance audit of coal/lignite based thermal power plants as per Ash Notification dated 31.12.2021

Sl. No.	Name of the nominated expert	DOB	Designation	Department	Contact No.	Email Id	Organization/ Institute	Central/ State Institute	Relevant experience on prescribed posts with break-up (years)	Remarks, if any
1.										
2.										
3.										
4.										
5.										
6.										
7.										

Note: The institutions shall ensure that the nominations of interested experts forwarded by them must be fulfilling the prescribed eligibility criteria as on 31.03.2024.



By Email & Speed Post

IPC-II/TPP/CP-11/76/2022/

June 27, 2022

Minutes of the 1st meeting of the Committee for monitoring the implementation of provisions of the Notification No. 5481(E) dated 31.12.2021 - Para E (3) held on 11.06.2022 at 11.30 AM

Sir,

Minutes of the 1st meeting of the Committee for monitoring the implementation of provisions of the Notification No. 5481(E) dated 31.12.2021 - Para E (3) held under the chairmanship of Sh. Tanmay Kumar, Chairman, CPCB on 11.06.2022 at 11.30 AM through video conferencing, are enclosed for information and necessary action.

Yours faithfully,

Nazim
5/27/6/2022

[Nazimuddin]

Sc. F & DH-IPC-II

To,

Members of the Committee
(As per the list enclosed)

Copy to:

Chairman of the Committee	:	for information.
Member Secretary, CPCB	:	for information.
Sh. Sanjeev Kumar Kassi, Chief Engineer (Thermal), Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi	:	for information and necessary action.

**Members of the Committee for monitoring the implementation of provisions of the Notification
No. 5481(E) dated 31.12.2021 (Para E (3))**

1. Shri N. Subrahmanyam, Sc.-D (HSM Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, **New Delhi - 110 003**
2. Shri Aravind Kumar M.K.,
Deputy Secretary, EC&ET Division,
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg, **New Delhi**
3. Shri Anandji Prasad - Advisor (Project)
Ministry of Coal,
Room No. 303-B, Shastri Bhawan,
Dr. Rajendra Prasad Road, **New Delhi – 110 001**
4. Shri B. Veera Reddy - Director (Technical)
(Second representative of Ministry of Coal),
Coal India Limited,
Coal Bhawan, Premise No. 04 Mar,
Plot No. AF-III, Action Area-1A,
New Town, Rajarhat, **Kolkata – 700 156**
5. Shri P.N. Sharma, Chief Controller of Mines,
(Representative of Ministry of Mines),
Indian Bureau of Mines,
Indira Bhawan, Civil Lines,
Nagpur – 440 001, Maharashtra
6. Shri Paresh Kumar Goel - Director Transport),
Ministry of Road Transport & Highways,
Transport Bhawan, 1, Parliament Street,
New Delhi – 110 001
7. Sh. Rama Kant Singh, Director,
(Representative of Department of Heavy Industry),
Ministry of Heavy Industries,
Room No. 172-D, Udyog Bhawan,
New Delhi-110011

Minutes of the 1st meeting of the Committee for monitoring the implementation of provisions of the Notification No. 5481(E) dated 31.12.2021 (Para E (3)) held on 11.06.2022 at 11.30 AM

The 1st meeting of the Committee for monitoring the implementation of provisions of the Notification No. 5481(E) dated 31.12.2021 (Para E (3)) was held on 11.06.2022 at 11.30 AM. The meeting was chaired by Chairman of the Committee / Chairman CPCB Mr. Tanmay Kumar. List of participants is attached.

Representatives of CPCB made a presentation before the Committee, explaining the sections of the notification dated 31.12.2021:

- Responsibility of thermal power plants (A),
- Responsibility of users (B) and Procedure for supply of ash or ash based products (D),
- Imposition of environmental compensation for non-compliance (C), and
- System of enforcement, monitoring, audit and reporting (E)

Progress on following points was apprised to the Committee:

- Three committees, namely, Committee for monitoring the implementation of the provisions of the notification (E-3), Committee to examine, review and recommend eco-friendly ways of utilization of ash in addition to eleven (A-3), and Committee 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 (B-5.i) constituted by CPCB Office Orders dated 25.05.2022.
- The updated list of 32 coal mines identified by Task Force constituted by MoP for backfilling in mine voids along with list of 82 non-coal abandoned mines was sent to SPCBs on 18.02.2022
- Formation of a team of CEA, NTPC and CPCB to help developing the portal for monitoring the utilization of Ash.
- Request to IIT-D for expediting the proposal for preparing guidelines regarding specifications and procedure for annual certification of ash ponds in consultation with CEA.
- BIS provided list of publications regarding existing specification and guidelines for manufacture of ash based products on 24.02.2022 (B-9).
- DGMS informed that backfilling in mine voids / mixing with external overburden dumps activities are to be done as per the provisions of the Coal Mines Regulations 2017 / Metalliferous Mines Regulation 1961 and that the activity is mine specific. Scientific study is required to be done (B-3).

Following important action points were apprised to the Committee:

- CPCB or SPCBs to inspect silos installed by TPPs from time to time (A-8), the periodicity of which may be decided by CPCB.
- CPCB to develop web portal or mobile phone App for uploading data on fly ash availability on daily basis and providing monthly reports and annual report by TPPs (A-9, E-1 & E-2).
- Certification of reclamation of ash pond/dyke by CPCB or SPCBs within a year from 31.12.2021 (A-5).
- CPCB to prepare technical specifications and procedures for ash ponds in consultation with CEA (A-6).
- To collect and collate guidelines of BIS and IRC for ash utilization and products (B-2, B-9).
- To collect and collate guidelines of DGMS and IBM for utilization in mines (B-3).
- SPCBs to allow ash disposal in low lying areas as per guidelines of CPCB. CPCB to put in place guidelines for all type of activities in the notification expeditiously including online process for grant of permissions by SPCBs (B-6 & B-7).

- CPCB to open separate bank account for depositing EC by TPPs and defaulters to CPCB (C-2).
- CPCB to compile annual report of TPPs and submission to MoEF&CC by May 30th every year (E-2).
- CPCB or SPCB to publish annual report of ash utilisation of all other agencies (E-2).
- Monitoring of ash utilisation at least once in six months and six monthly report (E-3).
- State Governments to constitute Committees under Chairman SPCBs to resolve disputes (E-4)
- Authorization of auditors for submission of annual audit report to CPCB (E-5).

The Committee was also apprised about the Supreme Court order dated 10.05.2022 referring to action on points E-3, E-4 and E-5 regarding monitoring by national level committee, committees at state level, and annual audit system and the MoEF&CC's DO letter dated 19/05/2022 referring to action on points A-9, E-1 & E-2 and B-6 & B-7, regarding portal and app and online process for grant of permissions by SPCBs

Committee members from Ministry of Coal and Ministry of Mines informed about the issues regarding stability and safety of OB dumps if fly ash is mixed with OB in operational coal mines and that one study by IIT-BHU has indicated that the stability of ash mound mixed with Over burden may get adversely affected. As regards disposal in voids of dis-used coal mines, 32 such mines have already been notified and every year 5-6 mines becomes un-operational and can be added to the list.

Representative of Ministry of Power informed about the guidelines issued regarding auction and supply of ash which are in accordance with the notification which does not necessarily allow free transportation.

Representative of Ministry of Environment Forest and Climate Change informed about representation received in the Ministry related to difficulties in complying with the provisions regarding utilisation of legacy ash and capping ash ponds in short period, stability issues in mixing of ash with OB, and no provision mandating free supply of ash to ash products. It was also apprised that a DO letter has been sent to state governments regarding constituting state level committees.

After deliberations on various points following decision were taken:

1. MoC, MoM and DGMS will provide details of issues related to disposal of ash with OB.
2. Locations of un-operational mines available for disposal of ash and locations of nearby power plants may be mapped and MoP may play an active role for facilitating allocation of abandoned coal mines to power plants by coordinating with Ministry of Coal and that of other mines by coordinating with Ministry of Mines and State Government. Representation of DCPPA in this regard may be forwarded to MoP and MoC.
3. Ministry of Power will examine the representations regarding difficulties in capping ash ponds within stipulated time and provide comments to MoEF&CC. Representations received in MoEF&CC and representation of DCPPA in this regard may be forwarded to MoP.
4. Representative of Ministry of Power agreed to issue instruction to NTPC to extend necessary help in developing ash portal and App.
5. CPCB will write to SPCBs for action on provisions in the notification related to them.
6. Development of guidelines for ash ponds and annual certification and audit will be expedited
7. A database of ash and ash product users may be developed, demand may be assessed and provisions of the notification requiring use of ash and ash products may be publicised.

The meeting ended with a vote of thanks to the chair.

List of participants of the 1st meeting of the Committee for monitoring the implementation of provisions of the Notification No. 5481(E) dated 31.12.2021 (Para E (3))

Sl. No.	Name of Participants and Organization	Email I'd
1.	Sh. Tanmay Kumar, IAS, Chairman, Central Pollution Control Board	ccb.cpcb@nic.in
2.	Shri N. Subrahmanyam, Sc.-D (HSM Division), Ministry of Environment, Forest and Climate Change	n.subrahmanyam@gov.in
3.	Shri Aravind Kumar M.K., Deputy Secretary, EC&ET Division, Ministry of Power (Couldn't participate in the meeting)	mkaravind.kumar@ias.gov.in
4.	Shri Anandji Prasad - Advisor (Project) Ministry of Coal	advp.moc@nic.in
5.	Shri B. Veera Reddy - Director (Technical) (Representative of Ministry of Coal), Coal India Limited	dt.cil@coalindia.in
6.	Shri P.N. Sharma, Chief Controller of Mines, (Representative of Ministry of Mines), Indian Bureau of Mines	ccom@ibm.gov.in, dheeraj.kumar83@gov.in
7.	Shri Paresh Kumar Goel - Director Transport), Ministry of Road Transport & Highways (Couldn't participate in the meeting)	paresh.goel89@gov.in
8.	Sh. Rama Kant Singh, Director, (Representative of Department of Heavy Industry) Ministry of Heavy Industries	singh.ramakant59@gov.in

1.	Dr. Prashant Gargava, Member Secretary, Central Pollution Control Board	mscb.cpcb@nic.in
2.	Sh. Sanjeev Kumar Kassi, Chief Engineer (Thermal), Ministry of Power	sanjeev_kassi@nic.in
3.	Sh. Nazimuddin, Sc. 'F' & DH-IPC-II, Central Pollution Control Board	nazim.cpcb@nic.in
4.	Sh. Abhijit Sinha, General Manager (Env.), Central Mine Planning and Design Institute (subsidiary of Coal India Limited)	gmenv.cmpdi@coalindia.in
5.	Sh. Gaurav Gehlot, Sc. 'C', IPC-II, Central Pollution Control Board	gehlot.cpcb@nic.in
6.	Sh. Bhanu Joshi, Section Officer, Ministry of Power	bhanu.joshi@nic.in
7.	Sh. Durga Nand Jha, SRF, IPC-II, Central Pollution Control Board	durganand.cpcb@nic.in



By Email / Speed Post

IPC-II/TPP/CP-11/76/2022/

August 18, 2022

Minutes of 1st meeting of the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, as per the Notification No. 5481(E) dated 31.12.2021 - Para B (5)(i), held on 01.08.2022 at 04.00 PM

Sir,

Minutes of the 1st meeting of the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, as per the Notification No. 5481(E) dated 31.12.2021 - Para B (5)(i), held under the chairmanship of Sh. Tanmay Kumar, Chairman, CPCB on 01.08.2022 at 04.00 PM through video conference, are enclosed for information and necessary action.

Yours faithfully,

[Handwritten Signature]

[Nazimuddin]

Sc. F & DH-IPC-II

To,

Members of the Committee
(As per the list enclosed)

Copy to:

Chairman of the Committee	:	for information.
Member Secretary, CPCB	:	for information.
Other participants of the meeting (as per the list enclosed)	:	for information / necessary action.

Members of the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, as per the Notification No. 5481(E) dated 31.12.2021

1. Shri Munna Kumar Shah, Sc.-D (IA Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, **New Delhi - 110 003**
2. Shri Aravind Kumar M.K.,
Deputy Secretary, EC&ET Division,
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg, **New Delhi**
3. Shri Anandji Prasad - Advisor (Project)
Ministry of Coal,
Room No. 303-B, Shastri Bhawan,
Dr. Rajendra Prasad Road, **New Delhi – 110 001**
4. Shri B. Veera Reddy - Director (Technical)
(Second representative of Ministry of Coal),
Coal India Limited,
Coal Bhawan, Premise No. 04 Mar,
Plot No. AF-III, Action Area-1A,
New Town, Rajarhat, **Kolkata – 700 156**
5. Shri P.N. Sharma, Chief Controller of Mines,
(Common representative of Ministry of Mines and IBM),
Indian Bureau of Mines,
Indira Bhawan, Civil Lines,
Nagpur – 440 001, Maharashtra
6. Shri Mohammed Niyazi, Director - Mine Safety (S&T),
Director General of Mine Safety,
DGMS Head Office, Sardar Patel Nagar,
Dhanbad – 826 001, Jharkhand

**MINUTES OF 1ST MEETING OF THE COMMITTEE FOR IDENTIFICATION OF
MINES FOR BACKFILLING OF MINE VOIDS WITH ASH OR MIXING OF ASH
WITH OVERBURDEN DUMP HELD ON 01.08.2022**

The 1st meeting of the committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump was convened on 01.08.2022 at 04:00 PM through video-conferencing under the chairmanship of the Chairman, CPCB. The list of participants of the meeting is enclosed.

A presentation was made by CPCB about the provisions of the notification dated 31.12.2021 and action taken so far in this matter.

The committee was apprised that earlier a Task Force was formed by Ministry of Power which identified 32 abandoned coal mines (22 of CIL and 10 of SCCL) for the purpose of backfilling with ash, apart from 82 abandoned non-coal mines which may also be used for ash disposal. The lists of these abandoned coal and non-coal mines were sent to SPCBs by CPCB on 30.09.2020 and 18.02.2022 with request to facilitate linkages between the coal mines and nearby power plants. MoC requested CPCB to share the said lists with all the members of the committee.

The committee was also apprised about the decisions taken in the 1st meeting of the committee for monitoring the implementation of provisions of notification dated 31.12.2021 held on 11.06.2022 related to mines identification for ash disposal, the detailed comments received from IBM and MoM after the said meeting, and the observation of Secretary (Power) in the meeting held on 05.07.2022 that CPCB should get the abandoned mines allotted to power plants for disposal of ash and also work with CMPDIL regarding progressive closure plan for their mines.

MoM and IBM said that exhausted and abandoned mines can be used for ash disposal but generally the feasibility and safety related issues may not favour ash disposal with OB dump in operational coal mines. It was also informed that once the lease period of a mine expires, it is returned to State Govt. Both MoM and IBM were asked to clarify whether they had raised the aforementioned issues at the time of finalization of the aforesaid notification and to also provide the list of mines whose leases had expired so that the matter could be taken up with the State Mining Departments.

DGMS said that the feasibility and safety aspects of disposal of ash in mine voids and by mixing with OB dump should be done based on mine specific scientific studies on case to case basis. CPCB requested DGMS to provide their detailed comments on the matter.

After deliberations on above points following decisions were taken:

1. MoM/IBM and MoC shall provide the current status of exhausted coal and non-coal mines, respectively, regarding their occupier authority and availability for disposal of ash etc. and shall also make the status available on their websites.

2. Central level working group of MoP/CEA, MoC and MoM shall decide allocation of coal mines and non-coal mines (major minerals) which are available for ash disposal to power plants based on proximity, better mode of transport, size of power plant vis-a-vis mine. CEA shall be the nodal agency for this working group.
3. District level working groups of Regional Officer SPCB, and district level Revenue and Mining Officers headed by District Magistrate shall decide allocation of non-coal mines (minor minerals) which are available for ash disposal to power plants based on proximity, better mode of transport, size of power plant vis-a-vis mine. Regional Officer SPCB shall be the nodal agency for these working groups.
4. MoM/IBM and MoC/CMPDIL shall give suggestions about how to simplify the procedure of allowing ash disposal in non-coal and coal mines, respectively, including standard conditions regarding progressive and final mine closure plans and amendment needed for this purpose in any existing guidelines so that the mine voids are made available for disposal of fly ash.
5. MoEF&CC shall consider relaxation in EC conditions of power plants and non-coal mines as done in respect to coal mines by OM dated 28th August 2019
6. A team of experts of CMPDI, CIMFR and representatives of CIL and SCCL shall examine the findings of studies already carried out for disposal of ash in operational coal mines by mixing with OB dump and give suggestions to facilitate ash disposal in operational mines and any studies that needs to be carried out for this purpose.

List of participants of the 1st meeting of the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump as per the Notification No. 5481(E) dated 31.12.2021 (Para B (5)(i)) held on 01.08.2022

Sl. No.	Name of Participants and Organization	Email I'd
1.	Sh. Tanmay Kumar, IAS, Chairman, Central Pollution Control Board	ccb.cpcb@nic.in
2.	Shri Munna Kumar Shah, Sc.-D (IA Division) Ministry of Environment, Forest and Climate Change	munna.shah@gov.in
3.	Shri Aravind Kumar M.K., Deputy Secretary, EC&ET Division, Ministry of Power (Couldn't participate in the meeting)	mkaravind.kumar@ias.gov.in
4.	Shri Anandji Prasad - Advisor (Project) Ministry of Coal	advp.moc@nic.in
5.	Shri B. Veera Reddy - Director (Technical) (Representative of Ministry of Coal), Coal India Limited (Couldn't participate in the meeting)	dt.cil@coalindia.in
6.	Shri P.N. Sharma, Chief Controller of Mines, (Common representative of Ministry of Mines and IBM), Indian Bureau of Mines (Couldn't participate in the meeting)	ccom@ibm.gov.in,
7.	Shri Mohammed Niyazi, Director - Mine Safety (S&T), Director General of Mine Safety	mniyazi@dgms.gov.in

1.	Shri Dheeraj Kumar, Deputy Secretary, Ministry of Mines	dheeraj.kumar83@gov.in
2.	Shri Pankaj Kulshrestha, Controller of Mines, Indian Bureau of Mines , Ministry of Mines	ccom-mes@ibm.gov.in, com.plcdn@ibm.gov.in
3.	Shri Baleshwar Thakur, Director, TCD, Central Electricity Authority , Ministry of Power	tcdcea@nic.in
4.	Shri Anil Jain, Chief Engineer, TCD, Central Electricity Authority , Ministry of Power	aniljain-cwc@nic.in
5.	Sh. Abhijit Sinha, General Manager (Env.), Central Mine Planning and Design Institute , Coal India Limited	gmenv.cmpdi@coalindia.in
6.	Sh. Nazimuddin, Sc. 'F' & DH-IPC-II, Central Pollution Control Board	nazim.cpcb@nic.in
7.	Sh. Gaurav Gehlot, Sc. 'C', IPC-II, Central Pollution Control Board	gehlot.cpcb@nic.in
8.	Sh. Durga Nand Jha, SRF, IPC-II, Central Pollution Control Board	durganand.cpcb@nic.in

**SPEED POST**

B-33014/07/2020/IPC-II/TPP/

February 18, 2022

To,

The Member Secretary,
State Pollution Control Boards
(As per list enclosed)

Sub: Updated list of abandoned mines identified for ash filling by the Task Force - reg.

Sir,

In compliance to the order dated 12.02.2020 of Hon'ble NGT, Principal Bench, New Delhi in O.A. Nos. 117, 499 and 102 of 2014 (Para 32(e)) CPCB vide letter dated 30.09.2020 forwarded to SPCBs the list of 21 abandoned coal mines identified for ash filling by the Task Force constituted by Ministry of Power, Govt. of India and requested SPCBs to facilitate linkages/MoU between the identified mines and the power plants, as well as with other available abandoned mines (coal/non-coal) in the State (copy attached for ready reference).

Subsequently, Ministry of Coal, Govt. of India vide letter No. 43012/13/2017-CPAM dated 22.04.2021 has provided the updated list of 32 abandoned coal mines identified for ash filling by CIL and SCCL, which has been forwarded by the Task Force vide letter dated 29.06.2021 to CPCB (copy enclosed).

Therefore, the updated list of above abandoned coal mines is being forwarded for necessary action as requested earlier vide letter dated 30.09.2020.

Further, the Task Force has also provided a list of 82 non-coal mines pertaining to State Governments which has been provided by Ministry of Mines, Govt. of India. The said list is also enclosed for information and necessary action.

Encl: As above

Yours faithfully,
[Signature]
[Nazimuddin]

Divisional Head-IPC-II

Copy to:

1. The Director (HSM Division) : for information.
Ministry of Environment, Forest & Climate Change
Jal Wing, Indira Paryavaran Bhawan
Jor Bagh Road, New Delhi - 110 003
2. The Exec. Director (SSEA) - Convenor of Task Force : for information.
NTPC Limited,
EOC Annexe Building, A-8A, Sector - 24, Noida,
Uttar Pradesh - 201 301
3. The Under Secretary (Sh. R.K. Das) : for information.
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg
New Delhi

List of State Pollution Control Boards

1. The Member Secretary,
Chhattisgarh Environment Conservation Board,
Paryavas Bhavan, North Block Sector-19,
Atal Nagar, **Raipur - 492 002**,
Chhattisgarh
2. The Member Secretary,
Jharkhand State Pollution Control Board,
T.A. Bldg., HEC, P. O. Dhurwa,
Ranchi - 834 004, Jharkhand
3. The Member Secretary,
Madhya Pradesh Pollution Control Board,
Paryavarana Parisar, E-5, Arera Colony,
Bhopal - 462 016, Madhya Pradesh
4. The Member Secretary,
Maharashtra Pollution Control Board,
Kalpataru Points, 3rd & 4th Floor,
Road No. 8, Sion Circle, Opp. PVR Theatre,
Mumbai - 400 022, Maharashtra
5. The Member Secretary,
Odisha State Pollution Control Board,
Paribesh Bhawan, A-118,
Nilakantha Nagar, Unit - VIII,
Bhubaneswar - 751 012, Odisha
6. The Member Secretary,
Telangana State Pollution Control Board,
Paryavarana Bhawan, A-III, Industrial Estate,
Sanathnagar, **Hyderabad - 500 018**
7. The Member Secretary,
West Bengal Pollution Control Board,
Paribesh Bhawan, 10A, Block-LA, Sector-III,
Bidhannagar, **Kolkata-700 106**,
West Bengal
8. The Member Secretary,
Andhra Pradesh Pollution Control Board,
D. No. 33-26-14 D/2, Near Sunrise Hospital,
Pushpa Hotel Centre, Chalamalavari Street,
Kasturibaipet, **Vijayawada - 520 010**

9. The Member Secretary,
Goa State Pollution Control Board,
Near Pileme Industrial Estate,
Opposite Saligao Seminary,
Saligao, Bardez, Goa - 403 511
10. The Member Secretary,
Gujarat Pollution Control Board
Paryavaran Bhawan, Sector 10-A,
Gandhi Nagar - 382 010, Gujarat
11. The Member Secretary,
Karnataka State Pollution Control Board,
"Parisara Bhawan", #49, 4th & 5th Floor,
Church Street, Bangalore - 560 001, Karnataka
12. The Member Secretary,
Rajasthan Pollution Control Board,
A-4, Institutional Area, Jalana Dungri,
Jaipur - 302 004, Rajasthan
13. The Member Secretary,
Tamil Nadu Pollution Control Board,
76, Anna Salai, Guindy Ind. Estate,
Race View Colony, Guindy,
Chennai - 600 032, Tamil Nadu
14. The Member Secretary,
Uttar Pradesh Pollution Control Board,
H. No. TC-12 V, Vibhuti Khand,
Gomti Nagar, Lucknow - 226 010,
Uttar Pradesh
15. The Member Secretary,
Uttarakhand Pollution Control Board,
Gaura Devi Bhawan, 46 B, IT Park,
Sahastradhara, Dehradun - 248 001,
Uttarakhand

SPEED POST

B-33014/07/2020/IPC-II/TPP/ 37701-37709

September 30, 2020

To,

The Member Secretary,
State Pollution Control Boards
(As per list enclosed)

Sub: Hon'ble NGT Order dated 12.02.2020 in O.A. Nos. 117, 499, 102/2014 on utilization of fly ash - reg.

Sir,

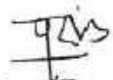
Please refer to the order of Hon'ble NGT, Principal Bench, New Delhi dated 14.07.2020 in O.A. Nos. 117, 499, 102/2014 on utilization of fly ash. As per Para 32(e) of the above order, Hon'ble NGT had directed that 'Task Force of Ministry of Power and Ministry of Coal may recommend list of abandoned mines/quarries for mine back filling purposes to the CPCB. CPCB may notify the same accordingly for use by the TPPs as per applicable guidelines and permission from State PCBs/PCCs'.

MoP vide letter no. 9/7/2011-St. Th. (Vol. V) dated 06.07.2020 has forwarded the list of 21 mines identified by the Task Force for offer of backfilling (copy enclosed). MoP has further informed that more abandoned mines in the list may be added as and when identified by the coal subsidiaries and provided to MoP, through the Task Force constituted in NTPC.

In view of the above, MoP letter dated 06.07.2020 enclosing the list of 21 abandoned mines for mine back filling purposes is being forwarded with the request that SPCB may facilitate linkages/MoU between the listed mines, as well as other available abandoned mines in the state, with the nearby power plants. It is further requested that a nodal officer of SPCB may be deputed for this purpose, and progress on the matter may be informed to CPCB on quarterly basis for apprising the MoEF&CC in compliance of the above order.

Encl: As above

Yours faithfully,


(Prashant Gargava)
Member Secretary

Copy to:

1. The Director (HSM Division) : for information.
Ministry of Environment, Forest & Climate Change
Jal Wing, Indira Paryavaran Bhawan
Jor Bagh Road, New Delhi - 110 003
2. The Under Secretary (Sh. Nishant Kumar) : for information.
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg
New Delhi

3. Pk to CCB

dc

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
N3
21/10/2020

List of State Pollution Control Boards

1. The Member Secretary,
Chhattisgarh State Environment Conservation Board,
Paryavas Bhawan, North Block Sector-19,
Atal Nagar, Raipur - 492 002, Chhattisgarh
2. The Member Secretary,
Jharkhand State Pollution Control Board
T.A. Bldg., HEC, P. O. Dhurwa,
Ranchi - 834 004, Jharkhand
3. The Member Secretary
Madhya Pradesh Pollution Control Board
Paryavaran Parisar, E-5, Arera Colony
Bhopal - 462 016, Madhya Pradesh
4. The Member Secretary
Maharashtra Pollution Control Board,
Kalpataru Points, 3rd & 4th Floor,
Sion Matunga Scheme Road No.6 Opp. Cine Planet,
Sion Circle, Sion (E), Mumbai - 400 022
5. The Member Secretary
Odisha State Pollution Control Board
Paribesh Bhawan, A-118, Nilakantha Nagar
Unit VIII, Bhubaneswar - 751 012,
Odisha
6. The Member Secretary
Telangana State Pollution Control Board
Paryavaran Bhawan,
A-III, Industrial Estate, Sanathnagar,
Hyderabad - 500 018
7. The Member Secretary
West Bengal Pollution Control Board
Paribesh Bhawan, 10-A, Block LA,
Sector III, Salt Lake City,
Kolkata - 700 091

No. 9/7/2011-St. Th. (Vol. V)
Government of India
Ministry of Power

Shram Shakti Bhawan, Rafi Marg
New Delhi dated 06.07.2020

To,

Member Secretary,
CPCB, Parivesh Bhawan,
East Arjun Nagar, Delhi-110032

Sub:- Hon'ble National Green Tribunal (NGT) Orders dated 12.02.2020 on utilisation of fly ash - reg.

Sir,

I am directed to refer to para 32(e) of the Hon'ble NGT Orders dated 12.02.2020 in OA No. 117,499,102/2014 in which the Hon'ble Court had directed:

"Task Force of Ministry of Power and Ministry of Coal may recommend list of abandoned mines/quarries for mine back filling purposes to the CPCB. CPCB may notify the same accordingly for use by the TPPs as per applicable guidelines and permission from State PCBs/PCCs."

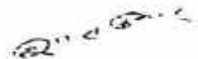
2. It is stated that NTPC is the Convenor of the Task Force which was revitalised by MoP on 10.04.2019 for reviewing and recommending the list of operational mines or abandoned mines/ quarries, for mine backfilling purposes. So far, 21 mines have been identified by CIL and SCCL (copy enclosed) and the same is provided to the Convenor of the Task Force in its 6th meeting held on 20.05.2020. These are the only mines presently identified for offer of backfilling. Further, more abandoned mines in the list may be added as and when identified by the coal subsidiaries and provided to MoP, by the Task Force constituted in NTPC.

3. It is requested to take necessary action in the matter.

4. This issues with the approval of Joint Secretary (Thermal).

Yours faithfully,

Enclosed: as stated.



(Nishat Kumar)

Under Secretary to the Govt. of India

Tel: 23715507, Ext: 212

e-mail- nishat.kumar@nic.in

List of mines identified for fly ash filling in CIL & SCCL

S. N.	Company	Admin. Areas	Name of Mine	OC/UG	Distt. And State	Area of OC void (Ha.)	Volume of ash that may be accommodated (Approximate) (Lakh Cum.)	Nearby TPP's	Distance from TPP's (kms.)	Annexure-I Availability of Transport infra
1	WCL	Majri	Telwasa OC	OC	CHANDRAPUR(MH)	80.13	200	GMR power, Warora, SaiWardha Power, Warora	39	Road
2		Majri	Dhorwasa OC	OC	CHANDRAPUR(MH)	51.75	100		39	
3		Majri	NavinKunada OC	OC	CHANDRAPUR(MH)	82.6	250		37	
4	SECL	Korba	Manikpur west OC	OC	Korba/C.G	74	210	NTPC & CSPGCL (MoU Signed with NTPC).	20-30	Road
5		Korba	Surakachhar 3&4 pit	UG	Korba/C.G	0	3.3 (1.5 filled up)	NTPC (MoU signed)	20-30	
6		Bhatgaon	Dugda	OC	Surajpur/C.G	25	170	NTPC, Korba	250	
7		Bishrampur		OC	Surajpur/C.G	9	17	NTPC, Korba	250	
8		Sohagpur	ShardaOC (OPQR & Trench T-1 patch)	OC	Shahdol-Anuppur/M.P	6.0 & 9.0	10.0 & 30.0	ATPS	10	
9	NCL	Block-B	Gorbi	OC	Singrauli, MP	26	14	NTPC (MoU signed)	35	Road
10	MCL		South Balanda (Q-2 & Q-3)	OC		63	147.3 (95 % filled up)	NTPC (Ongoing)	10	Pipeline
11			Jaganath OC, Q-IV	OC		36	170 (3 % filled up)	Bhusan steel (Stopped since Feb-2016 -no permits)	20	EC for pipeline
12		Jaganath	Jaganath OC, Quarry VI & VII	OC	Angul, Odhisa	29 & 16= 45.0	64.3 & 39.5 =103.90	NTPC (MoU in process)	10	
13			Jaganath OC, Q-VIII	OC		34.325	178.2	NTPC (MoU in process)	22	
14			South Balanda (Q-1)	OC		20	39.7 (7 L Cu.m filled)	NBVL (Stopped since 2013 - no EC)	10	

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List of mines identified for fly ash filling in CIL & SCCL										Annexure-I	
15		Bharatpur	Bharatpur	OC		90.53	133	NALCO (laying of pipe line in process)	12	Pipeline	
S. N.	Company	Admin. Areas	Name of Mine	OC/UG	Distt. And State	Area of OC void (Ha.)	Volume of ash that may be accommodated (Approximate) (Lakh Cum.)	Nearby TPP's	Distance from TPP's (kms.)	Availability of Transport infra	
16	ECL	Mugma	Bajna/ Pusai	OC	Dhanbad, Jharkhand	6	12	MPL, Maithon	10	Road	
17	ECL	Satgram	Nimcha	OC	Paschim Bardhaman, W.B	25	50	DTPS, Durgapur / MTPS, Mejia	23	Road	
18	CCL	Kathara	Govindpur	UG	Bokaro/Jharkhand		0.85 (Bottom ash)	DVC/STPS	10	Road	
19		NK	Dakra (To be available in 2023-24)	OC	Ranchi/Jharkhand	38.5	214.5	Patratu	45	Road	
20	BCCL	WJA	Murulidih (Cluster-XIII)	OC	Dhanbad - Jharkhand	1.6	1.5	CTPP	25	Road	
21	SCCL	RG-1	Medapalli OCP (To be closed in 2022-23)	OC	Peddapalli, Telangana	258.31	2164.3	NTPC (Under construction)	5	Road	



एन टी पी सी लिमिटेड

भारत सरकार का उद्यम

NTPC Limited

A Govt. of India Enterprise

(Formerly National Thermal Power Corporation Ltd.)

केन्द्रीय कार्यालय / Corporate Centre

शुभजीत मलिक चौधरी

कार्यकारी निदेशक (सुरक्षा, सतत विकास, पर्यावरण एवं राख प्रबंधन)

SUBHOJIT MULLICK CHOWDHURY

EXECUTIVE DIRECTOR

(SAFETY, SUS. DEV., ENVT & ASH MGMT)

Dated: 29.06.2021

Respected Sri Sanjeev Paliwal Ji,

This has reference to 9th meeting of Task Force formed by Ministry of Power vide office Memorandum dated 14.03.2019, to review and recommend a list of abandoned mines/ quarries in the country for mine back-filling purpose. Ministry of Coal vide office Memorandum no 43012/13/2017-CPAM attached as **Annexure-1** has shared a list of 32 mines of CIL and SCCL.

Ministry of Mines has also shared with Task Force a list of 82 Mines of mineral other than coal. The same is attached as **Annexure-2**. The same list has been sent to Ministry of Mines for verification. Ministry of Mines (MoM) has been requested to verify the list and send the same to you for uploading on CPCB website.

It is requested that both list of abandoned Mines of coal and list of mines of minerals other than coal may be uploaded on CPCB website for information to TPPs of the country. Also, all SPCB/PCC may be directed to facilitate TPPs in allocation of mines and ash filling.

With Regards,

(S.M. CHOWDHURY)

Convenor of Task Force & ED (Safety, SD, Environment & Ash Management)

Enclosures:

- (1) Annexure-1 -List of Mines shared by MoC
- (2) Annexure-2 – List of Mines other than coal shared by MoM.

Copy to :

Sri Nazimuddin Ji
CPCB, Delhi

ई ओ सी एनेक्सी बिल्डिंग, ए-८ ए, सेक्टर-२४, नोएडा २०१३०१ (उ प्र)

EOC Annexe Building, A-8A, Sector-24, Noida (U.P.) 201301

Tel. Off: 0120-2410466, Fax: 0120-2410621, E-mail: smchowdhury@ntpc.co.in

पंजीकृत कार्यालय एन टी पी :सी भवन, स्कोप कॉम्प्लेक्स, ७, इंस्टीट्यूशनल एरिया, लोधी रोड, न्यू दिल्ली - ११०००३

REGD.OFFICE: NTPC BHAVAN, SCOPE COMPLEX, 7, INSTITUTIONAL AREA, LODHI ROAD, NEW DELHI-110003

No.43012/13/2017-CPAM

Government of India
Ministry of Coal

Shastri Bhavan, New Delhi

Date : 22nd April, 2021

Office Memorandum

Subject:	List of UG mines and abandoned OC mines identified by CIL and SCCL for ash filling

The undersigned is directed to refer to the recommendations dated 01.03.2019 of Expert Committee constituted by NITI Aayog for best utilization of fly ash. One of the recommendations of the Expert Committee, pertaining to MoC was identification of mines for fly ash filling and periodic updation of the list by a Task Force constituted by Ministry of Power.

2. In compliance to Expert Committee recommendations and subsequent order dated 12.02.2020 of Hon'ble NGT, MoC vide its letter dated 08.04.2020 had communicated to MoEF&CC a list of mines (21 Nos.) identified by coal PSUs for fly ash/bottom ash filling.

3. Based on the inputs received from coal PSUs, the list of mines for fly ash/bottom ash filling has now been updated. The revised list comprises of 22 mines of CIL (Annexure-I) and 10 mines of SCCL (Annexure-II).

Encl: As above



(Manish Uniyal)

Under Secretary to the Govt. of India

To,

1. Shri A N Singh
Addl. Director (S)/Scientist 'E', HSM Division
Ministry of Environment, Forest and Climate Change
Indira Paryavaran Bhawan, New Delhi

2. Shri RK Das
Under Secretary to the Govt. of India.
Ministry of Power, New Delhi
Tel: 23715507, Ext: 212

Annexure-I

List of CIL mines identified for fly/bottom ash filling as on 31.03.2021							
Sl.No	CIL Subsidiary	Admin. Areas	Name of Mine	OC/UG	Volume (Approx) (Lakh Cu.m)	Nearby TPP's	Remarks
Ongoing mine for fly ash Dumping= 06 NOS							
1	MCL	Jaganath	South Balanda Q-II &III	OC	14.73	NTPC	MoU signed on 15.07.2004 and 14.57 lakh cu.m has been filled
2			Jaganath OC, Quarry IV	OC	17	Bhusan steel	Already filled with 0.558 lakh cu.m. Filling stopped from Feb, 2016 as the permission for transportation of ash has not obtained by Bhusan Steel.
3			Jaganath OC, Quarry VI & VII	OC	6.43 & 3.96 =10.39	NTPC	MoU for ash filling was executed on 30.07.2020 and 0.462 lakh cum has been filled.
4			South Balanda Q-I	OC	0.883	NBVL	Already filled with 0.524 lakh cu.m , Fly ash dumping is continuing .
5	SECL	Korba	Manikpur, western quarry	OC	210	NTPC & CSPGCL	1)MoU has been signed with NTPC for filling of fly ash 105 lakh cu.m As per agreement, 2.13 lakh cu.m fly ash has been filled 2)MoU has been signed with CSPGCL for 105 lakh cu.m and as per agreement 4.17 lakh cu.m fly ash has been filled
6			Surakachhar 3&4 pit	UG	1.50 & 1.80	NTPC	MoU has been signed with NTPC on 13.10.16 for 1.50 lakh cu.m and filling has been completed. Fresh MoU with NTPC signed on 31.08.2019 for filling of 1.80 lakh cu.m. As on date 0.855 lakh cu.m has been filled.
MoU signed = 04 NOS							
7	BCCL	WJA	Murulidith (Cluster-XIII)	OC	1.5	CTPP	MoU between BCCL & DVC for Back filling Fly-Ash from Chandrapura Thermal Power plant has been signed on 14th September 2020. Safety Clearance from DGMS and Clearance from MoEFCC for dumping fly ash within 500 m range from Damodar river is yet to be obtained by DVC.
8	NCL	Block-B	Gorbi	OC	14	NTPC	MoU has been signed with NTPC on 03.01.2019. NTPC is in the process for obtaining statutory clearances.

List of CIL mines identified for fly/bottom ash filling as on 31.03.2021

Ongoing mine for fly ash Dumping= 06 NOS

MoU signed = 04 NOS

Sl.No	CIL Subsidiary	Admin. Areas	Name of Mine	OC/UG	Volume (Approx) (Lakh Cu.m)	Nearby TPP's	Remarks
9	MCL	Jaganath	Jaganath OC, Quarry VIII	OC	17.8	NTPC	MoU for ash filling was executed on 18.09.2020.
10		Bhartpur	Bharatpur	OC	13.3	NALCO	Laying of pipeline by NALCO is under process for transportation of fly ash.
On process = 12 NOS							
11	WCL	Majri	Telwasa OC	OC	200	GMR power, Warora, SaiWardha Power, Warora	Abandoned Mine Plan (AMP) has been submitted to DGMS vide our letter no. WCL/ MA/ CTSA/ SAM/ 2020/280 and 277 dated 30.09.2020, field inspection from DGMS officials awaited. A meeting with MAHAGENCO was held on 12.02.2021 at WCL HQ. In the meeting, the guidelines of CIL on Fly ash filling in mine void was explained in detail to MAHAGENCO. The safety and environmental issues in respect of operational mines was also informed.
12		Majri	Dhorwasa OC	OC	100		Abandoned Mine Plan (AMP) has been submitted to DGMS vide our letter dated 30.09.2020, DGMS visited the site on 21.11.2020.
13		Majri	NavinKunada OC	OC	250		Void is filled with water
14	SECL	Bhatgaon	Dugga	OC	170	NTPC, Korba	Bishrampur Quarry-1, partially backfilled. Part has been planted and remaining part is filled with water.
15		Bishrampur	Bishrampur	OC	17	NTPC, Korba	TPPs have submitted their applications. Allotment will be done with consent of state pollution control Board.
16		JamunaKotma	Jamuna OC	OC	10	NTPC,	ECL has approved dumping of Fly ash in Pusia OCP.
17		Sohagpur	ShardaOC (OPQR patch & Trench T-1 patch)	OC	10.0 & 30.0	TPPS	ECL has approved dumping of fly ash in Lachipur Colliery & voids in Nabakajora Colliery under Kajora Area .MoU is under process
18	ECL	Mugma	Pusai	OC	12	MPL, Maithon	Bottom ash could be filled in the mine void for stowing.
19		Kajora	Lachipur	OC	3	DSTPS	It is a running mine and expected reserve may exhaust by 2023. Available for ash filling from 2023-24
20			Nabakajora	OC	3.8	(DVC)Durgapur	
21	CCL	Kathara	Govindpur	UG	0.85	DVC/STPS	
22		NK	Dakra	OC	214.5	Patratu	

List of SCCL Mines identified for fly ash/Bottom ash filling as on 31.03.2021											
OC mines (1)											
Sl. No.	Comp.	Area	Name of Mine	OC	District	Area (Ha)	Volume (Lakh Cu.m)	Nearby TPP	Distance (Km)	Transport	Remarks
1	SCCL	RG-1	Medapalli OCP	OC	Peddapalli T elangana	258.31	2164.3	NTPC	5.00	Road	Mine to be closed in 2022-23
List of UG mines (9 Nos.) - suitable for Bottom ash filling											
Sl. No.	Comp.	Admin Area	Name of Mine	UG	District	Volume of ash (Cu.m/Annum)		Nearby TPPs	Distance from TPPs	Transport Infra	Remarks, if any
						Utilization Potential	Actual utilization (2019-20)		Km (Approx)		
2	SCCL	RG-I	GDK-1 Inc.	UG	Peddapalli	220828	164079	STPP, NTPC	19.41, 26.10	Road	Bottom ash and Processed OB (POB) are utilised for stowing
3	SCCL	RG-I	GDK-2 Inc.	UG	Peddapalli	283687	275582	STPP, NTPC	21.24, 27.94	Road	
4	SCCL	RG-II	GDK-7Lep	UG	Peddapalli	219398	219398	STPP, NTPC	24.47,32.00	Road	-
5	SCCL	RG-II	Vakilpalli	UG	Peddapalli	18699	18699	STPP, NTPC	32.4, 39.0	Road	-
6	SCCL	SRP	RK-7 Inc.	UG	Mancherial	250948	86452	STPP	13.05	Road	Bottom ash, Processed OB (POB) & Sand are utilised for stowing.
7	SCCL	SRP	SRP-3 & 3A Inc.	UG	Mancherial	218879	60520	STPP	12.71	Road	
8	SCCL	SRP	IK-1A Inc.	UG	Mancherial	168467	81865	STPP	15.89	Road	
9	SCCL	MM	Kasipet	UG	Mancherial	146162	94621	STPP	40.62	Road	Bottom ash & sand are utilised for stowing.
10	SCCL	MM	RK 1A	UG	Mancherial	26240	15841	STPP	25.70	Road	
	Total UG					1553308	1017058		536251		

LIST OF 82 ABANDONED MINE SITES (Non-Coal)

SI No.	State	Name of Mine Site	Mineral	Earlier Lessee
1	Andhra Pradesh	Borra	Calcite	Perl Glass India Ltd.
2	Andhra Pradesh	Budarayavalasa	Lime kanker	M/s FACOR
3	Andhra Pradesh	Dasari Ramanaidu Valasa II	Lime kanker	M/s FACOR
4	Andhra Pradesh	Dasari Ramanaidu Valasa I	Lime kanker	M/s FACOR
5	Andhra Pradesh	Korlam I	Quartz	M/s FACOR
6	Andhra Pradesh	Kunchagumadam	Lime kanker	M/s FACOR
7	Andhra Pradesh	Moutoor	Feldspar	Sh.B.A.Khan
8	Andhra Pradesh	Palakandyaaur	Lime kanker	M/s FACOR
9	Andhra Pradesh	Pedabantupalli	Lime kanker	M/s FACOR
10	Andhra Pradesh	Pullajipeta	Quartz	M/s FACOR
11	Andhra Pradesh	Regati V.U mine	Lime kanker	M/s FACOR
12	Andhra Pradesh	Sri Ramchandra	Manganese	M/s FACOR
13	Goa	Sacorda	Iron ore	Shri V.D.Chowgule
14	Gujrat	Aditya	Chalk	Patel Min.Industries
15	Jharkhand	Dhadu	Fireclay	Shri M.P.Singhdeo
16	Jharkhand	Kahalgaoon	Fireclay	Biharilal & Bros
17	Jharkhand	Mandupat	Bauxite	HINDAL Indus.Ltd.
18	Jharkhand	Rajbar	Fireclay	R.C.Mohapatra
19	Jharkhand	Shanti No.2	Mica	S.K.Jhanjhari
20	Jharkhand	Shanti U/G	Mica	S.K.Jhanjhari
21	Jharkhand	Shanti West	Mica	S.K.Jhanjhari
22	Jharkhand	Mohudi	Iron	M/s TISCO
23	Karnataka	Mysore	Gold	M/s BGML
24	Karnataka	Nandidurg	Gold	M/s BGML
25	Madhya Pradesh	Badretha	Limestone	Bhagwati Prasad Agrawal
26	Madhya Pradesh	Bahadurpalli	Quartz	Mahalaxmi Glass Corpn. Pvt.Ltd.
27	Madhya Pradesh	Bamangawan	Ochre	Vimla Agrawal
28	Madhya Pradesh	Bhamraha	White eatrh	Bagri Minerals & Chemicals Ltd.
29	Madhya Pradesh	Bharoli	Ochre	Ram Das Agrawal
30	Madhya Pradesh	Bhatiatola	Dolomite	M.P.State Mining Corpn.Ltd.
31	Madhya Pradesh	Bodhanwara	Fireclay	V.P.Gupta
32	Madhya Pradesh	Chhenehara	Ochre	Shiv Kumar Agrawal
33	Madhya Pradesh	Dudiyan khara	Barytes	Bundela Enterprises
34	Madhya Pradesh	Jamnera	Fireclay	Burn Standard Co.Ltd.
35	Madhya Pradesh	Jhaulana (barapathar)	Ochre	Shiv Kumar Agrawal
36	Madhya Pradesh	Kalhera	Limestone	Ram Kishore Pathak
37	Madhya Pradesh	Karanjia	Ochre	Makel Minerals
38	Madhya Pradesh	Karanjia	Ochre	Makel Minerals
39	Madhya Pradesh	Karanjia	Ochre	Makel Minerals
40	Madhya Pradesh	Kari	Pyrophyllite	Putti Lal Tiwari
41	Madhya Pradesh	Khamtara	Fireclay	S.N.Sunderson & Co.

42	Madhya Pradesh	Khodola	Fireclay	Kedarmal Sawalram
43	Madhya Pradesh	Kishnapura	Pyrophyllite	Rajendra Kumar Tiwari
44	Madhya Pradesh	Kusiara bhatha	Ochre	Harrish Mineral Supply Co.
45	Madhya Pradesh	Lalpur	Dolomite	Capital Minerals
46	Madhya Pradesh	Lamani	Ochre	Jailal Bharatlal
47	Madhya Pradesh	Lamataghat	Fireclay	Burn Standard Co.Ltd.
48	Madhya Pradesh	Latagaon-b	Limestone	Gopal Shran Singh
49	Madhya Pradesh	Malachaua	Ochre	Ramdas Rajkishore Agrawal
50	Madhya Pradesh	Malachaua	Ochre	Ramdas Rajkishore Agrawal
51	Madhya Pradesh	Morur	Ochre	Shiv Kumar Agrawal
52	Madhya Pradesh	Paniyar khera	Pyrophyllite	M.P.State Mining Corpn.Ltd.
53	Madhya Pradesh	Phutkapahar	Bauxite	M/s BALCO
54	Madhya Pradesh	Pondi	Limestone	Burn Standard Co.Ltd.
55	Madhya Pradesh	Ramsalaiya khonda khurd	Limestone	Abhishak Cement
56	Madhya Pradesh	Sagral	Limestone	Anal Pal Singh
57	Madhya Pradesh	Singhanpuri(new)	Fireclay	Burn Standard Co.Ltd.
58	Madhya Pradesh	Umara	Laterite	Birla Jute & Indu.Ltd. (Cement Div.)
59	Maharashtra	Nawargaon II	Kyanite	M/s MSMC Ltd.
60	Maharashtra	Pitichua	Chromite	M/s MSMC Ltd.
61	Orissa	Bankiamunda	Quartz	M/s IMFA Ltd.
62	Orissa	Domuhani	Manganese	AMTC P.Ltd..
63	Orissa	Naupara II	Quartzite	M/s IMFA Ltd
64	Orissa	Sargipalli	Pb-zn-cu	M/s HCL
65	Rajasthan	Khautani-2	Gypsum	M/s RSMM Ltd.
66	Rajasthan	Ranasar	Gypsum	M/s RSMM Ltd.
67	Tamilnadu	L.N.Patti	Qtrz/felds	Tamil Nadu Min.Ltd
68	Tamilnadu	Nagampalli	Qtrz/felds	Tamil Nadu Min.Ltd
69	Tamilnadu	Pungambadi	Qtrz/felds	Tamil Nadu Min.Ltd
70	Tamilnadu	Pungambodi	Qtrz/felds	Chettinad mb-Fh.Silica P.Ltd.
71	Tamilnadu	Sowdhapuram	Limestone	Tan India CementLtd
72	Tamilnadu	Sungakarampatti	Qtrz/felds	M/s Tamin
73	Tamilnadu	Vadugapatti	Qtrz/felds	Tamil Nadu Min.Ltd
74	Tamilnadu	Vellakoil	Qtrz/felds	Tamil Nadu Min.Ltd
75	Tamilnadu	Lakkammanaiekenpatti (0.61H)	Qtrz/felds	Tamil Nadu Min.Ltd
76	Tamilnadu	Mewasa	Qtrz/felds	Tamil Nadu Min.Ltd
77	Tamilnadu	Pallakapalayam	Qtrz/felds	Tamil Nadu Min.Ltd
78	Tamilnadu	Sirukalanai	Qtrz/felds	Tamil Nadu Min.Ltd
79	Uttar Pradesh	Bawal Tanda	Pyrophyllite	M/s J. K. Minerals
80	Uttarakhand	Durmala	Rock phosphate	M/s PPCL
81	Uttarakhand	Maldeota	Rock phosphate	M/s PPCL
82	Uttarakhand	Malla	Limestone	M/s ACC Ltd.



By Email / Speed Post

IPC-II/TPP/CP-11/76/2022/

February 28, 2023

Minutes of the 2nd (joint) meeting of the two committees - the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held on 18/02/2023 at 11.00 AM

Sir,

Minutes of the 2nd (joint) meeting of the two committees – the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held under the chairmanship of Shri Tanmay Kumar, Chairman, CPCB on 18.02.2023 at 11.00 AM through video conference, are enclosed for information and necessary action.

Yours faithfully,

Nazimuddin 28/2/2023

[Nazimuddin]

Sc. F & DH-IPC-II

To,

Members of the Committees
(As per the lists enclosed)

Copy to:

Chairman of the Committee	:	for information.
Member Secretary, CPCB	:	for information.
Other participants of the meeting (as per the list enclosed)	:	for information / necessary action.

**Members of the Committee for monitoring the implementation of provisions of the Notification
No. 5481(E) dated 31.12.2021 (Para E(3))**

1. Shri N. Subrahmanyam, Sc.-D (HSM Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, New Delhi - 110 003
2. Shri Satish Kumar,
Director (Thermal),
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg, New Delhi
3. Shri Anandji Prasad - Advisor (Project)
Ministry of Coal,
Room No. 303-B, Shastri Bhawan,
Dr. Rajendra Prasad Road, New Delhi - 110 001
4. Shri B. Veera Reddy - Director (Technical)
(Second representative of Ministry of Coal),
Coal India Limited,
Coal Bhawan, Premise No. 04 Mar,
Plot No. AF-III, Action Area-1A,
New Town, Rajarhat, Kolkata - 700 156
5. Shri P.N. Sharma, Chief Controller of Mines,
(Representative of Ministry of Mines),
Indian Bureau of Mines,
Indira Bhawan, Civil Lines,
Nagpur - 440 001, Maharashtra
6. Shri Paresh Kumar Goel - Director Transport),
Ministry of Road Transport & Highways,
Transport Bhawan, 1, Parliament Street,
New Delhi - 110 001
7. Shri Rama Kant Singh, Director,
(Representative of Department of Heavy Industry),
Ministry of Heavy Industries,
Room No. 172-D, Udyog Bhawan,
New Delhi-110011

Members of the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, as per the Notification No. 5481(E) dated 31.12.2021

1. Shri Munna Kumar Shah, Sc.-D (IA Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, New Delhi - 110 003
2. Shri Satish Kumar,
Director (Thermal),
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg, New Delhi
3. Shri Anandji Prasad - Advisor (Project)
Ministry of Coal,
Room No. 303-B, Shastri Bhawan,
Dr. Rajendra Prasad Road, New Delhi - 110 001
4. Shri B. Veera Reddy - Director (Technical)
(Second representative of Ministry of Coal),
Coal India Limited,
Coal Bhawan, Premise No. 04 Mar,
Plot No. AF-III, Action Area-1A,
New Town, Rajarhat, Kolkata - 700 156
5. Shri P.N. Sharma, Chief Controller of Mines,
(Common representative of Ministry of Mines and IBM),
Indian Bureau of Mines,
Indira Bhawan, Civil Lines,
Nagpur - 440 001, Maharashtra
6. Shri Mohammed Niyazi, Director - Mine Safety (S&T),
Director General of Mine Safety,
DGMS Head Office, Sardar Patel Nagar,
Dhanbad - 826 001, Jharkhand

Minutes of the 2nd (joint) meeting of the two committees– the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held on 18.02.2023 at 11.00 AM

The 2nd (joint) meeting of the two committees - the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), was held on 18.02.2023 at 11.00 AM. The meeting was chaired by Chairman of the Committees / Chairman CPCB Shri Tanmay Kumar. List of participants is attached. Committees' members from MoP, MoM, IBM, DGMS, MoRTH, and DHI were not present in the meeting and the Chairman asked that their organizations may be apprised about the same.

Representatives of CPCB made a presentation before the Committee about the important actions taken and being taken on the decisions of the 1st meetings of the two committees held on 11.06.2022 and 01.08.2022 respectively and the important points related to ash disposal in un-operational and operational mines, as below:

A. Important actions completed:

1. Ash portal as per Ash Notification 31.12.2021 developed and opened on 17.11.2022 for data entry by NTPC plants and in 19.12.2022 for data entry by other plants
2. MoEF&CC issued amendment notification dated 30.12.2022
3. List of available mines for ash disposal (32 coal & 82 non-coal) placed on web page - "Fly Ash Management and Utilization" created on 13.12.2022
4. List of certified auditors for compliance audit of ash utilization finalised

B. Important actions being taken:

5. Action is being taken – i) for adding reports formats in the new ash portal as were suggested by CPCB on 09.09.2022, 11.09.2022 and 15.09.2022, and ii) for minor changes in new ash portal as per CPCB's comments dated 25.01.2023 on CEA's proposal for in reference to Para 9(iii) of MoM of Secretary (Power) dated 23.12.2022 (**NTPC**)
6. The guidelines for ash ponds/dykes and their annual certification have been prepared by CEA in consultation with CPCB after considering comments / suggestions of stakeholders. Further, the guidelines have been modified slightly in view of amendment ash notification 30.12.2022 and submitted for concurrence of MoP (**CEA, MoP**)

C. Actions points related to ash disposal in un-operational and operational mines:

7. Mapping and allocation of available (22+10) coal mines to power plants (**MoC**)
8. Any requests for allocation of available non-coal mines (**MoP**)
9. Mines specific studies for disposal of ash in operational mines with OB and amendment in closure plans (**MoC**)
10. Suggestions to simplify the procedure of allowing ash disposal in mines and to facilitate ash disposal in operational mines with OB (**MoC** and **MoM**),
11. Lists of available mines for ash disposal to be updated every quarter (**MoC** and **MoM**)
12. Prevention of ash pond/dykes breaches through proper inspection & maintenance, designating officers responsible for any accident, supervision at senior level and annual safety certification (**Power Plants**)

After deliberations on above points the following decisions were taken:

1. NTPC shall complete the work related to report formats and incorporate changes as proposed by CEA and CPCB by 28th February 2023 (**NTPC**)
2. CEA informed that the guidelines on ash ponds are likely to be approved within a week (**CEA**)
3. The ash portal shall be improved by adding GIS features to view power plant and its ash ponds, alert generation features to ensure information submission within time limit (**NTPC**)
4. MoC shall provide updated allocation status and actual status of 32 identified mines to CPCB within a week so that status may be updated on CPCB website (**MoC, CPCB**)
5. MoC shall convene meeting of the Central Level Working Group by 28th Feb to discuss criteria for allocation of coal mines. MoM may also be invited to the meeting. (**MoC**)
6. MoP may send any request of power plants for allocation for non-coal mine for ash disposal to CPCB so that the same may be forwarded to the District Level Working Group (**MoP**)
7. CEA shall provide inputs to MoC for GIS mapping of available coal mines and power plants (**CEA**)
8. MoC shall provide the list of coal mines or mine pits within coal mines likely to be available for ash disposal in near future (**MoC**)
9. On receipt of a request from power plant regarding ash disposal in an operational coal mine the coal mine concerned shall undertake feasibility study for this purpose (**MoC**)

The joint meeting was convened to also review the status of implementation of ash notification in Singrauli-Sonebhadra region in view of deliberations in the 2nd meeting of the Fly Ash Management and Utilisation Mission for the area constituted by the order dated 18.02.2022 of NGT-PB in O.A. No. 164 of 2018. The inspection reports of thermal power plants and coal mines in Singrauli-Sonebhadra region carried out during 2nd week of February 2023 to verify the compliance status were presented before the Committees.

After deliberations on the inspection reports the following decisions were taken:

1. The inspection reports of thermal power plants and coal mines shall be forwarded to SPCBs for necessary action in respect of the violations observed, with copy to MoEF&CC by 28th Feb 2023. The reports will be shared with concerned thermal power plants and coal mines. (**CPCB**)
2. Summary reports regarding violations related to EC conditions by coal mines will be provided to MoEF&CC by 28th Feb 2023 (**CPCB**)
3. Thermal power plants in Singrauli-Sonebhadra region shall submit action plans for ash utilisation to CPCB and SPCBs (**Power Plants**)
4. In reference to the disposal of ash by Anpara (Anpara and Lanco Anpara) and Obra plants into the reservoir and the river respectively observed in the recent inspections as well in a number of past inspections, concerned units shall be held responsible for violations and disposal of ash into the reservoir and the river and action shall be taken by SPCB. SPCB shall ensure that siltation assessment and apportionment study, which was to be coordinated by U.P. Irrigation Department, is completed at the earliest, based on which de-silting activity may be undertaken at the cost of violators as directed by NGT-PB (**UPPCB, MPPCB**)
5. The ash utilisation status of all thermal power plants in the country in the form of balance sheet shall be analysed and projection made about the likelihood of the thermal power plants meeting the target of 100% utilisation based on their current levels of utilisation, and based on such an analysis carried out by CPCB team, a report be prepared to bring out the gap in utilisation and the need for drawing up an action plan and the report shared with MoEF&CC by 1st week of March 2023. Ranking and colour coding of the power plants according to utilisation status may be done. The status shall also be uploaded on web page.

The meeting ended with a vote of thank to the chair.

List of participants of the 2nd (joint) meeting of the two committees– the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i)

Sl. No.	Name of Participants and Organization	Email I'd
1.	Shri Tanmay Kumar, IAS, Chairman, Central Pollution Control Board	ccb.cpcb@nic.in
2.	Shri N. Subrahmanyam, Sc.-D (HSM Division), Ministry of Environment, Forest and Climate Change (Not participated in the meeting)	n.subrahmanyam@gov.in
3.	Shri Munna Kumar Shah, Sc.-D (IA Division), Ministry of Environment, Forest and Climate Change	munna.shah@gov.in
4.	Shri Satish Kumar, Director (Thermal), Ministry of Power (Not participated in the meeting)	satish.kumar.74@gov.in
5.	Shri Anandji Prasad - Advisor (Project) Ministry of Coal	advp.moc@nic.in
6.	Shri B. Veera Reddy - Director (Technical) (Representative of Ministry of Coal), Coal India Limited (Not participated in the meeting)	dt.cil@coalindia.in
7.	Shri P.N. Sharma, Chief Controller of Mines, (Common representative of Ministry of Mines and IBM), Indian Bureau of Mines (Not participated in the meeting)	ccom@ibm.gov.in, dheeraj.kumar83@gov.in
8.	Shri Paresh Kumar Goel - Director Transport), Ministry of Road Transport & Highways (Not participated in the meeting)	paresh.goel89@gov.in
9.	Shri Rama Kant Singh, Director, (Representative of Department of Heavy Industry) Ministry of Heavy Industries (Not participated in the meeting)	singh.ramakant59@gov.in
10.	Shri Mohammed Niyazi, Director - Mine Safety (S&T), Director General of Mine Safety (Not participated in the meeting)	mniyazi@dgms.gov.in

1.	Shri Akshay Bapat, Executive Director (Environment), Coal India Limited	dt.cil@coalindia.in
2.	Shri Gulshan Raj, Chief Engineer, CD Division, Central Electricity Authority , Ministry of Power	tcdcea@nic.in, gulshanraj-cwc@nic.in
3.	Shri Venkat Ramana Reddy, Executive Director (Safety), Shri Santosh Kumar Takhele, Chief GM (EMG, AU & SD), and other representatives of NTPC Limited	edssea@ntpc.co.in, sktakhele@ntpc.co.in
4.	Representatives of Uttar Pradesh Pollution Control Board	ms@uppcb.com
5.	Representative of Madhya Pradesh Pollution Control Board	ms-mppcb@mp.gov.in
6.	Shri Sanjeev Kumar, GM (Environment), and other representatives Northern Coalfields Limited	gmenv.ncl@coalindia.in
7.	Shri Nazimuddin, Sc. 'F' & DH-IPC-II, Central Pollution Control Board	nazim.cpcb@nic.in

8.	Shri Rajendra Dattatray Patil, Sc. 'D', RD-Lucknow Central Pollution Control Board	patil.cpcb@nic.in
9.	Shri Sunil Kumar Meena, Sc. 'D', RD-Bhopal, Central Pollution Control Board	sunil.cpcb@gov.in
10.	Shri Gaurav Gehlot, Sc. 'C', IPC-II, Central Pollution Control Board	gehlot.cpcb@nic.in
11.	Shri Durga Nand Jha, SRF, IPC-II, Central Pollution Control Board	durganand.cpcb@nic.in
12.	Representatives of Northern Coalfields Limited Mines	-
13.	Representatives of NTPC TPPs (Vindhyachal STPS, Rihand STPS, Singrauli STPS), UPRVUNL TPPs (Anpara TPS, Obra TPS), Lanco Anpara 'C' TPS, Reliance Power Sasan UMPP, Adani Power Mahan Energen TPP, J.P. Power Ventures Nigrie STPP	-



केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार
MINISTRY OF ENVIRONMENT FOREST & CLIMATE CHANGE GOVT OF INDIA

By Email / Speed Post

IPC-II/TPP/CP-11/76/2022/ 5387-5396

October 20, 2023

Minutes of the 3rd (joint) meeting of the two committees - the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held on 06.10.2023 at 12.00 PM

Sir,

Minutes of the 3rd (joint) meeting of the two committees – the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held under the chairmanship of Shri Tanmay Kumar, Chairman, CPCB on 06.10.2023 at 12.00 PM through video conference, are enclosed for information and necessary action.

Yours faithfully,

Nazimuddin
20/10/2023

[Nazimuddin]

Sc. F & DH-IPC-II

To,

Members of the Committees
(As per the lists enclosed)

Copy to:

Chairman of the Committees : for information.

Member Secretary, CPCB : for information.

Other participants of the meeting : for information.
(as per the list enclosed)

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
निर्गत... *Nazimuddin*
दिनांक... 20/10/2023

‘परिवेश भवन’ पर्वी अर्जुन नगर, दिल्ली-110032

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दूरभाष/Tel : 43102030, 22305792, वेबसाइट/Website : www.cpcb.nic.in

**Members of the Committee for monitoring the implementation of provisions of the Notification
No. 5481(E) dated 31.12.2021 (Para E(3))**

1. Shri N. Subrahmanyam, Sc.-D (HSM Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, **New Delhi - 110 003**
2. Shri Satish Kumar,
Director (Thermal),
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg, **New Delhi**
3. Shri Anandji Prasad - Advisor (Project)
Ministry of Coal,
Room No. 303-B, Shastri Bhawan,
Dr. Rajendra Prasad Road, **New Delhi – 110 001**
- 3 (a) Shri B. Veera Reddy - Director (Technical)
(Second representative of Ministry of Coal),
Coal India Limited,
Coal Bhawan, Premise No. 04 Mar,
Plot No. AF-III, Action Area-1A,
New Town, Rajarhat, **Kolkata – 700 156**
4. Shri P.N. Sharma, Chief Controller of Mines,
(Representative of Ministry of Mines),
Indian Bureau of Mines,
Indira Bhawan, Civil Lines,
Nagpur – 440 001, Maharashtra
5. Shri Paresh Kumar Goel - Director Transport),
Ministry of Road Transport & Highways,
Transport Bhawan, 1, Parliament Street,
New Delhi – 110 001
6. Shri Rama Kant Singh, Director,
(Representative of Department of Heavy Industry),
Ministry of Heavy Industries,
Room No. 172-D, Udyog Bhawan,
New Delhi-110011

Members of the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, as per the Notification No. 5481(E) dated 31.12.2021

1. Shri Munna Kumar Shah, Sc.-D (IA Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, **New Delhi - 110 003**
2. Shri Satish Kumar,
Director (Thermal),
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg, **New Delhi**
- 2 (a) Representative of Ministry of Power from Central Electricity Authority
- 2 (b) Representative of Ministry of Power from NTPC Ltd.
3. Shri Anandji Prasad - Advisor (Project)
Ministry of Coal,
Room No. 303-B, Shastri Bhawan,
Dr. Rajendra Prasad Road, **New Delhi – 110 001**
- 3 (a) Shri B. Veera Reddy - Director (Technical)
(Second representative of Ministry of Coal),
Coal India Limited,
Coal Bhawan, Premise No. 04 Mar,
Plot No. AF-III, Action Area-1A,
New Town, Rajarhat, **Kolkata – 700 156**
4. Shri P.N. Sharma, Chief Controller of Mines,
(Common representative of Ministry of Mines and IBM),
Indian Bureau of Mines,
Indira Bhawan, Civil Lines,
Nagpur – 440 001, Maharashtra
5. Shri Mohammed Niyazi, Director - Mine Safety (S&T),
Director General of Mine Safety,
DGMS Head Office, Sardar Patel Nagar,
Dhanbad – 826 001, Jharkhand

Minutes of the 3rd(joint) meeting of the two committees– the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held on 06.10.2023 at 12.00 PM

The 3rd (joint) meeting of the two committees - the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), was held on 06.10.2023 at 12.00 PM. The meeting was chaired by Chairman of the Committees / Chairman CPCB Shri Tanmay Kumar. The list of participants is attached. Committees' members from MoEF&CC, MoM, IBM, MoRTH, and DHI were not present in the meeting.

Representatives of CPCB made a presentation before the Committee about the progress on implementation of the ash notification since 2nd (joint) meetings of the Committees held on 18.02.2023, as below:

1. **Authorization of Auditors:** List of certified auditors for compliance audit of ash utilization by TPPs issued on 06.03.2023 and 17.07.2023.
2. **Guidelines for technical specifications, O&M, and annual certification of ash ponds/dykes:** Guidelines prepared and uploaded on CPCB and CEA websites on 30.06.2023.
3. **Status of Ash Portal:**
 - a. All 180 **Integrated Power Plants (IPPs)** registered on the Ash Portal by March 2023, completed data of past months since 01.04.2022 by June 2023, and are regularly uploading ash data on a monthly basis. CPCB has provided access to the Ash Portal to SPCBs for effective enforcement and monitoring of compliance of the Ash Notification and also to MoEF&CC, MoP and CPCB RDs for viewing the data.
 - b. So far, 116 **Captive Power Plants (CPPs)** have registered over the Ash Portal and these plants are also uploading their data on a monthly basis. CPCB vide letter dated 02.08.2023 and direction under section 18(1)(b) dated 13.09.2023 has directed concerned SPCBs to ensure registration and regular uploading of ash data by CPPs on the Ash Portal.
 - c. CPCB has also directed SPCBs to review and ensure regular uploading of ash data on the Ash Portal by all coal and lignite-based thermal power plants (IPPs and CPPs) in the State.
 - d. NTPC IT team is currently providing technical services to CPCB for Ash Portal. Action for inviting tenders for O&M of the Fly Ash Portal within CPCB is in process. NTPC-IT team has prepared the report formats feature for the Ash Portal, and is ready to present these to CEA and CPCB before incorporation. CEA has also suggested by emails dated 10.08.2023, 25.08.2023, and 27.09.2023 to develop some features as per the discussions of the meetings convened in MoP.
 - e. Status of Ash Utilization as per the Ash Portal:

Description	FY 2022-23
Total No. of TPPs	240
Installed Capacity (MW)	2,19,449.08
Coal Consumed (LMT)	8,561.34
Total Ash Generation (LMT)	3,067.12
Total Ash Utilisation (LMT)	2,907.3
Percentage Ash Utilisation (%)	94.79

Note: One thermal power has inadvertently entered incorrect data of ash generation on the Ash Portal which has been corrected in the above summary. The plant has been instructed to rectify the error.

- f. Some thermal power plants have reported the quantity of ash employed in ash dyke raising as utilization (on Ash Portal as well as in annual reports), which is incorrect reporting as ash dyke raising is not covered under the prescribed avenues of ash utilization under Para A(2) (i) to (x) of the Ash Notification dated 31.12.2021. The above figure of ash utilisation also includes 9.04 LMT of ash in ash dyke raising.

(representatives of NTPC informed that their plants have rectified this issue on the Ash Portal)

4. Identification and allocation of abandoned coal mines for disposal of ash by thermal power plants:

- a. Four meetings of the Central Level Working Group (CLWG), Ministry of Coal for allotment of coal mine pits have been held. Out of 21 mine of CIL, 19 have been allocated, 01 is being used as a water reservoir by the local community, and 01 not allocated as coal reserve has not been exhausted.

(MoC informed that Krishnashila OC mine has been allocated in advance which will be available in the coming years after exhausting the coal resources)

- b. Ministry of Coal has informed that CLWG will perform allocation of abandoned coal mines only, not the non-coal (major mineral) mines as these mines are outside the jurisdiction of the Ministry of Coal.
- c. CEA has obtained coordinates of nearby abandoned coal mines from TPPs.

5. Identification and allocation of abandoned non-coal mines for disposal of ash by thermal power plants:

- a. Ministry of Mines vide DO letter dated 12.05.2023 has furnished the list of 207 non-coal mines comprising 82 earlier identified, 56 surrendered to State Govts., 57 partially surrendered to State Govts. and 12 working mines available for backfilling with fly ash.
- b. Ministry of Mines has instructed Regional Controllers of Mines to facilitate TPPs in identification of leases, signing MoU, taking State Govt. on board. Regional Controllers of Mines have also been instructed to identify more feasible mines.
- c. In pursuance with the DO letter dated 08.06.2023 of MoEF&CC, CEA has circulated the list of available 195 non-coal mines for ash disposal to TPPs to enable them to approach concerned mine owners and State Govts. CEA has compiled requests received from TPPs for allocation of non-coal mines also.

6. **Actions taken on the decisions taken in 4th meeting of Ash Mission chaired by Secretary-EF&CC:**

- a. **Decision:** Third-party audit for verification of implementation of action plans of TPPs, industries, stone crushers and coal mines in Singrauli and Sonbhadra region.

Action Taken: Implementation of action plans is verified on a quarterly basis by the Oversight Committees empowered by NGT. Last verification was carried out in June 2023, and the next is due in October 2023. Updated status of implementation of action plans obtained from the stakeholders, and comments of the Oversight Committee on the reported status compiled for presenting in the meeting of Ash Mission scheduled on 19.10.2023.

- b. **Decision:** Implementation of decisions made during 1st, 2nd and 3rd meetings of Ash Mission in respect of pending actions shall be undertaken.

Action Taken: Updated status of action taken on decisions of 1st, 2nd, and 3rd meetings of Ash Mission obtained from the stakeholders and compiled for presenting in the meeting of Ash Mission scheduled on 19.10.2023.

After deliberations on the above points, the following decisions were taken:

1. CPCB shall convene a workshop with authorised auditors and provide a uniform format for compliance audit reports (**CPCB**)
2. CPCB shall take action to ensure that SPCBs issue notices to all CPPs in their States to ensure immediate registration on the Ash Portal (**CPCB**)
3. NTPC, CEA, and CPCB shall convene a meeting to incorporate modification in the Ash Portal as proposed by CEA and CPCB. The Ash Portal shall be improved by adding GIS features to map abandoned mines available for ash disposal within 300 kms radius of thermal power plants requesting for allocation of mines (**NTPC, CEA, CPCB**)
4. CPCB shall analyse ash utilisation and storage status of thermal power plants located around the million-plus cities/non-attainment cities (NACs) and critically polluted areas (CPAs) and take appropriate action in respect of non-compliant plants (**CPCB**)
5. MoC shall provide the list of coal mines or mine pits within coal mines likely to be available for ash disposal in the near future i.e. 5 years (**MoC**).
6. On receipt of request from a thermal power plant for disposal of ash with overburden in operational mines as per the Ash Notification, the concerned mine owner will carry out a feasibility study, as per the circular of DGMS (**MoC**)
7. District Level Working Groups under SPCBs will also allocate non-coal (major mineral) mines to power plants, in addition to the non-coal (minor mineral) mines (**SPCBs, CPCB**)
8. CPCB, IBM, and DGMS shall discuss the process for allocation of non-coal mines to interested thermal power plants (**CPCB, IBM, DGMS**)

The meeting ended with a vote of thank to the chair.

List of participants of the 3rd (joint) meeting of the two committees– the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i)

A. Central Pollution Control Board

1. Shri Tanmay Kumar, IAS, Chairman (Chairman of the Committees)
2. Shri Nazimuddin, Sc. 'F' & DH-IPC-II
3. Shri Gaurav Gehlot, Sc. 'C', IPC-II
4. Shri Durga Nand Jha, SRF, IPC-II

B. Ministry of Power

1. Director (CDD), Central Electricity Authority (Representative of Ministry of Power in the Committee under Para B(5)(i))
2. Shri A. K. Samaiyar, ED (SSEA), NTPC Ltd. (Representative of Ministry of Power in the Committee under Para B(5)(i))
3. Shri S. K. Takhele, CGM (SSEA), NTPC Ltd.

C. Ministry of Coal

1. Shri Anandji Prasad - Advisor (Project), Ministry of Coal (Member of the Committees)
2. General Manager, Coal India Limited
3. Representative of Central Mine Planning and Design Institute

D. Director General of Mine Safety

1. Shri Mohammed Niyazi, Director - Mine Safety (S&T), DGMS (Member of the Committee under Para B(5)(i))



केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार
MINISTRY OF ENVIRONMENT FOREST & CLIMATE CHANGE GOVT OF INDIA

IPC-II/TPP/CP-11/76/2022/ 6042-6067

November 07, 2024

Minutes of the 4th (joint) meeting of the two committees– the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held on 11.10.2024 at 04.00 PM

Sir,

Minutes of the 4th (joint) meeting of the two committees – (i) the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3) and (ii) the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held under the chairmanship of Shri Tanmay Kumar, Chairman, CPCB on 11.10.2024 at 04.00 PM through video conference, are enclosed for information and necessary action.

For ensuring effective implementation and monitoring of the Ash Notification No. S.O. 5481 (E) dated 31.12.2021 (subsequently amended on 30.12.2022 and 01.01.2024) CPCB has also issued directions dated 14.10.2024 to concerned SPCBs under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981, a copy of which is attached for information/necessary action.

Yours faithfully,

[Signature]

[Nazimuddin]

Sc. F & DH-IPC-II

To,

Members of the Committees
(As per the lists enclosed)

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
निर्गत.....
दिनांक..... 07/11/24

o/c

Copy to:

1. Chairman of the Committees	:	for information.
2. Member Secretary, CPCB	:	for information.
3. Other participants of the meeting (as per the list enclosed)	:	for information.
4. The Member Secretary State Pollution Control Boards (as per the list enclosed)	:	for information/necessary action.
5. Authorized Auditors (as per CPCB's O.M. dated 09.09.2024)	:	for information/necessary action

‘परिवेश भवन’ पूर्वी अर्जुन नगर, दिल्ली-110032

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दूरभाष/Tel : 43102030, 22305792, वेबसाइट/Website : www.cpcb.nic.in

**Members of the Committee for monitoring the implementation of provisions of the Notification
No. 5481(E) dated 31.12.2021 (Para E(3))**

1. Shri N. Subrahmanyam, Sc.-E (HSM Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, **New Delhi - 110 003**
2. Shri Satish Kumar,
Director (Thermal),
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg, **New Delhi**
3. Shri Anandji Prasad - Advisor (Project)
Ministry of Coal,
Room No. 303-B, Shastri Bhawan,
Dr. Rajendra Prasad Road, **New Delhi – 110 001**
- 3 (a) Shri B. Veera Reddy - Director (Technical)
(Second representative of Ministry of Coal),
Coal India Limited,
Coal Bhawan, Premise No. 04 Mar,
Plot No. AF-III, Action Area-1A,
New Town, Rajarhat, **Kolkata – 700 156**
4. Shri P.N. Sharma, Chief Controller of Mines,
(Representative of Ministry of Mines),
Indian Bureau of Mines,
Indira Bhawan, Civil Lines,
Nagpur – 440 001, Maharashtra
5. Shri Paresh Kumar Goel - Director (Transport),
Ministry of Road Transport & Highways,
Transport Bhawan, 1, Parliament Street,
New Delhi – 110 001
6. Shri Vikas Dogra, Director,
(Representative of Department of Heavy Industry),
Ministry of Heavy Industries,
Room No. 124, Udyog Bhawan,
New Delhi-110011

Members of the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, as per the Notification No. 5481(E) dated 31.12.2021

1. Shri Munna Kumar Shah, Sc.-E (IA Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, **New Delhi - 110 003**
2. Shri Satish Kumar,
Director (Thermal),
Ministry of Power,
Shram Shakti Bhawan, Rafi Marg, **New Delhi**
- 2 (a) Representative of Ministry of Power from Central Electricity Authority
- 2 (b) Representative of Ministry of Power from NTPC Ltd.
3. Shri Anandji Prasad - Advisor (Project)
Ministry of Coal,
Room No. 303-B, Shastri Bhawan,
Dr. Rajendra Prasad Road, **New Delhi – 110 001**
- 3 (a) Shri B. Veera Reddy - Director (Technical)
(Second representative of Ministry of Coal),
Coal India Limited,
Coal Bhawan, Premise No. 04 Mar,
Plot No. AF-III, Action Area-1A,
New Town, Rajarhat, **Kolkata – 700 156**
4. Shri P.N. Sharma, Chief Controller of Mines,
(Common representative of Ministry of Mines and IBM),
Indian Bureau of Mines,
Indira Bhawan, Civil Lines,
Nagpur – 440 001, Maharashtra
5. Shri Saifullah Ansari, Director - Mine Safety (S&T),
Director General of Mine Safety,
DGMS Head Office, Sardar Patel Nagar,
Dhanbad – 826 001, Jharkhand

List of State Pollution Control Boards

1. The Member Secretary,
Andhra Pradesh Pollution Control Board
D. No. 33-26-14 D/2, Near Sunrise Hospital,
Pushpa Hotel Centre, Chalamalavari Street,
Kasturibaipet, **Vijayawada – 520 010**
2. The Member Secretary,
Pollution Control Board- Assam,
Bamunimaidam, **Guwahati – 781 021**, Assam
3. The Member Secretary,
Bihar State Pollution Control Board
Parivesh Bhawan, Plot No. NS-B/2,
Paliputra Industrial Area, Patliputra,
Patna – 800 023, Bihar
4. The Member Secretary,
Chhattisgarh Environment Conservation Board,
Paryavas Bhavan, North Block Sector-19,
Atal Nagar, **Raipur – 492 002**, Chhattisgarh
5. The Member Secretary,
Gujarat Pollution Control Board
Paryavaran Bhavan, Sector 10-A,
Gandhi Nagar - 382 010, Gujarat
6. The Member Secretary,
Goa State Pollution Control Board
Nr. Pilerne Industrial Estate, Opp. Saligao
Seminary, Saligao – Bardez, **Goa – 403 511**
7. The Member Secretary,
Haryana State Pollution Control Board
C-11, Sector-6, **Panchkula- 134109**, Haryana
8. The Member Secretary,
Jharkhand State Pollution Control Board,
T.A. Bldg., HEC, P. O. Dhurwa,
Ranchi – 834 004, Jharkhand
9. The Member Secretary,
Karnataka State Pollution Control Board
“Parisara Bhavan”, #49, 4th & 5th Floor,
Church Street, **Bangalore 560 001**
10. The Member Secretary,
Madhya Pradesh Pollution Control Board,
Paryavaran Parisar, E-5, Arera Colony,
Bhopal – 462 016, Madhya Pradesh

11. The Member Secretary,
Maharashtra Pollution Control Board,
Kalpataru Points, 3rd & 4th Floor,
Road No. 8, Sion Circle, Opp. PVR Theatre,
Mumbai – 400 022, Maharashtra
12. The Member Secretary,
Meghalaya State Pollution Control Board,
“ARDEN”, Lumpyngngad,
Shillong – 793 014, Meghalaya
13. The Member Secretary,
Odisha State Pollution Control Board,
Paribesh Bhawan, A-118, Nilakantha Nagar,
Unit - VIII, **Bhubaneswar – 751 012**, Odisha
14. The Member Secretary,
Punjab Pollution Control Board
Vatavaran Bhawan, Nabha Road
Patiala 147 001, Punjab
15. The Member Secretary,
Rajasthan Pollution Control Board,
A-4, Institutional Area, Jalana Dungri,
Jaipur 302 004, Rajasthan
16. The Member Secretary,
Tamil Nadu Pollution Control Board
76, Anna Salai, Guindy Industrial Estate,
Race View Colony, Guindy,
Chennai – 600 032, Tamil Nadu
17. The Member Secretary,
Telangana State Pollution Control Board,
Paryavaran Bhawan, A-III, Industrial Estate,
Sanathnagar, **Hyderabad – 500 018**
18. The Member Secretary,
Uttar Pradesh Pollution Control Board,
H. No. TC-12 V, Vibhuti Khand, Gomti Nagar,
Lucknow - 226 010, Uttar Pradesh
19. The Member Secretary,
Uttarakhand Pollution Control Board,
Gaura Devi Bhawan, 46 B, IT Park,
Sahastradhara, **Dehradun – 248 001**, Uttarakhand
20. The Member Secretary,
West Bengal Pollution Control Board,
Paribesh Bhawan, 10A, Block-LA, Sector-III,
Bidhannagar, **Kolkata-700 106**, West Bengal

Minutes of the 4th (joint) meeting of the two committees– the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held on 11.10.2024 at 04.00 PM

The 4th (joint) meeting of the two committees - the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), was held on 11.10.2024 at 04.00 PM through VC. The meeting was chaired by the Chairman of the Committees Shri Tanmay Kumar, Chairman CPCB. The list of participants is attached. Committees' members from MoRTH and DHI were not present in the meeting.

2. Representative of CPCB made a presentation before the Committees about the progress on implementation of the ash notification since 3rd (joint) meeting of the Committees held on 06.10.2023, as below:

- I. **Annual implementation report:** Status of compliance of various provisions of the Ash Notification dated 31.12.2021 (and subsequent amendments) by the independent thermal power plants (TPPs) across the country during the first FY of the first compliance cycle i.e. FY 2022-23 was provided by CPCB vide letter dated 20.02.2024 to MoEF&CC. The same was also shared with CEA for information and to all concerned SPCBs for information and appropriate action in respect of the non-compliance of various provisions of the Ash Notification by the TPPs in their States.

Brief details of ash generation and utilization by the independent TPPs (IPPs) across the country during the FYs 2022-23 (updated) as well as 2023-24 (interim) are given as below:

Description	FY 2022-23	FY 2023-24
Coal Consumed (MMT)	820.5	897.5
Total Ash Generation (MMT)	291.8	316.1
Total Ash Utilisation (MMT)	263.6	303.8
Percentage Ash Utilisation (%)	90.36%	96.11%

The major non-compliance points requiring action taken by the TPPs are as below:

- a. 09 TPPs during FY 2022-23 and 17 TPPs during FY 2023-24 (05 common) have failed to comply with their minimum annual target of 80% ash utilization (lists enclosed), and are liable to be imposed with environmental compensation @ Rs. 1000 per ton on unutilised ash at the end of their first compliance cycle.
- b. 22 TPPs are exceeding the permitted area limit (0.1 hectare/MW) of operational ash pond or dyke for temporary storage of ash (list enclosed). The area of the ash ponds/dykes exceeding the prescribed limit needs to be stabilized and reclaimed with greenbelt/plantation and certified through the concerned SPCBs by 31.03.2025.
- c. 90 TPPs have not installed dedicated silos for storage of dry fly ash for at least 16 hours of ash based on installed capacity (list enclosed).

- d. Some thermal power plants have incorrectly reported/claimed ash utilization in i) disposal of ash into the operational ash ponds/dykes claiming it as low lying area, ii) stabilization of old un-operational (legacy) ash ponds/dykes as current ash utilization, iii) ash dyke raising activities, which are not considered as ash utilization as per the Ash Notification, 2021.
 - e. Some thermal power plants are merely depending upon allocation of abandoned mine voids for disposal of ash to meet the utilisation targets, which is inconsistent with the Para B(5)(ii) of the Ash Notification, 2021 i.e. *“Thermal power plants or mines shall not wait for disposal of ash till the identification is done by the above mentioned committee [under Para B(5)(i)], to meet the utilisation targets mandated as above [under Para A(4) and A(5)]”*.
- II. Ash utilization status of TPPs located nearby/around various million-plus cities (**MPCs**)/ non-attainment cities (**NACs**) and critically polluted areas (**CPAs**):
 - a. 27 TPPs are having 3-year first compliance cycle, out of which 03 TPPs (1. Vizag TPP, HNPCL, 2. Koradi TPS, MAHAGENCO, 3. Mettur TPS-II, TANGEDCO) during FY 2022-23 and 02 TPPs (1. Koradi TPS, MAHAGENCO, 2. North Chennai TPS-I, TANGEDCO) during FY 2023-24 failed to comply with their minimum annual target of 80% ash utilization.
 - b. 04 TPPs are having 4-year first compliance cycle, which have more than minimum annual target of 80% ash utilization during FY 2023-24.
- III. **Authorization of Auditors:** Updated list of authorised auditors to carry out compliance audit of ash utilization by TPPs issued by CPCB vide O.M. dated 09.09.2024 (earlier O.M dated 17.07.2023). The number of authorised auditors have been increased from **77 to 124**. A uniform report format for carrying out the annual compliance audit of TPPs and the users is to be provided by CPCB to the authorised auditors by convening a workshop.
- IV. CPCB and CEA have issued **“Guidelines on Design, Construction, O&M and Annual Certification of Coal Ash Ponds, June 2023”** as per the Ash Notification, 2021. However, the Ash Notification, 2021 doesn't prescribe the timeline to submit the certification report to the concerned SPCB, due to which the status of implementation of the guidelines is not reported by the TPPs on regular basis/timely manner.
- V. CPCB is conducting a study project through Jadavpur University for the **evaluation of coal bottom ash** samples of 10 TPPs using coal from various coal sources **to confirm its suitability as partial sand replacement material in the production of concrete**. MoU was signed in March 2024. Bottom ash samples from all 10 identified TPPs have been collected by Sept 2024 and analysis is under progress.
- VI. **Status of Ash Portal:**
 - a. All 192 IPPs are registered over the Ash Portal and uploading ash data and 287 Captive Power Plants (CPPs) have been registered over the Ash Portal (increased from 116 as compared to the status presented during the 3rd meeting of the committee). SPCBs have informed to have issued instructions/directions to the CPPs in their States.

- b. CPCB vide letters dated 19.01.2024 and 29.08.2024 instructed SPCBs to:
- Update and confirm the list of CPPs in the State and ensure registration of all CPPs on the Fly Ash Portal. List of all registered CPPs again shared with SPCBs, along with list of CPPs which are yet to be connected as per the list provided by SPCBs in 2018.
 - Review and ensure regular data uploading by all TPPs in the State on the Ash Portal by monitoring the same on regular basis for effective enforcement of compliance of the Ash Notification.
- c. Status of ash utilization during FY 2023-24 (interim) by all TPPs (IPPs and CPPs) in the country as per the Ash Portal:

Description	FY 2023-24
Coal Consumed (MMT)	956.0
Total Ash Generation (MMT)	340.0
Total Ash Utilisation (MMT)	322.5
Percentage Ash Utilisation (%)	94.86%

- d. The suggestions given by CEA for updation of the Ash Portal which were possible have been addressed through NTPC-IT team. Some features which are not possible to be addressed in the existing software framework and some new requirements as per MoP's policy dated 15.03.2024 are to be addressed on the new portal which is being developed on the updated software framework by the CPCB IT-Division. CEA has been requested to provide comments on the draft formats for requirements related to compliance of MoP's advisory dated 15.03.2024.

VII. Identification and allocation of abandoned coal mines for disposal of fly ash by thermal power plants:

- 07 meetings of the Central Level Working Group (CLWG), Ministry of Coal (MoC) for allotment of coal mine pits have been convened. Requests received for allocation of abandoned mine voids till the 7th meeting of CLWG on 02.08.2024 have been taken up and discussed by the CLWG. The representative of MoC informed about the status of allocation mine voids by the CLWG (57 mine voids allocated so far to TPPs).
- Chairperson, CLWG advised that all the pending MoUs (except Krishnashila, NCL allotment to NTPC Singrauli) shall be concluded at the earliest.
- Chairperson, CLWG advised CIL to look into the feasibility of the large no. of abandoned/ discontinued mines available with CIL for disposal of the fly ash and to share a list of such mines to MoC.
- As per the decision of the Fly Ash Management and Utilization Mission, the **SOPs** have been framed and circulated among concerned for:
 - Allocation of mines in respect of safety and administrative related matters (both underground and opencast mines, working as well as abandoned).
 - Signing of MoU between identified mines and TPPs.
 - Carrying out feasibility studies for mixing of ash with overburden/ backfilling in operational mines in case of opencast/underground mines, as the case may be.

- e. Secretary, Ministry of Coal vide D.O. letter dated 06.08.2024 has requested Secretary, MoEF&CC to review and amend the provisions of the Ash Notification, 2021 regarding mandatory mixing of at least 25% of ash in external overburden (OB) dumps of coal mines with OB on the weight-to-weight basis under the "Polluter Pays Principle". MoC has submitted that the issue of mixing fly ash with OB has been examined by different coal companies in consultation with CMPDIL, CIMFR, DGMS, etc., and further deliberated in the CLWG, based on which it has been observed that mixing of ash with OB as per the Ash Notification may pose the problems related to compromising factor of safety and increase in land and rehabilitation & resettlement (R&R) requirements.
- f. Coordinates of abandoned coal mines available for ash disposal to nearby power plants may be provided by MoC to CPCB for mapping on the upgraded Ash Portal.

VIII. Identification and allocation of abandoned non-coal mines for disposal of fly ash by thermal power plants:

- a. The list of 207 non-coal mines shared by the Ministry of Mines which are available for backfilling with fly ash have been circulated to all concerned. District Level Working Group (DLWG) under State Govt. is to consider requests for allocation of non-coal mines.
 - b. Requests received in CPCB in this matter have been forwarded to concerned SPCBs with appropriate instructions to the requesting TPPs.
 - c. Regional Controllers of Mines have been instructed by the Ministry of Mines to identify more feasible mines, and to facilitate TPPs in identification of leases, signing MoU, taking State Govt. on board.
3. The representative of MoEF&CC informed that the MoC's D.O. letter 06.08.2024 to review and amend the provisions of the Ash Notification, 2021 regarding mandatory mixing of at least 25% of ash with overburden (OB) in external OB dumps of coal mines, has been received in MoEF&CC and is under review.

The Chairman of the committees advised MoC to make a detailed presentation before the MoEF&CC about the findings of the studies carried out by different coal companies regarding complexity in mixing of ash with OB dumps in operational mines.

4. The MoEF&CC's representative also informed that the Ministry has received multiple representations from brick manufacturing units/associations about non-supply of certain fixed quantum of ash to such units on subsidized rates, which is non-compliance of the MoP's guidelines dated 15.03.2024 framed in compliance with the Ash Notification, 2021. In this regard MoP in the matter has responded that the guidelines are to be enforced by the concerned SPCBs.

The CPCB's representatives informed that as per the Para E(4) of the Ash Notification, 2021, the State Governments are required to constitute a state level dispute resolution committee under Chairman, SPCB for the purpose of resolving disputes between thermal power plants and users of

ash or manufacturer of ash based products. The Chairman of the committees instructed CPCB to obtain the status of constitution of the aforesaid committees from the concerned SPCBs.

5. After deliberations on the above points, the following decisions were taken:

- a. CPCB to provide a uniform report format for carrying out the annual compliance audit of TPPs and the users to the authorised auditors by convening a workshop. The auditors shall also verify the condition of ash handling and storage, and modes of ash utilization/disposal by TPPs to check if the ash handling, storage, and utilization/disposal is being carried out in an environmentally sound manner (**CPCB, Authorised Auditors**)
- b. CPCB shall take action to ensure issuance of notices to the TPPs non-compliant with various provisions of the Ash Notification, 2021 to caution them for further course of action by SPCBs/CPCB, including imposition of environmental compensation on TPPs failed to comply minimum 80% annual ash utilization targets, in near future (**CPCB, SPCBs**)
- c. 05 TPPs non-compliant with the provision of minimum 80% annual ash utilization targets during both the FYs 2022-23 and 2023-24 shall be inspected to check their overall status of compliance w.r.t. Ash Notification (**CPCB, SPCBs**)
- d. MoP/CEA and concerned SPCBs shall take action to ensure installation of dedicated silos by TPPs for storage of dry fly ash for at least 16 hours of ash based on installed capacity (**SPCBs, MoP/CEA**)
- e. Implementation of “*Guidelines on Design, Construction, O&M and Annual Certification of Coal Ash Ponds, June 2023*” shall be ensured by all TPPs and the annual certification report shall be submitted annually by TPPs to concerned authorities (i.e. SPCBs, CPCB, CEA, MoEF&CC-IRO) by 30th November every year. The annual compliance audit report shall also include the status of submission of the annual certification report by the TPPs (**All TPPs, Auditors, SPCBs, CPCB, MoP/CEA**)
- f. TPPs shall ensure that the ash is utilized only in the areas/avenues of usage prescribed in the Ash Notification, 2021. The area of the ash ponds/dykes exceeding the prescribed limit shall be stabilized and reclaimed with greenbelt/plantation and certified through the concerned SPCBs by 31.03.2025 (All TPPs, SPCBs) (**All TPPs, SPCBs**)
- g. Coordinates of abandoned coal mines available for ash disposal to nearby power plants to be provided by MoC to CPCB for mapping on the upgraded Ash Portal (**MoC**)
- h. The Ash Portal shall be upgraded to incorporate compliance aspects of various provisions of the Ash Notification, 2021 as amended and MoP’s advisory dated 15.03.2024 (**CPCB**)
- i. The allocation of identified mine voids (coal and non-coal) shall be continued in a time bound manner as per the developed procedures (**MoC, MoM**).

The meeting ended with a vote of thank to the chair.

List of participants of the 4th (joint) meeting of the two committees– the Committee for monitoring the implementation of provisions of the Ash Notification 31.12.2021 - Para E(3), and the Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump - Para B(5)(i), held on 11.10.2024 at 04.00 PM

A. Central Pollution Control Board

1. Shri Tanmay Kumar, IAS, Chairman (Chairman of the Committees)
2. Shri Bharat Kumar Sharma, Member Secretary
3. Shri Nazimuddin, Sc. 'F' & DH-IPC-II
4. Shri Durga Nand Jha, SRF, IPC-II

B. Ministry of Environment, Forest and Climate Change

1. Shri N. Subrahmanyam, Scientist-E, HSM Division (Member of the Committee under Para E(3))
2. Shri R. P. Rastogi, Scientist-D, IA Division (Representative of the Member of the Committee under Para B(5)(i))

C. Ministry of Power

1. Sh. P.S. Mohan Kumar, Additional Director (CDD), Central Electricity Authority (Representative of Ministry of Power in the Committee under Para B(5)(i))
2. Executive Director, SSEA, NTPC (Representative of Ministry of Power in the Committee under Para B(5)(i))
3. Shri H. K. Dash, Executive Director, NTPC
4. Shri Mukesh Kumar, Additional Director (CDD), Central Electricity Authority
5. Shri Rohit Bhardwaj, Section Officer, Ministry of Power

D. Ministry of Coal

1. Director, Ministry of Coal (Representative of the Member of the Committees)

E. Ministry of Mines and Indian Bureau of Mines

1. Shri P.N. Sharma, Chief Controller of Mines, IBM (Member of the Committees)

F. Director General of Mine Safety

1. Shri Saifullah Ansari, Director - Mine Safety (S&T), DGMS (Member of the Committee under Para B(5)(i))

List-I: TPPs non-compliant with their minimum annual target of 80% ash utilization during FY 2022-23 and FY 2023-24

FY 2022-23			FY 2023-24		
S.No.	Name of TPP	S.No.	Name of TPP	S.No.	Name of TPP
1.	Bhavnagar Lignite TPP, GSECL, Gujarat	1.	Bhavnagar Lignite TPP, GSECL, Gujarat	10.	Chhabra TPP RRVUNL, Rajasthan
2.	Koradi TPP, MAHAGENCO, Maharashtra	2.	Koradi TPP, MAHAGENCO, Maharashtra	11.	North Chennai TPS-I TANGEDCO, Tamilnadu
3.	Bela TPP, Ideal Energy Ltd., Maharashtra	3.	Bela TPP, Ideal Energy Ltd., Maharashtra	12.	North Chennai TPS-II TANGEDCO, Tamilnadu
4.	Chhabra SCTPP, RRVUNL, Rajasthan	4.	Chhabra SCTPP, RRVUNL, Rajasthan	13.	TAQA Neyveli TPS, Tamilnadu
5.	Ramagundam-B TPP, TSGENCO, Telangana	5.	Ramagundam-B TPP, TSGENCO, Telangana	14.	Kothagudem Stage VI TPS, TSGENCO, Telangana
6.	Vizag TPP, HNPCL, Andhra Pradesh	6.	Rayalseema TPS, APGENCO, Andhra Pradesh	15.	Meja TPS NTPC, Uttar Pradesh
7.	Guru Gobind Singh TPS, PSPCL, Punjab	7.	Bellari TPS, KPCL, Karnataka	16.	Harduaganj TPS UPRVUNL, Uttar Pradesh
8.	Kalisindh TPP RRVUNL, Rajasthan	8.	Raichur TPS, KPCL, Karnataka	17.	Parichha TPS UPRVUNL, Uttar Pradesh
9.	Mettur TPS-II, TANGEDCO, Tamilnadu	9.	Yermarus TPS, KPCL, Karnataka		

State-wise no. of TPPs: Gujarat (1), Maharashtra (2), Rajasthan (2), Telangana (1), Andhra Pradesh (1), Tamilnadu (1), Punjab (1)

State-wise no. of TPPs: Gujarat (1), Maharashtra (2), Rajasthan (2), Telangana (2), Andhra Pradesh (1), Karnataka (3), Tamilnadu (3), Uttar Pradesh (3)

List-II: TPPs exceeding the permitted area limit (0.1 hectare/MW) of operational ash pond or dyke for temporary storage of ash

S.No.	Name of TPP	S.No.	Name of TPP	S.No.	Name of TPP
1.	Bongaigaon TPP, NTPC, Assam	9.	Nawapara TPS, TRN Energy, Chhattisgarh	17.	Mouda TPS, NTPC, Maharashtra
2.	Barh, STPS NTPC, Bihar	10.	Sikka TPS, GSECL, Gujarat	18.	Darlipalli STPP, NTPC, Odisha
3.	Nabi Nagar TPS, BRBCL, NTPC, Bihar	11.	Indira Gandhi STPS, NTPC, Haryana	19.	Goindwal Sahib TPS, GVK Power, Punjab
4.	Sipat TPS, NTPC, Chhattisgarh	12.	Bokaro TPS, DVC, Jharkhand	20.	Bhadradi TPS, TSGENCO, Telangana
5.	Marwa TPS, CSPGCL, Chhattisgarh	13.	Koderma TPS, DVC, Jharkhand	21.	NTPC Meja TPS, MUNL, Uttar Pradesh
6.	Raigarh TPP, Adani Power, Chhattisgarh	14.	Kudgi STPS, NTPC, Karnataka	22.	Raghunathpur TPS, DVC, West Bengal
7.	Bandhakhar TPP, MCCPL, Chhattisgarh	15.	Shree Singaji TPS, MPPGCL, M.P.		
8.	SCPL Ratija TPS, Chhattisgarh	16.	Solapur TPS, NTPC, Maharashtra		

List-III: TPPs which have not installed dedicated silos for storage of dry fly ash for at least 16 hours of ash based on installed capacity

Sl. No.	Name of Thermal Power Plant	State	Capacity (MW)	Capacity of dry fly ash silos (MT)	Approx. capacity of Dry Fly Ash Silos (Hours)
1.	Dr. Narla Tata Rao TPS, APGENCO	A.P.	1760	3500	5
2.	Rayalseema TPS, APGENCO	A.P.	1650	7506	14
3.	Damodaram Sanjeeviah Stage-I, APGENCO	A.P.	1600	4000	12
4.	Simhadri, NTPC	A.P.	2000	8000	15
5.	Bongaigaon Thermal Power Project, NTPC	Assam	750	2250	13 to 14
6.	Kahalgaoon, NTPC	Bihar	2340	5200	8 to 9
7.	Muzaffarpur TPS, NTPC KBUNL	Bihar	390	1800	15.73
8.	Barh STPS, NTPC	Bihar	1980	5020	9 to 10
9.	Nabi Nagar TPS, BRBCL	Bihar	1000	1500	5.50
10.	Nabi Nagar Power G.C. (NPGCL), NTPC	Bihar	1980	2100	5 to 5.5
11.	Barauni TPS, NTPC	Bihar	720	2600	12.00
12.	Korba STPS, NTPC	Chhattisgarh	2600	2200	3.00
13.	Lara STPP, NTPC	Chhattisgarh	1600	2100	4.50
14.	Dr. Shyama Prasad Mukherjee TPS, CSPGCL	Chhattisgarh	500	2200	13 to 14
15.	Tamnar TPP, OP Jindal Power STPP Stage-1	Chhattisgarh	1000	3200	9 to 10
16.	Tamnar TPP, OP Jindal Power STPP Stage-2	Chhattisgarh	2400	9200	10.5 to 11.5
17.	Lanco Amarkantak TPS	Chhattisgarh	600	3000	15.62
18.	Uchpinda TPS, RKM Power	Chhattisgarh	1440	8480	15.49
19.	Raipur Energen, Adani Power	Chhattisgarh	1370	3600	9 to 10
20.	ACBIL Chakabura TPP	Chhattisgarh	60	375	6.50
21.	Ratija TPP, Spectrum Coal & Power	Chhattisgarh	100	1150	14.00
22.	Nawapara TPS, TRN Energy	Chhattisgarh	600	2560	12 to 14
23.	Balco TPS. Korba	Chhattisgarh	1200	4000	12.00
24.	Gandhinagar TPS, GSECL	Gujarat	630	500	3.00
25.	Wanakbori TPS, GSECL	Gujarat	2270	7100	12.50
26.	Kutch Lignite TPS, GSECL	Gujarat	150	0	0.00
27.	Panipat TPS, HPGCL	Haryana	710	1700	8.00
28.	Yamunanagar TPS, DCRTTP, HPGCL	Haryana	600	2000	10.00
29.	Chandrapura TPS, DVC	Jharkhand	500	1200	7 to 9
30.	Koderma TPS, DVC	Jharkhand	1000	3000	11.00
31.	Maithon TPP, DVC	Jharkhand	1050	4000	15.00
32.	North Karanpura TPP, NTPC	Jharkhand	1320	1500	7.89
33.	Bellari TPS, KPCL	Karnataka	1700	8700	15.64
34.	Yermarus TPP, KPCL	Karnataka	1600	6000	13 to 14
35.	Vindhyachal STPS, NTPC	M.P.	4760	9600	11.25
36.	Gadarwara STPP, NTPC	M.P.	1600	0	0.00
37.	Khargone STPS, NTPC	M.P.	1320	1500	4.92
38.	Birsingpur, Sanjay Gandhi TPS, MPPGCL	M.P.	1340	5000	15.00
39.	Satpura TPS, MPPGCL	M.P.	1330	2400	7.50
40.	M. B Power Annupur TPS	M.P.	1200	5000	15.00
41.	Khaperkheda TPS, MAHAGENCO	Maharashtra	1340	3000	6 to 7
42.	Nasik TPS, MAHAGENCO	Maharashtra	630	0	0.00
43.	Koradi TPS, MAHAGENCO	Maharashtra	2190	3375	5 to 6
44.	Bhusawal TPS, MAHAGENCO	Maharashtra	1210	2250	5 to 6

45.	Chandrapur Super TPS, MAHAGENCO	Maharashtra	2920	5630	5.00
46.	Dahanu TPS, Adani Power	Maharashtra	500	690	5.5 to 6.5
47.	Solapur STPS, NTPC	Maharashtra	1320	0	0.00
48.	Mouda STPS, NTPC	Maharashtra	2320	8800	14.37
49.	Amarawati TPP, RattanIndia	Maharashtra	1350	1800	5.00
50.	Vedanta TPP, Jharsuguda	Odisha	2400	8000	10.00
51.	Talcher Kaniha STPS, NTPC	Odisha	3000	9760	10.5 to 11.5
52.	Darlipalli STPP, NTPC	Odisha	1600	6000 (UC)	10 (Constructing)
53.	IB Valley TPP, Jharsuguda, Stage-I	Odisha	420	480	3 to 4
54.	Guru Gobind Singh TPS, Ropar, PSPCL	Punjab	840	450	2.00
55.	Lehra Mohabbat TPS, PSPCL	Punjab	920	2000	8 to 11
56.	Rajpura TPP, Nabha Power	Punjab	1400	5595	15.44
57.	Talwandi Sabo TPS, Vedanta	Punjab	1980	7950	14.00
58.	Goindwal Sahib TPS, GVK Power	Punjab	540	2000	15.50
59.	Kota STPS, RRVUNL	Rajasthan	1240	3500	10 to 11
60.	Chhabra TPS, RRVUNL	Rajasthan	1000	3500	12 to 14
61.	Shree Cement Ltd. IPP	Rajasthan	300	600	12 to 14.5
62.	Tuticorin TPS, TANGEDCO	Tamilnadu	1050	600	1.70
63.	North-Chennai-I TPS, TANGEDCO	Tamilnadu	630	3000	14.50
64.	Mettur TPS, TANGEDCO	Tamilnadu	840	3500	13.50
65.	Neyveli Lignite TPS-2, NLC	Tamilnadu	1470	2400	12.54
66.	Vallur TPP, NTPC	Tamilnadu	1500	5100	11 to 12
67.	Ramagundem STPS, NTPC	Telangana	2600	500	7.00
68.	Rammagundam-B TPS, TSGENCO	Telangana	62.5	200	8 to 10
69.	Kothagudem V Stage TPS, TSGENCO	Telangana	500	900	4.50
70.	Kothagudem VII Stage TPS, TSGENCO	Telangana	800	2000	13 to 15
71.	Kakatiya TPS, TSGENCO (Stage-I, II)	Telangana	1100	3300	14.00
72.	SINGARENI TPP, SCCL	Telangana	1200	3600	13.00
73.	Bhadradi TPS, TSGENCO	Telangana	1080	2000	5 to 6
74.	Singrauli STPS, NTPC	U.P.	2000	1500	3 to 4
75.	Rihand STPS, NTPC	U.P.	3000	7000	13.00
76.	Unchahar STPS, NTPC	U.P.	1550	3500	9 to 10
77.	Tanda TPS, NTPC	U.P.	1760	3025	6 to 7
78.	NTPC Meja TPS, MUNL	U.P.	1320	1575	5.50
79.	Paricha TPS, UPRVUNL	U.P.	920	3200	11 to 12
80.	Obra B TPS, UPRVUNL	U.P.	1000	700	2.00
81.	Anpara A, B & D TPS, UPRVUNL	U.P.	2630	3000	5.50
82.	Rosa TPP, Power Supply RPL	U.P.	1200	4000	14 to 15
83.	Anpara C TPP, Lanco Power	U.P.	1200	2000	7 to 8
84.	Lalitpur TPP, Bajaj Energy	U.P.	1980	6000	12 to 13
85.	Farakka STPS, NTPC	W.B.	2100	2700	5 to 6
86.	Mejia TPS, Bankura, DVC	W.B.	2340	5340	6 to 7
87.	Durgapur Steel TPS, DVC	W.B.	1000	3000	11 to 12
88.	Raghunathpur TPS, DVC	W.B.	1200	3000	7 to 8
89.	Santalidih TPS, WBPCL	W.B.	500	2000	11 to 12
90.	Bakreswar TPS, WBPCL	W.B.	1050	2900	13 to 15

F. No. 09/01/2019-HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003

Dated: 7th December, 2022

OFFICE MEMORANDUM

Sub.: Minutes of the meeting of Fly Ash Management and Utilization Mission held on 24.11.2022- reg.

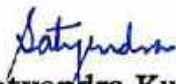
The undersigned is directed to enclose herewith the minutes of the meeting of "Fly Ash Management and Utilization Mission" held under the Co-Chairpersonship of Secretary (EF&CC) and Secretary (Power) on 24.11.2022 at 15:00 hrs at Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, New Delhi.

2. It is requested, to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority

Encl.: As above

Yours sincerely,


(Dr. Satyendra Kumar)

Director

Ph: 011-20819291

Email: satyendra.kumar07@nic.in

To:

1. Secretary, Ministry of Power, New Delhi
2. Secretary, Ministry of Coal, New Delhi
3. Chief Secretary, State of U.P.
4. Chief Secretary, State of M.P.
5. Chairman, Central Pollution Control Board, New Delhi
6. Additional Chief Secretary /Principal Secretary, Environment Department, Government of Uttar Pradesh
7. Additional Chief Secretary /Principal Secretary, Environment Department, Government of Madhya Pradesh

8. Additional Chief Secretary /Principal Secretary, Department of Power, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Department of Power, Government of Madhya Pradesh
10. Additional Chief Secretary /Principal Secretary, Department of Industries, Government of Uttar Pradesh
11. Additional Chief Secretary /Principal Secretary, Department of Industries, Government of Madhya Pradesh
12. Chairman, UPPCB, Uttar Pradesh
13. Chairman, MPPCB, Madhya Pradesh
14. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
15. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
16. CMD, NCL
17. CMD, M/s NTPC Limited
18. CMD, M/s Anpara Thermal Power Plant (Power Plant)
19. CMD M/s Anpara 'C' Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s Renusagar Thermal Power Plant
22. CMD, M/s UPRVUNL
23. CMD, M/s Grasim Industries Limited, Renukoot, Sonbhadra
24. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
25. CMD, M/s M.P. Power Generating Co. Ltd., Madhya Pradesh

Copy to:

1. Secretary (EF&CC)
2. PPS to AS (NPG)
3. Guard File

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

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 Sonbhadra 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.)**

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 Sitiesh 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

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

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**

- **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**

- **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

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.

SI 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

SI 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.

SINo	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.

SI 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

SI 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

SI 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.

SI 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.

2012 Provisions of Ash Utilisation Notification and responsibilities of stakeholders 475

SI 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

SI 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, <i>Para B(1)</i>	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, <i>Para B(3)</i>	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, <i>Para B(5)</i>	Completed	-	CPCB
10	Committee to get the updated quarterly reports for identified mines, <i>Para B(5)</i>	Ongoing	Immediate	CPCB
11	Filling of low lying areas with ash for approved projects in accordance to the guidelines by CPCB, <i>Para B(6)</i>	Ongoing	Immediate	CPCB and SPCB/PCC
12	SPCB to publish the approved low lying sites, location, area and permitted quantity annually on its website, <i>Para B(6)</i>	Ongoing	Annual	SPCB/PCC

2014 Sl No.	Action	477	Status	Timeline	Enforcement Agency/Dept.
13	CPCB to put the guidelines in place for all types of activities envisaged under the notification, <i>Para B(7)</i>		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, <i>Para B(8)</i>		Ongoing	Immediate	CPCB and SPCB/PCC
15	Issuance of notice to agencies for mandatory utilization of ash & ash-based products, <i>Para D(1)</i>		Ongoing	On-need basis	Owners of TPPs, manufacturers of ash based products
16	Enforcement and monitoring of utilization of ash by TPPs, <i>Para E(1)</i>		Ongoing	Quarterly	CPCB, SPCB/PCC and District Magistrate
17	Development of web portal by CPCB for provisions under the notification, <i>Para E(1)</i>		Ongoing	Immediate	CPCB
18	TPPs to upload monthly information regarding ash generation and utilization, <i>Para E(2)(i)</i>		Ongoing	By 5th of next month	CPCB
19	TPPs to upload annual implementation report providing information about compliance of provisions in the notification, <i>Para E(2)(i)</i>		Yet to start	By 30th of April	SPCB/PCC
20	Compilation of annual reports submitted by TPPs by CPCB and CEA, <i>Para E(2)(i)</i>		Yet to start	By 31st of May	CPCB, CEA

SI 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

SI 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

SI No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
2.	M/s NTPC Rihand Super Thermal (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

SI No.	Stakeholders	Actions	481 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/UPPC B
		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/UPPC B
		Completion of installation of another 02 CAAQMS	Installed	-			CPCB/UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Connected	-	-	-	CPCB/UPPC B
		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/UPPC B
		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 sprinkling system installed	-	-	CPCB/UPPC B
		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					

SI No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
5.	M/s Northern Coalfields Limited (NCL) Bina, 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

SI 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/UPP CB
		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/UPP CB
		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/UPP CB
		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/UPP CB
		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/UPP CB
		Effective tire washing facility for transport vehicles	-	Proposal of tyre washing facility at Dudhichua Project is in final stage of completion.	-	May, 2023	CPCB/UPP CB
		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/UPP CB
		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/UPP CB

SI 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 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, 2023	CPCB/UPPCB
		Open the site of CAAQMS from all the direction	Complied	-	-	-	-

SI No. 2022	Stakeholder	Actions	Status			Timeline	Enforcement Agency/D ept.
			Completed	Ongoing	Yet to be Started		
8.	M/s Northern Coalfields Limited (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

SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/D ept.
			Completed	Ongoing	Yet to be Started		
8.	M/s Northern Coalfields Limited (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

SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
10.	Aluminum Smelter: M/s HINDALCO Industries Renukoot, Sonbhadra Ltd,	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

SI No. 2026	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			489 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

SI No.	Stakeholder	Actions	490 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

SI 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

SI 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/CPC B
		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/CPC B
		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/CPC B
		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

Thanks

Action Plans based on the recommendations of the Joint Committee

SI 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 m ³ /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

SI 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 sprinkling 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					

SI 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

SI 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

SI 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 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, 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

SI 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

SI 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 TPSSs. 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

SI 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

SI 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

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		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

SI 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, <i>Para A(3)</i>	Completed	-	CPCB
2	100% Utilisation of current ash by thermal power plants as per timelines, <i>Para A(4)</i>	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., <i>Para A(6)</i>	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, <i>Para A(7)</i>	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, <i>Para A(8)</i>	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, <i>Para A(9)</i>	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, <i>Para B(1)</i>	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, <i>Para B(3)</i>	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, <i>Para B(5)</i>	Completed	-	CPCB
10	Committee to get the updated quarterly reports for identified mines, <i>Para B(5)</i>	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, <i>Para B(6)</i>	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, <i>Para B(6)</i>	Ongoing	Annual	SPCB/PCC
13	CPCB to put the guidelines in place for all types of activities envisaged under the notification <i>Para B(7)</i>	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, <i>Para B(8)</i>	Ongoing	Immediate	CPCB and SPCB/PCC
15	Issuance of notice to agencies for mandatory utilization of ash & ash-based products, <i>Para D(1)</i>	Ongoing	On-need basis	Owners of TPPs, manufacturers of ash based products
16	Enforcement and monitoring of utilization of ash by TPPs, <i>Para E(1)</i>	Ongoing	Quarterly	CPCB, SPCB/PCC and District Magistrate
17	Development of web portal by CPCB for provisions under the notification, <i>Para E(1)</i>	Ongoing	Immediate	CPCB

18	Thermal power plants to upload monthly information regarding ash generation and utilisation, <i>Para E(2)(i)</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, <i>Para E(2)(i)</i>	Yet to start	By 30th of April	SPCB/PCC
20	Compilation of annual reports submitted by thermal power plants by CPCB and CEA, <i>Para E(2)(i)</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, <i>Para E(3)</i>	Completed	-	CPCB
22	Meeting of the Committee to review annual implementation reports, <i>Para E(3)</i>	Ongoing	Once in six months	CPCB
23	Committee to hold stakeholder consultation for monitoring of ash utilization , <i>Para E(3)</i>	Ongoing	Once in six months	CPCB
24	Committee to submit six monthly report to MoEFCC, <i>Para E(3)</i>	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, <i>Para E(4)</i>	Ongoing	Immediate	CPCB
26	Compliance audit for ash disposal by thermal power plants and user agencies by auditors authorised by CPCB, <i>Para E(5)</i>	Ongoing	Annual	CPCB, SPCB/PCC
27	Audit report to be submitted to CPCB and concerned SPCB, <i>Para E(5)</i>	Yet to start	By 30th November every year	CPCB and SPCB/PCC
28	Initiation of action against non-compliant thermal power plants, <i>Para E(5)</i>	Yet to start	Within fifteen days of receipt of audit report	CPCB, SPCB/PCC

F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003

Dated: 9th March, 2023

OFFICE MEMORANDUM

Sub.: Minutes of the second meeting of 'Fly Ash Management and Utilization Mission' held on 31.01.2023- reg.

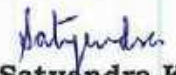
The undersigned is directed to enclose herewith the minutes of the second meeting of "Fly Ash Management and Utilization Mission" held under the Chairpersonship of Secretary (EF&CC) on 31.01.2023 at 12:00 hrs at Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, New Delhi.

2. It is requested to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority,

Encl.: As above

Yours sincerely,


(Dr. Satyendra Kumar)
Director
Ph: 011-20819291
Email: satyendra.kumar07@nic.in

To:

1. Secretary, Ministry of Power, New Delhi
2. Secretary, Ministry of Coal, New Delhi
3. Chief Secretary, State of U.P.
4. Chief Secretary, State of M.P.
5. Chairman, Central Pollution Control Board, New Delhi
6. Additional Chief Secretary /Principal Secretary, Environment Department, Government of Uttar Pradesh
7. Additional Chief Secretary /Principal Secretary, Environment Department, Government of Madhya Pradesh

8. Additional Chief Secretary /Principal Secretary, Department of Power, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Department of Power, Government of Madhya Pradesh
10. Additional Chief Secretary /Principal Secretary, Department of Industries, Government of Uttar Pradesh
11. Additional Chief Secretary /Principal Secretary, Department of Industries, Government of Madhya Pradesh
12. Chairman, UPPCB, Uttar Pradesh
13. Chairman, MPPCB, Madhya Pradesh
14. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
15. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
16. CMD, NCL
17. CMD, M/s NTPC Limited
18. CMD, M/s Anpara Thermal Power Plant (Power Plant)
19. CMD M/s Anpara 'C' Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s Renusagar Thermal Power Plant
22. CMD, M/s UPRVUNL
23. CMD, M/s Grasim Industries Limited, Renukoot, Sonbhadra
24. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
25. CMD, M/s M.P. Power Generating Co. Ltd., Madhya Pradesh

Copy to:

1. PPS to Secretary (EF&CC)
2. PPS to AS (NPG)
3. Guard File

**Minutes of the meeting of Fly Ash Management and Utilization Mission
held on 31.01.2023 at 12:00 hrs**

The second meeting on 'Ash Management and Utilization Mission' was convened on 31st January, 2023 at 12:00 hrs for the issues related with industrial pollution in Singrauli and Sonbhadra region of M.P. and U.P. respectively. The list of participants is annexed at **Annexure I**.

(1) During the meeting, **following discussions were held:**

1. The first meeting of the Mission was held on 24th November, 2022 to address the pollution related issues in Singrauli, M.P. and Sonbhadra, M.P. During the meeting, several directions were given by the Mission including timely submission and implementation of the action plan by concerned stakeholders.
2. Based on the recommendations of the Mission in the last meeting, a Secretariat has been established at CPCB for coordination, monitoring, supervision and implementation of activities pertaining to decisions made by the Mission from time to time. CPCB presented the status of activities undertaken as below:
 - i. A web page - "Fly Ash Management and Utilization" – to place relevant information in public domain was created on 13.12.2022.
 - ii. Action plans submitted by power plants, coal mines and industries in Singrauli and Sonbhadra Action Plan have been shared with Oversight Committees members for MP and UP for review and scrutiny.
 - iii. Action plans of power plants and coal mines in Singrauli and Sonbhadra and the latest report of the Oversight Committees for MP and UP (District Magistrate, concerned officers of CPCB RD and State Pollution Control Board) have been scrutinized and common action points were formulated and shared with power plants and coal mines. Updated status of compliance of power plants and coal mines on common action points have been obtained. The same has been shared with State Pollution Control Board, respective Oversight Committees for quarterly verification and furnishing the status to Mission Secretariat.

- iv. The updated status of compliance of action plans for power plants and coal mines and industries have been obtained.
 - v. Action Plans for stone crushers have been submitted by M.P. State Government.
 - vi. Action plans are yet to be received from individual stone crushers from State Government of U.P in respect of Sonbhadra district.
 - vii. Draft guidelines for ash ponds/dykes have been prepared by CEA in consultation with CPCB. In view of the recent amendment notification of Ash Utilisation Notification, 2021, the guidelines are under modification to incorporate the provisions of latest amendments on use of reclaimed ash ponds for setting up of solar and wind energy plants.
 - viii. Oversight Committees for U.P. and M.P. comprising representatives of CPCB, SPCB and DM of concerned States, have submitted the first quarterly report on compliance verification.
 - ix. An account 'Voluntary Contribution Fund for Environmental Restoration & Relief' has been opened jointly by Government of M.P. and MPPCB. The account is yet to be opened by Government of U.P.
 - x. Report w.r.t. public health and risk impact assessment is submitted by Government of M.P. However, Govt. of UP is yet to submit the report in this regard.
3. It was observed that no participation from UP Govt was there.
4. Several power plants/industries raised concerns regarding disposal of fly ash particularly in respect to the non-availability of mines for backfilling or mixing of ash with external overburden dumps.
5. M/o Coal has so far identified 32 abandoned coal mines along with availability of volumes for backfilling ash by Thermal Power Plants. Nearly half of these mines have been allocated to TPPs for initiating backfilling of ash.
6. It was highlighted that a Committee under the chairmanship of Chairman, CPCB with representatives from M/o Coal, M/o Mines, M/o Power, DGMS and IBM has been constituted under Ash Utilisation Notification, 2021 for

identification of mines for backfilling of mine voids with ash/ mixing of ash with overburden dump including examination of safety, feasibility (not economic feasibility) and aspects of environmental contamination. The committee shall update the list of such mines once in quarter.

7. It was informed that Reliance Sasan Thermal Power Plant with their captive coal mine has completed the study carried out by CIMFR which provided favourable recommendations for mixing of ash with overburden in operational mine. Trials for mixing of overburden and fly ash were completed and DGMS permission was also granted. The activity of mixing of ash with the overburden dump will start soon in Sasan captive coal mine.
8. NCL informed that IIT BHU conducted a study for one of its operational mine and the study found that it is not safe for backfilling with ash. However, Sasan case study was presented by MP Pollution Control Board to NCL and concerned District Magistrate to take up similar studies for backfilling of ash in mine voids.
9. Hindalco Industries informed that they require an abandoned or working mine for disposal of red mud and boiler ash. Studies found that red mud has alkaline in nature and is suitable for backfilling in acidic mines.
10. Gorbi abandoned mine of M/s NCL was allotted to NTPC and UPRVUNL (Anpara TPP) for backfilling of ash in mine voids. NTPC has started backfilling of ash in Gorbi mines whereas, UPRVUNL is yet to start such activity. So far, 0.3 million m³ of ash has been disposed in Gorbi mine.
11. MP PCB has raised concerns of pollution generated from transportation of fly ash from Anpara TPP (UPRVUNL) to Gorbi mine for backfilling of mine voids.
12. The ash utilization percentages of various thermal power plants for FY 2021-22 are presented as below:
 - i. Nigrie, JP Associates- 89.6%
 - ii. Rihand, NTPC- 59.3%
 - iii. Singrauli, NTPC- 57.5%
 - iv. Vindhyachal, NTPC- 53%
 - v. Sasan, RPL- 52.3%

- vi. Mahan, Essar Power- 25.5%
- vii. Anpara C, Lanco- 12.8%
- viii. Obra B, UPVUNL-5.5%
- ix. Anpara A, B & D, UPVUNL-2.6%

13. Ash Utilisation Notification, 2021 mandates all Thermal Power Plants achieve 100% utilization of current ash within 3-5 year compliance cycle as applicable based on the utilisation levels in the FY 2021-22.
14. It was also mentioned that major pollution in Singrauli region of M.P. is predominantly caused by the dust generated due to coal transportation from mines to TPPs, loading and unloading activities of coal near railway sidings.
15. It was mentioned that skill training was provided to SHGs for promoting small scale clay brick manufacturers to switch over to ash based brick units in Madhya Pradesh.
16. It was mentioned that Ash Utilisation Notification, 2021 mandates all building construction agencies within 300 km radius of TPPs to use ash based products/bricks which requires to be implemented by State Pollution Control Board and District Magistrate.

(2) The **following decisions were made** during the meeting:

1. Government of U.P. to submit Action Plans regarding stone crushers in Sonbhadra District and the implementation report on the compliance of the conditions of CTOs as well as ECs in respect of all the industries.

(Action: Env. Dept, Government of U.P.)

2. Government of U.P. to create a separate account to receive voluntary contributions and funds for environment restoration and relief. 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: Env Dept., Government of U.P.)

3. Concerned State Governments to arrange for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries, and share the report with CPCB.

(Action: State Governments of U.P. and M.P.)

4. Oversight Committees comprising CPCB, concerned SPCB and respective DMs shall carry out continued verification of the implementation of action plans by industries in Singrauli & Sonbhadra, and furnish the status report once in quarter.

(Action: Oversight Committees of U.P. and M.P.)

5. Northern Coalfields Ltd. (NCL) to conduct feasibility study in excavated portions of all its operational mines as well as abandoned mines, along with availability of volume for backfilling of ash in mine voids or mixing of ash with external Overburden dumps. A template comprising details of all the mines may be formulated and a report in this regard may be submitted.

(Action: Ministry of Coal)

6. Ministry of Coal and Ministry of Mines to take effective steps for identification of more mines and make them available to coal and lignite based thermal power plants for backfilling and mixing of ash with external overburden dumps, in line with the Ash Utilisation Notification, 2021.

(Action: M/o Coal & M/o Mines)

7. Director General, DGMS may be co-opted as member of the Mission.

(Action: MoEFCC)

8. Committee under the chairpersonship of Chairman, CPCB may convene a meeting for identification of mines as well as for the development of SOP for making operational/abandoned mines available to the TPPs with M/o Coal, NCL, DGMS, NTPC, Anpara-UPRVUNL and other stakeholders, and prepare the plan for studies(mine-wise/region wise or as deemed fit) regarding availability of mines with timelines along with parallel steps for the necessary

approvals(as that of DGMS), for backfilling of ash and mixing of ash with OB in Singrauli and Sonbhadra region.

(Action: CPCB)

9. All thermal power plants shall scrupulously implement the action plans to achieve 100% ash utilization as per the compliance cycle prescribed under the Ash Utilisation Notification, 2021.

(Action: All TPPs in Singrauli and Sonbhadra region)

10. Action plans of thermal power plants shall also include status of annual safety certification of ash dykes and measures taken to prevent breaches, designation of officer responsible in this regard.

(Action: All TPPs)

11. Anpara TPP, UPRVUNL shall submit the time bound action plan for 100% utilization of ash vis-à-vis present utilization rates, backfilling of ash in Gorbi mines along with the concerns of MPPCB regarding pollution from transportation, and other plans for achieving 100% utilization of ash.

(Action: Govt of U.P., UPRVUNL)

12. Draft guidelines for technical specifications and annual certification of ash ponds/dykes may be finalised.

(Action: CPCB and CEA)

13. A meeting with Ministry of Coal, NCL, NTPC, Indian Railways, other TPPs, owners of private railway siding may be convened to identify mitigation measures for prevention, control and abatement of dust pollution predominantly caused by mining activities and transportation of coal in Singrauli region and furnish a detailed report. Accountability of pollution generated from coal transportation, loading and unloading activities may be fixed on TPPs, coal mines and railway siding (private or public) based on the jurisdiction of activities.

(Action: MPPCB and UPPCB)

14. Skilling and outreach programmes may be conducted on similar lines of training of SHGs by MPPCB for promoting switch over to ash based brick/product manufacturing.

(Action: MP and UP Govt.)

15. Enforcement measures regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs prescribed under Ash Utilisation Notification, 2021, shall be implemented to promote ash based product manufacturing.

(Action: UPPCB, MPPCB and concerned District Magistrates)

16. NHAI may be requested to utilize the ash for the road construction project.

(Action: MoEFCC)

17. As informed, studies found that red mud has alkaline in nature and is suitable for backfilling in acidic mines. Identification of an abandoned or working mine for disposal of red mud and boiler ash may be undertaken, if feasible.

(Action: CPCB)

18. Effective implementation of the mandate of 100% utilisation of ash by TPPs across the country must be ensured. In this regard, the compliance matrix shared along with the minutes of the first meeting must be implemented in a time bound manner and on a regular basis.

(Action: CPCB, CEA, All State Govts (having TPPs), All stakeholders as per Compliance Matrix)

Annexure I

List of Participants

1. Smt. Leena Nandan, Secretary, EFCC
2. Shri. Alok Kumar, Secretary, Power
3. Shri Tanmay Kumar, Chairman, CPCB
4. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
5. Shri Anandji Prasad, Advisor, MoC
6. Dr. Satyendra Kumar, Director, MoEFCC
7. Shri Nazimuddin, Scientist F, CPCB
8. Shri N. Subrahmanyam, Scientist D, MoEFCC
9. Shri Chandra Mohan Thakur, MS, MPPCB
10. Shri Gurdeep Singh, CMD, NTPC
11. Shri Ramesh Babu, Director (Operations), NTPC
12. Shri MVR Reddy, ED, SSEA, NTPC
13. Shri S.K. Takhele, CGM (SEA), NTPC
14. Shri Chetan Awsathi, STA to ED (SSEA), NTPC
15. Shri Gaurav Gahlot, Scientist C, CPCB
16. Shri Durga Nand Jha, JRF, CPCB
17. RO, MPPCB, Singrauli
18. Shri Hemant K. Sharma, Director (Environment), MPPCB
19. Shri R.K. Gupta, Superintending Engineer, MPPCB
20. Shri Gulshan Raj, CE, CD, CEA
21. Shri Amit Kumar, Director, CD, CEA
22. Shri Madan Gupta, COO, Jaiprakash Power Ventures Ltd.
23. Shri M.K.V. Ramanrao, CTO, Jaiprakash Power Ventures Ltd.
24. Shri Jitendra Malik, Director, NCL
25. Shri H.B. Shinde, CM (Environment), NCL, Singrauli
26. Shri Shripal Bhatt, DGM (Civil), NOIDA
27. Dr. Avinash Tripathi, Officer on Special Duty, NOIDA
28. Shri Wasim Ahmed, Senior DGM, Lanco Anpara Power Ltd.
29. Shri Arun Tholia, ED(Commercial), Lanco Anpara Power Ltd.
30. Shri Rajeev Tyagi, P.G.M, UPSIDA
31. Shri Santosh Kumar, DGM, NTPC

32. Shri Guru Prasad, MD, UPRVUNL
33. Shri S.K. Dutta, Director (Project), UPRVUNL
34. Shri Vipul N. Rajyaguru, GM, Grasim Industries
35. Dr. Vijay Yadav, AGM (Environment), Grasim Industries Ltd., Renukoot
36. Shri Sayed M Islam, Manager (EHS), Birla Carbon
37. Shri V R Shankar, President, Aditya Birla
38. Smt. Vaishali Surawar, Hindalco
39. Shri Jitendra Prasad, Add. Vice President, Sasan Power Ltd.
40. Shri Sanjay Singh, Grasim Industries
41. Shri R.N. Shukla, GM (Environment), APL
42. Shri Rohit Kumar
43. Shri Utpal Sarkar
44. Shri Ashwani Tyagi
45. Shri V R Shankar

F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003

Dated: 8th June, 2023

OFFICE MEMORANDUM

Sub.: Minutes of the third meeting of 'Fly Ash Management and Utilization Mission' held on 01.05.2023 - reg.

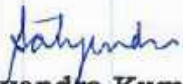
The undersigned is directed to enclose herewith the minutes of the third meeting of "Fly Ash Management and Utilization Mission" held under the Chairpersonship of Secretary (EF&CC) on 01.05.2023 at 11:00 hrs at Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, New Delhi.

2. It is requested to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority

Encl.: as above

Yours sincerely,


(Dr. Satyendra Kumar)
Director
Ph: 011-20819291
Email: satyendra.kumar07@nic.in

To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chief Secretary, State of Uttar Pradesh
5. Chief Secretary, State of Madhya Pradesh
6. Chairman, CPCB, New Delhi
7. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh

8. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
9. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
11. Director General, Directorate General of Mines Safety, Jharkhand
12. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
14. Chairman, UPPCB, Uttar Pradesh
15. Chairman, MPPCB, Madhya Pradesh
16. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
17. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
18. CMD, M/s NTPC Limited
19. CMD, M/s Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s UPRVUNL
22. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
23. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra

Copy to:-

1. PPS to Secretary (EF&CC)
2. PPS to AS(NPG)
3. Guard File

**Minutes of the meeting of Fly Ash Management and Utilization Mission
held on 01.05.2023 at 11:00 hrs**

The third meeting on 'Ash Management and Utilization Mission' was convened on 1st May, 2023 at 11:00 hrs to review the status of actions taken based on the recommendations of the Mission established in the meeting held on 31.01.2023. The list of participants is annexed at **Annexure I**.

(a) During the meeting, **following discussions were held:**

1. Ash generation and utilization by all TPPs in the country was reviewed. 186 TPPs (2,11,620 MW) generated 262.6 million tonnes during FY 2021-22. Overall ash utilization in the country was 94.7%. The details of ash utilization by TPPs are as below:
 - i. 80 % (1st compliance cycle of 3 years): 144 TPPs
 - ii. 60-80 % (1st compliance cycle of 4 years): 21 TPPs
 - iii. <60 % (1st compliance cycle of 5 years): 38 TPPs
 - 12 TPPs: non-operational; 01 TPP: data not received
2. Ash utilization percentage of various thermal power plants in Singrauli and Sonbhadra region was reviewed. The region generated 29.3 MT during FY 2022-23 and utilized 14.13 MT (48%). The details of ash utilization during FY 2021-22 & 2022-23 are as under:
 - i. Nigrie, JP Associates: 89.55% & 100.8%
 - ii. M/s Sasan TPS: 52.3% & 109.4%
 - iii. M/s Mahan Energen TPS: 25.46% & 100%
 - iv. M/s NTPC Vindhyanchal: 53% & 37.31 %
 - v. M/s Singrauli: 57.5% & 40.16%
 - vi. Rihand: 59.2% & 52.9%
 - vii. Anpara A, B & D, UPVUNL: 2.62% & 1.89%
 - viii. Obra B, UPVUNL: 5.4% & 15.34%
 - ix. Anpara 'C' Lanco TPS: 12.8% & 11.67%

3. M/s Vindhyanchal informed that tender for supplying ash for road construction projects was under process. It was informed that despite the allotment of the Gorbi mine to the power plant, infrastructure development for ash disposal was still in progress.
4. Action plans of stone crushers from Govt. of M.P. were received. Field inspections were carried out by a team of District Collector, SPCB and Mining Officers. Principal Secretary, Environment Dept. Govt. of M.P. reviewed the progress of implementation of action plans on 25.04.2023. Out of 63 stone crushers, the following have installed one or other pollution control measures:
 - 23: dust containment cum suppress system
 - 24: wind breaking wall
 - 60: water sprinkling
 - 43: greenbelt
5. The crushers located in M.P. were directed to install the remaining pollution control measures within three months.
6. Action Plans of stone crushers from U.P. (Sonbhadra District) were submitted on 21.04.2023. Around 200 stone crushers of large capacities are located at single location, causing air pollution in the region. Govt. of U.P. informed that seven defaulters out of 220 stone crushers had been closed and monitoring of air quality is carried out on weekly basis.
7. Oversight Committees of U.P. and M.P. comprising official from CPCB, SPCB and District Magistrate had carried out field inspections in February, 2023. CPCB forwarded the inspection reports of UPPCB and MPPCB for taking action on violations on 20.02.2023.
8. Principal Secretary, Deptt. Of Environment, Govt. of M.P. reviewed overall progress of actions mandated under the Mission on 25.04.2023 and issued following directions:
 - a. Vindhyanchal TPP, Sasan Power, Mahan Energen, M/s Hindalco, M/s JP Nigrie, were given directions and timelines to install pollution control measures and achieve 100% ash utilisation.

- b. Northern Coalfields Ltd. directed to conduct feasibility study for mixing of ash in OB dumps and backfilling of ash in voids of working mines.
 - c. Coal mines were mandated to procure mechanical sweepers, fog and mist sprinklers for taking up dust mitigation measures.
 - d. Coal mines were directed to set up coal handling plant and railway siding for evacuation of coal through rail to match to the expanded production capacities.
 - e. Jayant, Dudhichua and Nigahi coal mines were issued notices for taking dust pollution control measures for avoiding contamination of water bodies. Notices served to impose environmental compensation.
 - f. Suliyari open cast mine, Amelia coal mine, Mohar and Mohar Amlori coal mine and Amelia north coal mine were directed to set-up concrete roads and procure mechanical sweepers and water sprinkling machines for control of air pollution.
 - g. 8 railway sidings (ECR-3, WCR-3 and NCL-2) were directed for ensuring installation of air pollution control measures.
 - h. PWD was directed to inspect the construction of roads for control of air pollution.
9. Obra TPS had discharged ash into nearby nalla and M/s Anpara TPS had discharged ash into Rihand reservoir from the ash ponds. MPPCB imposed Environmental Compensation on UPRUVNL. The company informed that 51000 m³ of ash from the nalla near to Obra TPS and 66000 m³ of ash from Rihand reservoir had been desilted so far. The desilted ash had been used for filling up of low lying areas.
10. Central Level Working Group constituted under Additional Secretary, Ministry of Coal for allocation of coal mines for disposal of ash convened a meeting on 31.03.2023, and decided that further scientific studies for allocation of working mines for disposal of ash is not required in operational mines in view of safety issues.
11. Studies conducted by CIMFR have shown that backfilling of ash in Gare Palma IV (working mine) providing good results since 15 years and suggested that

similar study may be conducted on mine-to-mine basis. Further, Sasan coal mine has conducted a study regarding mixing of OB with ash and have shown favourable results.

12. NCL has initiated studies to be conducted by CIMFR in operational mines and the reports will be submitted by December, 2023.
13. Ministry of Coal has provided the status of identification of mines for backfilling of ash in mine voids:
 - a. 32 abandoned mines identified
 - Ash filling is ongoing/ completed: 10 mines
 - MoU is in process: 02 mines
 - Identified: 09 mines
 - b. 18 Underground (UG) coal mines of CIL
 - c. 01 Opencast mine and 09 UG mines of SCCL (100 lakh m³ bottom ash is expected to be utilized)
14. Ministry of Mines has identified 82 abandoned mines (other than coal) for filling mine voids with ash.
15. M/s Anpara, UPVUNL has requested NCL and Ministry of Coal to allot pit no. 3 of Gorbi mine for disposal of ash. NCL informed that the proposal will be submitted for Board's approval. Ministry of Coal has informed that Pit no.3 of Gorbi mine will be allocated once all statutory requirements have been met by the respective TPP.
16. NTPC mentioned that TPPs may be notified regarding the closure of the mines in advance as it takes approximately 4-5 years for infrastructure development for transportation and disposal in mine voids.
17. M/s Hindalco informed that signing of MoU between DFO, U.P, Aluminium Association of India and IIFM Bhopal is under process for backfilling of Dala abandoned stone quarry with fly ash and red mud. Request made to NCL to allot one pit of Gorbi mine for filling it with red mud and fly ash.

18. NH39 from Sidhi to Waidhan, Singrauli for about 92 km is constructed by NHAI in M.P. It was requested that ash may be utilized in the said road construction project.
19. Committee of Implementation of Ash Utilization Notification, 2021 and Committee for identification of mines under chairpersonship of Chairman, CPCB convened meeting on 18.02.2023 and Ministry of Coal was requested to update the status of allocation and initiation of backfilling, list out mines likely to be available and undertake mine (operational) specific studies for disposal of ash.
20. CPCB has identified organizations for annual certification of ash dykes in line with Ash Utilization Notification, 2021. Certification of ash dykes of thermal power plants located at Singrauli district have been done during the month of February, 2023.
21. M/o Power issued show-cause notice to 43 TPPs (37 TPP were having less than 60% of ash utilization and 06 TPPs having 60-80% ash utilization percentage). MPPCB and UPPCB issued notices to coal mines for imposing Environmental Compensation for non-compliances and no response was received from the respective Coal mine.
22. MPPGCL made several requests for allotment of abandoned mines of SECL for utilizing ash from Amarkantak TPS, Chachai for backfilling of mine voids with ash. It was informed that SECL is not allotting the said mine voids as it has been transformed into a water body.
23. Respective Committee of MoEFCC, CPCB and SPCBs constituted as per the directions of NGT in O.A. No. 862 of 2022 regarding pollution due to road transportation of ash of thermal power plants in Singrauli and Sonbhadra region carried out field inspections and submitted the reports to NGT in March 2023.
24. In line with Ash Utilization Notification, 2021, CPCB has developed ash portal on 19.12.2022 for enabling TPPs to furnish details of fly ash generation and utilization/ disposal. 180 TPPs out of 186 TPPs have uploaded the ash data on portal.
25. Director, DGMS mentioned that factor of safety of 1.5 is to be maintained to ensure long term stability and safety of OB dumps mixing with ash. Site specific

studies needs to be done to determine the percentage of ash to be mixed in the OB dumps. Further, ash can be used in place of sand stowing carried for filling up of underground mine voids.

26. The guidelines for technical specifications and annual certification of ash ponds/dykes have been further modified in view of amendment ash notification 30.12.2022 and CEA will obtain concurrence of Ministry of Power on the said guidelines.
27. Govt. of U.P. has directed District Magistrate, Sonbhadra to open a separate account to receive voluntary contributions and funds for environment restoration and relief.
28. Regarding health impact study, Madhya Pradesh Pollution Control Board nominated ICMR- NIREH for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries. Govt. of U.P is yet to submit the status.
29. District Magistrate of Singrauli District, Madhya Pradesh has identified different SHGs and initiated skilling and outreach programme for promoting switch over to ash based brick/product manufacturing under State Rural Livelihood Mission. Action in this regard is yet to be taken by UP Govt.
30. Government of M.P. and U.P. have directed respective District Magistrates to take enforcement measures regarding mandatory use of ash based products/bricks on obligated entities such as building construction agencies.

(b) The **following decisions were made** during the meeting:

1. Allocation of pits no. 3 of Gorbi abandoned mine to Anpara TPP, UPRVUNL for backfilling within one month. Allotment of abandoned mine of SECL to Amarkantak TPP, M.P. to M/s MPPGCL and abandoned mine of WCL to TPPs.

(Action: Ministry of Coal, NCL, SECL and WCL)

2. Updating the list of coal mines approaching for closure of mine in 3-5 years so that TPPs can engage with coal mines for setting up of infrastructure for transportation and disposal of ash in mine voids.

(Action: Ministry of Coal)

3. Updating information of 82 identified abandoned mines (other than coal) and setting-up procedure for signing of MoU between the identified mines and TPPs. Steps for identification of more mines for enabling TPPs achieve 100% ash utilisation.

(Action: Ministry of Mines)

4. Issue necessary instructions regarding not requiring permission from DGMS for filling up of mine voids and mixing of ash in OB dumps, and SOP for carrying out feasibility studies in respect of all mines.

(Action: Ministry of Coal and Ministry of Mines)

5. Stipulation of specific conditions in Environmental Clearances of coal mines and non-coal mines for conducting feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Ash Utilization Notification, 2021

(Action: MoEF&CC)

6. Utilization of ash in the road construction project NH39 from Sidhi to Waidhan, Singrauli, M.P. for 92 km. MoRTH may be requested to issue necessary instructions to NHAI to engage with TPPs for utilization of ash.

(Action: MoEF&CC and MoRTH)

7. Ministry of Coal may be apprised about the action initiated by MPPCB and UPPCB on environmental non-compliances of coal mines in Singrauli and Sonbhadra region.

(Action: MoEF&CC)

8. Examination of actions plans submitted by thermal power plants and stone crushers and carry out continued verification of the implementation of action plans of TPPs, Industries, mines and stone crushers in Singrauli and Sonbhadra region.

(Action: CPCB)

9. Examine the inspection and compliance reports of Anpara and Obra TPPS w.r.t. desilting ash from Rihand Reservoir and Renu River and disposal of desilted ash in low lying areas.

(Action: CPCB)

10. Finalization of guidelines for technical specifications and annual certification of ash ponds/dykes.

(Action: CPCB and CEA)

11. Dust containment and suppression measures are to be taken by the stone crushers. Carry out assessment of air quality in and around stone crushers on regular basis to verify the impact of mitigation measures taken by the stone crushers.

(Action: Stone crushers in Singrauli and Sonbhadra region, MP PCB & UP PCB)

12. All thermal power plants and stone crushers shall update the progress in regard to the implementation of action plans by respective stakeholders.

(Action: All TPPs and stone crushers in Singrauli and Sonbhadra region)

13. Creation of separate account to receive voluntary contributions and funds for environment restoration and relief. 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: Env Dept., Government of U.P.)

14. Submission of one-year action plan along with specific deliverables in respect of conducting health and risk impact assessment studies of operations of TPPs and ash generating industries, within one month.

(Action: State Governments of U.P. and M.P.)

15. Enforcement measures regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs prescribed under Ash Utilisation Notification, 2021, shall be implemented.

(Action: UPPCB, MPPCB, concerned District Magistrates)

16. Skilling and outreach programmes to be conducted on similar lines of training of SHGs by M.P. for promoting switch over to ash based brick/ product manufacturing.

(Action: Govt. of U.P. and M.P.)

17. Anpara TPP and Obra TPP to desilt the remaining ash discharged in Rihand Reservoir and Renu River by May, 2023. Desilted ash disposed in low lying areas to be stabilized with soil cover and grass/ green belt to avoid pollution.

(Action: M/s UPRVUNL)

18. Assessment and monitoring of desilting activities in water bodies where Anpara and Obra discharged ash, and stabilization activities of low lying area where desilted ash is filled up to verify the status of remedial measures taken, by June, 2023.

(Action: UPPCB and Forest Department, Govt. of UP)

19. Inter-state transportation of ash is to be permitted for utilization of ash in the specified eco-friendly purposes along with safeguards for pollution control and mitigation.

(Action: Govt. of UP and M.P.)

20. Submission of action plan indicating the timelines for initiation and completion of feasibility studies for assessing the area and volume available for ash backfilling in mine voids and mixing of ash in OB dumps in all NCL mines.

(Action: NCL)

21. Submission of time-bound action plan for achieving 100% utilization of ash by TPPs. Cost-benefit analysis to be conducted for outweighing benefits of bearing ash transportation cost/promotion of ash based product manufacturing/coal transportation cost vis-à-vis environmental compensation.

(Action: UPRVUNL, NTPC and Anpara Lanco, All TPPs)

22. A study on mixing of red mud with ash in Gorbi abandoned mine is to be carried out to neutralize acidic water of Gorbi mine pit.

(Action: NTPC and NCL)

23. Effective implementation of the mandate of 100% utilisation of ash by TPPs across the country must be ensured. In this regard, the compliance matrix shared along with the minutes of the first meeting must be implemented in a time bound manner and on a regular basis.

(Action: CPCB, CEA, All State Govts. (having TPPs), All stakeholders as per Compliance Matrix)

Annexure I

List of Participants

1. Smt. Leena Nandan, Secretary, EF&CC
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Shri Deepal Goal, Director, MoC
5. Shri Dheeraj Kumar, DS, M/o Mines
6. Shri Tirupathi Reddy Kommidi, Additional Chief Manager, NLC India Ltd., MoC
7. Shri Nazimuddin, Scientist F, CPCB
8. Shri N. Subrahmanyam, Scientist D, MoEFCC
9. Shri Chandra Mohan Thakur, PDS- Env., GoMP & MS, MPPCB
10. Shri Ajay K. Sharma, MS, UPPCB
11. Shri Mohammed Niyazi, Dir. (S&T), DGMS
12. Shri Ashutosh Kr. Dubey, ADM, Sonbhadra
13. Shri Manjeet K. Sinha, AGM-IT, NTPC
14. Shri MVR Reddy, ED, SSEA, NTPC
15. Shri S.K. Takhele, CGM (SEA), NTPC
16. Shri Chetan Awsathi, STA to ED (SSEA), NTPC
17. Shri Durga Nand Jha, JRF, CPCB
18. RO, MPPCB, Singrauli
19. Shri Hemant K. Sharma, Director (Environment), GoMP
20. Shri Rajendra Singh, CEO, UPPCB
21. Shri R.K. Gupta, Superintending Engineer, MPPCB
22. Shri Umesh Kr. Gupta, AEE, UPPCB, Sonbhadra
23. Shri Gulshan Raj, CE, CD, CEA
24. Shri Amit Kumar, Director, CD, CEA
25. Ms. Rehana Beg, Resident Engineer, M.P. Power Generating Company Limited
26. Shri Ravikant Raut, Chief Chemist, M.P. Power Generating Company Limited
27. Shri M. L. Patel, Chief Engineer, M.P. Power Generating Company Limited
28. Shri Ashok Rai, Mining Officer, Singrauli
29. Shri Ranjeet Nirmal, DMO GBN, Mining Dept. Govt. of UP
30. Shri Sanjeev Kumar, GM (Env. &F), NCL

31. Dr. Avinash Tripathi, Officer on Special Duty, NOIDA Authority
32. Shri R. K. Sharma, Project Eng., Noida Authority
33. Shri M. Narasimha Murthy, V.P., Lanco Anpara Power Ltd.
34. Shri Himanshu Verma, Sr. Manager, Lanco Anpara Power Ltd.
35. Shri Santosh Kumar Singh, Head, Adani, Mohan Energy Ltd.
36. Shri S.K. Dutta, Director (Project), UPRVUNL
37. Dr. Vijay Kr. Yadav, AGM (Environment), Grasim Industries Ltd., Renukoot
38. Shri Sayed M Islam, Manager (EHS), Birla Carbon, Renukoot
39. Shri Ashwani Tyagi, NTPC
40. Shri Vinay Ramaiya
41. Ms. Vaishali Surawar, Hindalco
42. Shri Rajashekar, NTPC
43. Shri P N Sharma, IBM
44. Shri Bharat Bhushan Chugh, Associate, NTPC
45. Shri Debanjan Basak, RPSG
46. Shri Ajit Kumar, NTPC
47. Dr. Neeraj Verma, RRT 1
48. Shri Pushpender Gaur IBM RO, Gandhinagar
49. Prof. (Dr.) Partha Ghosh
50. Shri Surajit Basu
51. Dr. Vinod K Verma, Sr VP, Aditya Birla
52. Dr. Sanjoy Chakraborty, RPSG
53. Ms. Soubhagya Tripathy, Hindalco Aditya Birla
54. Shri Mukesh Mukesh, Aditya Birla

F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003

Dated: 2nd August, 2023

OFFICE MEMORANDUM

Sub.: Minutes of the fourth meeting of 'Fly Ash Management and Utilization Mission' held on 04.07.2023 - reg.

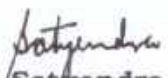
The undersigned is directed to refer the fourth meeting of 'Fly Ash Management and Utilization Mission' held on 04.07.2023 at 11:00 hrs at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 01.05.2023.

2. In view of the above, minutes of the fourth meeting of 'Fly Ash Management and Utilization Mission' is enclosed herewith.
3. It is requested to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated.

Yours sincerely,


(Dr. Satyendra Kumar)

Director

Ph: 011-20819291

Email: satyendra.kumar07@nic.in

To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chief Secretary, State of Uttar Pradesh
5. Chief Secretary, State of Madhya Pradesh
6. Chairman, CPCB, New Delhi

7. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
8. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
9. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
11. Director General, Directorate General of Mines Safety, Jharkhand
12. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
14. Chairman, UPPCB, Uttar Pradesh
15. Chairman, MPPCB, Madhya Pradesh
16. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
17. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
18. CMD, M/s NTPC Limited
19. CMD, M/s Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s UPRVUNL
22. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
23. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra

Copy to:-

1. PPS to Secretary (EF&CC)
2. PPS to AS(NPG)
3. Guard File

Minutes of the 4th meeting of Fly Ash Management and Utilization Mission
held on 04.07.2023 at 11:00 hrs

The fourth meeting on 'Fly Ash Management and Utilization Mission' was convened on 4th July, 2023 at 11:00 hr to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 01.05.2023. The list of participants is annexed at **Annexure I**.

a. During the meeting, **following discussions were held:**

1. Central Level Working Group constituted under Additional Secretary, Ministry of Coal for allocation of coal mines for disposal of ash to thermal power plants convened a meeting on 04.05.2023, and allocated Gorbi Pit- 2 and 3 of NCL to NTPC Vindhyanchal and Anpara TPS, UPRVUNL, respectively.
2. Status of allocation of abandoned mines to TPPs for backfilling of ash:
 - i. Sarni UG of WCL allocated to Satpura TPS of MPPGCL: draft MoU has been shared with MPPGCL for acceptance.
 - ii. Sharda OC (OPQR patch) of SECL allocated to Amarkantak TPS, M.P. to M/s MPPGCL-volume of 1.6 lakh m³ (15%) void was made available, out of which 90,000 m³ has been filled so far. Remaining 85% void was made available to MB Power Ltd.
 - iii. Sharada OC of SECL, Trench-1 was allocated to:
 - a. Amarkantak TPS, MPPGCL, Chachai- 0.9 lakh m³ (16 km)
 - b. NTPC, Sipat- 10.93 lakh m³ (187 km)
 - c. NTPC, Korba- 12.53 lakh m³ (199 km)
 - d. SGTPS, MPPGCL, Birsinghpur- 5.63 lakh m³ (78 km)
 - iv. M/s NCL informed that three meetings were held and the draft MoU with M/s UPRVUNL (Anpara TPP) for signing had been shared. M/s UPRVUNL informed that the MoU would be signed immediately within a week for initiation of backfilling activities.

- v. MPPGCL informed that as per the agreement, 90,000 CuM ash had been filled into the mine void of Sharda OC (OPQR patch) out of allocated void of 1.6 lakh CuM. Sharda OC has a capacity 30 lakh CuM out of which major portion of mine voids was given to M/s MB Power Ltd. It was informed that Amarkantak Power Plant, Chachai of MPPGCL is located at 16 km from the Sharda mine voids and ash can be easily transported to the void.
 - vi. MPPGCL requested to consider the allocation of Trench 2 or 3 of Sharda OC for backfilling of remaining quantity of ash as the mine is located in M.P. and ATPS of MPPGCL does not have any alternate allocation.
3. It was informed that mine void of Sharada OC (Trench 1), Chachai of SECL is used as water reservoir and meets the water requirement for industrial & community use. CIL informed that adjacent void, Trench-2 could be allotted to Amarkantak TPS, MPPGCL, Chachai.
 4. MPPGCL shared that Sarni underground mine of WCL was yet to be allocated as MoU was under finalization due to issues related to mine safety. DGMS in this regard stated that individual mine may conduct scientific study in respect of factor of safety and submit the report.
 5. It was informed that Singareni UG coal mine (SCCL) had filled up fly ash in the mine voids by ensuring the safety parameters. The SOP followed in this regard may be used for ash filling in mine voids of other UG mines.
 6. M/o Coal informed that 22 mines of CIL had been allocated for backfilling activities. The physical progress of ash back filling is dismal. NTPC has filled 32 lakhs CuM ash so far out of 655 lakhs CuM voids made available. NTPC has shared 5-year action plan for utilization of legacy ash. MPPCB was requested to permit 3000 CuM ash transportation per day against 1400 CuM. MPPCB informed that there was no restriction on quantity of ash transportation. However, District Administration allows transportation only during night time to avoid traffic and maintain safety.
 7. M/o Coal informed that about 4-5 operational mines would get closed in next few years and made available for backfilling of ash. NCL informed that two

operational mines of NCL namely Kakri Opencast Project (March, 2024) & Krishnashila Opencast Project (March, 2027) are approaching for closure by March, 2024 and March 2027, respectively.

8. NCL expressed no objection for conducting the study on mixing of red mud with ash in Gorbi abandoned mine and stated that NTPC and Hindalco Industries may carry out the said study on mutually agreed terms. NTPC expressed that appropriate safeguards in regard to discharge of wastewater from the mine into the water bodies may be considered.
9. Feasibility study to assess the area/volume available for ash backfilling and mixing of ash in with OB of NCL mines is ongoing at Nigahi operational mine by CIMFR. Approval for conducting study for Amlori, Jayant, Khadia and Dudhichua mines at M.P. is under process.
10. Ministry of Mines has shared the list of 207 identified non-coal mines for backfilling with fly ash. Further, directions were issued to all the Regional Controllers of Mines to identify more working mines, where mineral was exhausted, for backfilling activities. The list of 207 identified non-coal mines is presented below:
 - i. 82 abandoned mines: list shared earlier
 - ii. 56 mines: surrendered to State Govt.
 - iii. 57 mines: part surrendered
 - iv. Pits of 12 working mines: available for backfilling with fly ash
11. CPCB informed that the list of 207 identified non-coal has been made available on Fly Ash Management Mission's website. CEA has circulated the list to all the TPPs.
12. Anpara TPP has desilted 1.52 lakh CuM deposited ash from Rihand reservoir and desiltation of remaining 50,000 CuM ash will be completed by July, 2023. Further, desilted ash is being used to fill low lying areas. Total 58000 CuM deposited ash have been completely desilted from Renu river by Obra TPP. Desilted ash has been disposed in low lying areas in Obra Sector 2 & 3 and stabilized with soil. Development of green belt is under progress.

13. UPPCB informed that the assessment and monitoring of desilting activities in water bodies due to Anpara and Obra discharged ash will be conducted after June, 2023.
14. Regular inspections are being carried out by UPPCB and MPPCB to verify implementation of action plan by TPPs, stone crushers and industries. UPPCB is yet to submit the compliance report. The Oversight Committee conducted field inspection in the month of May, 2023.
15. Meetings were held under Principal Secretary, Env. Dept., GoMP on 09.05.2023 & 27.06.2023 to review the implementation of action plan and issued following directions:
 - i. NHAI, MP Road Development Corporation and PWD were instructed regarding compulsory use of ash in all the road construction projects in the area.
 - ii. 4 TPPs (NTPC, Amarkantak TPP, Sanjay Gandhi TPP, Shri Shingaji TPP) having % ash utilization less than 55% were directed to submit action plan for 100% ash utilization.
 - iii. NTPC Vindhyanchal was directed to complete modernization process of ESP (within 2 months), install water sprinkler system to control fugitive dust emission from ash dyke and construction of fly ash storage silos (16 hrs capacity).
 - iv. Sasan Power Ltd. was directed for laying 25 km long pipeline for transportation of ash. Mahan Energen Ltd. were directed to complete arrangement of merry-go-round and conveyer system for coal transportation and initiate transportation of ash through rail. Mohar & Mohar Amlori Extension Coal Project of Sasan Power Ltd. was directed to conduct study for mixing ash with overburden.
 - v. All TPPs were directed to submit ash dyke safety study report by reputed institute.
 - vi. NCL coal mines were directed to use 18 procured fog cannons to prevent fugitive dust emission. NCL Amlori Project were directed to establish

ETP. APMDC Ltd. were instructed regarding coal transportation through rail by March, 2025.

- vii. ECL was instructed to construct boundary wall, concrete roads and install water sprinklers in railway sidings by Dec, 2023. WCL was directed for timely completion of construction of Bargavan, Gondwali and Gajara Bahra railway siding.
 - viii. 3 stone crushers which have not taken pollution control measures, were directed to be closed and remaining crushers were directed to meet timelines for pollution control.
16. Secretary, Env. Dept. issued directions to the concerned departments for mandatory use of ash based products by all building construction agencies. A meeting was held on 09.05.2023 under Chief Secretary, Govt. of M.P. and 27.06.2023 under PS, Env. Dept. on implementation of action plan. Directions were issued to concerned stakeholders to utilize ash by roads construction agency, ash based products manufacturers and coal mines.
17. UPPCB informed that air pollution control system such as covered conveyer system, covered jaw crusher, water sprinkling arrangement, wind breaking wall, green belt, pucca roads have been installed in all 313 stone crushers and also no new stone crushers is allowed to established. 155 stone crushers were inspected out of which 47 defaulting units were issued show-cause notices under Air Act. Further, an area of 10 Ha is afforested by Miyawaki technique for the control of dust pollution.
18. MPPCB conducted air quality monitoring around Phulwari, Sonbhadra District on 22.06.2023 & 23.06.2023. It was stated that due to the installation of pollution control systems such as water sprinkler, greenbelt development, wind breaking wall and dust containment cum suppress system and due to precipitation on 22.06.2023, the results were found within the prescribed standards (PM_{10} : $100 \mu g/m^3$). Further, out of 63 inspected stone crushers, 3 crushers are to be closed and remaining crushers to meet timelines for pollution control.

19. M/s Hindalco informed that pits of Dala abandoned stone quarry is partially filled with water and are available for disposal of fly ash. Formulation of SoP by Aluminium Association of India and IIFM Bhopal is under process for conducting pilot study on mixing of red mud with fly ash for backfilling of Dala abandoned stone quarry.
20. State Govts. informed that inter-state transportation of ash has not been banned and no application was received for inter-state ash transportation.
21. CPCB has finalized guidelines for technical specifications and annual certification of ash ponds/dykes on 27.06.2023.
22. Stipulation of conditions in Environmental Clearances of coal mines and non-coal mines for conducting feasibility studies for assessment of voids for backfilling activities is under consideration by Expert Appraisal Committee (Coal Mining).
23. MoEF&CC on 4.05.2023 requested NHAI to utilize ash in all road construction projects enabling TPPs to achieve 100% ash utilization.
24. Collector of Singrauli District, Madhya Pradesh had organised a workshop on 24.06.2023 for identified SHGs for promoting switch over to ash based brick/product manufacturing. Further, directions were given to the TPPs for ensuring availability of fly ash to these SHGs. Govt. of U.P. has directed TPPs to organise skilling and outreach programme. TPPs are promoting 31 MSMEs engaged in manufacturing ash based products/ brick manufacturers.
25. Proposals from AIIMS, Bhopal for conducting health and risk impact assessment studies in Sonbhadra and Singrauli region were sanctioned on 30.06.2023 and 27.06.2023, respectively.
26. Govt. of U.P. has opened a separate account to receive voluntary contributions and funds for environment restoration and relief. It was discussed that the funds already collected under Environmental Compensation for recovering damages and remediation activities in Singrauli and Sonbhadra region may be transferred to the accounts recently created by State Government for effective utilisation for improving environment (air, water and soil) specific to this region.

27. Time-bound action plan for utilization of legacy ash were received from NTPC (Rihand Nagar & Shaktinagar), UPRVUNL (Obra TPS & UPRVUNL Anpara TPS) and Lanco Anpara Power Ltd.

28. NTPC informed that they have engaged with NHAI for road construction projects for the supply of ash. Along with this and filling of mine voids would increase the utilisation to 70%.

b. The **following recommendations were made** during the meeting:

1. SOP to be developed in respect of working mine (opencast and underground mines) for safety related issues in allocation of mines. Also, SOP to be formulated for carrying out feasibility studies for filling up of mine voids in respect of all mines.

(Action: Ministry of Labour and Employment, and DGMS)

2. Updating list of identified abandoned mines for enabling TPPs to approach the concerned mines for backfilling of mine voids with ash for achieving 100% ash utilisation. SOP for signing-up of MoU between the identified mines and TPPs to be finalised.

(Action: Ministry of Mines)

3. Details of SOP followed for Singareni underground mine (SCCL) for ash filling in mine voids may be shared with WCL and NCL for adoption of similar SOP conditions in the MoU to be signed with TPPs. A copy may be shared with MoEFCC.

(Action: Ministry of Coal)

4. Status regarding details of identified mine voids, allocation to TPPs, signing of MoU and quantity of ash filled up against the available volume may be shared and may be put up on the website and updated monthly.

(Action: Ministry of Coal)

5. List of coal mines approaching for closure of mines in 3-5 years to be updated and shared with MoP & TPPs for making early allocation, signing of MoU and preparatory activities for initiation of backfilling of ash.

(Action: Ministry of Coal)

6. A scientific methodology with GIS mapping may be evolved for allocation of mine voids/ mixing of OB dumps with ash to TPPs based on proximity to the mine and transportation distance so that the environmental impacts/ costs of transportation can be minimised. In case of Sharda OC mine (Trench -1, 2 & 3), existing allocation of 90,000 m³ to Amarkantak TPS, MPPGCL may be reviewed and it may be increased as the TPP is 16 kms from the said mine.

(Action: Ministry of Coal)

7. Completion of feasibility study for Nigahi operational mine within two months and submission timelines for initiation and completion of feasibility studies for other working mines for assessment of area and volume available for ash backfilling in mine voids and mixing of ash in OB dumps in all NCL mines. Findings of feasibility study of Nigahi operational mine shall be presented during the next meeting of the Mission.

(Action: Ministry of Coal and NCL)

8. Meeting with all TPPs to get the details about abandoned mines which may be geographically favourable to the TPPs and furnish the list of TPPs along with priority list of abandoned mines.

(Action: MoP, CEA)

9. M/o Labour and Employment and DGMS to be communicated regarding finalisation of SOP in regard to backfilling of ash in ppencast and underground mines (for both abandoned as well as working mines)and mixing of ash with overburden in dumps. A separate meeting may be convened with DGMS, M/o Coal and M/o Mines in this regard.

(Action: MoEF&CC)

10. Third-party audit for verification of implementation of action plans of TPPs, industries, stone crushers and coal mines in Singrauli and Sonbhadra region including desilting activities and reclamation of low lying areas carried out, may be undertaken through empanelled institutions/agencies and the report in this regard may be furnished during the next meeting of Mission. CPCB may work

out the cost to be incurred by individual industry in case of unit specific audit and jointly by cluster of industries in case of cluster specific audit.

(Action: CPCB)

11. In order to ensure 100% utilization of ash by all lignite and coal based thermal power plants across the country, effective monitoring and supervision of provisions of Ash Utilization Notification dated 31.12.2021 have to be scrupulously complied with. Respective stakeholders have been mapped in respect of the various activities mandated under the notification which has been shared with CPCB with the minutes of previous meeting. 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, MoP, CEA, All State Govts, All stakeholders)

12. Directorate of Mines and Geology may update the list of abandoned mines available in their respective States and make it available on State Govts. website including abandoned stone crushers. This may be put up on the website and updated every month.

(Action: State Govts. of U.P. and M.P.)

13. Environmental Compensation collected by respective SPCBs from the industries of Singrauli and Sonbhadra region prior to the opening of specific accounts and kept in common EC fund, may be transferred to respective accounts created by the State Govts, in addition to voluntary contributions. A mechanism to be put in place to utilise the funds received from this region to be used only for the said region for restoration of environment and relief. Further, State Forest Department may be engaged for carrying out measures for restoration of environment.

(Action: State Govts. of U.P. & M.P.)

14. Increase in utilisation of quantum of ash for making ash based products or eco-bricks through SHGs may be assessed by comparing pre- and post-skilling and outreach programmes. This may be updated every three months. SHGs to be

involved in making eco-bricks that can be used in tree plantation/afforestation, toilet construction activities of the public utility projects.

(Action: State Govts. of U.P. & M.P.)

15. Implementation of effective enforcement measures regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs as prescribed in Ash Utilisation Notification, 2021 and implementation of additional measures beyond the Notification, to minimise the disposal of ash in mine voids and low lying areas.

(Action: State Govts. of U.P. and M.P.)

16. Study on mixing of red mud with ash and its environmental aspects such as leaching of heavy metals into ground and surface water may be conducted and the results may be shared with CPCB.

(Action: State Govt. of M.P., MPPCB)

17. Ambient air quality monitoring in and around stone crushers to be conducted and baseline data of last two years (same season) be analysed to verify impact of mitigation measures taken by stone crushers. This may be carried out on a regular basis and data may be compiled in a continuous manner to assess the improvements as well as its sustainability. Carry out continuous evaluation of CEPI Score of Singrauli and Sonbhadra region and compile the data over the time in a continuous manner to assess the progress made. A presentation in this regard along with the implementation of CEPI action plan and verification/monitoring of desilting activities of Obra & Anpara (UPRVUNL) may be made during next meeting of the Mission.

(Action: State Govts. of U.P. and M.P., UPPCB and MPPCB)

18. SOP to be laid down for stipulation of measures to be taken during road transportation of ash, in the permission/ Consent to Operate issued for backfilling of mine void with ash and mixing the ash with OB.

(Action: State Govt. of U.P. and M.P., MPPCB and UPPCB)

19. Finalization and signing of MoU with M/s NCL for initiation of backfilling activities in Gorbi Pit-3, within a week and timelines for commencing backfilling activities to be shared. Action taken report in this regard may be submitted to the MoEF&CC.

(Action: State Govt. of U.P., Anpara TPP, UPRVUNL, MoC and NCL)

20. Carry out desiltation of remaining quantity of ash discharged in Rihand reservoir by Anpara TPP. Desilted ash disposed in low lying areas to be stabilized with soil cover and grass/ green belt. Progress to be updated on the website on monthly basis.

(Action: State Govt. of U.P., Anpara and Obra TPP, UPRVUNL)

21. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd and 3rd meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

List of Participants

1. Smt. Leena Nandan, Secretary, EF&CC
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Sh. Anandji Prasad, Advisor (Project), MoC
5. Dr. Satyendra Kumar, Director, MoEFCC
6. Shri Tirupathi Reddy Kommidi, Additional Chief Manager, MoC
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17. RO, MPPCB, Singrauli
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20. Shri Ramesh Babu, Director (Operations), NTPC
21. Shri S.K. Takhele, CGM (SSEA), NTPC
22. Shri G., Rajashekar, GM (AMG), NTPC

23. Shri Ashwani Tyagi, DGM, NTPC
24. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
25. Shri S.K. Dutta, Director (Technology), UPRVUNL
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31. Renukoot
32. Dr. Vinod K. Verma, Head Regulatory Affairs, Hindalco
33. Shri Shripal Singh, DGM (Civil), NOIDA
34. Shri S.K. Bhargava, Executive Engineer, MPIDC, Bhopal
35. Shri Shubham Pundeer, Manager (Project), YEIDA
36. Jitendra Prasad, Additional Vice President (EHS), Sasan Power Ltd.
37. Shri K.K. Mahobe, CE Civil AU& PC
38. DMF, Singrauli, MP
39. CSPGL

F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003

Date: 24th November, 2023

OFFICE MEMORANDUM

Sub.: Minutes of the fifth meeting of 'Fly Ash Management and Utilization Mission' held on 19.10.2023 - reg.

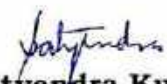
The undersigned is directed to refer the fifth meeting of 'Fly Ash Management and Utilization Mission' held on 19.10.2023 at 11:00 AM at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 04.07.2023.

2. In view of the above, minutes of the fifth meeting of 'Fly Ash Management and Utilization Mission' is enclosed herewith.
3. It is requested to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated

Yours sincerely,


(Dr. Satyendra Kumar)

Director

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To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chief Secretary, State of Uttar Pradesh
5. Chief Secretary, State of Madhya Pradesh
6. Chairman, CPCB, New Delhi

7. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
8. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
9. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
11. Director General, Directorate General of Mines Safety, Jharkhand
12. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
14. Chairman, UPPCB, Uttar Pradesh
15. Chairman, MPPCB, Madhya Pradesh
16. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
17. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
18. CMD, M/s NTPC Limited
19. CMD, M/s Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s UPRVUNL
22. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
23. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra

Copy to:-

1. PPS to Secretary (EF&CC)
2. PPS to AS(NPG)
3. Guard File

Minutes of the 5th meeting of Fly Ash Management and Utilization Mission held on 19.10.2023 at 11:00 AM

The fifth meeting of 'Fly Ash Management and Utilization Mission' was convened on 19th October, 2023 at 11:00 AM to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 04.7.2023. The list of participants is enclosed as Annexure I.

2. At the outset, Secretary welcomed all the participants. Addl. Secretary, MoEF&CC briefed about the recommendations/decisions made by the Mission in last meeting held on 04.07.2023.

3. A presentation was made by the Madhya Pradesh Pollution Control Board on the progress of implementation of various decisions of the Mission. The following details were presented:

(i) 5 Thermal Power Plants, 8 Coal mines (NCL), 56 Stone crushers, and 08 railway sidings (03 ECR; 03 ECR; 02 NCL) have submitted the action plans for implementation of pollution control measures. Periodical monitoring of action plans for TPPs, coal mines and Industries is carried out by the Board. Status of implementation of action plan and its progress has been shared with CPCB and also uploaded on MPPCB website.

(ii) Status of ash utilisation by 5 TPPs in Singrauli region of MP were presented:

TPP name	Year 2021-22		Year 2022-23		Year 2023-24 (till Sept.)	
	Generation of ash (L MT)	Utilisation (%)	Generation of ash (L MT)	Utilisation (%)	Generation of ash (L MT)	Utilisation (%)
NTPC Vindhyachal Singrauli	82.38	53.05%	76.64	37.31%	33.95	57.53%
Sasan Power Limited	53.47	52.35%	45.99	109.5%	23.85	99.1%
Mahan Energen Limited	8.36	25.46%	9.08	100.2%	6.68	117%

Jaypee Nigrie Super TPP Vill. Nigrie, Singrauli	15.79	89.55%	14.55	100.09%	9.22	86.48%
Hindalco Industries Ltd, Mahan Aluminium, Singrauli	11.54	85.55%	11.82	79.4%	5.69	134%
Total	171.54 LMT	56.96%	158.08 LMT	70%	79.4 LMT	83.87%

(iii) Status of utilisation of 15 thermal power plants (including TPPs in Singrauli) in Madhya Pradesh was presented:

Year	Ash generation (LMT)	Ash utilisation (LMT)	Utilisation (%)
FY 2021-22	285.12	176.99	62.07%
FY 2022-23	303.06	223.8	73.84%
FY 2023-24 (till Sept)	154.91	131.55	84.92%

(iv) Out of 303.06 LMT ash generation in FY 2022-23, 43.79 LMT ash utilized for backfilling in Gorbi pit and low lying areas, 10.32 LMT supplied to brick manufacturing and 70.41 LMT for others purposes.

(v) 04 Thermal Power Plants in MP have low utilisation levels of ash, namely NTPC Vindhyachal (57.53%), NTPC Gadarwara (65.31%), Sanjay Gandhi TPS, Umari (63.95%), Amarkantak TPS, Chachai (78.8%) in FY 23-24 (up to September 2023)

(vi) MPPCB issued permissions for ash utilisation in low lying areas with total area of 750.9 ha in 62 sites with capacity more than 218.5 LMT out of which 86.96 ha was utilised in 22 sites by various thermal power plants and agencies.

(vii) NTPC Vindhyanchal informed that 70% of ash generated is supplied to NHAI projects. NTPC submitted a plan to reach utilisation of 81.16% by end of FY 2023-24 from the current utilisation of 57.33%.

(viii) Chief Secretary, Govt. of M.P. directed all the stakeholders viz. NHAI, PWD, MPRDC, MPBDC & Works Department to use ash based products/bricks within 300 km radius of TPPs.

(ix) Skilling and outreach programmes for training of SHGs have been conducted by District Collector Singrauli to promote manufacturing of ash based products/bricks.

(x) Principal Secretary, Env. Dept., GoMP reviewed the implementation of action plans and air quality improvement in Singrauli region on 13.09.2023 and following directions were issued:

- a. SECL was directed to allocate abandoned mine void of Sharda opencast mine Trap-T1 to Amarkantak TPS, Sanjay Gandhi TPS.
- b. Decision on permission for inter-state transportation of fly ash from TPPs to Gorbi mine will be taken on the basis of merits of the activity.
- c. Central Laboratory, Bhopal was directed to complete the study on mixing of red mud with fly ash in Gorbi mine.
- d. NTPC Vindhyanchal was directed to install dust control arrangements. Instructions were given to Sasan Power Plant for removal of fly ash from Thargatta and Garya drain and be verified by Oversight Committee.
- e. All TPPs in Singrauli were directed to complete all pending activities recommended by the Mission.
- f. NCL was directed to complete the feasibility study for mixing of 25% ash in overburden of mines by CIMFR.
- g. East Central Railway and West Central Railways Siding Managements were directed to take coal dust emission control measures. Further, it was directed to communicate Chairman, Railway Board regarding non-implementation of action plan.

(xi) The measures namely, adequate capacity of silos to store fly ash, transportation of ash by bulkers, facility for washing of wheels of transportation trucks, keeping pond ash in moist condition (about 15%), installing permanent sprinklers, road sweeping through mechanical sweepers have been ensured at TPPs to prevent fugitive dust from ash handling and storage activities.

(xii) Out of 56 stone crushers in Singrauli region, 48 stone crushers have installed dust containment system, 41 have constructed wind breaking wall and 48 have arrangements for regular cleaning and wetting system. Further, 8 stone crushers were closed by Collector, Singrauli due to non-compliance. MPPCB conducted monitoring near stone crushers and PM10 levels were found within norms.

(xiii) Air quality analysis has been carried out in the Singrauli region during Dec, 2021- Sept, 2022 and Dec, 2022-Sept, 2023. Air Quality Index (AQI) has marginally improved from 157 in 2021-22 to 130 in 2022-23. There has been significant improvement in air quality during July-September.

(xiv) Action plans were submitted by 01 TPP and 07 NCL coal mines including Municipal Corporation Singrauli (MCS) for bringing down CEPI score. CEPI score in Singrauli region was assessed by CPCB action plan calculated by CPCB (May, 2022) was 61.38 and 45.17 by MPPCB (Aug., 2023) which is out of severely polluted area category.

(xv) The following activities from the action plan of various industries in M.P have been reported under progress:

- M/s NTPC Vindhyachal STPP, Singrauli (13 units):
 - a. Installation of FGD for SO₂ in 12 units
 - b. NOX emission control measures
 - c. % increase in fly ash utilization
 - d. R&M for Unit-4 – Commissioning job
 - e. Installation of sprinklers at ash dyke V1, V2, V3A & V3B
 - f. Arrangement for 01 Mechanized cleaning machine
- M/s Sasan Power Limited
 - a. Installation of FGD for SO₂ removal
 - b. Construction of pipeline for ash transportation
 - c. Sprinkling system in ash dyke
 - d. Submission of NEERI Report for breach of ash dyke
- M/s Mahan Energen limited:
 - a. Installation of FGD for SO₂
 - b. Development work of railway siding
 - c. Transportation by Merry go round
- M/s Hindalco Industries Ltd. Mahan, Aluminium, Bhargwan, Singrauli: Installation of FGD installation for SO₂ in Unit-1,2,3,4,5 and construction of RCC road

- Jaypee Nigrie Super Thermal Power Plant:
 - a. Installation of FGD for SO₂
 - b. Verification of Ash dyke safety report
 - c. Permanent sprinkling system at fly ash dyke
- Northern Coalfields Ltd., Singrauli: Submission of report on study conducted by CIMFR on backfilling of fly ash in OB in Nigahi Mine by December 2023.
- NCL, Amlori Project: RCC approach road and set-up treated water storage tank of 10 lakh Lt capacity
- NCL, Nigahi: Set- up additional 10 MTPA CHP and construction of CC Road
- NCL, Jayant Project: CConstruction of sedimentation pond & Pump house and arrangment for truck mounted mist spray (01).
- NCL, Block-B Project:
 - a. 4.5 MT coal handling plant
 - b. Laying of roads
 - c. 02 new fixed fog machines
- NCL, Dudhichua Project
 - a. 10 MT Coal handling plant
 - b. Dudhichua sector A to Jayant tiraha road
 - c. Additional 08 nos. stationery fog canons
 - d. New ETP of capacity 30 MLD & New Bunds
- NCL, Bina ext.
 - a. Construction of CHP of 9.5 MTPA Capacity
 - b. WBM to RCC of 4.8 kms
 - c. 02 new fixed fog machines
 - d. ETP up gradation- No progress

- APMDC Ltd.-Sulyari Open Cast Project: Set-up of coal handling plant and 5.2 KM (500 m added) chainage work.
- Sasan Power Limited (Moher & Moher Amlohri extension coal mine):
 - a. Utilized approx 30,000 MT fly ash with OB dump since April-23 to June-23. Backfilling stopped due to monsoon.
 - b. Procure mist canon for dust suppression.
 - c. Rehabilitation and resettlement of affected people.
- Jaiprakash Power Ventures Ltd., Amelia (North) Coal Mine: Not agreed to use fly ash with OB dumps. Procurement of 10 no. fog cannons.
- THDC India Ltd., Amelia Coal Block (New mine):
 - a. Coal handling plant
 - b. Remaining 2.32 km road construction
 - c. Set-up ETP of 10 kl
- East Central Railway, Spur III & X
 - a. Fixed water sprinklers
 - b. Green belt
 - c. Work as per CPCB Guidelines
- East Central Railway, Mahedaiya
 - a. Fixed water sprinklers
 - b. Green belt
 - c. Work as per CPCB Guidelines
 - d. Wind breaking wall
 - e. Approach road
- West Central Railway: Gajra Bahra, Gondawali and Bargawan:
 - a. Dust Protection walls
 - b. Water sprinkling system or tankers

- c. Drainage facility
- d. A pucca circulating handling area
- e. All weather approach Road
- f. Green belt around the coal siding area

(xvi) MPPCB constituted a four-member Committee under the chairpersonship of District Collector of each District for identification and allotment of abandoned non-coal mines to TPPs.

4. A presentation was made by the UP Pollution Control Board on the progress of implementation of various decisions of the Mission. The following details were presented:

(i) Obra TPS and Anpara TPS of UPRVUNL, Shaktinagar TPS & Rihand Sagar TPS of NTPC, Renusagar TPP of Hindalco, Lanco Anpara TPP have submitted the 05-year action plan for 100% utilisation of ash.

(ii) 06 Thermal Power Plants in Sonbhadra region have furnished the 05-year action plan for 100% utilisation of ash:

- a. M/s UPRVUNL, Anpara TPS:
- b. M/s UPRVUNL, Obra TPS
- c. M/s NTPC Shaktinagar TPS.
- d. M/s NTPC Rihand Nagar.
- e. M/s Hindalco Industries Ltd. (Power Division), Renusagar, Sonbhadra.
- f. M/s Lanco Anpara Power Ltd., Anpara, Sonbhadra

(iii) Ash utilisation in Sonbhadra region by 06 Thermal Power Plants is presented as below:

Ash quantity/Year	2021-22	2022-23	2023-24 (till Sept.)
Total quantity of ash generation	15.11 LMT	16.19 LMT	8.06 LMT
Quantity of ash utilization	5.79 LMT	5.68 LMT	3.48 LMT
% utilization of ash	38.3%	35.1%	43.2%

(iv) Out of 5.7 LMT utilisation of ash in 2022-23, the majority of the quantity (3.5 LMT) is utilised in roads, flyover and other construction activities.

(v) NTPC informed that a project is undertaken to convert bottom ash into sand. The arrangements are made to segregate bottom ash and fly ash disposed in a pond so as to enable conversion of bottom ash in to sand.

(vi) UPRVUNL for Anpara TPP civil, mechanical and electrical contracts will be placed in a month. MPPCB issued permission for transportation of ash from Anpara TPP to Gorbi mine. The ash backfilling activities are expected to start by December, 2023.

(vii) Details of coal transportation by NCL mines is presented as below:

Mine name	Mode of transportation (%)		
	Rail	Road	Aerial Ropeway
Dudhichua	77.72%	18.4	3.9
Bina	69.41	30.6	-
Khadia	70.5	29.5	-
Krishanshila	53.9	12.9	33.2
Kakri	57.65	42.34	-
Total	70.36	23.74	5.9

(viii) An amount of 58,000 m³ of deposited ash of Obra TPP (UPRVUNL) has been desilted from Renu/Rihand River and deposited in low lying areas in Obra Sector 2&3. Soil stabilization work of low lying areas has been completed and Miyawaki afforestation is carried out.

(ix) An amount of 206540.944 m³ visible ash Anpara TPP (M/s UPRVUNL) from side pocket of Rihand Reservoir has been removed and filled in low lying areas. Stabilization of ash in low lying area with soil cover has been completed and plantation work is in progress.

(x) Presently, 31 Fly ash based brick manufacturing units are operational in Sonbhadra. To increase utilization of ash based products, UPPCB issued directions to Thermal Power Plant vide letter dated 09-05-2023 to submit action plan for utilization of fly ash as per Fly Ash Notification dated 31.12.2021 and monthly progress report to CPCB and UPPCB, and organize workshop to encourage manufacturing of Fly ash based Products.

(xi) Chairman, UPPCB directed different departments on 15.05.2023 for utilization of fly ash and fly ash based products within 300 Km radius of TPPs and to provide the progress report.

(xii) A workshop held on 07.10.2023 at UPRVUNL Obra, Sonbhadra to promote Ash Utilization in manufacturing of Fly Ash Bricks and in other sectors with Fly Ash Bricks Units, TPPs and District Administrative and SPCB.

(xiii) In regard to fugitive dust emissions from ash handling and transportation, the measures namely, storage of ash under covered sheds, transportation of dry fly ash in closed tankers, arrangement at TPPs for washing of wheels of the trucks transporting ash, transportation of pond ash within water conditioning (minimum moisture of 15%) have been taken by Thermal Power Plants.

(xiv) Out of 313 Stone crushers in Sonbhadra area, 215 stone crushers have adequate Air Pollution Control Systems (APCS) such as covered conveyer system, covered jaw crusher, water sprinkling arrangement, wind breaking wall, green belt, pucca roads. 98 Stone Crushers are yet to install adequate APCS. Board issued show cause notices to 98 nos. of stone crusher units U/s 31-A of Air Act 1981, on 28.06.2023, 22.09.2023 & 25.09.2023 in which APCS were not adequate. Out of 98 units, closure directions issued against 17 Nos. of stone crusher units.

(xv) No new stone crusher is allowed to be established in District Sonbhadra. To control the dust emission and increase visibility on the road in the evening, all stone crushers are directed to stop operation between 5.00 PM to 10.00 PM daily.

(xvi) Air quality was analysed in the Sonbhadra region to see the impact of implementation measures by various industries. PM₁₀ levels have improved in 2022-23 as compared to the last year. PM₁₀ levels are 131 ug/m³ in 2022-23 (Upto Sept) as compared to 167.4 ug/m³ in 2021-22. AQI is 135.2 in 2022-23 as compared to 141.04.

(xvii) To bring down the CEPI scores, Action Plans were prepared for restoration of Polluted river stretch of River Rihand, Stretch-Renukoot and River Son Stretch-Chopan. All industries generating effluents have installed ETP/STP for treatment of Industrial/Domestic effluents and are achieving ZLD. Domestic sewage of cities Renukoot and Pipari contribute to the organic load of the Rihand river. Directions issued to concerned ULBs for survey and inventorization of drains discharging in Rihand river.

(xviii) CPCB assessed CEPI Score for Sonbhadra region and was 67.88 in May, 2022. UPPCB has re-assessed the CEPI Score in August, 2023 and is at 49.2 which is out of severely polluted area category.

(xix) Voluntary Contribution Fund for environmental restoration and relief has been opened by D.M. Sonbhadra. D.M. Sonbhadra has to provide Action Plan for restoration of Environment of District Sonbhadra, which has to be submitted to Hon'ble NGT by UPPCB for permission of transfer of EC fund.

(xx) MoU is under execution with AIIMS Bhopal for Initiating the Public Health and Risk Impact Assessment study due to fly ash consisting of 3 projects whose duration of completion is 6 months to 2 years.

(xxi) MoU between M/s NCL Singrauli (M.P.) & M/s UPRVUNL-Anpara has been signed on 15th July, 2023 for backfilling fly ash generated from Anpara TPP in Gorbi Open Cast Abandoned Mine (Pit No.-03) of NCL Singrauli (M.P.). The estimated volume of void filled with acidic water is approximately 13 Million cubic meter (Gorbi Pit-3), which will be made available for filling with fly Ash. M/s NCL Singrauli (M.P.) has given consent to allow UPRVUNL-Anpara for filling of Fly ash in Pit-3 of abandoned Gorbi mines. Permission for road transport of fly ash to Gorbi mines is awaited from District Administration, Singrauli.

(xxii) UPPCB issued directions to Northern Coalfields Ltd, Sonbhadra on 09.05.2023 to submit action plan for back filling of ash in abandoned mines and conducting feasibility study for mixing of Fly ash in back filling of Live mines. UPPCB has directed on 21.06.2023 to 05 NCL Mines Projects, Sonbhadra to provide status of Back filling of live mines void with ash mixed with OB. Action plan of NCL is awaited.

(xxiii) Director, Geology and Mining Department, Govt. of U.P. on 16.10.2023 has shared the details of 10 abandoned mines in Sonbhadra (6 nos) and Jhansi (04 nos) region with TPPs for taking necessary steps for backfilling of ash.

(xxiv) To prevent fugitive dust emissions from mines and coal transportation, the measures namely, coal transportation by tarpaulin covered trucks, installation of CCTV camera at the mine exit for continuous monitoring of trucks, covered belt conveyor from coal crusher to rake loading point, water sprinkling measures at material transfer points, water sprinkling through truck mounted mist guns and mobile tankers for within mine premises are under taken by coal mines.

5. M/o Coal has presented the status of identification mines for taking up backfilling of ash or ash mixing with Overburden in mine voids.

i. Details of 10 new identified mines are presented as below:

a. SECL:

- o Dugga void (Volume: 170 LCuM) is filled with water.
- o Bishrampur mine void (Volume: 17 LCuM) is partly filled with water as well as prohibitory orders imposed by DGMS under Sec. 22A (2).

b. WCL: Dhorwasa OC (Volume: 100 LCuM) allocated to MAHAGENCO

c. CCL:

- o Govindpur UG (Volume: 0.85 LCuM) allotted to DVC/STPS (Bottom ash could be filled for stowing)
 - o Dakra (Volume: 214.5 LCuM) allotted to Patratu: Mine is currently running and will be available from year 2023-24.
 - o Dakra-Bukbuka allocated to Hindalco Industries: available form year 2027-28.
 - o New selected Dhoru UG allocated to DVC (CTPS): after end of life of the mine
 - d. MCL: Jagannathpur OCP (Quarry VII) allocated to JTPS
 - e. NCL: Krishnashila allocated to NTPC Singaruli.
 - f. SCCL Medapalli OC (Volume: 2164.3 LCuM): mine void is 500 m away from Godavari river hence, no dumping of ash can be done.
- ii. Central level Working Group recommended the following mines to various TPPs in its meeting held on 21.9.2023:
- f. CIL-MCL mines, Jagannath OCP (Quarry VIII) to Jindal India Thermal Power Ltd.
 - g. CIL-CCL Dakra-Bukbuka mine to Hindalco Industries Ltd. (cogen Power Plant) for filling from FY 2027-28 onwards.
 - h. CIL-CCL New Selected Dhoru UG mine to NTPC Singrauli after end of life of mine
 - i. CIL-NCL Grobi Pit 1 & 2 to NTPC (Singrauli TPS)
- iii. A meeting was held under AS, MoEF&CC on 04.09.2023 for finalization of SOPs. MoC was directed to finalize SOPs based on the recommendation of the Committee constituted by MoC within one month.
- iv. SOPs in regard to safety related issues in allocation of mines and backfilling of ash in opencast and underground (operational and abandoned) and mixing of ash with OB dump to be finalized by M/o Coal. A committee has been constituted comprising DGMS and representatives of MoP, NTPC and CIMFR.
- v. NTPC informed of the challenges faced for signing MoU with mining operators for backfilling of ash in abandoned mines such as paying of lease rent, obtaining permission from DGMS and depositing funds in escrow account.
6. DGMS informed that a Guidelines for scientific study in opencast mines under Regulation 106 (2) of Coal Mines Regulation, 2017 by DGMS (Tech.) has been issued vide

circular no. 03 dated 16.01.2020 all the mine owners/ agents/ managers of opencast working coal mines and was advised to conduct a mine specific scientific study in respect of slope stability and other parameters, before commencing opencast working and submit the report. Factor of safety 1.5 to be maintained for permanent & long standing slopes. No prior permission provisioned for dumping fly ash in overburden dumps. In case of underground mines, scientific study may be conducted and based on the report backfilling activities may be carried out. The following has been summarised:

- a. **U/g working mines:** ash filling in mine voids require scientific study as well as permission from Regional Director General of Mines. DGMS issues permission within a period of 3 months after the submission of requisite study.
 - b. **Opencast working mines:**
 - i. ash filling in mine voids require scientific study to be furnished to DGMS office. No permission from DGMS is required.
 - ii. Ash mixing with OB dumps: No study and permission is required. However, safety considerations such as Factor of Safety of 1.5 is to be maintained.
 - c. **Abandoned mines:** No study and permission is required from DGMS once the mine is abandoned and lease is handed over to State Government or concerned authority.
7. CPCB made presentation on action taken on the decisions made by the Mission in its last meeting held on 04.07.2023.
- i. Status of implementation of action plans by 18 TPPs/ coal mines/industries as verified by the Oversight Committees empowered by Hon'ble NGT in June, 2023 is presented below:
 - a. Lanco Anpara C and NTPC Rihand will install FGD by Dec., 2025 and Dec 2026, respectively.
 - b. Grasim Industries Ltd. Chemical Division, Renukoot to shift mercury bearing brine sludge from factory premises to TSDF. The matter is sub-judice before the Hon'ble Supreme Court and is presently under stay.
 - c. Partial implementation of action plan w.r.t. ZLD for domestic effluent and control of fugitive emissions by HINDALCO Aluminium Smelter.
 - d. 8 TPPs/ coal mines (NTPC Singrauli, Renuagar TPP, UPRVUNL Anpara TPS, UPRVUNL Obra TPS, NCL Dudhichuwa Mine, NCL Kakri Mine, NCL Khadia

Mine, Sasan Power Ltd.) have extended their tentative time limits for implementation of specific plans/points. NCL Bina and NCL Krishnashila yet to implement action plans within timeframe set earlier.

- e. NTPC Singrauli and Anpara TPS are implementing measures to completely stop the discharge of ash pond overflow/ wastewater into the Rihand reservoir. Obra TPS has stopped ash pond overflow water carrying ash into the Renu river.
 - f. The trucks transporting coal from coal mines to TPPs are covered with thin LDPE sheets/ green net only, instead of tarpaulin resulting spillages at several locations. Fine coal dust was found along public road (Auri Mode-Shakti Nagar) and the black powder is also visible on the houses built along the roadsides as well as vehicles parked.
- ii. Updated status of action taken on decisions of 1st, 2nd, and 3rd meetings of the Mission obtained from the stakeholders are as follows:

Meeting	No. of Decisions	Complied	Regular activities*	Time-bound/ Yet to comply**
1 st	11	7	3	1
2 nd	18	13	2	3
3 rd	23	12	4	7

*All 9 decisions points repeated in 4th meeting's decisions

**6 decisions points repeated in 4th meeting's decisions. Remaining 5 decisions points are related to health risk assessment studies (3), verification of desiltation of ash by UPRVUNL plants (1), cost-benefit analysis of compliance / non-compliance by TPPs (1)

8. NCL informed that it operates 10 opencast mines across U.P. and M.P. over 312 sq km area, all of which are adjacent to each other. Further, the feasibility study on utilising fly ash in the Nigahi operational mine of NCL by CIMFR, Dhanbad is underway. Physical and mechanical properties of pond ash (NTPC Vindhyanchal and Shaktinagar) and OB (Nigahi mine) were determined. Study in respect of mixing of ash with OB experimental dump and its affect on production due to ash disposal in running mines, overburden management are in

progress. Experimental dump will be filled in five phases with pond ash-OB mixture randomly in the ratio of 1:3. Report will be submitted in December, 2023.

9. Pollution control measures such as 44 fixed fog cannons, 20 tyre mounted cannons, 14 road sweeping machines and 173 mobile water sprinklers have been deployed in all NCL mines.

10. Hindalco industries requested for allocation of abandoned Makra stone pit, Obra aggregate stone quarry, Obra road pit no. 2 & 3 and Dalla stone quarry for backfilling of ash. Further, MPPCB was requested to grant the consent to use red mud to neutralize acidic water of Gorbi coal mine of NTPC.

11. It was informed that Hon'ble NGT (PB) O.A. 862/2022 order dated 25.11.2022 in the matter of Pankaj Kumar Mishra Vs Union of India & Ors. regarding control of air pollution caused by transportation of fly ash by TPPs located in Sonbhadra and Singrauli region and unregulated coal mining & stone crushers activities, constituted a Joint Committee comprising MoEF&CC, CPCB & SPCB and directed to furnish factual report within 3 months. The Committee inspected coal mines and TPPs during Feb., 2023 and filed Action Taken Report dated 21.04.2023 before NGT. Hon'ble NGT on 10.5.2023 directed to forward a copy of report dated 21.04.2023 to MoEF&CC for further action against violations reported & furnish the report. Following are the recommendations of Joint Committee as per Report dated 21.04.2023: -

- i. Truck/tippers cover of heavy duty such as 400GSM & more thickness and adequate in size to avoid fall of coal & ash on road during transport.
- ii. Night vision Pan-tilt-zoom CCTVs & lights at prominent locations along the roads used for transportation of coal & ash may jointly be established by Coal mines, TPPs and District Administration.
- iii. Device a mechanism to impose penalty on violation by the truckers/transporters.
- iv. Formulate a traffic management plan with emphasis on road safety on the prominent routes of coal & ash transportation.
- v. Vehicle engaged in transportation of fly ash & coal to have valid Pollution Under Check (PUC) certificate and a periodic check.
- vi. Engage mechanically designed vehicles to transport the wet ash.
- vii. Effective implementation of CPCB guideline on "disposal/utilization of Fly ash for reclamation of low-lying areas and in stowing of abandoned mines/quarries.
- viii. Nagar Nigam shall deploy mechanized road sweeping machines.

- ix. Short and long-term plan to create alternate/ separate roads for the coal/ fly ash transportation and for the commuting of the general public.
- x. Construction of NH 39 should be completed at the earliest.
- 12. The following **recommendations were made during the meeting**:
 - i. Effective implementation of the provisions of Ash Utilization Notification, 2021 for mandatory 100% utilisation of ash by TPPs must be ensured. Status in this regard may be presented in the next Mission meeting.

(Action: Ministry of Power and CEA)

- ii. Details regarding total volume of mine voids and quantum of ash that can be utilised and quantum of ash that has been utilised so far in mine void filling and mixing of ash in OB dumps along with the list of mines approaching for closure of in 3-5 years may be shared.

(Action: Ministry of Coal and Ministry of Mines)

- iii. Stipulation of specific provisions in Mine Closure Plan for enabling activities of backfilling of ash in available/ remaining mine void and mixing it with OB dumps.

(Action: Ministry of Mines and Ministry of Coal)

- iv. Completion of feasibility study to assess the area/volume available for ash backfilling and mixing of ash in with OB of NCL mines at Nigahi operational mine by CIMFR within given timeframe. Findings of feasibility study of Nigahi operational mine to be presented during the next meeting of the Mission.

(Action: Ministry of Coal and NCL)

- v. NCL to make a presentation in the next meeting of the Mission regarding action plan and status of mine closure in terms of reclamation and restoration of biodiversity for the abandoned mines.

(Action: NCL)

- vi. Geo-tagging of Thermal Power Plants and Geo-tagging of mine voids may be undertaken

(Action: Ministry of Power and Ministry of Coal)

- vii. As recommended in the 4th meeting of the Mission, Standard Operating Procedures (SOPs) are to be prepared before the next meeting for the following:
 - a. SOP for allocation of mines in respect of safety and administrative related matters (both UG/OC, working as well as abandoned)

- b. SOP for signing of MoU between identified mines and TPPs
- c. SOP for carrying out feasibility studies for identification of mine voids or OB dumps mixing of ash with OB in operational mines.
- d. SOP for carrying of scientific studies for backfilling of ash in mine voids of working U/G and Opencast mines.

(Action: Ministry of Coal and Ministry of Mines)

- viii. M/o of Railways and Railway Board to be communicated for taking necessary air pollution control measures in respect of ECR (Mahadia) and WCR (Gajra Bahara, Gondawali and Bargawa) in Singrauli region of MP. Railway Board may be included as member of the Mission.

(Action: MoEF&CC)

- ix. Request of Hindalco TPP regarding allocation of abandoned stone quarry in Dala region may be forwarded to State Government and Committee for identification of mines under Ash Utilisation Notification, 2021.

(Action: MoEF&CC)

- x. CEPI score estimated by MPPCB and UPPCB in the Singrauli and Sonbhadra regions may be re-validated by CPCB.

(Action: CPCB)

- xi. An advisory may be issued to all SPCB/PCCs to circulate the latest technologies for adoption by Stone crushers for improved air pollution control measures.

(Action: CPCB)

- xii. Road map for value added products such as use of bottom ash/ fly ash as a substitute for sand, bottom ash use in concrete making in coastal infrastructure projects to be prepared in consultation with NTPC, National Test House and other stakeholders.

(Action: CPCB)

- xiii. Best available technologies/practices for ash based products to be prepared and made available on MoEFCC and CPCB website.

(Action: CPCB)

- xiv. Environmental compensation imposed on TPPs, coal mine, stone crushers in Singrauli and Sonbhadra to be monitored and action to be taken against non-compliance. Status in this regard may be shared in the next meeting.

(Action: CPCB, UPPCB and MPPCB)

- xv. Recommendations of Joint Committee as mentioned in the directions of Hon'ble NGT(PB) O.A. 862/2022 vide Order dated 25.11.2022 to be shared with MPPCB and UPPCB for submitting the details of action taken report regarding its compliance and implementation. All respective industries, TPPs, mines/ stone crushers and railway sidings to ensure the compliance of the recommendation of Joint Committee and submit the compliance report to respective SPCBs.

(Action: CPCB, SPCBs and respective Industries/ stakeholders)

- xvi. Abandoned mines which are not needed by TPPs and those completed backfilling activities may prepare plans for reclamation and restoration of biodiversity as part of mine closure plan and compliance of environmental clearance. Reclamation activities may be carried out under the supervision of State Forest Department.

(Action: Dept. of Mines and Forest Dept., Govt. of MP and UP)

- xvii. Ambient air quality monitoring in and around thermal power plants, coal mines and stone crushers may be conducted and base line data set of the same seasons collected over the past two years may be analysed. Continuous evaluation of CEPI Score of Singrauli and Sonbhadara region and compilation of data may be carried out to assess the progress made in respect of control of air pollution.

(Action: State Govts. of U.P. and M.P., UPPCB and MPPCB, CPCB)

- xviii. Study on mixing of red mud with ash and its environmental aspects may be conducted and the results may be shared with CPCB.

(Action: State Govt. of M.P., MPPCB)

- xix. Necessary directions shall be issued for covering the trucks with tarpaulin sheets for transportation of coal and ash by road and not to use thin LDPE sheets/ green net only to prevent spillage and fugitive emission of coal dust and fly ash during transportation.

(Action: UPPCB and MPPCB)

- xx. Identification of available low lying areas for disposal of ash by TPPs and monitoring of specific conditions stipulated in the consent granted for dumping of ash in it. Utilization of ash for filling allotted sites of low lying areas must be monitored through geo-tagging and/or Video monitoring. Ash disposed in low lying areas to be stabilized with soil cover and grass/ green belt.

(Action: All TPPs, UPPCB and MPPCB)

- xxi. Commencement of backfilling of ash in mine void of allotted Gorbi pit no. 3 by Anpara TPS by December, 2023. Progress in this regard may be shared with the concerned SPCB and CPCB.

(Action: Anpara TPP, UPRVUNL, UPPCB)

- xxii. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd, 3rd and 4th meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

List of Participants

1. Smt. Leena Nandan, Secretary, EF&CC- Chairperson
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Sh. Anandji Prasad, Advisor (Project), MoC
5. Sh. Piyush Singh, Joint Secretary (TD), MoP
6. Shri Tirupathi Reddy Kommidi, Additional Chief Manager, MoC
7. Shri N.K. Janoo, CCF, Forest Dept., Govt. of U.P., Meerut
8. Shri Swatantra Kumar Srivastava, Divisional Forest Officer, Forest Dept., GoU.P., Renukoot
9. Shri Chandra Mohan Thakur, MS, MPPCB
10. Shri Ajay K. Sharma, MS, UPPCB
11. Shri Ashutosh Kumar Dubey, ADM, Sonbhadra, U.P.
12. Shri Nazimuddin, Scientist F, CPCB
13. Shri N. Subrahmanyam, Scientist D, MoEFCC
14. Shri Mohammed Niyazi, Dir. (S&T), DGMS
15. Shri Kamal Kumar Jangid , Director, CEA
16. Shri P.S. Mohan Kumar, Deputy Director, CEA
17. Shri Tarun Kumar, Deputy Director, CEA, MoP
18. Shri Ranjeet Nirmal, District Mining Officer (GB Nagar), Directorate of Geology and Mining, GoUP.
19. Shri Rajendra Singh, AE, CD-3, PWD, Ghaziabad
20. Shri Mukesh Srivastava, RO, MPPCB, Singrauli
21. Shri R.K. Gupta, Superintending Engineer, MPPCB
22. Shri Gaurav Gahlot, Scientist C, CPCB
23. Shri Ramesh Babu, Director (Operations), NTPC
24. Shri S.K. Takhele, CGM (SSEA), NTPC
25. Shri G., Rajashekar, GM (AMG), NTPC
26. Shri Ashwani Tyagi, DGM, NTPC
27. Shri A.K. Samaiyar, ED, NTPC
28. Shri M.M. Mishra, Advisor, NCL, Singrauli
29. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
30. Shri Dinkar Tiwari, DM, NCL

31. Shri Sunil Prasad Singh, DT (NCL), CIL
32. Shri S.K. Dutta, Director (Technology), UPRVUNL
33. Shri Anand Kumar, Chief Engineer, UPRVUNL
34. Shri Ravikant Raut, Chief Chemist, MPPGCL
35. Smt. Rehana Beg, Resident Engineer, MPPGCL
36. Shri Ravikant Raut, Chief Chemist, MPPGCL
37. Shri Himanshu Verma, Sr. Manager, Lanco Anpara Power Ltd.
38. Shri Harshal Ambulkar, Vice-President, Grasim Industries Ltd.
39. Shri L.K. Dutta, Vice-President, Grasim Industries Ltd.
40. Dr. Vinay Kumar Yadav, AGM (Environment), Grasim Industries Ltd., Renukoot
41. Dr. Vinod K. Verma, Head Regulatory Affairs, Hindalco Industries
42. Smt. Vaishali Surawar, Hindalco Industries
43. Shri Sayed M Islam, Sr. Manager, Birla Carbon Industries Pvt. Ltd.
44. Shri Abhishek Singh, Manager, Greater Noida Authority
45. Shri Rajeev Sharma, AE, MPIDC, Bhopal
46. Dr. Sujit Kumar Mandal, Chief Scientist, CSIR-CIMFR, Dhanbad
47. Shri Prashant, CSIR-CIMFR, Dhanbad
48. Shri Durgananda Jha, SRF, CPCB
49. Shri Avneesh Kumar Chauhan
50. Shri Vinay Ramaiya
51. Shri Mukesh Mittal

F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003
Date: 3rd April, 2024

OFFICE MEMORANDUM

Sub.: Minutes of the sixth meeting of 'Fly Ash Management and Utilization Mission' held on 31.01.2024 - reg.

The undersigned is directed to refer the sixth meeting of 'Fly Ash Management and Utilization Mission' held on 31.01.2024 at 12:00 PM at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 19.10.2023.

2. In view of the above, minutes of the sixth meeting of 'Fly Ash Management and Utilization Mission' is enclosed herewith.
3. It is requested to kindly furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated

Yours sincerely,


(Dr. Satyendra Kumar)

Director

Ph: 011-20819291

Email: satyendra.kumar07@nic.in

To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chairman, Ministry of Railways (Railway Board), New Delhi
5. Chief Secretary, State of Uttar Pradesh
6. Chief Secretary, State of Madhya Pradesh

7. Chairman, CPCB, New Delhi
8. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
11. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
12. Director General, Directorate General of Mines Safety, Jharkhand
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
14. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
15. Chairman, UPPCB, Uttar Pradesh
16. Chairman, MPPCB, Madhya Pradesh
17. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
18. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
19. CMD, M/s NCL
20. CMD, M/s NTPC Limited
21. CMD, M/s Lanco Anpara Power Pvt. Ltd.
22. CMD, M/s Hindalco Industries Ltd.
23. CMD, M/s UPRVUNL
24. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
25. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
26. CMD, M/s Sasan Power Limited, Singrauli
27. CMD, M/s APMDC Ltd., Singrauli
28. Industries, Mines and Stone crushers concerned in Singrauli and Sonbhadra Region.

Copy to:-

1. PSO to Secretary (EF&CC)
2. PPS to AS(NPG)
3. Guard File

Minutes of the 6th meeting of Fly Ash Management and Utilization Mission held on 31.01.2024 at 12:00 PM

The sixth meeting of ‘Fly Ash Management and Utilization Mission’ was convened on 31st January, 2024 at 12:00 PM to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 19.10.2023. The list of participants is enclosed as Annexure.

2. At the outset, Secretary welcomed all the participants. Addl. Secretary, MoEF&CC briefed about the decisions made by the Mission in last meeting held on 19.10.2023.

3. A presentation was made by the Madhya Pradesh Pollution Control Board on progress of implementation of action plans and recommendations of Joint Committee in regard to control of air pollution due to transportation. The following details were presented:

- i. 05 Thermal Power Plants of capacity 12140 MW generated 158.08 LMT ash in Singrauli, Madhya Pradesh in FY 2022-23. Status of implementation of action plan for fly ash utilisation in the region were presented:

TPP name	Year 2021-22		Year 2022-23		Year 2023-24 (till Dec.)	
	Generatio n of ash (L MT)	Utilisatio n (%)	Generatio n of ash (L MT)	Utilisatio n (%)	Generatio n of ash (L MT)	Utilisatio n (%)
NTPC Vindhyach al Singrauli	82.38	53.05%	76.64	37.31%	51.18	56.66%
Sasan Power Limited	53.47	52.35%	45.99	109.5%	36.37	98.70%
Mahan Energen Limited	8.36	25.46%	9.08	100.2%	10.68	102.36%
Jaypee Nigrie Super TPP	15.79	89.55%	14.55	100.09%	13.83	75.38%

Vill. Nigrie, Singrauli						
Hindalco Industries Ltd, Mahan Aluminium, Singrauli	11.54	85.55%	11.82	79.4%	8.31	135.74%
Total	171.54 LMT	56.96%	158.08 LMT	70%	120.36 LMT	81 %

ii. Status of ash utilisation by 15 TPPs in Madhya Pradesh including TPPs in Singrauli:

Year	Ash generation (LMT)	Ash utilisation (LMT)	Utilisation (%)
FY 2021-22	285.12	176.99	62.07%
FY 2022-23	303.06	223.8	73.84%
FY 2023-24 (till Dec.)	204.4	172.53	87.41%

- iii. Out of 120.36 LMT ash utilisation by 05 TPPs in Singrauli in FY 2023-24 (till Dec.), 49.1 LMT (50%) ash was utilised for ash dyke raising and other activities, 19.07 LMT (19.5%) ash supplied to cement industries and 16.4 LMT (16.84%) ash utilised in road construction projects.
- iv. Out of 204.4 LMT ash generation by 15 TPPs in Singrauli region in FY 2023-24 (till Dec.), 25.94 LMT ash utilized for backfilling in Gorbi pit and low lying areas, 46.34 LMT supplied to roads & other construction projects and 49.47 LMT supplied to cement industries.
- v. 03 TPPs in M.P. have utilised less than 80% ash generated by them namely, NTPC Vindhyanchal (56.6%), Sanjay Gandhi TPS, Umaria (62.7%), Jaypee Nigrie STPP (75.3%) in FY 2023-24 (till Dec.).
- vi. NTPC Vindhyanchal is expected to utilise approximately 70 LMT (70%) available ash in road construction projects by March 2023. It was informed that a coordination Committee has been constituted under Director, NTPC to review the MoUs signed between TPPs and ash users for allocation of ash to road construction and other

related projects. CO₂ sequestration plant is also installed to capture 20 tonnes of CO₂ per day from the flue gas of the Power Plant to yield 10 tonnes/day of methanol through hydrogenation process.

- vii. Sanjay Gandhi TPS emphasized the challenges associated with the lifting of ash from the existing ash dyke (starter dyke only) with single lagoon. It was informed that the dyke was designed solely for ash disposal without any provision for lifting of ash and is surrounded by hilly terrain on three sides. MPPCB in this regard was requested to provide low-lying areas for disposal of current ash.
- viii. NCL operates 12 coal mines in Singrauli region, which produced 162 million tonnes of coal in FY 2022-23.
- ix. Action plans have been submitted by 05 Thermal Power Plants, 08 coal mines (NCL), 56 stone crushers and 08 railway sidings (03 ECR; 03 ECR; 02 NCL) for implementation of pollution control measures.
- x. The following activities form action plan of various industries in M.P. have been reported under progress:
 - a) M/s NTPC Vindhyanchal STPP, Singrauli (13 units)
 - FGD installation for SO₂ in 12 units by June, 2025
 - NOX emission control measures
 - % increase in fly ash utilisation
 - Renovation of ESP and installation of Mechanized cleaning system by March, 2024.
 - b) M/s Sasan Power Limited
 - FGD installation for SO₂ by Dec. 2026
 - Construction of pipeline for fly ash transportation by March 2024. Orders issued for procurement of equipment.
 - Sprinkling system in ash dyke
 - Submission of NEERI Report for breach of ash dyke
 - c) M/s Mahan Energen limited
 - FGD installation for SO₂ by Dec., 2026

- Development work of railway siding. Railway's approval is pending.
 - Transportation by Merry go round. Forest clearance is pending.
- d) M/s Hindalco Industries Ltd.: Installation of FGD installation for SO₂ in Unit-1,2,3,4,5 by Dec. 2026 and construction of RCC road by Aug. 2024.
- e) Jaypee Nigrie STPP: Installation of FGD installation for SO₂ by Dec., 2026 and % increase in fly ash utilisation.
- f) Northern Coalfields Ltd., Singrauli: Submission of report on study conducted by CIMFR on backfilling of fly ash in OB in Nigahi Mine by March, 2024.
- g) NCL, Nigahi: Construction of additional 10 MTPA Coal Handling Plant (CHP) and CC roads by March, 2024.
- h) NCL, Jayant Project: Arrangements for truck mounted mist spray and fog forming sprinklers and installation of Continuous Effluent Quality Monitoring System (CEQMS).
- i) NCL, Block-B Project: Construction of 4.5 MT CHP and other roads by June 2024.
- j) NCL, Dudhichua Project: Construction of roads and RCC bunds. Proposal for construction of new ETP (30 KLD) is dropped. Existing ETP needs to be upgraded.
- k) NCL, Bina ext.: Construction of 9.5 MTPA CHP, ETP upgradation and Installation of CEQMS by March 2024
- l) APMDC Ltd.-Sulyari Open Cast Project: Construction of CHP by March, 2025 and approach roads (5.2 km) under progress.
- m) Sasan Power Limited (Moher & Moher Amlohri extension coal mine):
- As utilisation in OB dumps
 - Procurement of mist cannons for dust suppression
 - Rehabilitation and resettlement of affected people
- n) Jaiprakash Power Ventures Ltd., Amelia (North) Coal Mine: Ash utilisation in OB dump will be done as per CIMFR study.
- o) THDC India Ltd., Amelia Coal Block (new mine)
- Ash utilisation as per CIMFR study
 - Construction of CHP by November 2024
 - 10 KLD ETP installation

- Construction of railway sidings

p) East Central Railway, Spur III & X

- Fixed water sprinklers
- Green belt
- Work as per CPCB Guidelines

q) East Central Railway, Mahedaiya

- Fixed water sprinklers
- Green belt
- Work as per CPCB Guidelines
- Wind breaking wall
- Construction of approach road

r) West Central Railway, Gajra Bhara and Bargawan showed no substantial progress w.r.t. the following activities:

- Dust Protection walls
- Water sprinkling system or tankers
- Drainage facility
- A pucca circulating handling area
- All weather approach Road
- Green belt around coal siding area

- xi. NEERI was engaged to conduct a study on environmental damage caused due to fly ash breach in Sasan Mega Power Ltd. in year 2020. Environmental compensation of Rs. 75 crore was estimated. The report was further forwarded to IIT BHU for re-evaluation and is under review. The final report is yet to be submitted to MPPCB.
- xii. In order to complete the feasibility study at Nigahi operational mine, NCL requires 534 trips for ash transportation out of which 225 trips for fly ash have been completed so far. Due to the restrictions on fly ash transportation during the day, sufficient quantity could not be made available at the study area (10 trips as against 15 trips in a day).

- xiii. NCL, Dudhichuwa proposed to install a new ETP of capacity 30 KLD, however it was mentioned that the existing ETP is adequate with few modifications. It was informed that the request regarding the modification of existing ETP has been submitted. An Oversight Committee comprising officials from CPCB and MPPCB inspected the treatment plant and observed that the ETP was operating below capacity and outdated. It was recommended to upgrade the ETP with advanced treatment technologies. Expert agencies in this regard have been approached for modification of existing ETP.
- xiv. It was informed that APMDC Ltd. (Sulyari Open Cast Project) in Singrauli region is permitted to transport coal exclusively by road for the next 5 years and required to establish the railway transportation system within this timeframe. APMDC Ltd. yet to initiate the construction work.
- xv. Action plans have been submitted by 56 stone crushers. 48 stone crushers have installed Dust containment system, 41 installed wind breaking wall, 48 have arrangements for regular cleaning and wetting. 08 stones crushers are closed by Collector, Singrauli.
- xvi. MPPCB has issued following directions in compliance to recommendations of Joint Committee to control of pollution caused by ash transportation in accordance with Hon'ble NGT(PB) O.A. 862/2022 order dated 25.11.2022:
 - a. TPP/Coal mines vide letter dated 14.12.2023 were directed to use heavy duty cover such as 400 GSM & more thickness of adequate size by trucks/tippers transporting coal/fly ash.
 - b. TPP/Coal mines/ District administration/ Nagar Nigam Singrauli vide letter dated 14.12.2023 were directed to install PTZ CCTVs, lights and control rooms, impose penalty on transporters on violation, prepare traffic management plan, PUC certificate for vehicle used for transportation of ash and coal.
 - c. TPP/Coal mines/ District administration/ Nagar Nigam Singrauli vide letter dated 14.12.2023 were directed to procure mechanically designed vehicle for wet transportation of ash, follow CPCB guidelines for disposal of fly ash, deploy road sweeping machine.
 - d. District Collector was requested to prepare action plan for roads for transportation of coal/ fly ash on 14.12.2023.
 - e. NHAI to complete the pending work of NH-39. Work is under progress.

xvii. The Oversight Committee comprising officials of CPCB, MPPCB and District Magistrate, Singrauli inspected thermal power plants, coal mines and railway sidings for verification of compliances of directions given by Hon'ble NGT vide its order dated 18.02.2022 in the August 2023 and January 2024 and submitted the report for 3rd and 4th quarter, respectively. Recommendations are as below:

- a) The Committee has imposed environmental compensation on various TPPs, coal mines and railway sidings for non-compliances. Hon'ble Supreme Court has referred the case to the Hon'ble NGT for re-consideration.
- b) West Central Railway and East Central Railway to comply non-compliances reported by Oversight Committee and SPCB and obtain CTO.
- c) NCL Jayant to ensure proper maintenance of O&G trap and coal siding spur-I & II.
- d) NCL Dudhichua to expedite work of RCC bund, stop effluent discharge to Balia nalla and review technical feasibility of ETP design.
- e) NCL Nigahi to ensure that no overburden and effluent shall meet Mundwani dam.
- f) M/s Sasan TPP to review technical design and feasibility of overflow logoon and submit environmental damage assessment report prepared by NEERI and ensure cleaning of ash from where drain meets to river.
- g) M/s Trimula Industries Ltd. to ensure effective operation of air pollution control devices, conveyor belt and OCEMS, cleaning of iron fines and road cleaning.

4. A presentation was made by Uttar Pradesh Pollution Control Board on progress of implementation of action plans and recommendations of Joint Committee in regard to control of air pollution due to transportation. The following details were presented:

- i. 06 TPPs in Sonbhadra namely, M/s UPRVUNL, Anpara TPS, M/s UPRVUNL, Obra TPS, M/s NTPC Shaktinagar TPS, M/s NTPC Rihand Nagar, M/s Hindalco Industries Ltd. (Renusagar) and M/s Lanco Anpara Power Ltd have submitted 5-year action plan for 100% utilisation of ash.
- ii. 06 TPPs of capacity 10670 MW produced 56.8 LMT ash in FY 2022-23. Status of fly ash utilization by 06 TPPs in Sonbhadra, U.P. were reported as below:

Financial Year	Total quantity of ash generated (LMT)	Total quantity of ash utilised (LMT)	% ash utilisation
2021-22	151.1	57.9	38.3%

2022-23	161.9	56.8	35.08%
2023-24 (till Dec)	121.1	67.4	55.6%

- iii. 05 TPPs in Sonbhadra region have low ash utilisation level namely, Lanco Anpara (15.8%), Anpara, UPRVUNL (40.55%), NTPC Shaktinagar (42.4%), Rihandnagar (70.02%) and Obra (78.3%).
- iv. Out of 121.1 LMT ash generation in FY 2023-24 (till Dec.), 34.68 LMT was utilised in construction of roads and highways, 25.2 LMT was filled in low lying areas, 10.42 LMT ash supplied to cement industries and 10.2 LMT supplied to brick manufacturers.
- v. Sonbhadra regions have 05 NCL coal mines and had produced total 49 MTPA coal in FY 2022-23.
- vi. Action plans have been submitted by 06 TPPs, 03 industries, 05 coal mines (NCL), and 313 stone crushers for implementation of air pollution control measures. The following activities form action plan of various industries in U.P. have been reported under progress:
 - a) M/s NTPC Shaktinagar: FGD installation (by Dec, 2026) and expansion of Ash Water Recirculation System (AWRS) capacity.
 - b) M/s NTPC Rihandnagar: Installation of FGD, Dry Ash Extraction System (DAES) in stage I & II and cold fog dust is in progress.
 - c) M/s UPRVUNL (Anpara A, B & D TPS)
 - ESP installation
 - FGD installation at A, B & D TPS
 - Construction of Bio-methanation plant
 - d) M/s Lanco Anpara and M/s Hindalco Industries (Power Division), Renusagar yet to install FGD.
 - e) M/s UPRVUNL (Obra): FGD installation and removal of old deposited ash in progress.
 - f) NCL, Bina Project
 - Construction of new 9.5 MTPA CHP by March, 2024
 - Plantation along Auri-Shaktinagar highway

- ETP & STP upgradation
 - Installation of 01 additional Continuous Ambient Air Quality Monitoring Stations (CAAQMS)
- g) NCL, Dudhichuwa Project
- Construction of new 10 MTPA CHP by March, 2024
 - 02 RCC bunds to prevent discharge to balia nala
 - Construction of Siltation pond
 - Tyre washing system/mechanism of Coal transporting vehicles
- h) NCL, Kakri Project: Plantation along roadside and tyre washing system/mechanism of Coal transporting vehicles on road.
- i) NCL, Khadia Project
- ETP upgradation
 - Tyre washing system/mechanism of Coal transporting vehicles
 - Construction of railway sidings
- j) NCL, Krishnashila Project: Construction of sedimentation pond and green belt.
- k) Aluminium Smelter: Hindalco Industries
- Equipment for wastes generated
 - Completion of study on mixing of red mud with fly ash
 - Submission of report on feasibility study awarded to IIFM Bhopal
- l) M/s Grasim Industries and M/s Birla Carbon have initiated Miyawaki plantation outside the plant premises.
- m) Out of 313 stone crushers, 35 stone crushers have yet to install air pollution control system. Show cause notices were issued to 18 stone crusher units and closure directions to 17 Nos. of stone crusher under Air Act for non-compliance.
- vii. Status of coal transportation by NCL via different modes in FY 2023-24 (till Dec) was presented as below:

S. No.	NCL projects	Mode of coal transportation %		
		Rail	Road	Ropeway
1.	NCL Dudhichua	84.4	15.6	-
2.	NCL Bina	71.2	28.73	-
3.	NCL Khadia	75.2	24.8	-
4.	NCI Krishnashila	50.51	14.9	34.5
5.	NCI Kakri	50.4	49.5	-

- viii. Coal mines in Sonbhadra region have adopted air pollution control measures such as use of tarpaulin covered trucks, installed CCTV cameras, covered conveyer belt, water sprinkling system, truck-mounted mist gun and mobile water sprinkling tankers.
- ix. MoU was signed on 15.07.2023 by NCL and Anpara for backfilling of ash in Gorbi Pit no. 3. Consent granted by NCL for ash filling. 13 Million cubic meters of void (filled with acidic water) will be made available by NCL. Regulatory permissions are being sought by UPRVUNL. Ash filling is yet to be started.
- x. Lanco Anpara has placed orders for 5 lakh tonnes, 3 MoUs and tenders are in pipeline. It was informed that 60% ash utilisation will be achieved by March, 2024.
- xi. Lanco Anpara has received request from UPEDA on 19th January, 2024 for supply of ash for road construction project for which signing of MoU is in final stage.
- xii. Obra TPS has stabilized and reclaimed legacy ash through plantation/ green cover. Additionally, an ash dyke has been constructed for disposal of ash.
- xiii. M/s UPRVUNL, Obra TPP has completely desilted 58000 CuM deposited ash from Renu/ Rihand river and was disposed in low lying area in Obra Sector 2 & 3. Soil stabilization has been completed and Miyawaki afforestation has been initiated.
- xiv. M/s Anpara TPP has removed 206540.9 CuM visible ash from Rihand reservoir so far and disposed off in low lying area. Soil stabilization is completed and plantation is under progress.
- xv. Consent-to-Operate granted to 11 units for disposal of ash in low-lying areas. 3856784.05 MT ash have been disposed so far.
- xvi. In the year 2023-24 (till January), 19 Million Tonnes of coal (17% of total coal production). 02 CHP are under construction and expected to be commissioned by next

year, which will enhance the rail transportation to 118 MTPA from the present 85 MTPA. Ministry of Coal has targeted to achieve mechanization and coal transportation by rail to 95% by year 2026-27.

- xvii. It was discussed that coal mines have sought amendments in Environmental Clearance for transporting coal by road for the period beyond year 2026-27.
- xviii. Central Laboratory, Bhopal to complete the study on mixing of red mud with fly ash in Gorbi mine. Hindalco Industries requested Indian Institute of Forest Management, Bhopal regarding feasibility study. Red mud pilot study may be taken up separately by MPPCB as it may lead to the leaching of heavy metals embedded in the red mud besides treating the acidic water of mine voids.
- xix. UPPCB has forwarded the list of available abandoned mines in Sonbhadra (06 mines) and Jhansi (04 mines) shared by Director, Geology and Mining Department, Govt. of U.P. to Thermal Power Plants on 16.10.2023, for backfilling activities.
- xx. CPCB estimated the combined CEPI score of 62.59 for Sonbhadra and Singrauli region in Dec. 2017 and March 2018. Further, CPCB evaluated CEPI Score for Sonbhadra region in May 2022 and was 67.88. Subsequently, UPPCB conducted re-assessment of CEPI score in August, 2023 and is at 49.2. Further, MPPCB assessed the CEPI score in August, 2023 for Singrauli region which is at 45.17. CPCB will assess CEPI score for Sonbhadra and Singrauli region in April, 2024.
- xxi. Air pollution control measure such as storage of ash under covered shed, ash transportation by closed tankers, silos for dry ash storage, facility for washing of wheels of transportation trucks, keeping pond ash in moist condition (about 15%) for transportation and loading of ash on trucks/bulkers through telescopic chutes have been undertaken by Thermal Power Plants.
- xxii. To control fugitive dust emission, measures such as transportation of coal in tarpaulin covered trucks, installation of CCTV cameras, covered conveyer belt, water sprinkling system, arrangements for truck-mounted mist gun and mobile water sprinkler tankers have been adopted by coal mines in Sonbhadra region.
- xxiii. In Sonbhadra region, ambient air quality was analysed to assess the impact of implementation measures by various TPPs. PM₁₀ level has improved to 146.3 µg/m³ in 2023-24 (till Dec.) from 167.3 µg/m³ in 2022-23. AQI improved to 135 in 2023-24 (till Dec.) as compared to 141 in 2022-23.
- xxiv. NEERI has conducted field visit on 27.12.2023 to determine carrying capacity of Stone crusher area Dala, Billi and Obra region. Report is awaited.

- xxv. Environmental compensation of Rs. 13.473 cr. were imposed on 8 TPPs (Lanco Anpara, NTPC Rihandnagar, Shaktinagar, Anpara TPs, Obra TPS, Hindalco Ind. Aluminium re-processing unit, Hindalco-Al Division and Birla Carbon). Rs. 0.516 cr. have been deposited by 04 TPPs. Closure directions issued to 17 stone crushers out of 313 stone crushers.
- xxvi. Environmental compensation of Rs. 9.954 crores imposed on 05 NCL projects (Bina, Duddhichua, Kakri, Khadia, Krishnshila). Amount is yet to be deposited. NCL Bina project deposited Rs. 2 crores for illegal dumping of coal at railway siding at Krishnshila as per Supreme Court and NGT directions.
- xxvii. UPPCB vide letter dated 18.10.2023, 13.12.2023 & 09.1.2024 has issued directions in compliance to recommendations of Joint Committee to control of pollution caused by ash transportation in accordance with Hon'ble NGT(PB) O.A. 862/2022 order dated 25.11.2022. Status was presented as below:
- a) 20% moisture content of ash is being maintained for transportation
 - b) Tyre cleaning mechanism before ash transportation is under construction.
 - c) Air pollution control measures such as transportation of ash through bunkers/ tarpaulin covered trucks, installation of water sprinkling system, development of green belt at ash dykes and water sprinkling on roads is undertaken by all TPPs. Submission of ash dyke report annually by TPPs.
 - d) TPPs have installed PTZ camera at exit of the ash transportation point.
 - e) NCL Coal mines have installed truck mounted fog cannons machines, fixed fog cannon, tyre washing mechanism (in 1 out of 4 coal mines), mechanical road sweeping machines, fixed water sprinkling mechanism, road sweeping machines and water sprinkling activities on mine road.
- xxviii. A workshop to promote ash utilisation in manufacturing of fly ash bricks and other was held on 7.10.2023 with fly ash brick manufacturing units, thermal power plants, officials of district administrative, and representatives from the State Pollution Control Board (SPCB), at UPRVUNL Obra, Sonbhadra.
5. A presentation was made by Ministry of Power/ CEA on status of implementation of the provisions of Ash Utilization Notification, 2021 to achieve 100% ash utilisation by TPPs

- i. A joint meeting under the chairmanship of Member (Thermal), CEA with the officials of CPCB and NTPC was held on 2.01.2024 regarding to review the implementation of provisions of Ash Utilisation Notification, 2021 and recommended the following:
 - a) CPCB to engage professional IT solutions agency to modify the portal w.r.t. essentials like current and legacy ash targets and their present utilisation.
 - b) All SPCBs (enforcement agencies under the Notification) to be requested to direct all TPPs within their respective jurisdictions, to upload the ash ponds coordinates for development of GIS layer for geo-tagging of TPPs. MoM/MoC may be requested for sharing mine coordinates for geo-tagging of mine voids.
 - ii. With respect to geo-tagging of TPPs, 50 TPPs have uploaded ash ponds coordinates as on date. TPPs have reported constraints in retrieving coordinates after uploading on CPCB's coal ash portal. CPCB has been provided with regular updates on this issue.
 - iii. Guidelines for procedure for annual certification of the ash pond or dyke has been published by CEA and CPCB on 30th June, 2023 and is available at CPCB and CEA's websites.
 - iv. CEA has forwarded the list of 505 TPPs (194 grid connected plants and 311 captive power plants) to CPCB for their updation and registration on Coal Ash Portal.
 - v. A meeting was convened with NHAI and NTPC to resolve the issues related to supply of ash by TPPs for road construction projects.
6. A presentation was made by Ministry of Coal on finalisation of SOPs for backfilling of ash in mine voids and mixing of ash in overburden dumps by Thermal Power Plants:
- i. SOPs have been drafted and submitted to the Committee chaired by Additional Secretary (Coal) for approval. Draft SOPs have been circulated to the concerned stakeholders and will be finalised within one month.
 - ii. CIL allocates its mine voids in accordance with the 'Guidelines of CIL offering mine out voids for fly ash disposal' as approved on 15.04.2020. No ash backfilling activities are currently being undertaken in the open-cast and underground mines of SCCL. SECL has prepared SOP for signing of MOU between identified mines and TPPs in line with CIL guidelines.
 - iii. It was informed that 60 L CuM out of 1788 L CuM voids of allotted mines have been filled with ash, so far. Steps to identify mines closing in next 3-5 years have been

finalized and will present before the Committee constituted under the Chairmanship of Additional Secretary (Coal). Thermal power plants were requested to identify mines in close proximity to their locations.

- iv. M/o Coal has identified various underground mines voids for filling bottom ash. The list will be circulated to concerned stakeholders.
 - v. The Central Level Working Group on 21.09.2023 allocated the following mines to TPPs-
 - a) CIL–MCL Jagannath OCP (Quarry-VII) allocated to Jindal India Thermal Power Limited
 - b) CIL –CCL Dakra- Bukbukamine allocated to Hindalco Industries Ltd.
 - c) CIL –CCL New Selected Dhoru UG mine allocated to DVC (CTPS)
 - d) Krishnashila, NCL allocated to NTPC-Singrauli
 - e) CIL –NCL Gorbi Pit 1 & 2 allocated to NTPC (Singrauli TPS also)
 - ii. MPPGCL informed that the issue regarding allocation of Sarni UG of WCL to Satpura TPS was discussed in the 4th meeting of Central Level Working group on 21.09.2023. The allocation request is still pending with WCL for approval. WCL is also not in agreement with the MoU.
7. NCL presented the status on feasibility study conducted at Nigahi mine and action plan and status of mine closure in terms of reclamation and restoration of biodiversity for the abandoned mines:
- i. CIMFR to complete the feasibility study conducted at Nigahi operational mine by March 2024. The study aims to identify the factors based on which the mixing of percentage of fly ash with overburden will be determined.
 - ii. Central Level working group allocated abandoned pits of Gorbi mine to the following TPPs:

Gorbi Mine void	Area of pit (Ha)	Quantity of ash that can be accommodated (Million tonne)	Allotted to Power plant	Quantity of ash filled
Pit 1	40	25	NTPC Vindhyanchal	1.853 Million tonne

			NTPC Singrauli	MoU in process
Pit 2	8	7.5	NTPC Vindhyanchal	MoU in process
			NTPC Singrauli	MoU in process
Pit 3	26	16.25	UPRUVNL- Anapra TPS	Mou signed on 15.7.2023. Ash filling yet to be started.

- iii. The post-mine closure plan, inter alia, encompasses the biological reclamation of the three Gorbi Pit-1, Pit-2, & Pit-3 (74 ha) after filling it with ash up to ground level.
 - iv. Final mine closure plan envisages activities such as ambient air quality and water quality monitoring (during and post backfilling), dismantling of infrastructure, construction of concrete wall with masonry pillars around backfilled pits (Length: 17,000 m), garland drain, sign boards, sprinkling system, vegetation of external OB dump degraded slope over 29.4 ha, landscaping and plantation over 164.4 ha, mine void completely filled with fly ash (devoid of water body), achieve convex shaped area by covering it with soil layer to avoid water accumulation after backfilling.
 - v. It was informed that in line with Ministry of Coal's Policy Guidelines for use of land acquired under Coal Bearing Areas (Acquisition & Development) Act, 1957, NCL has imposed lease rent (approximately Rs. 1 crore per annum) on the land area to be used for development of infrastructure required for backfilling activities which is causing delay in finalising the MoUs.
 - vi. Anpara TPS, UPRUVNL has sought permission from District Administration in Singrauli, M.P. regarding transportation of fly ash by road to the allotted Pit-3 of Gorbi mine for backfilling activities.
8. CPCB presented the status of actions taken on various decisions of the Mission:
- i. Status of actions taken on decisions of 1st, 2nd, 3rd and 4th meetings of the Mission obtained from the stakeholders are as follows:

Meeting	No. of Decisions	Compiled	Regular activities	Time-bound / Yet to comply*
1 st	11	7	3	1

2 nd	18	12	3	3
3 rd	23	12	4	7
4 th	21	8	8	5

* 08 decisions are time bound/ yet to comply and are related to health risk assessment studies, feasibility study for OB, pilot study for red mud, desiltation, reclamation and stabilization of ash by UPRVUNL plants and its verification, review of EC condition of non-coal mines, cost-benefit analysis of compliance / non-compliance by TPPs, GIS mapping of coal mine pits, SOP for non-coal mines, real-time data of availability of ash across all thermal power plants across the country, assessment of legacy ash in respect of all power plants across the country, online clearance for use of ash in low lying areas for approved projects only and making the compliance and reporting of all provisions relating to Ash Utilisation Notification online for all coal/lignite based thermal power plants across the country.

- ii. CPCB vide letter dated 27.12.2023 to MPPCB and UPPCB has sought details regarding monitoring/ assessment of CEPI score in and around TPPs, coal mines and stone crushers and status of compilation/ analysis of data done to assess the progress made in respect of control of air pollution.
- iii. CPCB has commenced the re-validation process of CEPI score assessed by MPPCB and UPPCB for Singrauli and Sonbhadra region, respectively in August 2023. Tender has been floated for re-validation, and will be made available by the end of February, 2024. The bid in this regard was uploaded on 29.01.2024, and will be finalized on 09.02.2023.
- iv. CPCB has published 'Environmental Guidelines for Stone Crushing Units' in July, 2023 to prevent fugitive dust emission and uploaded on CPCB's website. The guidelines were circulated to all the SPCBs/ PCCs.
- v. Jadavpur University has submitted the study proposal on value-added utilization of bottom ash generated from coal fired thermal power plants by developing innovative technologies for its use in concrete production as partial replacement of sand on 28.04.2023. CPCB conducted a meeting with JU on 8.11.2023 and also discussed the matter with the relevant department of NTPC. A short Proposal on testing bottom ash of 10 TPPs was submitted on 5.1.2024, and revised proposal on 16.1.2024. CPCB on 30.1.2024 recommended to provide financial assistance of Rs. 20 lakhs for the study. The study will be completed within nine months.

9. Chairman, Railway Board was requested to nominate an officer as a member of the Mission on 30.11.2023. MoEF&CC vide letter dated 17.01.2024 forwarded the recommendations of Mission w.r.t. air pollution control measures at ECR and WCR railway sidings.

10. Request of Hindalco TPP regarding allocation of abandoned stone quarry in Dala region was forwarded to PS, Dept. of Geology and Mining and Chairman, Committee for identification of mines on 21.12.2023.

11. Ministry of Mines vide letter dated 8.11.2023 has stated that Ministry of Labour & Employment may be requested to provide inputs regarding exemption from permission of DGMS for backfilling in mine voids and mixing of ash in OB dumps and preparation of SOP for carrying out feasibility studies in respect of all mines in view of safety issues in non-coal mines.

12. The following **recommendations were made during the meeting:**

- i. A streamlined procedure may be devised to enable potential users of ash in reaching out to Thermal Power Plants to acquire ash for various construction projects or other eco-friendly purposes. NTPC and thermal power plants to upload the availability of ash for utilisation by various agencies and prospective user agencies on the centralized portal on real time basis, to facilitate relevant stakeholders or ash users to reach out to the respective Thermal Power Plants (TPPs) for utilization in various eco-friendly purposes. A feature could be integrated in the portal allowing potential ash users to submit their applications to TPPs. Demand and supply module may be integrated into the portal.

(Action: Ministry of Power, NTPC and CPCB)

- ii. Carry out continuous evaluation of implementation of action plans by TPPs, industries, coal mines and stone crushers in Singrauli and Sonbhadra region. Compliance reports of TPPs that have effectively utilized ash above 80% in the past two years may be shared with other TPPs or Industries.

(Action: Ministry of Power, Ministry of Coal, UPPCB and MPPCB)

- iii. CIMFR to complete the feasibility study to assess the area/volume available for ash backfilling and mixing of ash in with overburden of NCL mines at Nigahi and Amelia (North) coal mines within given timeframe. Findings of feasibility study of Nigahi operational mine to be presented in the next meeting of the Mission.

(Action: Ministry of Coal, NCL & Jaiprakash Power Ventures Ltd.)

- iv. Allocation of Sarni UG mine voids of M/s WCL to Satpura TPS, M.P. Power Generation Company Ltd. for backfilling of ash may be made at the earliest.

(Action: Ministry of Coal & WCL)

- v. Neutralization of acidic mine water may be carried out, and subsequent reclamation may be undertaken through development of green cover/ plantations in abandoned mine voids to foster biodiversity restoration.

(Action: Ministry of Coal and NCL)

- vi. Ministry of Coal to review the policy/ guidelines regarding charging lease rent from TPPs for development of facilities/infrastructure required for the purpose of ash backfilling, water treatment and connected activities in the allocated mine voids/coal bearing areas.

(Action: Ministry of Coal)

- vii. A review to be undertaken with coal mines for early operationalisation of Coal Handling Plants and achieving maximum transportation of coal by rail as per the timelines prescribed by M/o Coal vis-à-vis timelines obtained through amendments of Environmental Clearances of coal mines.

(Action: Ministry of Coal, NCL, Coal Mines & Railway Board)

- viii. Draft SOPs prepared by M/o Coal for allocation of mines, signing of MoU and feasibility studies for mixing of ash with OB/backfilling of ash in o/c & u/g mines, to be shared with SPCBs and TPPs for their inputs for making it practical for implementation. A consultation meeting to be convened with all concerned stakeholders to finalize the draft SOPs. Following finalization of SOPs, the Ministry of Coal and the Ministry of Power may jointly organize a program to disseminate them to Thermal Power Plants (TPPs) and State Pollution Control Boards (SPCBs) and all other stakeholders. Additionally, the application process for allocation of mine voids to TPPs for backfilling activities may be streamlined by making the application as well as availability of mine voids online on the centralized portal. The progress to be presented in the next meeting.

(Action: Ministry of Coal and Ministry of Mines)

- ix. Details of specific air pollution control measures to be taken by Railway Board at railway sidings to be shared for communication to Railway board to by MoEFCC.

(Action: MPPCB, UPPCB and MoEF&CC)

- x. Secretary, Dept. of Power, UP to be communicated regarding the low status of status of utilisation of ash by UPRVUNL for reviewing situation to increase the utilisation levels in accordance with Ash Utilisation Notification, 2021.

(Action: MoEF&CC)

- xi. Re-validation of CEPI score of Singrauli (45.17) and Sonbhadra region (49.2) as estimated by MPPCB and UPPCB in August 2023 to be completed by April, 2024.

(Action: CPCB)

- xii. Assessment of CEPI score in Singrauli and Sonbhadra region is to be done twice in a year i.e. pre-monsoon (April-May) and post-monsoon season (December-February).

(Action: MPPCB and UPPCB)

- xiii. Examine environmental damage assessment reports submitted by NEERI and IIT BHU, and evaluate the environmental compensation & liability for the damage caused by the ash dyke breach and necessary safeguards to be taken for restoration of environment. Action taken report to be shared with MoEF&CC and CPCB.

(Action: MPPCB)

- xiv. Progress of implementation of action plans, along with timelines in respect of ash utilization and control of pollution may be updated by all Thermal Power Plants, stone crushers and coal mines. A meeting may be convened with the TPPs regarding ash utilisation in various purposes to show best practices and solutions about how several other TPPs are able to achieve 100% utilisation. Status in this regard may be presented in the next meeting.

(Action: UPPCB and MPPCB)

- xv. Estimation of environmental compensation in line with Ash Utilisation Notification, 2021 for non-compliance of targeted ash utilisation or low utilisation of ash by TPPs, and other Industries in Singrauli and Sonbhadra region. Action taken report may be shared.

(Action: CPCB, UPPCB and MPPCB)

- xvi. Action plans submitted by thermal power plants, industries, stone crushers, coal mines and railway sidings in regard to ash utilisation and control of air pollution to be evaluated and compared against Environmental Clearance (EC) conditions and

Consent to Operate (CTO) requirements, and carry out verification of implementation of these action plans. Compliance status to be presented in next meeting of the Mission.

(Action: UPPCB, MPPCB and CPCB)

- xvii. Third-party audit/evaluation for verification of implementation of action plans of TPPs, industries, stone crushers, coal mines and railway sidings in Singrauli and Sonbhadra region may be undertaken by technical institution/ agencies for implementation of action plan as well as compliance EC and CTO conditions. CPCB may create an institutional system for third-party verification of environmental compliances with use of EC funds available with SPCBs.

(Action: CPCB, MPPCB & UPPCB)

- xviii. Concerns regarding implementation of action plans by Eastern Central Railway (Spur III & X and Mahedaiya) & West Central Railway (Gajra Bahra and Bargawan) and construction of railway sidings at TPPs, industries and coal mines for coal and ash transportation by Thermal Power Plants (TPPs), industries, and coal mines in the Singrauli and Sonbhadra region may be addressed and compiled. Report in this regard may be shared with CPCB and MoEF&CC.

(Action: MPPCB and UPPCB)

- xix. Inter-state transportation of ash may be permitted for utilization of ash in the specified eco-friendly purposes along with safeguards for pollution control and mitigation.

(Action: Env. Dept., Govt. of UP and M.P.)

- xx. Notices to be issued for the TPPs & industries (Jaypee Nigrie, Mahan Energen, APMDC & THDC, etc) who are not present during meeting of the Mission.

(Action: MoEFCC)

- xxi. Contracts for supply of ash to users of road construction projects to be finalised by March, 2024 for utilisation of ash from NTPC Vindhyachal and other TPPs of NTPC.

(Action: NTPC and Ministry of Power)

- xxii. A solution to evacuation of the current ash stored temporarily in the ash pond is to be found out for achieving 100% ash utilisation, in line with the prescribed timelines in the Ash Utilisation Notification, 2021.

(Action: MPPGCL)

- xxiii. Submission of environmental damage assessment reports prepared by NEERI in regard to ash dyke breach, to MPPCB within 15 days and laying of pipeline for transportation of ash from TPP to mine void by March, 2024.

(Action: M/s Sasan Power Ltd.)

- xxiv. A notice to be issued for not initiation of construction of railway sidings, in order to complete the construction and ensure coal transportation by rail within the permitted time of 5 years, stipulated timeframe.

(Action: MPPCB & APMDC Ltd.-Suliyari Open Cast Project)

- xxv. Enforcement of 'Environmental Guidelines for Stone Crushing Units' published by CPCB in July 2023, to curb fugitive dust emissions and control of air pollution. SPCBs to prepare a report outlining the applicability of guidelines based on capacity and implementation the said guidelines including emission level in and around stone crushing units pre and post implementation. Status in this regard to be presented in the next meeting.

(Action: UPPCB, MPPCB & All stone crushers in Singrauli and Sonbhadra region)

- xxvi. Submission of action plan indicating timelines for completion of activities in regard to ash utilisation and air pollution control measures. TPPs to plan utilisation in eco-friendly purposes and utilisation in mine voids and low lying areas to be the last resort after exhausting all other eco-friendly purposes.

(Action: All TPPs and Coal mines in Singrauli and Sobhadra)

- xxvii. Initiation of backfilling of ash in allotted mine void of Gorbi Pit no. 3 by Anpara TPS, UPRVUNL. Status may be shared with UPPCB and CPCB.

(Action: UPPCB, UPRVUNL & Anpara TPS)

- xxviii. Finalisation of MoU with UPEDA for supply of ash for road construction projects.

(Action: M/s Lanco Anpara and UPPCB)

- xxix. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd, 3rd, 4th and 5th meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly

basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

List of Participants

1. Smt. Leena Nandan, Secretary, EF&CC- Chairperson
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Shri Anandji Prasad, Advisor (Project), MoC
5. Shri Satyendra Kumar, Director, MoEF&CC
6. Shri Abhishek Singh, DEE/ Mining, MoC
7. H.K. Sharma, Director (Technology), MPPCB
8. R.K. Gupta, S.E., MPPCB
9. Shri Sanjeev Kumar Singh, MS, UPPCB
10. Shri Umesh Kumar Gupta, RO, Sonbhadra, UPPCB
11. Shri Nazimuddin, Scientist F, CPCB
12. Shri N. Subrahmanyam, Scientist D, MoEFCC
13. Shri Mohammed Niyazi, Dir. (S&T), DGMS
14. Shri Satish Kumar, Director (Thermal), MoP
15. Shri Ajay Jha, Director/ EnHM, Railway Board
16. Shri Gaurav Sharma, Director ME/EnHM, Railway Board
17. Shri Amit Kumar, Director, CEA
18. Shri Aman Khare, Dy. Director, CEA
19. Shri Deepak Kumar Raghuvanshi, Dy. Director, CEA
20. Shri Shubham Pachauri, Dy. Director, CEA
21. Shri Praveen Gupta, Member (Thermal), CEA
22. Shri D.K. Sharan, AE, CD-2, Gahziabad, UPPWD
23. Shri Ranjeet Nirmal, District Mining Officer, Directorate of Geology and Mining, GoUP.
24. Shri Gaurav Gahlot, Scientist C, CPCB
25. Shri S.K. Takhele, ED (SSEA), NTPC
26. Dr. Vijay Prakash, ED (Env.), NTPC

27. Shri G., Rajashekar, GM (AMG), NTPC
28. Shri Ashwani Tyagi, DGM (Ash Mgt.), NTPC
29. Shri A.K. Samaiyar, ED, NTPC
30. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
31. Shri Rajeev Sharma, AE, RO Gwalior, MPIDC
32. Shri S.S. Singhal, JE, RO Gwalior, MPIDC
33. Shri Rakesh Singh, RO Gwalior, MPIDC
34. Shri R.S. Yadav, DGM, UPSIDA
35. Prabhat Yadav, Manager (Civil), UPSIDA
36. Shri Abhishek Pal, Manager (Civil), GNIDA
37. Shri Abhishek Singh, Manager (Civil), GNIDA
38. Shri S.K. Dutta, Director (Project), UPRVUNL
39. Shri Anand Kumar, Chief Engineer, UPRVUNL
40. Shri Ravikant Raut, Chief Chemist, MPPGCL
41. Shri N.B. Soni, Executive Engineer (F.A.V.), Sarni STPS, MPPGCL
42. Shri Narendra Malgaye, Executive Engineer, SSTPP Mundi, MPPGCL
43. Smt. Rehana Beg, Resident Engineer, MPPGCL
44. Shri Ravikant Raut, Chief Chemist, MPPGCL
45. Shri Jitendra Prasad, Additional VP-EHS, Sasan Power Ltd. (Reliance power)
46. Shri Santosh Kumar Singh, Head (AESG), Mahan Energen Ltd.
47. Shri Himanshu Verma, Sr. Manager (HSE), Lanco Anpara Power Ltd.
48. Dr. Vinay Kumar Yadav, AGM (Environment & Sustainability), Grasim Industries Ltd.,
Renukoot
49. Shri Sayed M Islam, Sr. Manager (EHS), Birla Carbon Industries Pvt. Ltd.
50. Shri Ashutosh Kumar Dwivedi, Additional CEO, Greater Noida Authority, U.P.
51. Shri Durgananda Jha, SRF, CPCB
52. Shri Avneesh Kumar Chauhan
53. Shri Kamlesh Maurya

- 54. Shri Indranil Das
- 55. Shri Vinay Ramaiya
- 56. SCCL

F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003
Date: 19th July, 2024

OFFICE MEMORANDUM

Sub.: Minutes of the seventh meeting of 'Fly Ash Management and Utilization Mission' held on 26.06.2024 - reg.

The undersigned is directed to refer the seventh meeting of 'Fly Ash Management and Utilization Mission' held on 26.06.2024 at 03:00 PM at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 31.01.2024.

2. In view of the above, minutes of the seventh meeting of 'Fly Ash Management and Utilization Mission' is enclosed herewith.
3. It is requested to kindly furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated

Yours sincerely,


(Dr. **Satyendra Kumar**)
Director

Ph: 011-20819291
Email: satyendra.kumar07@nic.in

To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chairman, Ministry of Railways (Railway Board), New Delhi
5. Chief Secretary, State of Uttar Pradesh
6. Chief Secretary, State of Madhya Pradesh

7. Chairman, CPCB, New Delhi
8. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
11. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
12. Director General, Directorate General of Mines Safety, Jharkhand
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
14. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
15. Chairman, UPPCB, Uttar Pradesh
16. Chairman, MP PCB, Madhya Pradesh
17. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
18. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
19. Director, CSIR-NEERI, Nagpur
20. CMD, M/s NCL
21. CMD, M/s NTPC Limited
22. CMD, M/s Lanco Anpara Power Pvt. Ltd.
23. CMD, M/s Hindalco Industries Ltd.
24. CMD, M/s UPRVUNL
25. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
26. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
27. CMD, M/s Sasan Power Limited, Singrauli
28. CMD, M/s APMDC Ltd., Singrauli
29. Industries, Mines and Stone crushers concerned in Singrauli and Sonbhadra Region.

Copy to:-

1. PSO to Secretary (EF&CC)
2. PPS to AS(NPG)
3. SO, HSMD

Minutes of the 7th meeting of Fly Ash Management and Utilization Mission held on 26.06.2024 at 03:00 PM

The seventh meeting of 'Fly Ash Management and Utilization Mission' was convened on 26th June, 2024 at 03:00 PM to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 31.01.2024. The list of participants is enclosed as Annexure.

2. At the outset, Secretary, EFCC welcomed all the participants. Additional Secretary, MoEF&CC briefed about the decisions taken by the Mission in last meeting held on 31.01.2024.

3. A presentation was made by the Madhya Pradesh Pollution Control Board on progress of implementation of action plans and environmental guidelines for stone crushing units published by CPCB for control of air pollution. The following details were presented:

- i. 05 Thermal Power Plants of capacity 12140 MW generated 158.96 LMT ash in Singrauli, Madhya Pradesh in FY 2023-24. Status of implementation of action plan for fly ash utilisation in the region were presented.

TPP name	Year 2021-22		Year 2022-23		Year 2023-24	
	Generation of ash (L MT)	Utilisation (%)	Generation of ash (L MT)	Utilisation (%)	Generation of ash (L MT)	Utilisation (%)
NTPC Vindhyachal Singrauli	82.38	53.05%	76.64	37.31%	66.83	56.2%
Sasan Power Limited	53.47	52.35%	45.99	109.5%	48.98	100%
Mahan Energen Limited	8.36	25.46%	9.08	100.2%	14.27	103.7%
Jaypee Nigrie Super TPP	15.79	89.55%	14.55	100.09%	18.06	89.1%

Vill. Nigrie, Singrauli						
Hindalco Industries Ltd, Mahan Aluminium, Singrauli	11.54	85.55%	11.82	79.4%	10.82	131.1%
Total	171.54 LMT	56.96%	158.08 LMT	70%	158.96 LMT	83.04 %

- ii. Status of ash utilisation by 15 TPPs in Madhya Pradesh including TPPs in Singrauli:

Year	Ash generation (LMT)	Ash utilisation (LMT)	Utilisation (%)
FY 2021-22	285.12	176.99	62.07%
FY 2022-23	303.06	223.8	73.84%
FY 2023-24	315.3	299.6	95%

- iii. 05 thermal power plants (TPPs) in the Singrauli region have utilized 132.01 lakh metric tonnes (LMT) of ash in FY 2023-24. This includes 4.45 LMT (3.3%) for brick production, 15.16 LMT (11.4%) for filling low-lying areas, 22.5 LMT (17%) for road construction, 26.5 LMT (20.1%) supplied to cement industries, and 63.3 LMT (47.9%) used for backfilling in abandoned mines, overburden (OB) mixing, stone quarry, and dyke raising activities.
- iv. 15 TPPs in Madhya Pradesh have utilized 299.6 LMT generated ash for backfilling in abandoned mines, overburden (OB) mixing, stone quarry, and dyke raising activities (32.9%), roads construction (25.7%), supplied to Cement industries (23.2%), filling low-lying areas (14.4%) and bricks manufacturing (3.6%).
- v. 02 TPPs in M.P. have utilized less than 80% ash in year 2023-24 namely, NTPC Vindhyachal, Singrauli (56.2%) and Sanjay Gandhi TPS, MPPGCL (69.01%). Further, ash utilization compliance cycle (03 year) of Jaypee Nigrie STPP was found non-satisfactory for year 2023-24.
- vi. STPSS, MPPGCL raised the concerns regarding difficulty in evacuation of current ash from operational ash as the ash pond is surrounded by hilly terrain

and there is absence of partition dyke. It was requested to consider the ash dumped in the low lying area of ash pond (up to El 481 M.) to create an operational platform and to construct a partition dyke for 2 lagoons for simultaneous operations.

- vii. CPCB has clarified that as per Ash Utilization Notification, 2021, operational ash pond/dyke cannot be treated as both active ash pond and low-lying area for ash utilization.
- viii. MoU between NTPC Vindhyanchal and CIL was signed on 31.05.2024 for Gorbi Pit 2 for ash filling. Contract signed for supply of ash to NHAI for road construction projects, which expected to increase ash utilization. Rail infrastructure to be constructed for transportation of ash from TPP to Gorbi mine. Creation of platform surrounding mine void for ash backfilling in progress. CTO to be obtained from MPPCB within a month. MoU was signed for development of infrastacture for backfilling activities.
- ix. It was informed that lease rent will be applicable to fly ash dumping, however it will be charged if any, on infrastructure requirement to be built on the land and nominal lease rent will be applicable to the extent the policy approved by the Cabinet. MoU has been signed for 6 road projects 15 LMT. NCL was requested to allow more than 15,000 tonnes per day against 3000 tonnes per day dumping of fly ash in existing pit in Gorbi mine. NCL informed that conditions will be accepted as per SOP and asked them to apply for the permission. Also, MPPCB is requested to permit transportation of ash from thick tarpaulin polythene covered truck from pond to NHAI for 20-30 kms distance only. Expected to achieve 80% ash utilization.
- x. Mines have been allocated to Amarkantak TPS and MoU has been signed.
- xi. Vindhyanchal TPS indigenous pilot plant for carbon capture unit commissioned since year 2022, it captures CO₂ from flue gas. Methanol fuel can be generated as fuel. Operationalization of methanol will be done by Aug 2024.
- xii. NCL operates 08 coal mines in Singrauli, which produced 126.8 million tonnes of coal in FY 2023-24. Details of mode of coal transportation are as follows:

S. No.	Coal mine	Coal production (Million tonnes) (FY 2023-24)	Mode of Coal Transportation (Million tonnes)		CHP Capacity (MTPA)	
			Rail/ Marry-Go-Round	Road	Existing	Under Construction
1.	Amlohri OCP	15	14.68	0.91	10	2
2.	Bina OCP	10.5	7.52	3.07	4.5	9.5
3.	Block-B OCP	5.47	4.44	1.03	3.5	4.5
4.	Dudhichuwa OCP	25	18.88	3.96	20	5
5.	Jayant OCP	30	28.81	1.29	25	-
6.	Jhingurda OCP	3.34	2.71	0.61	2.5	-
7.	Khadia OCP	15	11.96	3.79	10	4
8.	Nigahi OCP	22.5	20.81	1.96	15	10
	Total	126.81	109.81 (86%)	16.62 (16.6%)	90.5	35

xiii. Action plans have been submitted by 05 Thermal Power Plants, 08 NCL coal mines, 04 private mines, 56 stone crushers and 08 railway sidings (03 ECR; 03 ECR; 02 NCL) for implementation of pollution control measures.

xiv. The following activities form action plan of various industries in M.P. have been reported under progress:

a. M/s NTPC Vindhyanchal STPP, Singrauli (13 units)

- FGD installation for SO₂ in 12 units by June, 2025
- NOX emission control measures
- % increase in fly ash utilisation (non-satisfactory for FY 2023-24)
- Renovation & modernization of ESP by Oct., 2024

- Installation of Mechanized cleaning system by May, 2024
 - Inventorization study for industries operating around the Rihand reservoir (contract awarded for 2 years)
- b. M/s Sasan Power Limited
- FGD installation for SO₂ by Dec. 2026
 - Construction of pipeline for fly ash transportation by Dec., 2024. Orders issued for procurement of equipment.
 - Gawaiya/Garra nallah- Some deposit is still there (Verification to be done by RO)
- c. M/s Mahan Energen limited
- FGD installation for SO₂ by Dec., 2026
 - Development work of railway siding. Railway's approval is pending.
 - Transportation by Merry go round by Dec., 2026
- d. M/s Hindalco Industries Ltd.: Installation of FGD installation for SO₂ in Unit-1,2,3,4,5 by Dec. 2026 and construction of RCC road by Aug. 2024.
- e. Jaypee Nigrie STPP: Installation of FGD installation for SO₂ by Dec., 2026 and % increase in fly ash utilisation (non-satisfactory for FY 2023-24).
- f. Northern Coalfields Ltd., Singrauli: Submission of final report on study conducted by CIMFR on backfilling of fly ash in OB in Nigahi Mine by October, 2024.
- g. NCL, Khadia Project
- Carrying capacity of Mine & traffic study (EC Condition) by Dec., 2024
 - Installation of CEQMS (EC Condition) by May, 2024
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
- h. NCL, Amlori Project
- Installation of 01 CAAQMS (EC Cond.) by Sep., 2024

- Transportation of material by rail/conveyor belt (EC Cond.) by Dec., 2024
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
 - Carrying capacity of Mine & traffic study (EC Cond.)
- i. NCL, Nigahi
- Additional 10 MTPA CHP by Dec., 2024
 - Construction of CC Road (Nigahi wharf wall to Central workshop) by Dec., 2024
 - Installation of CEQMS at ETP (EC Cond.) (Connectivity is pending)
 - Deployment of trucks based on Hybrid Fuel Technology/ CNG/ EVs (EC Cond.) by Dec., 2024
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
- j. NCL, Jayant Project
- Installation of CWQMS
 - Deployment of trucks based on Hybrid Fuel Technology/ CNG/ EVs (EC Cond.). Timelines not given.
 - Installation of fixed type fog canon (EC Cond.) by July, 2024
 - Fixed type water sprinkler along haul road till CHP, Rly siding & OB dump area (EC Cond.) by August, 2024
 - Eco park will be developed (EC Cond.) by March 2025
 - Carrying capacity of Mine & traffic study (EC Cond.) by Dec., 2024
 - Action plan for cleaning of balliya nallah. Timelines not given.
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
- k. NCL, Block-B Project
- 4.5 MT coal handling plant by Oct., 2024

- Other roads by June 2024
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
- I. NCL, Dudhichua Project
- Approach road in front of GM office (500 m) (Completed, verification awaited)
 - Study of existing ETP (Oversight committee observation). Report awaited.
 - Action plan for cleaning of baliya nallah. Timeline not given.
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024.
- m. NCL, Bina ext.
- Construction of CHP of 9.5 MTPA Capacity by June, 2024
 - ETP upgradation by July, 2024
 - Installation of CEQMS (connectivity to CPCB server)
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
 - Carrying capacity of Mine & traffic study (EC Cond.) by Dec., 2024
- n. NCL, Jhingurda: Plantation over an area of 60 Ha within a period of 02 year (EC Condition) by FY 2025-26 and installation of automatic wheel washing system (Added on 01.06.2024) by Dec., 2024.
- o. APMDC Ltd.-Sulyari Open Cast Project
- Fly ash utilization in OB. Timeline not given
 - Immediate Installation of CHP (EC Cond.) by March 2025
 - Railway siding construction without delay (EC Cond.) by March 2025
 - Crusher and in-pit belt conveyor with mist type sprinkler (EC Condition). Timeline not given
 - CWQMS in ETP/STP (EC Condition). Timeline not given.

- ETP for workshop & CHP (added on 01.06.2024). Timeline not given.
- p. Sasan Power Limited (Moher & Moher Amlohri extension coal mine)
- Utilizing fly ash in OB Dumps
 - Procurement of mist canon by March 2024
 - Rehabilitation & resettlement of affected people – Silt removal is going on, planning to erect barriers by May, 2024
- q. Jaiprakash Power Ventures Ltd., Amelia (North) Coal Mine
- Fly ash utilization in OB dumps will be done according to CIMFR study. Report awaited.
 - Plantation on dump area towards kanchan river (EC Cond.) by Monsoon 2024
 - Fixed water sprinklers near railway siding (EC Cond.) by Aug., 2024
 - Dedicated road for coal transportation within ML & Outside ML up to NH with air pollution measures like Fog canons, wind barrier & green belt (EC Cond.). Timelines not given.
- r. THDC India Ltd., Amelia Coal Block (New mine)
- Fly ash utilization in OB dumps will be done according to CIMFR study. Timelines not given.
 - Construction of CHP with RLS – under progress for 10.68 km out of 14 km by Nov., 2024
 - Construction of Permanent railway siding- Land not allotted by year 2026
 - Ultra sonic Flow meter in ETP/STP (EC Cond.) by Sep., 2024
 - Installation of 03 No. Of CAAQMS. (EC Cond.). 01 operational and 01 proposed.
 - Installation of STP for township (CTO Cond.). Timelines not given.
- s. East Central Railway, Spur III & X
- Fixed water sprinklers by Sep., 2024
 - Work as per CPCB Guidelines by Dec., 2024

- Status of control of dust found un- satisfactory
- t. East Central Railway, Mahedaiya
- Fixed water sprinklers by Sept 2024
 - Wind breaking wall by Sept 2024
 - Construction of approach road by Sept 2024
 - Work as per CPCB Guidelines by Dec 2024
 - Status of control of dust found un- satisfactory
- u. West Central Railway, Gondawali showed no substantial progress w.r.t. the following activities:
- Green belt around coal siding area by Sep., 2024
 - Dust Protection walls by Dec., 2024
 - Water sprinkling system or tankers by Dec., 2024
 - Drainage facility by Dec., 2024
 - A pucca circulating handling area by Dec., 2024
 - All weather approach Road by Dec., 2024
- v. West Central Railway, Bargawan showed no substantial progress w.r.t. the following activities:
- Dust Protection walls (1300 m) by Dec., 2024
 - Water sprinkling system -1000 m by Aug., 2024
 - A pucca circulating handling area by Aug., 2024
 - Drainage facility by Aug., 2024
 - All weather approach Road by Aug., 2024
 - Green belt around the coal siding area by Sep., 2024
- w. West Central Railway: Gajra Bahra
- Dust Protection walls (1.5 m height extension). No timeline reported.
 - Water sprinkling system -500 m- Wall mounted sprinkling system- Material received. No timeline reported

- Water sprinkling system -700 m- Movable sprinkling system. No timeline reported
 - Pucca circulating handling area
 - All weather approach Road. No timeline reported
 - Green belt around the coal siding area. No timeline reported
- xv. Action plans have been submitted by 56 stone crushers. 48 stone crushers have installed dust containment system, 41 installed wind breaking wall, 48 have arrangements for regular cleaning and wetting. 08 stones crushers are closed by Collector, Singrauli.
- xvi. Direction issued to Collector, Singrauli & RO vide dated 18.04.2024 to submit action plan for stone crushers as per CPCB Guidelines. RO, Singrauli issued directions to crushers vide dated 30.04.2024 to install air pollution control equipment as per CPCB Guidelines. Closure notices were issued to 15 stone crushers (capacity 200 TPH) by RO, Singrauli for non-installation of air pollution control equipment.
- xvii. Notices were issued to 23 TPPs, industries, coal mines and railway sidings for non-compliances of action plan in May, 2024. Environmental compensation of approximately Rs. 138.7 crore have been levied on 13 TPPs/coal mines/railway sidings for non-compliance. The order of NGT dated 18.01.2022 has been quashed by Hon'ble Supreme Court.
- xviii. MS, CPCB chaired a review meeting held on 30.04.2024. The following recommendations were made:
- TPPs having low ash utilization were directed to submit monthly action plan for achieving 100% ash utilization. All TPPs and coal mines to complete pending activities listed under action plans and submit time-bound action plan to comply with the conditions mentioned in EC and Water/ air consent.
 - Sasan Power Ltd. to remove fly ash flowing into Gawaiya and Garra drain and construction of pipeline for ash transportation.
 - Mahan Energen to hold meeting with WCR, Jabalpur for non-availability of space for rail transportation of ash.

- Instructions to ECR & WCR for storing coal inside the premises and imposition of penalties against non-compliance.
 - ECR and WCR to submit time-bound action plan to comply with the conditions mentioned in Water/ air consent.
- xix. A review meeting was held by Collector, Singrauli on 12.06.2024.
- xx. Sasan Plant has shifted from pipeline to road for fly ash transportation from ash dyke to its mine for mixing with overburden. Currently, it is generating 4 Lakh MT per month. For transporting through pipeline, change in law was claimed in CERC and the petition is pending for hearing (Regulatory approval is in progress). Approval for Conveyor belt of 18 km from their plant to mine for ash transportation, was obtained from DGMS. At present, 5100 MT per day (~200 trips per day) of ash is being transported.
- xxi. Mahan Energen proposed railway sidings for ash transportation. Coal transportation from Singrauli and Suliyari mines will be done through conveyer belt to the TPP. Forest (Stage 2) clearance will be obtained by July 2024 and construction will start afterwards.
- xxii. Timelines for deployment of trucks not available due to non-availability of CNG and EV trucks in mining areas by Jayant Project. Request for modification in EC conditions will be placed.
- xxiii. Pollution control measures earlier were being implemented in stone crushers as per MPPCB guidelines. After CPCB published guidelines in 2023, it is being implemented as per CPCB guidelines which mandate every stone crushers for installation of dust control equipment.
4. A presentation was made by the Uttar Pradesh Pollution Control Board on the progress of implementation of action plans and environmental guidelines for stone crushing units published by CPCB for control of air pollution. The following details were presented:
- i. 06 TPPs in Sonbhadra namely, M/s UPRVUNL, Anpara TPS, M/s UPRVUNL, Obra TPS, M/s NTPC Shaktinagar TPS, M/s NTPC Rihand Nagar, M/s Hindalco Industries Ltd. (Renusagar) and M/s Lanco Anpara Power Ltd have submitted 5-year action plan for 100% utilisation of ash.

- ii. 06 TPPs of capacity 10670 MW produced 160.7 LMT ash in FY 2023-24. Status of fly ash utilization by 06 TPPs in Sonbhadra, U.P. were reported as below:

Financial Year	Total quantity of ash generated (LMT)	Total quantity of ash utilised (LMT)	% ash utilisation
2021-22	151.1	57.9	38.3%
2022-23	161.9	56.8	35.08%
2023-24	160.7	101.8	63.3%

- iii. 03 TPPs in Sonbhadra region have low ash utilisation level namely, Lanco Anpara (23.6%), Anpara, UPRVUNL (51.67%), NTPC Shaktinagar (40.4%). Anpara 51.67%, published 2 EOIs for establishment of cement plants and transportation of ash, discussed with various vendors and will be finalized and low lying areas have been identified. Shaktinagar (2 million tonnes) and Vindhyanchal (8 Million tonnes) are at same location and are adjacent to each other has been facing difficulty in utilisation. It was informed that Ash will be supplied to NHAI and road construction projects. NTPC Singrauli is also signing agreements for gorbi mine and utilization in road project. Lanco (23.6%), orders were given for 15 LMT ash, NCL has been requested for allocation of mine void for ash disposal. NCL informed that mine closed to the TPP will be closed in 1.5 yr and will be allocated accordingly.
- iv. Out of 101.8 LMT ash generation in FY 2023-24, 46.9 LMT ash was filled in low lying areas, 38.69 LMT was utilised in construction of roads and highways, 13.3 LMT ash supplied to cement industries, 2.33 LMT supplied to brick manufacturers and 0.43 LMT ash were used for construction of geo polymer roads.
- v. Sonbhadra region has 05 NCL coal mines and had produced total 59.48 MTPA coal in FY 2023-24. Details of mode of coal transportation are as follows:

S. No.	Coal mine	Coal production (Million tonnes) (FY 2023-24)	Mode of Coal Transportation (Million tonnes)			CHP Capacity (MTPA)	
			Rail/ Marry-Go-Round	Road	BPC	Existing	Under Construction
1.	Bina OCP	10.5	7.52	3.07	-	4.5	9.5
2.	Dudhichuwa OCP	25	18.88	3.96	-	20	5
3.	Kakri OCP	1.84	0.98	1	-	-	-
4.	Khadia OCP	15	11.96	3.79	-	10	4
5.	Krishnashila OCP	7.5	4.96	1.67	2.68	4	-
	Total	59.84	44.3 (74%)	13.49 (22.5%)	2.68	38.5	18.5

- vi. Action plans have been submitted by 06 TPPs, 03 industries, 05 coal mines (NCL), and 313 stone crushers for implementation of air pollution control measures. The following activities form action plan of various industries in U.P. have been reported under progress:
- M/s NTPC SSTPS, Shaktinagar to install FGD in all 7 units and expand AWRS capacity by March, 2025.
 - In M/s NTPC Rihandnagar SSTP, commissioning of FGD and DAES (Stage I & III) by 31.12.2025 and commissioning of Cold Fog Dust Suppression System in Stage I in progress.

- c. M/s Lanco Anpara Power Limited, Anpara - FGD installation by December, 2025
- d. M/s U.P. Rajya Vidyut Utpadan Nigam Ltd. (Anpara A, B & D TPS), Anpara-
 - Re-tendering for ESPs installation at ATPS by Dec., 2026
 - Renovation work under progress at BTPS by October, 2024
 - FGD installation at A, B & D TPS by Dec., 2026
 - Constructing Bio-methanation plant by Dec., 2026
- e. M/s Hindalco Industries Limited, Renusagar Power Division- FGD installation by March, 2025.
- f. M/s U.P. Rajya Vidyut Utpadan Nigam Ltd. (Obra A, B - TPS), Obra- FGD installation by March, 2025.
- g. M/s NCL Ltd., Bina Project, Bina- Construction of new CHP (9.5 MTPA) by Dec., 2024 and upgradation of ETP & STP by July, 2024.
- h. M/s NCL, Dudhichua Project- Tyre washing system/mechanism of Coal transporting vehicles on Road by August, 2024. Construction of new CHP (10 MTPA) by Dec., 2024.
- i. M/s NCL Ltd., Kakri Project- Tyre washing system/mechanism of Coal transporting vehicles on Road. Tender under progress.
- j. M/s NCL Ltd., Khadia Project
 - ETP upgradation by July, 2024
 - Tyre washing system/mechanism for Coal transporting vehicles on Road by Dec., 2024. Tender under progress.
 - Construction of Wharf wall / Railway Siding by August, 2024. Rail connectivity to wharf wall to be done by ECR railway siding.
- k. M/s NCL Ltd., Krishnashila Project- Construction of sedimentation ponds and green belt under progress. EC conditions to be included in action plan.
- l. Aluminium Smelter: M/s HINDALCO Industries Ltd, Renukoot- Procurement of equipment for segregation of waste category under progress.

- m. It was informed that a tripartite agreement was signed between the UP Forest Department, IIFM Bhopal, and AAI 18.08.2023 to conduct a pilot study assessing the impact of filling abandoned mine voids in 0.55 hectares forest areas (Dalla Range, Obra Forest Division) with red mud and/or fly ash. IIFM has prepared the DPR for this project. DFO Obra has obtained the CTO from 12.12.2023. Dewatering and wall grouting work has been completed, however, surface water seepage was observed resulting in water accumulation at the site. Committee visited the site to assess the situation and suggested that this issue could be resolved by filling natural soil up to a height of approximately 5 meters. IIFM issued a letter on 07.06.2024 to commence backfilling. AAI has shared the work execution schedule with IIFM and DFO Obra, w.e.f. 15.06.2024 to 04.06.2025. On-site work execution will begin after the monsoon season.
- n. M/s Grasim Industries Limited Chemical Division, Renukoot and M/s Birla Carbon India Pvt. Ltd., Renukoot- Miyawaki Plantation outside plant premises will be done.
- vii. 313 nos. of Stone Crusher units inspected. 215 Stone crushers have adequate APCS such as covered conveyer system, covered jaw crusher, water sprinkling arrangement, wind breaking wall, green belt, pucca roads etc. 98 Stone Crushers had not installed adequate APCS.
- viii. Based on the inspections carried out by Joint Committee, Show cause notices were issued to 70 stone crushers (50 are revoked, 20 are effective) and closures were issued to 28 stone crushers (15 revoked, 13 effective) for non-installation of APCS out of total 98 stone crushers in the region. An action plan and checklist were provided to the stone crushers, and the units have made commitments. The status will be verified by the Joint Committee after the monsoon season.
- ix. In Sonbhadra region, ambient air quality was analysed to assess, the impact of implementation measures by various TPPs. PM10 level has slightly increased to 160 µg/m³ in 2023-24 from 159 µg/m³ in 2022-23. AQI has slightly increased to 140 in 2023-24 as compared to 139 in 2022-23.

- x. For Assessment of CEPI Score in pre monsoon, sampling of Ground, Surface Water and monitoring of ambient air quality/ air quality has been done by UPPCB. Evaluation of CEPI Score is under progress.
5. A presentation was made by Ministry of Power/ CEA on status of implementation of the provisions of Ash Utilization Notification, 2021 for mandatory 100% utilisation of ash by TPPs:
- i. Ministry of Power has issued guidelines regarding streamlined procedure for ash disposal on 15.03.2024. These guidelines also include the special provisions for MSEs, in line with amendment to Ash Utilization Notification, 2021 dated 01.01.2024. The Guidelines have been circulated to all TPPs and other concerned stakeholders.
 - ii. The above guidelines lay down the general procedure for TPPs to invite bids on annual basis/longer period (not more than 3 years), limited auction to reserve quantity of ash for supply to MSEs at reserved price, open auction for all users, environmental safety issues, monitoring for entire ash disposal station, post closure reclamation of site etc.
 - iii. MoP vide its OM dated 01.05.2024 has requested MoC to align the draft SOPs with the steps for ash disposal outlined in the MoP guidelines dated 15.03.2024, to be followed by all TPPs as a regulatory requirement. MoP has stated that their comments are yet to be confirmed by MoC for finalising the draft SOPs.
 - iv. So far, 145 TPPs have submitted annual compliance report the FY 2023-24.
 - v. Compliance report of TPPs for the first year (FY 2022-23) of the first compliance cycle submitted by CPCB on 20.02.2024, the TPPs listed therein having ash utilization above 80% has been shared with all TPPs vide email dated 21.05.2024. CPCB has been requested to share the compliance report for the second year (FY 2023-24) of the first compliance cycle.
 - vi. Contracts for supply of ash to users of road construction projects from NTPC Vindhyachal and other TPPs of NTPC are in place and ash is being supplied as per demand and availability at NHAI / MoRTH end. It was also informed that that from either end, ash transportation panel/mechanism as per the MoP Guidelines & Secretary, Power meeting decision dated 18.01.2023 is in place.

6. A presentation was made by Ministry of Coal on finalisation of SOPs for backfilling of ash in mine voids and mixing of ash in overburden dumps by Thermal Power Plants:

- i. Central Working Group on 03.05.2024 under chairmanship of AS, Ministry of Coal allotted the following mines to TPPs-
 - a. CCL- Dakra- Bukbukamine allocated to NTPC and Hindalco Industries Ltd.
 - b. ECL-Spot 1, 2 & 3 of Madhabpur OC allocated to DVC- DSTPS
 - c. SECL Minni OCM-Dry Patch & Minni OCM near SISF Base camp of Govinda Mine allocated to MB Power (Madhya Pradesh) Limited
 - d. ECL-Parbelia Colliery (UG), Dubeswari (UG) and Nasramuda (UG) allocated to DVC-RTPS (Fly ash is already being supplied)
 - e. WCL- Sarni (UG) allocated to MPPGCL- STPS
 - f. ECL- Kunustoria, Ningha Mines, Pandebeshwar Mines allocated to DVC-DSTPS
 - g. ECL- Satgram Incline Colliery allocated to DVC-MTPS
- ii. MoC as on date have allocated 38 mines voids to 31 TPPs. Ash filling has been started in 12 mines and 295 lakh cum out of 1800 lakh cum allocated mine void have been dumped in the mine void.
- iii. Central Level Working Group recommended that coal companies and TPPs ensure the signing of MoUs for the allotment of mine voids within 2 months. Further, coal companies were requested to identify abandoned mines on a monthly basis and provide the list to the CEA, which will publish it, and TPPs will respond accordingly.
- iv. Draft SOPs have been communicated to all the stakeholders including TPPs and SPCBs. The format for TPPs to request mine allocation from the CEA has been circulated to all TPPs.
- v. It was informed that different coal companies will identify mines and circulate the information to the committee and all TPPs. TPPs will submit their requests through the CEA, which will examine the requests and communicate them to the committee. The committee will meet monthly to decide on allocations of

mine voids to TPPs. For operational opencast mines, various studies have concluded that it is unsafe to consider fly ash dumping unless the plants and mines are owned by the same organization. It was mentioned that the closed or abandoned opencast mine, closed or abandoned void of working opencast mine and closed or working underground mines (coal extraction by stowing method) may be considered for allotment for the purpose of fly ash filling/stowing.

- vi. Lease rent which has been paid to the State Government by coal companies is to be recovered from TPPs. Further, policy guidelines for use of land acquired under the Coal Bearing Areas (A&D) Act, 1987, vide MoC OM no. 43022/1/2020-LAIR dt: 22-04-2022 may be followed.
 - vii. The guidelines regarding responsibility of mine owners and TPPs after the site is handed over to TPPs for fly ash disposal have been issued on 15.03.2024.
5. A presentation was made by Indian Bureau of Mines (IBM), Ministry of Mines on finalisation of SOPs for backfilling of ash in mine voids and mixing of ash in overburden dumps by Thermal Power Plants:
- i. NTPC is doing pilot study for mixing of ash with overburden in Dulanga coal mine. IBM is monitoring the ultimate impact whether slope moving vertically or horizontally.
 - ii. Further, list of 197 abandoned non-coal mines and 7 working mines with 12 pits have been shared.
 - iii. SOP provides a detailed procedure for allocating mines for ash filling in mine voids or mixing of ash with the overburden, prescribing the roles of different authorities and the steps involved for Thermal Power Plants (TPPs).
 - iv. District Collector and Directorate of State Mines and Geology (DGM) will be the appropriate authority for abandoned mines and operational mines, respectively for overseeing environmental conditions for TPPs. District Collector and DGM to assess the mine voids and conduct a survey within 15 days, respective TPP to borne the cost of survey. TPPs to approach the concerned authority, under whose jurisdiction is the mine to be utilized, for disposal of ash. The identified volume of mine void / OB to be communicated to the TPP within 30 days of receipt of application by TPPs and upload on ash portal, simultaneously SPCB,

MoEFCC, District Collector (for transportation of fly ash) and CGWA/ CGWB to grant NOC within 30 days.

- v. In case of operational mines, a scientific / geo-technical stability study is to be furnished by TPP to DGMS within 30 days from the date of application. The Director Mines Safety shall furnish their comments on the said study. After the receiving the comments, appropriate authority to grant final approval for backfilling of ash in allotted mine voids. Further, before starting the backfilling work a comprehensive scheme for fly ash filling is to be prepared by the TPPs covering specified scientific aspects and other allied issues. SOP/ guidelines for MoU has been prepared to establish a formal agreement between the TPP and the designated Mine/s.
 - vi. IBM emphasized the importance of safety aspects in regard to ash backfilling and the need for a model code to be approved by an agency.
 - vii. Permission form DGMS is required only for ash filling in operational mine.
6. A presentation was made by Railway Board on status of implementation of air pollution control measures at East Central Railway and West Central Railway in Singrauli and Sonbhadra regions:
- i. Following pollution control measures have been reported under progress by ECR and WCR:
 - a. Singrauli region, M.P.
 - ECR-Spur III & X: Installation of fixed water sprinklers (Sep., 2024) and Work as per CPCB Guidelines (Dec., 2024).
 - ECR- Mahedaiya: Installation of fixed water sprinklers, work as per CPCB Guidelines and construction of wind breaking wall by Sep., 2024, and approach road by Dec., 2024.
 - WCR- Gajra Bahra: Dust Protection walls (no timelines given), water sprinkling system (wall mounted and movable), Ppucca circulating handling area, all weather approach road (no timelines given) and green belt around the coal siding area (status to be updated).
 - WCR- Gondawali: Dust Protection walls , water sprinkling system or tankers, drainage facility, pucca circulating handling area, all weather

approach road by Dec., 2024 and green belt around the coal siding area by Sep., 2024.

- WCR- Bargawan: Dust Protection walls by Dec., 2024, water sprinkling system, drainage facility, pucca circulating handling area, all weather approach road by Aug., 2024 and green belt around the coal siding area (Sep., 2024).

b. Sonbhadra region, U.P.

- ECR- Krishanshila Project: Construction of wind breaking wall, plantations all along the boundary wall, construction of garland drain, installation of water sprinklers and construction of rain water harvesting–cum-ground water recharge system (approval in process under current budget).
- ECR- Salaibanwa: Construction of wind breaking wall, Plantations all along the boundary wall, construction of garland drain, installation of water sprinklers, construction of rain water harvesting–cum-ground water recharge system, construction of approach road, construction of wharf (approval in process under current budget).

- ii. It was informed that Vindhyanchal TPS, in principle, was allowed to transport fly ash through rail to MHDA goods shed from where fly ash shall be transported upto Gorbi mines for back filling. Approval from Railway Board has been given to VTPS for construction of individual conveyor belt or silos for ash transportation. IPA issued on 09-04-2024.
- iii. Action has been initiated to use fly ash from CTPS power plant for stowing/backfilling for stabilization of one of the fire affected zone near railway track at Sonardih station in Dhanbad division.

7. CPCB presented the status of actions taken on various decisions of the Mission:

- i. Status of action taken on decisions of 1st, 2nd, 3rd, 4th, and 5th meetings of the Mission obtained from the stakeholders are as follows:

Meeting	No. of Decisions	Complied	Regular activities	Time-bound / Yet to comply
1st	11	7	3	1
2nd	18	13	3	2
3rd	23	13	4	6
4th	21	10	8	3
5th	22	12	7	3

*Actual 'time bound / yet to comply' decisions are related to - Feasibility study for OB in Nigahi mines , Health risk assessment studies by SPCBs , Desiltation, reclamation and stabilization of ash by UPRVUNL plants and its verification by Forest Dept. , GIS mapping of TPPs and coal mine pits by MoC , Review of EC condition of non-coal mines , Cost-benefit analysis on non-compliance by TPPs , Backfilling of ash in Gorbi mine pit 3 by Anpara TPS

- ii. Implementation status has been compiled and updated on CPCB's website.
- iii. Instructions have been issued to MPPCB and UPPCB to create a system/mechanism for third-party audit/evaluation for compliance verification of industries by SPCB-authorized technical institutions/ agencies.
- iv. Brief status of implementation of action plans by 18 TPPs// coal mines/ industries were presented as under:
 - a. 07 industries (NTPC Vindhyachal, NTPC Rihand, Lanco Anpara C, Birla Carbon India Pvt. Ltd., M.P. Power Generating Co. Ltd. (MPPGCL), Mahan Energen Ltd. and Grasim Industries Ltd. Chemical Division) have implemented their action plans (except for FGD installation in case of Lanco Anpara C and NTPC Rihand, having FGD implementation time limit up to Dec 2025 and Dec 2026, respectively, and one remaining point of Grasim Industries Ltd which is sub-judice in the Hon'ble Supreme Court and is presently under stay.
 - b. HINDALCO Aluminum Smelter also reported implementation of action plans. However, the Oversight Committee has observed partial implementation of action plans (w.r.t. ZLD for domestic effluent and control of fugitive emissions).
 - c. 10 TPPs/ coal mines (NTPC Singrauli, Renusagar TPP, UPRVUNL Anpara TPS, UPRVUNL Obra TPS, Sasan Power Ltd., NCL Dudhichuwa Mine, NCL Kakri Mine, NCL Khadia Mine, NCL Bina and NCL Krishnashila) have submitted extended tentative time limits for implementation of few points (mainly related to tyre washing facility, 25% mixing of ash with OB, transportation of coal in

environmentally sound manner, management of municipal solid waste, and OCEMS relocation).

- d. UPRVUNL Obra TPS has stopped ash pond overflow water carrying ash into the river Renu.
 - e. UPRVUNL Anpara TPS has implemented ZLD by commissioning new ETP of 30 MLD capacity in Anpara A & B plants.
 - f. UPRVUNL Anpara TPS has issued LOI to M/s CWPRS, Pune for study of diversion of Morcha Nala, and the study work is likely to be completed up to July, 2024.
 - g. NTPC Singrauli is implementing measures to completely stop the discharge of ash pond overflow into Rihand reservoir.
 - h. Trucks transporting coal from coal mines to TPPs are found covered with thin LDPE sheets/ green net only, instead of tarpaulin or other proper means, due to which spillages occur at several locations and fine coal dust is found along the public road (Auri Mode-Shakti Nagar) and the black powder is also visible on the houses built along the roadsides as well as vehicles parked.
 - v. CEPI score calculated by UPPCB and MPPCB has been re-validated in February 2024. CEPI score of Singrauli was 60.49 (2024) as compared to 61.38 in 2022. CEPI score of Sonbhadra was 67.86 (2024) as compared to 67.88 in 2022. Both Singrauli and Sonbhadra region are under Severely Polluted Areas category. A portal has been developed for monitoring of progress of CEPI Action Plan & CEPI Score of concern critically and severely polluted areas.
 - vi. Jadavpur University has commenced the study for value added utilization of bottom ash as partial substitute of natural sand in concrete in April, 2024. Samples of bottom ash from 5 out of 10 TPPs have been collected, and analysis has started. Additional bottom ash samples from 3 more TPPs will be collected between June, 2024, and July, 2024.
8. A presentation was made by CSIR-NEERI on stabilization of fly ash dumps with bamboo plantation:
- i. NEERI has highlighted the potential long-term environmental concerns associated with fly ash if not managed properly, citing the presence of non-

essential heavy metals like Cd, As, Pb, Hg, and Cr. In response, NEERI has developed Eco-Rejuvenation Technology aimed at stabilizing fly ash dumps by utilizing site-specific plant species (Bamboo sp.) to foster biodiversity on degraded land. NEERI has utilized consortia of microorganisms (bacteria and fungi) and organic waste material to enhance plant growth in the rhizosphere. It was informed that selection of plant species is crucial and varies depending on local environmental conditions.

- ii. NEERI collaborated with M/s Mahagenco to achieve 20-ft plant growth in fly ash dump areas using commercial bamboo species, requiring only a tenth of the typical investment. This approach effectively reduced soil and air pollution (PM₁₀) as well as metal leaching into groundwater within two years. It significantly increased belowground biomass and transformed 31 acres into forest, mirroring successful outcomes near Nagpur and at NEERI's own facilities, where 20 acres were reforested with a similar approach.
 - iii. A case study was presented wherein, over 03 years, the initiative yielded 74.04 tonnes per hectare of total biomass, releasing 98.84 tonnes per hectare of oxygen and sequestering 37.02 tonnes per hectare of CO₂. It also boosted biodiversity by enhancing flora and fauna. A significant reduction in the concentration of heavy metals in the fly ash dumpsite was observed. India boasts 137 bamboo species covering 16 million hectares. According to the specified guidelines, species that enter the food chain should be avoided when restoring degraded land.
8. It was informed that TPPs are required to submit annual compliance report in the format prescribed in Ash Utilization Notification, 2021. However, ACRs or compliance reports received are not completely filled by TPPs.
 9. Concerns with respect to air pollution control measures at ECR and WCR railway sidings, were forwarded to Secretary (Railway Board) on 02.5.2024.
 10. ACS, Dept. of Energy, Govt. of U.P. was requested to review the status of low ash utilization by Lanco Anpara, UPRVUNL (15.8%), NTPC, Shaktinagar (40.5%) and NTPC Rihandnagar (70.02%) and issue necessary direction for 100% ash utilization.
 11. Notices were issued to M/s Jaypee Nigrie, M/s Mahan Energen, M/s APMDC Ltd.& THDC Ltd. and other TPPs and industries for non-participation in the Mission

meeting. Concerned SPCBs were requested to direct respective TPPs, Industries, coal mines to ensure participation of one representative from each organisation in the Mission meetings.

12. After detailed deliberations, the **following decisions were made:**

- i. SOPs formulated for allocation of mines, signing of MoUs and feasibilities studies for mixing of ash with OB/ backfilling of ash in opencast and underground mines to be finalized within one month. Ministry of Coal may convene a meeting with Ministry of Power to consider the views of M/o Power for finalising SOPs.

(Action: M/o Coal and M/o Power)

- ii. Status of allocation of identified mines voids to the thermal power plants along with the timelines may be presented in next meeting of the Mission.

(Action: M/o Coal)

- iii. Allocation of mine void to NTPC Lanco Anpara for backfilling of ash into the mine void to achieve 100% ash utilization target.

(Action: M/o Coal and NCL)

- iv. NCL to establish a system for the advance allocation of mines approaching for closure in 3-5 years to thermal power plants to ensure timely initiation of ash backfilling into the mine voids. A list of these mines should be shared with TPPs, enabling them to approach the mines based on geographical location.

(Action: NCL and M/o Coal)

- v. CEA to compile legacy dumpsite which are being stabilized by TPPs.

(Action: M/o Power and CEA)

- vi. SOPs may be revised stating that NOCs are required exclusively from SPCBs for backfilling of ash in the mine void and mixing of ash with overburden dump in abandoned mines, and from DGMS only for backfilling activities in working underground mine. A standardized format for NOCs should be established to streamline the process of seeking necessary permissions by TPPs from concerned authorities for allocation of mine voids, thereby eliminating the

necessity for diverse information requests from different entities. Updated list of identified abandoned non-coal mines may be shared with MoP.

(Action: Ministry of Mines)

- vii. Verification and monitoring of implementation of action plans against the specified timelines in regard to EC conditions and Consent to Operate (CTO) requirements. CTO may be granted once all EC conditions are satisfactorily met, aiming to avoid discrepancies for effective implementation of the action plan. Status regarding pending activities along with the revised timelines to be presented in next meeting of the Mission.

(Action: MPPCB and UPPCB)

- viii. Submission of action plan indicating timelines for completion of activities in respect of ash utilisation in overburden dumps and implementing air pollution control measures as per EC conditions.

(Action: MPPCB and APMDC Suliyari project)

- ix. All stone crushers to ensure implementation of action plan and installation of air pollution control equipment in line with the environmental guidelines published by CPCB for stone crushers. Compliance status may be furnished by SPCB and CPCB.

(Action: MPPCB, UPPCB and all stone crushers in Singrauli and Sonbhadra region)

- x. Evaluation of CEPI score for pre-monsoon (April-May) season in Singrauli and Sonbhadra is to be completed and share the report with CPCB. CPCB to monitor progress of implementation of CEPI Action Plan & CEPI Score of concern critically and severely polluted areas.

(Action: MPPCB, UPPCB and CPCB)

- xi. Scrupulous implementation of action plans to achieve 100% ash utilization as per the compliance cycle prescribed under Ash Utilization Notification, 2021.

(Action: M/ UPRVUNL Anpara TPS, Obra TPS and all TPPs)

- xii. Coal companies to use conveyor belt or dedicated roads for coal transportation to control coal dust emission. The condition of roads used for coal

transportation should be mapped to control fugitive coal dust emissions in the region. Coal transportation via conveyor belts and tire washing mechanisms should also be included in the mapping. The concerned authority should be responsible for maintaining these roads, with regular monitoring conducted to verify their condition. SPCBs to map the responsibility of each segment of coal/ash/material transportation in the region.

(Action: All Coal mines in Singrauli and Sonbhadra region, MPPCB & UPPCB)

- xiii. A team of officials from CPCB, MPPCB and representatives from MPPGCL shall carry out inspection of ash pond of Sanjay Gandhi TPS, Birsinghpur to ascertain localized/ terrain specific solution for evacuation of current ash from operational ash dyke of SGTPS, Birsinghpur.

(Action: CPCB, MPPCB and Sanjay Gandhi TPS, MPPGCL)

- xiv. Compliance verification to be carried out in regard to ash utilization levels of M/s Jaypee Nigrie STPP, which was reported at 89 % in FY 2023-24 as against the compliance cycle of 100% utilisation, as prescribed under Ash Utilisation Notification, 2021.

(Action: CPCB)

- xv. Railway Board may be communicated for expeditious implementation of action plans in respect of pollution control measures at the railway sidings of ECR and WCR in Singrauli and Sonbhadra Region. Status in this regard may be presented during the next meeting of the Mission.

(Action: CPCB)

- xvi. IIFM may be requested to communicate to Hindalco industries for initiation of backfilling of mine voids of abandoned stone quarries with fly ash and red mud in Dalla region based on pilot study conducted by IIFM in association with Aluminium Association of India (AAI) and State Forest Department, Govt. of U.P.

(Action: CPCB)

- xvii. Stipulation of conditions for stabilization of mine voids filled with fly ash and restoration of biodiversity.

(Action: CSIR-NEERI)

- xviii. Inclusion of stabilization conditions formulated by NEERI for fly ash dumpsites as part of Environmental Clearance of TPPs, Coal and non-coal mines.

(Action: CPCB)

- xix. Commencement of backfilling of mine voids of abandoned stone quarries in Dalla region with fly ash and red mud under as per the DPR submitted by IIFM under the pilot study.

(Action: Hindalco Industries Ltd, Renukoot)

- xx. Submission of action plan and timelines for commencing backfilling activities in the allotted pit of Gorbi mine. Action plan shall also include steps to be taken for backfilling activities and status of actual utilization target. CTO to be obtained from MPPCB and initiation of backfilling activities to be undertaken. Action taken report in this regard shall be submitted to CPCB/Concerned SPCB.

(Action: NTPC Vindnyanchal)

- xxi. CSIR-NEERI's expertise may be leveraged for stabilizing and ecologically rejuvenating ash dumpsites through bamboo plantation or suitable site-specific plant species within the stipulated timeline under Ash Utilization Notification, 2021. NEERI may be involved in the consultative meetings with concerned stakeholder for implementation of stabilization or rejuvenation technologies/ models developed by them. A list of fly ash dumpsites stabilized by TPPs and actions taken may be shared with SPCBs and CPCB. Coal mines to prioritize stabilization of mine voids filled with ash, focusing on biodiversity restoration.

(Action: All TPPs and Coal mines)

- xxii. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd, 3rd, 4th, 5th and 6th meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the

website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

Annexure

List of Participants

1. Smt. Leena Nandan, Secretary, EF&CC- Chairperson
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Shri Bharat K Sharma, Member Secretary, CPCB
5. Shri Marapally Venkateshwarlu, Director, Ministry of Coal
6. Shri H.K. Sharma, Director (Technology), MPPCB
7. Shri R.K. Gupta, S.E., MPPCB
8. Shri Sanjeev Kumar Singh, MS, UPPCB
9. Shri Umesh Kumar Gupta, RO, Sonbhadra, UPPCB
10. Shri Nazimuddin, Scientist F, CPCB
11. Shri N. Subrahmanyam, Scientist E, MoEF&CC
12. Shri Mohammed Niyazi, Dir. (S&T), DGMS
13. Shri Satish Kumar, Director, Ministry of Power
14. Shri Manish K. Maindiratta, Regional Controller of Mines, IBM, Ministry of Mines
15. Shri P. N. Sharma, CCOM, Indian Bureau of Mines, Ministry of Mines
16. Shri Ajay Jha, Director/ EnHM, Railway Board
17. Shri Jasbir Singh, Dy. Director, M/o Railways
18. Shri Abhishek Vishal, DTM Chopar, M/o Railways
19. Shri Sanjay Gupta, Dy CEM (FM), Railways
20. Shri Neeraj Pathak, SCI, Railways
21. Shri S. K. Tanti, GEnHM, ECR, Indian Railways
22. Shri Ajit Kumar, AEnHM /DHN ECR, East Central Railways
23. Shri Utkarsh Tripathi, DMO, UP-DGM
24. Shri Praveen Gupta, Member (Thermal), CEA

25. Shri Kamal Kumar Jangid, Director, CEA
26. Shri P. S. Mohan Kumar, Deputy Director, CEA
27. Shri Manoj Kumar Choudhary, AD-1, CEA
28. Shri Aman Khare, Dy. Director, CEA
29. Shri Ashwini Kr. Tripathy, Dir. (Tech), UPRVUNL
30. Shri Aringrah Ravi, S.E., UPRVUNL
31. Dr. Vijay Prakash, ED (Env.), NTPC
32. Shri G. Rajashekar, GM (AMG), NTPC
33. Shri Ashwani Tyagi, DGM (Ash Mgt.), NTPC
34. Dr. Lal Singh, Principal Scientist, NEERI, Nagpur
35. Shri Parveen Enlomia, Sr. Manager, Noida Authority
36. Shri Sunil Prasad Singh, DT, NCL (Kaml kunarCIL)
37. Shri R. N.. Shukla, AVP. Env. ESG, Adani Power
38. Ms. Khushi Parekh, Ass. Manager, Mahan Energen Ltd
39. Shri S.K. Jain, Executive Engineer, MPIDC, Bhopal
40. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
41. Shri Manoj Pradhan, Vice President, Reliance Power Ltd.
42. Shri Amit Soni, Head-Env, Sasan Power Ltd.
43. Shri Himanshu Verma, Sr. Manager (HSE), Lanco Anpara Power Ltd.
44. Shri Vivek Gupta, Sr. G.M., Grasim Industries Ltd., Renukoot
45. Dr. Vinay Kumar Yadav, AGM (Environment & Sustainability), Grasim Industries Ltd., Renukoot
46. Shri D. K. Sharan, A.E, UPPWD, Ghaziabad, U.P.
47. Shri Ravikant yadav, Chief Chemist, MPPGCL
48. Shri Prabhat Yadav, Manager (Civil), UPSIDA
49. Dr. Bhanendra Singh, ACF Renukoot Forest Division UP, UP Forest Dept.

- 50. Shri Sanjay Selot, S. E., SGTPS, MPPGCL
- 51. Shri S. K. Singhai, SE (Civil), MPPGCL
- 52. Shri Rehana Beg, Resident Engineer, MPPGCL
- 53. Shri Ankur Varma, AM, SPL
- 54. Shri Vinay Ramaiya
- 55. Shri Durgananda Jha, SRF, CPCB

F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003

Date: 1st January, 2025

OFFICE MEMORANDUM

Sub.: Minutes of the eighth meeting of 'Fly Ash Management and Utilization Mission' held on 23.12.2024 - reg.

The undersigned is directed to refer the eighth meeting of 'Fly Ash Management and Utilization Mission' held on 23.12.2024 at 11:00 AM at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 26.06.2024.

2. In view of the above, minutes of the eighth meeting of 'Fly Ash Management and Utilization Mission' are enclosed herewith.
3. It is requested to kindly furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated

Yours sincerely,

N. Subrahmanyam
01/01/2025

(N. Subrahmanyam)

Scientist E

E-mail: n.subrahmanyam@gov.in

Ph.20819269

To

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chairman, Ministry of Railways (Railway Board), New Delhi
5. Chief Secretary, State of Uttar Pradesh
6. Chief Secretary, State of Madhya Pradesh
7. Chairman, CPCB, New Delhi

8. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
11. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
12. Director General, Directorate General of Mines Safety, Jharkhand
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
14. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
15. Chairman, UPPCB, Uttar Pradesh
16. Chairman, MPPCB, Madhya Pradesh
17. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
18. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
19. Director, CSIR-NEERI, Nagpur
20. CMD, M/s NCL
21. CMD, M/s NTPC Limited
22. CMD, M/s Lanco Anpara Power Pvt. Ltd.
23. CMD, M/s Hindalco Industries Ltd.
24. CMD, M/s UPRVUNL
25. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
26. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
27. CMD, M/s Sasan Power Limited, Singrauli
28. CMD, M/s APMDC Ltd., Singrauli
29. Industries, Mines and Stone crushers concerned in Singrauli and Sonbhadra Region.

Copy to:-

1. Dir.(AR)
2. PSO to Secretary (EF&CC)
3. PPS to AS(NPG)
4. PPS to JS(VPM)
5. SO, HSMD

Minutes of the 8th meeting of Fly Ash Management and Utilization Mission held on 23.12.2024 at 11:00 AM

The eighth meeting of ‘Fly Ash Management and Utilization Mission’ was convened on 23rd December, 2024 at 11:00 AM under the chairpersonship of Secretary, EF&CC, to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 26.06.2024. The list of participants is enclosed as **Annexure**.

2. At the outset, Secretary, EFCC welcomed all the participants. Special Secretary, MoEF&CC briefed about the decisions taken by the Mission in last meeting held on 26.06.2024.

3. A presentation was made by the Anpara Thermal Power Project (UPRVUNL) on status of implementation of NEERI technologies/ expertise for stabilizing ash dykes through bamboo plantation at the ash ponds of thermal power plants of UPRVUNL. The following details were presented:

- i. Anpara Thermal Power Project (2,630 MW) consumes around 40,000 MT of coal daily (132.0 LMT/ year). The ash generation from Anpara Thermal Power Project is 13,600 MT/day (45.0 LMT/year), out of which bottom ash is 2720 MT/day (9.0 LMT/year) and fly ash is 10,880 MT/day (36.0 LMT/year).
- ii. The fly ash generated is utilised in road projects, filling up of low lying areas, mines/ quarries, and in bricks & tiles industries. The details of generation and utilization of fly ash for Anpara TPS has been given below:

Financial Year	Ash Generation (LMT)	Ash Utilization (LMT)	% Ash Utilization
2022-23	43.52	0.82	1.88
2023-24	41.59	21.49	51.67
2024-25 (up to Nov., 2024)	49.45	12.15	24.54

- iii. 5.51 lakh MT pond ash has been disposed in Pipri low lying area in the FY 2024-25. Pond ash of 20 lakh MT and 10 lakh MT has been proposed to be disposed at low lying area and Gorbi Mines, respectively, in FY 2024-25.
 - iv. Anpara and Obra TPS is in process for developing railway infrastructure for transportation of ash in PPP Model. The consultant has submitted DPR for installation of DFAES and development of railway infrastructure for ash evacuation system through railway. Currently, RFP documents and concessionaire agreement are being prepared for inviting bids from interested bidders.
 - v. DM Singrauli has been requested to issue NoC for transportation of ash to Gorbi mines. Application for Consent to Operate (CTO) for transporting fly ash to Gorbi mines has been submitted to MPPCB.
 - vi. DM, Singrauli informed that NoC for transportation of fly ash from Anpara TPS to Gorbi mines will be issued in two days.
 - vii. MPPCB emphasized that to obtain the CTO, the ash dyke currently being used for fly ash disposal must be closed, and a permanent pipeline for fly ash transfer to Gorbi mines must be established, as transporting it by road could create more pollution.
 - viii. Miyawaki Plantation has been done for 50% area of the abandoned ash pond (Saddle dam-2) in Village Belwadah (near the current ash pond). Development of green belt through bamboo plantation will be done on the remaining 50% of the area of the abandoned ash pond (Saddle dam- 2).
 - ix. Reconnaissance survey has been done by NEERI in regard to implementation of NEERI technologies/ expertise for stabilizing abandoned ash dyke through bamboo plantation.
 - x. Ash/ soil sampling will be sent to NEERI for selection and screening of bamboo species. Plantation of bamboo species will be done as per NEERI's advice.
4. **Representative from Ministry of Power** highlighted that a meeting had been conducted regarding the compilation of legacy dumpsites which are being stabilized

by TPPs. 105 TPPs have responded and 5 TPPs are in the process of legacy dumpsite stabilization.

5. **Representative from West Central Railway (WCR)** stated that there are three Goods Sheds/ railway sidings of WCR in Singrauli Region: Bargawan Railway Coal Siding (BRRB), Gajara Bahara Goods Shed (GBGG) and Gondwali Coal Siding (GWCB). All the compliances regarding the implementation of air pollution control measures Gajra Bahara Goods Shed have been completed.

6. **Representative from East Central Railway (ECR)** gave a presentation on status of implementation of air pollution control measures at the Goods Sheds/ railway sidings at Singrauli region. The following points were highlighted during the meeting:

- i. There are three Goods Sheds/ railway sidings of ECR in Singrauli Region: SPUR III and X (SGRL), and MAHDEIYA (MHDA).
- ii. The status of compliance of directives of pollution control measures at the Goods Sheds/ railway sidings have been given below:

Directive	Status
Construction of wind breaking wall of sufficient height on both sides of railway siding	Complied 20 feet height of concrete boundary wall along with fencing/ protection screen/ GI sheet has been constructed.
Heap height of coal stock should be lesser than the height of the boundary wall	Complied
The occupier shall develop three tier plantations all along the boundary wall and other available spaces and shall continue enhancing its plant density and biodiversity.	Small and big trees are available in goods trees. Sampling plantation: • FY 2022-23: 50 saplings at SPUR and 50 saplings at MAHDEIYA • FY 2023-24: 50 saplings at SPUR and 100 saplings at MAHDEIYA

	FY 2024-25: 400 saplings at SPUR and 450 saplings at MAHDEIYA Further plantation will be done to enhance green cover in the sidings.
The occupier shall construct garland drain all along the boundary wall with de-silting pit.	Work sanctioned by Railway Board, it will be completed shortly.
To install fixed type water sprinklers in the railway siding.	SPUR – III & X - Two number water boring of 8 inch diameter & 100 m depth done for water sprinkling system - Installation of pipeline and sprinkler heads will be expedited. MAHDEIYA (MHDA) - One number water boring of 8 inch diameter and 100 m depth done for water sprinkling system. - Installation of pipeline and sprinkler heads will be expedited.
Continuous sprinkling of water for control of fugitive emissions.	Water sprinkling being done by water tankers.
Coal transportation vehicles must be covered with tarpaulin sheet.	Complied
The occupier shall construct rain water harvesting and ground water recharge system.	Work sanctioned by Railway Board, it will be completed shortly.
Construction of approach road	Approach road has been constructed in these sidings.
Construction of Wharf	Complied

7. It was mentioned that currently the coal is being handled manually at the Goods Sheds/ railway sidings of ECR, WCR and NCL. Ideally, there should be coal handling plants, with conveyer belts and silos to load the coal.

8. **Representative from Ministry of Coal** highlighted the following points regarding the allocation of mine voids:

- i. The following four mine voids have been allocated to different TPPs (including NTPC) for the purpose of fly ash filling:
 - Gorbi Pit 1, NCL allocated to NTPC (Singrauli)
 - Gorbi Pit 2, NCL Allocated to NTPC Vindhyachal and NTPC (Singrauli)
 - Krishnashila, NCL allocated to NTPC (Singrauli)
 - Gorbi mine (Pit-3), NCL allocated to Anpara Thermal Project-UPRVUNL
- ii. At present, there are no mine voids available at NCL. For advance allocation mines approaching for closure in 3-5 years, system has been established through dissemination of relevant SoPs, directing coal companies to submit a list of mines suitable or available for fly ash disposal, along with those expected to be available over the next 03 years, to the Ministry of Coal by the 10th of each month. These details will be shared with CEA for dissemination to TPPs so that any interested party can apply. Subsequently, the matter will be considered in the Central Level Working Group and allocation of mines will then take place.
- iii. As on date, 36 mine voids have been allocated, and fly ash filling of around 300 lakh m³ has taken place.
- iv. With regard to mixing of fly ash with OB in operational mine voids, the Central Level Working Group, in consultation with the stakeholders, has concluded that mixing of OB and flyash will not be safe.

9. **Ministry of Mines** has submitted the following status in regard to the allocation of mines for filling of fly ash:

- i. The earlier provided SOPs (vide OM dated 19.03.2024) for allocation for mines in respect of safety and administrative related matters have been modified by IBM.
- ii. A standardized format for seeking NOC by TPPs from concerned authorities for allocation of mine voids has been prepared by IBM.

- iii. A list of additional 38 mining areas (full area: 33 & partial area: 5) surrendered to State Government has been shared with M/o Power.

10. A presentation was made by MPPGCL regarding the inspection of ash pond of Sanjay Gandhi Thermal Power Station (SGTPS), Birsinghpur to ascertain localized/ terrain specific solution for evacuation of current ash from operational ash dyke of SGTPS (total installed capacity of 1340 MW), Birsinghpur. The following details were highlighted during the presentation:

- i. Team of officials from CPCB, MPPCB and representatives from MPPGCL had carried out the site inspection in September 2024.
- ii. Ash dyke-II, which is the only active ash pond, is surrounded by hills on three sides, having only a single compartment, non-uniform ash deposition on undulating pond bottom, creating operational challenges.
- iii. The ash is currently being deposited at a single location at a higher elevation, instead of at the section of the ash pond near the road where fly ash evacuation actually takes place.
- iv. Experts have indicated that fly ash evacuation cannot happen unless the roadside section of the ash pond is filled.
- v. Lifting of all deposited ash is not possible till ash is filled up to the level (elevation of 479 m) and two compartments are created.
- vi. Experts have recommended for improvement of the ash disposal system, and partitioning of the existing ash pond and creating a levelled platform at an elevation of 479 meters as a viable solution for ash evacuation.

11. A presentation was made by the Madhya Pradesh Pollution Control Board on the progress of implementation of action plans and environmental guidelines for stone crushing units published by CPCB for control of air pollution, and mapping of roads used for coal/ash transportation with responsible agencies to control air pollution. The following details were presented:

- i. Utilization fly ash generated from the 15 TPPs of Madhya Pradesh has increased from 55.6% in the FY 2021-22 to 74% in FY 2022-23 and 95% in FY

2023-24. Fly ash utilization during the current year (upto November, 2024) is 85%.

- ii. Status of implementation of action plan for fly ash utilisation generated from 05 TPPs (12140 MW) in Singrauli Region was presented.

TPP name	FY 2021-22		FY 2022-23		FY 2023-24		FY 2024-25 (up to Nov 24)	
	Ash Generation	Ash Utilisation	Ash Generation	Ash Utilisation	Ash Generation	Ash Utilisation	Ash Generation	Ash Utilisation
	(LMT)	(%)	(LMT)	(%)	(LMT)	(%)	(LMT)	(%)
NTPC Vindhyachal (4760 MW)	82.38	53.05	76.64	37.31	66.83	56.22	43.84	55.82
Sasan Power Limited (3960 MW)	53.47	52.35	45.99	109.5	48.98	100.7	36.37	32.17
Mahan Energen Limited (1200 MW)	8.36	25.46	9.08	100.2	14.27	103.72	11.06	81.65
Jaypee Nigrie Super TPP Vill. Nigrie, Singrauli (1320 MW)	15.79	89.55	14.55	100.09	18.06	89.17	11.41	107.0
Hindalco Industries Ltd, Mahan Aluminium (900 MW)	11.54	84.55	11.82	99.6	10.82	131.14	7.59	103.76
Total	171.54	56.96	158.08	70	158.96	83	110.27	59.21

- iii. 15 thermal power plants (TPPs) in Madhya Pradesh have utilized 868.71 lakh LMT of ash in from FY 2021-22 to FY 2024-25 (upto Nov 24). This includes

181.7 LMT (20.9%) for road & other construction work, 38.79 LMT (4.5%) for bricks production, 157.19 LMT (18.1%) for filling low-lying areas, 229.2 LMT (26.4%) supplied to cement industries, and 261.83 LMT (30.1%) used for backfilling in abandoned mines, overburden (OB) mixing, stone quarry, and dyke raising activities.

- iv. 02 TPPs in M.P. have utilized less than 80% ash in the FY 2024-25 (up to Nov 24) namely, NTPC Vindhyachal, Singrauli (55.82%) and Sasan Power Limited, Singrauli (32.17%). Sasan Power Limited explained that the low ash utilization rate during the FY 2024-25 was primarily due to the monsoon season, during which the DGMS prohibits the mixing of ash with OB, and highlighted that they have sought permission from MPPCB for dumping of ash in low-lying area.
- v. The following activities from action plan of various TPPs in Singrauli region have been reported to be under progress:
 - a. M/s NTPC Vindhyanchal STPP, Singrauli (13 units)
 - FGD installation completed in 2 units and to be completed in 11 units by April 2025
 - NO_x emission control measures completed in 7 units, not completed in 6 units
 - Inventorization study for industries operating around the Rihand reservoir: Contract awarded to NEERI for 2 years in Feb 2024, study in progress
 - b. M/s Sasan Power Limited
 - FGD installation for SO₂ by Dec. 2026. Vendor being finalized.
 - Permanent sprinkling system for 4 ash dykes: 1st phase completed (1.6 km out of 6.5 km), 2nd and 3rd phase to be completed by December 2025 and March 2025, respectively
 - Pipeline for fly ash transportation to its mine: 2 km pipeline procured
 - Cleaning of fly ash from Gawaiya (2 km)/ Garra nallah (in patches)- Under progress

- c. M/s Mahan Energen limited
 - FGD installation for SO₂ by December 2026. About 10% of civil work has been completed.
 - Coal transportation by road: Forest clearance pending.
 - Development work of railway siding for fly ash: No substantial progress
- d. M/s Hindalco Industries Ltd.: FGD installation for SO₂ in Unit-1,2,3,4,5 by Dec. 2026 and construction of RCC road by March 2025.
- e. Jaypee Nigrie STPP: Installation of FGD installation for SO₂ by December 2026.
- vi. The following activities from action plan of various coal mines in Singrauli region have been reported to be under progress:
 - a. NCL, Khadia Project
 - Fly ash utilization in OB dump: Not complied (timeline not given)
 - Coal handling plant required for 15 MTPA: 10 MTPA completed. Gap of 5 MTPA.
 - Transportation of coal through rail mode: Wharf wall under construction- 04 MTPA. Gap of 1 MTPA.
 - Carrying capacity of Mine & traffic study by January, 2025
 - Installation of Automatic wheel washing system by February, 2025
 - b. NCL, Amlori Project
 - Fly ash utilization in OB dump: Not complied (timeline not given)
 - Coal handling plant required for 15 MTPA: 12 MTPA completed. Gap of 3 MTPA.
 - Transportation of material by rail/conveyor belt: 12 MTPA completed, Gap of 3 MTPA.
 - Installation of Automatic wheel washing system by February, 2025
 - Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

c. NCL, Nigahi

- Fly ash utilization in OB dump: Not complied (timeline not given)
- Coal handling plant required for 22.5 MTPA: 15 MTPA completed, Gap of 7.5 MTPA.
- Transportation of material by rail/conveyor belt: 12 MTPA completed, Gap of 3 MTPA.
- Construction of pakka roads of 3.0 km by March, 2025.
- Installation of Automatic wheel washing system by June, 2025
- Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

d. NCL, Jayant Project

- Fly ash utilization in OB dump: Not complied (timeline not given)
- Coal handling plant required for 30 MTPA: 25 MTPA completed, gap of 5 MTPA
- Transportation of coal through rail mode: 25 MTPA completed, gap of 5 MTPA
- Deployment of 8 nos. of fixed type fog cannon by March, 2025
- Fixed type water sprinkler along haul road till CHP, Rly siding and OB dump area by March, 2026
- Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

e. NCL, Block-B Project

- Fly ash utilization in OB dump: Not complied (timeline not given)
- Coal handling plant of 4.5 MTPA under progress (40% completed)
- Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

f. NCL, Dudhichua Project

- Fly ash utilization in OB dump: Not complied (timeline not given)

- Installation of Automatic wheel washing system by December, 2024.
- Carrying capacity of Mine & traffic study by Jan., 2025 (under progress through CMPDIL)
- Study of existing EPT (Oversight committee observation): Not completed

g. NCL, Bina Extension

- Fly ash utilization in OB dump: Not complied (timeline not given)
- Additional CHP of 9.5 MPTA under progress (91% completed)
- Upgradation of ETP: Under trial (expected to be completed by December, 2024)
- Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

h. NCL, Jhingurda

- Fly ash utilization in OB dump: Not complied (timeline not given)
- Coal handling plant required for 4 MTPA: Not complied (gap of 5 MTPA)
- Installation of Automatic wheel washing system by December, 2025
- Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

i. APMDC Ltd.-Sulyari Open Cast Project

- Fly ash utilization in OB dump: Not complied (timeline not given)
- Coal handling plant required for 5 MTPA: Not complied (gap of 5 MTPA)
- Construction of railway siding by December, 2025
- Crusher and in-pit belt conveyor with mist type sprinkler by December, 2025
- Installation of Automatic wheel washing system: Not complied (timeline not given)
- CWQMS in ETP/STP (EC condition) by January, 2025

- j. Sasan Power Limited (Moher & Moher Amlohri extension coal mine)
 - Deployment of mist cannons to control air pollution: Under progress
 - Rehabilitation and resettlement of affected people by March, 2025
- k. Jaiprakash Power Ventures Ltd., Amelia (North) Coal Mine
 - Fly ash utilization in OB dumps: Not complied (timeline not given)
 - Plantation on dump area towards Kanchan river: Partially complied (50% remaining)
- l. THDC India Ltd., Amelia Coal Block (New mine)
 - Fly ash utilization in OB dumps: Not complied (timeline not given)
 - Coal handling plant required for 5.60 MTPA by June, 2025 (90% completed)
 - Construction of permanent railway siding: Not complied (timeline not given)
- vii. The following activities from action plan of coal handling Goods Sheds/ railway sidings in Singrauli region have been reported to be under progress:
 - a. ECR, Spur III & X
 - Installation of coal handling system: Not complied (timeline not given)
 - Water sprinkling system or tankers: Not complied (timeline not given)
 - Drainage facility: Not complied (timeline not given)
 - Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Not complied (timeline not given)
 - b. ECR, Mahedaiya
 - Installation of coal handling system: Not complied (timeline not given)
 - Water sprinkling system or tankers: Not complied (timeline not given)
 - Drainage facility: Not complied (timeline not given)

- Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Partially complied (timeline for completion not given)
- c. WCR, Gondawali
- Installation of coal handling system: Not complied (timeline not given)
 - Wind breaking wall of 1000 m: 500 m completed, 500 m remaining
 - Water sprinkling system or tankers: Not complied (timeline not given)
 - Drainage facility: Not complied (timeline not given)
 - Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Not complied (timeline not given)
- d. WCR, Bargawan
- Installation of coal handling system: Not complied (timeline not given)
 - Wind breaking wall of 1000 m: 600 m completed, 400 m remaining
 - Water sprinkling system or tankers: Not complied (timeline not given)
 - Drainage facility: Not complied (timeline not given)
 - Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Not complied (timeline not given)
- e. WCR, Gajra Bahra
- Installation of coal handling system: Not complied (timeline not given)
 - Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Partially complied (timeline for completion not given)
- viii. Out of the 56 stone crushers, 12 stone crushers have been shut down. 44 stone crushers have installed Air Pollution Control Equipment (APCE).

- ix. CEPI score 43.4 was observed during monitoring conducted by MPPCB, in consultation with the Regional Office of CPCB, in the period of May to June, 2024.
- x. Mapping of roads used for coal/ ash transportation with responsible agencies to control air pollution was presented for 5 different routes for coal/ash transportation.
- xi. Out of the 127 million tonnes of coal production, 109.81 million tonnes (86%) is being transported by rail/ merry-go-round and 16.62 million tonnes (16.6%) is being transported by roads. 35 million tonnes/annum CHP is under construction and installation.

12. A presentation was made by the Uttar Pradesh Pollution Control Board on the progress of implementation of action plans and environmental guidelines for stone crushing units published by CPCB for control of air pollution. The following details were presented:

- i. The status of fly ash generation and utilization by 06 TPPs in Sonbhadra, U.P. were reported as below:

Financial Year	Ash Generation (LMT)	Ash Utilization (LMT)	% Ash Utilization
2021-22	151.1	57.9	38.3
2022-23	161.9	56.8	35.1
2023-24	160.7	101.8	63.3
2024-25 (up to Nov., 2024)	219.05	106.2	48.5

- ii. Action plans have been submitted by 06 TPPs, 03 industries, 05 coal mines (NCL), and stone crushers for implementation of air pollution control measures. The following activities form action plan of various industries in U.P. have been reported to be under progress:

- a. M/s NTPC SSTPS, Shaktinagar to install FGD in all 7 units and expand AWRS capacity by March, 2026, and DAES#1 and U#7 is in commissioning is expected to be completed by March, 2025.
 - b. In M/s NTPC Rihandnagar SSTP, commissioning of FGD and DAES (Stage I) is expected to take place by 31.12.2026 and 31.12.2025, respectively. Cold Fog Dust Suppression (CFDS) System in Stage I and CFDS Stage II were commissioned in April, 2024 and November, 2024, respectively.
 - c. M/s MEIL Anpara Energy Limited (formerly M/s Lanco Anpara Power Limited, Anpara) - FGD installation by December, 2025
 - d. M/s U.P. Rajya Vidyut Utpadan Nigam Ltd. (Anpara A, B & D TPS), Anpara- FGD installation at A, B & D TPS by December, 2026
 - e. M/s Hindalco Industries Limited, Renusagar Power Division- FGD installation in Boiler 5 by June, 2025.
 - f. M/s U.P. Rajya Vidyut Utpadan Nigam Ltd. (Obra A, B - TPS), Obra- FGD installation by May, 2025, DFAES through railway to be installed by 2026.
- iii. The status of generation and utilization of fly ash was submitted by 06 TPPs. The details have been given below:

TPP name	FY 2023-24			FY 2024-25 (up to Nov 24)		
	Ash Generation (LMT)	Target Ash Utilization (%)	Actual Ash Utilization (%)	Ash Generation (LMT)	Target Ash Utilization (%)	Actual Ash Utilization (%)
UPRVUNL Obra TPP	14.4	102	95.25	112.3	105	31.82
UPRVUNL Anpara TPP	41.6	69	51.67	32.04	97.89	17.49
NTPC Rihand	42.2	67	80.42	27.8	101	82.85
NTPC Shaktinagar	30.2	-	40.44	24.1	140.8	103.82
MEIL Anpara Energy Limited	18.1	-	23.69	13.23	-	48.82

Hindalco Industries Limited, Renusagar Power Division	14.1	-	114.67	9.6	-	106.31
Total	160.6	-	63.3	219.1	-	48.5

- iv. Ash utilization was 56.817 LMT in FY 2022-23, 101.822 LMT in FY 2023-24 and 106.145 LMT in FY 2024-25 (up to Nov 2024).
- v. The status of implementation of action plan by the mining projects along with the timelines was presented. The details of the work under progress/ remaining work have been given below:
- a. M/s NCL Ltd., Bina Project, Bina- Construction of new CHP (9.5 MTPA) by June, 2025 (91% of the work completed); upgradation of ETP & STP by December, 2024 (99% of the work completed); and carrying capacity of mine and traffic study (EC condition) by December, 2024 (work under progress).
 - b. M/s NCL, Dudhichua Project- Tyre washing system/mechanism of Coal transporting vehicles on Road by December, 2024 (99% of work completed).
 - c. M/s NCL Ltd., Kakri Project- Tyre washing system/mechanism of Coal transporting vehicles on Road by February, 2025 (25% of work completed); construction of wharf wall/ railway siding: Platform work completed and rail connectivity to wharf wall is to be done by ECR.
 - d. M/s NCL Ltd., Khadia Project
 - ETP upgradation under progress
 - Tyre washing system/mechanism for Coal transporting vehicles on Road by December, 2024. Tender under progress.
 - Construction of Wharf wall / Railway Siding under progress. Rail connectivity to wharf wall to be done by ECR railway siding.
 - e. M/s NCL Ltd., Krishnashila Project- Construction of sedimentation ponds

vi. The status of implementation of action plan by other industries was presented. The details of the work under progress/ remaining work have been given below:

- a. M/s Grasim Industries Limited Chemical Division, Renukoot – Miyawaki Plantation inside the premises has been done and approximately 63% of green belt has been done inside the premises. Miyawaki Plantation outside the plant premises will be done.
- b. M/s Birla Carbon India Pvt. Ltd., Renukoot – Miyawaki Plantation has been completed in 150 m² . Miyawaki Plantation outside the plant premises will be done.
- c. Aluminium Smelter- M/s HINDALCO Industries Ltd., Renukoot :
 - Tri-party agreement between IIFM Bhopal, UP Forest Department and AAI done on 18.08.2023 to conduct a pilot study for assessing the impact of backfilling of abandoned quarry in Dalla region of approx.. 0.5 hectare area.
 - IIFM issued permission letter on 25.11.2024 to start the execution job.
 - IIFM has requested for concurrence from CCF, Mirzapur for void dewatering, filling of void by OB/ native soil and construction of well.

vii. The status of implementation of 'Environmental guidelines for stone crushing units' published by CPCB for control of air pollution was presented. The details have been given below:

- a. UPPCB published a press release in newspaper dated 20.11.2024 directing stone crushing units of Dalla, Bili Markundi, Obra region to ensure non-operation of stone crushing unit from 5:00 PM to 10:00 AM and to ensure proper operation of the installed air pollution control systems. Stone crushing units have also been directed to reduce vehicular dust emission by regular water sprinkling on road.
- b. Joint Committee has been constituted by District Magistrate dated 21.11.2024 for regular monitoring of air pollution control measures installed at the stone crushing units.

- c. A meeting of the Joint Committee was held on 11.12.2024 to discuss implementation of GRAP and review the compliance of status of Action Plan under NCAP.
 - d. District Magistrate has directed all TPPs and coal mines to reduce road dust during ash/ coal transportation by ensuring the usage of covered vehicles and regular water sprinkling along with road dust sweeping.
 - e. Regular inspections have been carried out by UPPCB and action has been taken against the non-complying units.
 - f. The level of PM10 in FY 2024-25 (during the months July, August, Sep, Oct, Nov) in ambient air near Dalla/ Obra stone crusher area is higher than the previous three financial years.
 - g. UPPCB is monitoring the ambient air quality at Anpara Station, Sonbhadra through manual monitoring station under NAMP. The level of PM10 has reduced in the FY 2024-25 (up to November, 2024) ($140 \mu\text{g}/\text{Nm}^3$) compared to FY 2023-24 ($166 \mu\text{g}/\text{Nm}^3$). The level of SO_2 and NO_2 have remained almost constant at $17 \mu\text{g}/\text{Nm}^3$ and $24 \mu\text{g}/\text{Nm}^3$, respectively. AQI has reduced (AQI: 127) in the FY 2024-25 compared to the FY 2023-24 (AQI: 144).
- viii. The status of mapping of roads used for coal/ ash transportation with responsible agencies to control air pollution was presented. The summary of transportation of coal via various different modes by NCL coal mines has been given as below:
- a. For FY 2024-25 (up to November 2024), the transportation modes for NCL coal mining projects are as follows:
 - **NCL Bina:** 72.4% by rail, 21% by road, and 6.6% by belt pipe conveyor.
 - **NCL Khadia:** 73.54% by rail and 26.46% by road.
 - **NCL Krishnashila:** 59.38% by rail, 29.95% by road, and 10.67% by belt pipe conveyor.
 - **NCL Kakri:** 61.18% by rail and 38.82% by road.
 - **NCL Duddhichua:** Currently, there is no mining activity in the Sonbhadra region.

- a. For the M/s NCL Bina project, the percentage of rail usage as the mode of transportation remains constant at 72% from FY 2023-24 to FY 2024-25 (up to Nov., 2024). Meanwhile, road transportation has decreased from 28% in FY 2023-24 to 21% in FY 2024-25, and the use of ropeway/belt pipe conveyor has risen from 0% in FY 2023-24 to 6.6% in FY 2024-25.
 - b. For the M/s NCL Krishnashila project, the percentage of rail usage as the mode of transportation has increased from 53% from FY 2023-24 to 59% in FY 2024-25 (up to Nov., 2024), road transportation has increased from 18% in FY 2023-24 to 30% in FY 2024-25, and the use of ropeway/belt pipe conveyor has decreased from 29% in FY 2023-24 to 11% in FY 2024-25.
 - c. For the M/s NCL Kakri project, the percentage of rail usage as the mode of transportation has increased from 49% from FY 2023-24 to 61% in FY 2024-25 (up to Nov., 2024), and road transportation has decreased from 51% in FY 2023-24 to 39% in FY 2024-25.
 - d. For the M/s NCL Khadia project, the percentage of rail usage as the mode of transportation has decreased from 75% from FY 2023-24 to 74% in FY 2024-25 (up to Nov., 2024), and road transportation has increased from 25% in FY 2023-24 to 26% in FY 2024-25.
 - e. Out of the 60 million tonnes of coal production, 44.3 million tonnes (74%) is being transported by rail/ merry-go-round, 13.49 million tonnes (22.5%) is being transported by roads and 2.68 million tonnes is being transported by Belt Pipe Conveyor. 18.5 million tonnes/annum CHP is under construction and installation.
13. After detailed deliberations, the **following decisions were made:**
- i. Anpara TPS and UPPCB to address the issue of fly ash utilization during FY 2024-25 and send the report to the Ministry with arrangements to be made, the conditions to be imposed and the timelines. The report will also include the challenges related transfer of fly ash to Gorbi Mines.

(Action: UPPCB and Anpara TPS)

- ii. NoC from DM, Singrauli and CTO by MPPCB for transportation of fly ash from Anpara TPS to Gorbi Mines may be granted, subject to the required conditions and timelines for transportation of fly ash.

(Action: DM, Singrauli and MPPCB)

- iii. SOP may be developed for implementation of NEERI technologies for stabilizing the abandoned ash dyke through bamboo plantation.

(Action: CPCB & NEERI)

- iv. Anpara TPS shall send a request to NEERI for the proposal on implantation of NEERI technologies/ expertise for stabilizing abandoned ash dyke through bamboo plantation. NEERI shall send the proposal to Anpara TPS within a week on receiving the request from Anpara TPS to award and initiate the work.

(Action: Anpara TPS and NEERI)

- v. ECR and WCR shall share geotagged photos with CPCB, of the air pollution control measures taken at railway sidings/ Goods Sheds in the Singrauli and Sonbhadra regions.

(Action: ECR and WCR)

- vi. ECR shall implement the air pollution control measures taken at the Goods Sheds / railway sidings. A certification from NEERI to be obtained that all dust control measures have been implemented and complied with. Any issues identified during the certification process will be addressed accordingly. This could serve as a model for air pollution control measures at coal-handling Goods Sheds/ railway sidings across Indian Railways.

(Action: ECR and NEERI)

- vii. CPCB shall create provisions on the online portal for uploading the locations, geotagged photos and short videos of the legacy ash dumpsites by TPPs and air pollution control measures taken at railway sidings by ECR and WCR.

(Action: CPCB)

- viii. Railway Board shall prepare action plan regarding the installation of automated coal handling mechanism at railway sidings.

(Action: Railway Board)

- ix. ECR and WCR shall make a presentation in the next Mission meeting covering all the stages of coal handling and transportation at the Goods Sheds/ railway sidings, including the details regarding the dust control measures at each stage in the Goods Sheds/ railway sidings.

(Action: ECR and WCR)

- x. Letters to be sent to the General Manager, West Central Railway Zone and East Central Railway Zone regarding the non-compliance of the action plans.

(Action: MoEF&CC)

- xi. CPCB, Ministry of Coal and Ministry of Mines shall work together to develop an GIS based online system for identification and allocation of mine voids, incorporating geotagged locations of both TPPs and mine voids, within 3 months. This information will be made available on the CPCB portal for access by all decision-makers. Additionally, the minutes of the Central Level Working Group meetings will also be made available on the portal.

(Action: Ministry of Coal, Ministry of Mines and CPCB)

- xii. Ministry of Coal shall present the status of coal transportation and installation of CHP/ conveyer belts with original, extended and committed timelines for all the coal mines with the said EC/CTO conditions in the next meeting of the Mission.

(Action: Ministry of Coal)

- xiii. Joint Committee report on ash dyke conditions of MPPGCL to be shared with the power plant. MPPGCL to submit action taken report as per the recommendations of the Joint Committee report and to be submitted to

CPCB and MPPCB. CPCB to examine the recommendations of the Joint Committee report.

MPPGCL shall share the report of the water quality from the toe drain of the Ash Dyke – II of Sanjay Gandhi Thermal Power Station (SGTPS), Birsinghpur with CPCB/ MoEF&CC to ascertain the impact of ash disposal activities on adjacent forest land.

(Action: MPPGCL)

- xiv. CSIR-NEERI shall prepare SOPs on (i) stabilization of ash ponds through plantation of bamboo species to improve biodiversity, (ii) control of pollution around operational ash ponds through plantation of bamboo species, and (iii) stabilization of mine voids filled with fly ash. For the SOP on the stabilization of filled mine voids, NEERI shall work with NTPC, Ministry of Coal, CPCB, UPPCB and MPPCB.

(Action: Ministry of Coal, CPCB, CSIR-NEERI, CPCB, UPPCB and MPPCB)

- xv. CSIR- NEERI to nominate a designated nodal officer to attend the meetings of the Fly Ash Management and Utilization Mission and for handling all related matters, and share the details of the nominated officer with MoEF&CC.

(Action: CSIR-NEERI)

- xvi. Sasan Power Limited, Singrauli, may hire independent experts to examine the technical feasibility and impact study of disposal of fly ash in the low-lying area in a scientific manner. Joint inspection may be done with MPPCB in this regard and the safeguards that can be put into place may be determined.

(Action: Sasan Power Limited, Singrauli and MPPCB)

- xvii. DO letter to be sent to NCL Chairman and Managing Director regarding the gaps in the compliance of the action plans and status of implementation of the action plans.

(Action: MoEF&CC)

- xviii. NCL to share the roles and responsibilities of the in-house environmental engineers appointed by them, and the activities undertaken by them at respective mines.

(Action: NCL)

- xix. Ministry, in coordination with CPCB, MPPCB and UPPCB, shall hold a meeting with the TPPs, coal mines and East/ West Central Railway regarding the status of implementation of the action plans, conditions of EC & CTO within one month. The review shall also include the mapping of the revised timelines as against the actual timelines.

(Action: MoEF&CC, CPCB, MPPCB and UPPCB)

- xx. Stone crushers of all capacities shall take measures to prevent/ suppress fugitive dust emissions from their operation in line with 'Environmental Guidelines for Stone Crushing Units' by CPCB. Status of implementation shall be submitted.

(Action: MPPCB, UPPCB and all stone crushers in Singrauli and Sonbhadra region)

- xxi. Comparison of the CEPI score calculation methods used by CPCB and MPPCB shall be carried out.

(Action: CPCB)

- xxii. Action plan to be prepared, within the next three months, outlining the allocation of responsibilities for construction of different sections of the roads for coal/ash transportation, control of air pollution during coal/ash transportation, components related to DPR preparation and funding. A meeting may be conducted with mining/ coal industrial

associations/agencies and stone crushers to work out the details in this regard.

(Action: MPPCB and UPPCB)

- xxiii. M/o Power and CEA to share the details regarding the number of TPPs in the country, number of TPPs in requirement of stabilization of legacy dumpsites and number of TPPs that have submitted the action plan for stabilization of legacy dumpsites.

(Action: M/o Power and CEA)

- xxiv. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd, 3rd, 4th, 5th, 6th and 7th meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

14. Meeting ended with a vote of thanks to the Chair.

List of Participants

1. Smt. Leena Nandan, Secretary, EF&CC- Chairperson
2. Shri Tanmay Kumar, Special Secretary, MoEFCC and Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Dr. Navneet Kothari, Secretary Env., Govt of MP
5. Shri Satyendra Kumar, Director, MoEFCC
6. Shri Achyut Anand Mishra, MS, MP Pollution Control Board
7. DM, SINGRAULI
8. DM, SONBHADRA
9. Shri Amit Kumar, Director, CEA
10. Shri Marapally Venkateshwarlu, Director, Ministry of Coal
11. Shri N. Subrahmanyam, Scientist E, MoEFCC
12. Shri Sourabh Kumar, Deputy Director, CEA, Mop
13. Shri R.P. Singh, Geologist, DGM UP Lucknow
14. Shri Anuj Kumar, Geologist, DGM.UP Lucknow
15. Shri Sudhir Kumar Singhai, Addl. CE, MP Power Gen. Co. Ltd.
16. Shri Ravikant Raut, Chief Chemist, M.P Power Gen. co. Lyd.
17. Shri Jitendra Prasad, Add. VP, Sasan Power Ltd.
18. Shri Reetesh Tiwari, RO Sonbhadra, UPPCB
19. RO MPPCB SHAHDOL
20. S. Ansari, Director (S&T), DGMS
21. Shri Vinay Ramaiya, EE, MPPCB
22. Shri Himanshu Verma, AGM-HSE, MEIL Anpara Energy Ltd.
23. Shri Kamaljeet Rai, DGM, MEIL Anpara Power Ltd.
24. Shri Ashok Kumar Singh, G.M., Grasim Chemical division-Renukoot

25. Shri A.K. Tripathy, Dir (Tech), UPRVUNL
26. Shri Vipin Kumar Gautam, SE, UPRVUNL
27. Shri Subodh Choudhary, PCME/ECR, East Central Railway
28. Shri Md. Tausif Ullam, DTM/Chopan Dhanbad, East Central Railway
29. Shri Rohit Singh, Demhm/Dhw, East Control Railway
30. Shri R. N. Shukla, Head Env. ESG. Forest, Adani Power Ltd.
31. Ms. Khushi Parekh, Asst. Manager, Mahan Energen Ltd.
32. Shri Ashwani Tyagi, DGM, NTPC Ltd.
33. Shri K. Karthikeyar, AGM, NTPC Ltd
34. Shri M.K.V. Rama Rao, Chief Technical Officer, JPVZ
35. Shri Sanjay Singh, Joint President, JPVL, NIGRIE/Delhi Office
36. Shri Mahendra Prasad, OSD, Noida
37. Shri Nandan Kr. Choudhury, Dy. Manager (Geo), Northern Cornfield Ltd.
Singrauli
38. Shri Dinkar Tiwari, Dy. Manager (Mining), NCL
39. Shri S.L. Gupta, CE, PWD Meerut
40. Shri Hitlar, AE, CD-2 PWD Ghaziabad
41. Shri Sanjay Gupta, Dy. CCM(FM), W.C.RLY
42. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
43. Shri Abhishek Singh, EE, NLCIL (MoC)
44. Shri Ranvir Prasad, MD, UPRVUNL
45. Shri Sunil Prasad Singh, D.T., NCL
46. Shri Ajay Prakash, CCM-FM WCRLY, W.C. Railway
47. Shri Sanjeev Kumar Wohra, Regional Officer, MPPCB
48. Shri Ajay Jha, Dir/ENHM/plyBQ, Railway Board
49. Team of STPP



भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

**REPORT ON FLY ASH GENERATION AT COAL / LIGNITE
BASED THERMAL POWER STATIONS AND ITS
UTILIZATION IN THE COUNTRY FOR THE YEAR 2021 - 22**

**CENTRAL ELECTRICITY AUTHORITY
CIVIL DESIGN DIVISION
NEW DELHI**

AUGUST- 2022

घनश्याम प्रसाद
अध्यक्ष तथा पदेन सचिव भारत सरकार
GHANSHYAM PRASAD
Chairperson & Ex-officio Secretary
To the Government Of India



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FOREWORD

Presently, the Coal and Lignite based Power Generating Stations contribute more than 69 % in the total electricity generation in the country. In near future also, the coal-based generation is likely to remain substantial. Indian coal has high ash content, of the order of 30–60 %, resulting in generation of a large quantity of fly ash in coal and lignite based Thermal Power Stations. At present, ash utilization is lower than its production on all India basis. As a result, there is a surplus ash stock, which has been increasing every year. The management of fly ash has been a matter of concern in view of requirement of large area of land for its storage and disposal as well as its potential to cause air and water pollution.

To address the above concerns, the Ministry of Environment & Forests and Climate Change (MoEF & CC) has issued various Notifications on fly ash utilization prescribing therein the targets for fly ash utilization for coal / lignite based Thermal Power Stations with an aim to achieve 100% utilization in a phased manner. Central Electricity Authority (CEA) has been monitoring the status of fly ash generation and its utilization in the country since 1996.

The utilization of fly ash has increased from about 6.64 Million Tonnes in 1996-97 to a level of 259.86 Million Tonnes in 2021-22. The percentage of fly ash utilization during 2021-22 was 95.95%. To materialize 100 % utilization of fly ash on all India basis, in line with MoEF & CC Notifications, extra efforts need to be put in by all Thermal Power Stations.

I wish to express my sincere thanks to all the Power Utilities and Thermal Power stations in the country for providing data/information on fly ash generation and its utilization to CEA for bringing out this report. I believe that this report would be useful for all the stakeholders and pave the way to achieve for 100% utilisation of fly ash in the country.


(Ghanshyam Prasad)

New Delhi
4 August 2022



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सेवा भवन, रामाकुष्मा पुरम्

MEMBER (Hydro)

& EX-OFFICIO ADDL. SECRETARY TO THE GOVERNMENT OF INDIA

CENTRAL ELECTRICITY AUTHORITY

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05.08.2022

NEW DELHI-110066

PREFACE

Management of fly ash at coal/lignite based Thermal Power Stations (TPS) 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 Notification of 14th September, 1999 and its subsequent amendments. The land to be acquired for creating ash dykes for ash disposal facilities at thermal power plants is becoming difficult. Fly ash, if not managed well, may pose environmental challenges.

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 & Forests (MoEF) 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. MoEF&CC, G.O.I 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 TPS. The latest Notification issued on 31st December 2021 by MoEF & CC on utilization of Fly ash shall be applicable for F.Y. 2022-23 onwards.

These initiatives and policy decisions by GoI have led to increased utilization of fly ash in various construction activities like making of fly ash based building products, manufacturing of Portland Pozzolana Cement, construction of roads / highways / flyovers, reclamation of low lying areas, backfilling and stowing of mines, wasteland development, construction of Roller Compacted concrete dams etc. Though in 2021 - 22, the ash utilization level has reached to about 95.95 % (259.86 Million Tonnes) as compared to less than 10% (6.64 MT) during the year 1996-97, a lot more needs to be done.

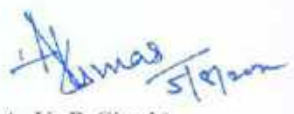
This report brings out the present status of fly ash generation at 200 coal / lignite based Thermal Power Stations and its utilization in the country. It also brings out the status of the level of fly ash utilization achieved by various thermal power stations in the country vis-à-vis targets prescribed in MoEF's Notification of 14th September 1999 and its subsequent amendments in 2003, 2009 & 2016. I am confident that the report will also be useful to all the stakeholders involved in fly ash management in the country for planning the utilization of fly ash and having necessary tie-up with the concerned thermal power station.

To be continued.....

स्वहित एवं राष्ट्रहित में ऊर्जा बचाएं
Save Energy for Benefit of Self and Nation

Data collection, its compilation, reconciliation & analysis is quite a vast task. Moreover, to provide a dependable / accurate data in desired formats is equally a major job. We acknowledge and express our gratitude to all Power Utilities and Thermal Power Stations for furnishing data in a timely manner. I would also like to place on record my appreciation of the efforts made by the officers and staff of Civil Design Division. We solicit suggestions from all concerned for further improving the presentation made in the report. All 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: tcdeca@nic.in).

New Delhi
August, 2022


(M. A. K. P. Singh)



Anil Jain

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CENTRAL ELECTRICITY AUTHORITY
विद्युत मंत्रालय
MINISTRY OF POWER
सेवा भवन, रामाकृष्णा पुरम्
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NEW DELHI-110066, Dated :

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 report on fly ash generation and its utilization in the country for the year 2021-22. Timely furnishing the required data and information by various Power Utilities and Thermal Power Stations to CEA is important for bringing out the report.

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 Baleshwar Thakur, Director, Shri P.S. Mohan Kumar, Deputy Director, Shri Manoj Kumar Choudhary, Assistant Director-II and other officers of TCD Division, CEA in the preparation of this report.

New Delhi

AUGUST, 2022


(Anil Jain)

Chief Engineer (CD)

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REPORT

CENTRAL ELECTRICITY AUTHORITY**CIVIL DESIGN DIVISION****FLY ASH GENERATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS
AND ITS UTILIZATION IN THE COUNTRY
(FOR THE YEAR 2021 - 22)****1.0 BACKGROUND**

Coal / Lignite based Thermal Power Generation has been the backbone of power capacity addition in the country. Indian coal is of low grade with ash content of the order of 30-60 % in comparison to imported coals which have a low ash content of the order of 2-20 %. A large quantity of ash is, thus being generated at Coal / Lignite based Thermal Power Stations in the country, which not only requires a large area of precious land for its disposal but is also one of the sources of pollution of both air and water.

Central Electricity Authority (CEA) has been monitoring the fly ash generation and its utilization at coal / lignite based thermal power stations in the country since 1996. Data on fly ash generation and utilization including modes of utilization are obtained from thermal power stations on Half-Yearly as well as on Yearly basis. The data thus obtained is analyzed and a report, bringing out the status of fly ash generation and its utilization in the country, is prepared. It is uploaded on the web site of CEA for bringing out the information in the public domain so that users of fly ash can have access to the information on the availability of fly ash at different thermal power stations in the country, in order to facilitate and promote the utilization of fly ash.

In order to reduce the requirement of land, for the disposal of fly ash in the ash ponds, and to address the problem of pollution caused by fly ash, the Ministry of Environment, Forests (MoEF) has issued various Notifications on fly ash utilization. The First Notification was issued on 14th September 1999 which was subsequently amended in the years 2003, 2009 and 2016 vide Notifications dated 27th August 2003, 3rd November 2009 and 25th January 2016 respectively. The amendment Notification of year 2009 prescribes the targets of Fly Ash utilization in a phased manner for all Coal / Lignite based Thermal Power Stations in the country so as to achieve 100% utilization of fly ash. The latest Notification on utilization of Fly Ash has been issued by MoEF & CC on 31.12.2021 which shall be applicable for the financial Year 2022-23 onwards.

The Thermal Power Stations in operation, before the date of the Notification (i.e. 3rd November 2009) are to achieve the target of fly ash utilization in successive 5 years; 50% in the first year; 60% in the second year; 75% in the third year ; 90% in the fourth year and 100% in the fifth year from the date of notification. The new Thermal Power Stations coming into operation after the MoEF's notification (i.e. 3rd November 2009) are to achieve the target of fly ash utilization as 50% in the first year, 70% in the second year, 90% in the third year and 100% in the fourth year from their date of commissioning. Ministry of Environment, Forest and Climate Change (MoEF&CC) has issued an amendment to the Notification on 25th January 2016 in order to widen the

scope of fly ash utilization, besides engraining upon Power Utilities to bear the cost of the transportation.

The report on “Fly Ash Generation and its Utilization at Coal / Lignite based Thermal Power Stations” provides the information and the status of fly ash utilization in the country. It also facilitates to ascertain the level of fly ash utilization achieved by various power stations in relation to targets prescribed in MoEF’s amended notification of 3rd November, 2009 and to take corrective measures in the cases of Thermal Power Stations lagging behind in achieving the prescribed targets of fly ash utilization.

2.0 ASH GENERATION & UTILIZATION DURING THE YEAR 2021-22

2.1 A Brief Summary

Fly ash generation & utilization data for the Year 2021-22 (April 2021 to March 2022) has been received from **200 (Two Hundred)** coal / lignite based thermal power stations of various power utilities in the country. Data received has been analysed to derive conclusions on present status of fly ash generation and its utilization in the country as a whole. A Brief summary of status is given in **Table-I** below:

TABLE-I
SUMMARY OF FLY ASH GENERATION AND UTILIZATION DURING
THE YEAR 2021-22

Description		Year 2021 - 22
No. of Thermal Power Stations from which data have been received	:	200
Installed capacity (Mega Watts)	:	213620.50
Coal Consumed (Million tons)	:	759.02
Fly Ash Generation (Million tons)	:	270.82
Fly Ash Utilization (Million tons)	:	259.86
Percentage Utilization (%)	:	95.95
Percentage Average Ash Content (%)	:	35.68

Power Station wise fly ash generation & its utilization status including the modes of utilization for the year 2021-22 for all the 200 thermal power stations is given in the statement at Annexure-I and State wise fly ash generation & its utilization status is given in Annexure-II.

2.2 Data Provided by Thermal Power Units Commissioned during the Year 2021-22:

During the Year 2021-22, Nine (9) Thermal power plants with a total installed capacity of 5260 MW as given in Table-II below were commissioned:

TABLE-II
DATA PROVIDED BY THERMAL POWER UNITS COMMISSIONED DURING
THE YEAR 2020-21

Sl.No	Name of Thermal Power Station	Name of Power Utility	Unit No.	State	Capacity (MW)	Date of Commission
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2021 - 22						
1	NABINAGAR- BRBCL	BHARATIYA RAIL BIJLEE COMPANY LIMITED (NTPC-JV)	4	Bihar	250.00	01.12.2021
2	TANDA	NTPC LTD.	6	Uttar Pradesh	660.00	01.07.2021
3	BARH SUPER TPS	NTPC LTD.	1	Bihar	660.00	12.11.2021
4	NABINAGAR-NPGC	NPGC (NTPC-JV)	2	Bihar	660.00	23.07.2021
5	DARLIPALI SUPER TPS	NTPC LTD.	2	Odisha	800.00	01.09.2021
6	BARAUNI	NTPC LTD.	9	Bihar	250.00	01.11.2021
7	KHARGONE SUPER THERMAL POWER STATION	NTPC LTD.	2	Madhya Pradesh	660.00	04.04.2021
8	SURATGARH	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	8	Rajasthan	660.00	06.10.2021
9	HARDUAGANJ	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	10	Uttar Pradesh	660.00	09.02.2022
Total for 2021 - 22					5260.00	

2.3 Retirement of Thermal Power Units during the Year 2021-22:

During the Year 2021-22, the following units with installed capacity as given in Table-III below have been decommissioned:

TABLE-III
THERMAL POWER UNITS RETIRED / DECOMMISSIONED DURING
THE YEAR 2021-22

Sl.No	Name of Thermal Power Station	Name of Power Utility	State	Unit No.	Capacity (MW)	Sub Total	Date of De Commissioning
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2021 - 22							
1	BOKARO	Damodar Valley Corporation	Jharkhand	3	210	210	01.04.2021
2	KANTI BIJLEE UTPADAN NIGAM LIMITED	KANTI BIJLEE UTPADAN NIGAM LIMITED (NTPC-JV)	Bihar	1 & 2	110 & 110	220	31.01.2022
3	KORADI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	7	210	210	02.09.2021
4	KOLAGHAT	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	1 & 2	210 & 210	420	28.03.2022
5	BANDEL	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	1	60	60	28.03.2022
Total for 2021 - 22						1120	

2.4 Power Utility Wise Status of Fly Ash Generation & its Utilization during the Year 2021-22:

The status of fly ash generation & utilization for the year 2021-22 for various power utilities in the country has been assessed based on the data received from Thermal Power Stations and the same is given in **Table – IV**:

TABLE-IV
POWER UTILITY WISE FLY ASH GENERATION AND UTILIZATION FOR
THE YEAR 2021-22

Sl. No.	Name of Power Utility	No. of TPS	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	Percentage Utilization (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	AARTI STEELS LIMITED	1	80.00	0.2612	0.2612	100.00
2	ANDHRA PRADESH POWER GENERATION CORPORATION (APGENCO)	2	3410.00	6.3033	5.7316	90.93
3	Andhra Pradesh Power Development Company Limited	1	1600.00	1.2329	0.8031	65.14
4	ACB (INDIA) Ltd.	5	490.00	1.5135	1.5133	99.99
5	ARAVALI POWER CORPORATION PVT LTD (NTPC-JV)	1	1500.00	1.6420	2.6160	159.32
6	ADANI POWER (MUNDRA) LIMITED	1	4620.00	0.3448	0.3566	103.41
7	ADANI POWER MAHARASHTRA LTD.	1	3300.00	4.5451	3.5557	78.23
8	ADANI POWER RAJASTHAN LTD.	1	1320.00	1.5625	1.5648	100.15
9	Abhijeet MADC Nagpur Energy Pvt. Ltd.	1	246.00	0.0000	0.0370	-
10	ADANI ELECTRICITY MUMBAI LIMITED	1	500.00	0.6346	0.6710	105.74
11	ADHUNIK POWER & NATURAL RESOURCES LTD.	1	540.00	1.1199	0.9762	87.17
12	Bajaj Energy Limited	5	450.00	0.3005	0.3005	100.00
13	BHARATIYA RAIL BIJLEE COMPANY LIMITED (NTPC-JV)	1	1000.00	1.6124	0.9127	56.60
14	BALCO	2	1740.00	3.1346	4.0345	128.71
15	BHADRESHWAR VIDYUT PRIVATE LIMITED	1	300.00	0.0215	0.0215	100.41
16	C.E.S.C. Ltd. (West Bengal)	3	1125.00	1.1135	1.1135	100.00
17	Chattisgarh State Power Generation Company Ltd. (C.S.P.G.C.L.)	3	2840.00	5.5878	2.4636	44.09
18	COASTAL ENERGEN PVT. LTD	1	1200.00	0.0674	0.0704	104.47
19	C.G.P.L (Gujarat)	1	4150.00	0.0360	0.0420	116.67
20	CHEMPLAST LIMITED	1	48.50	0.0192	0.0192	100.26
21	DB POWER LIMITED	1	1200.00	2.9851	3.4076	114.15
22	Damodar Valley Corporation (D.V.C.)	7	6750.00	12.4280	9.5306	76.69
23	Dhariwal Infrastructure Ltd. (Maharashtra)	1	600.00	0.9511	0.9511	100.00
24	MAHAN ENERGEN LTD.	1	1200.00	0.8359	0.2128	25.46

25	ESSAR POWER GUJARAT LTD	1	1200.00	0.0000	0.0000	#DIV/0!
26	Gujarat Industries Power Corporation Ltd. (G.I.P.C.L.)	1	500.00	0.4719	0.4719	100.00
27	Gujarat Mineral Development Corporation Ltd. (G.M.D.C.L.)	1	250.00	0.1158	0.2246	193.91
28	G.S.E.C.L. (Gujarat)	6	5160.00	5.1738	6.1721	119.30
29	GMR Warora Energy LTD. (Maharashtra)	1	600.00	0.8208	1.0294	125.41
30	GMR Kamalanga Energy LTD. (Odisha)	1	1050.00	2.3240	3.1018	133.47
31	Haryana Power Generation Cor. Ltd. (H.P.G.C.L.)	3	2510.00	2.2545	10.6771	473.60
32	HALDIA ENERGY LIMITED (W.B.)	1	600.00	1.0940	1.0940	100.00
33	HINDUJA NATIONAL POWER CORPORATION LIMITED	1	1040.00	0.0845	0.4047	478.97
34	INDIA POWER CORPORATION LTD.	1	12.00	0.0166	0.0166	100.00
35	INDIAN METALS & FERRO ALLOYS LTD. (Odisha)	1	200.00	0.5201	0.5201	100.00
36	IL & FS TAMIL NADU POWER COMPANY LIMITED	1	1200.00	0.0766	0.0766	100.00
37	IDEAL ENERGY PROJECTS LIMITED	1	270.00	0.0000	0.0000	-
38	JK CEMENT WORKS MUDDAPUR	1	50.00	0.0141	0.0141	100.00
39	JHAJJAR POWER LIMITED	1	1320.00	1.8045	1.8045	100.00
40	JINDAL POWER LIMITED	2	3400.00	5.4037	4.7499	87.90
41	JAIPRAKSH POWER VENTURES LIMITED	2	1820.00	2.2667	1.9754	87.15
42	JSW Energy Ltd.	2	2060.00	0.6145	0.6145	100.01
43	JINDAL INDIA THERMAL POWER LIMITED	1	1200.00	2.4016	1.2906	53.74
44	JINDAL STEEL AND POWER LIMITED	3	1685.00	2.5680	1.7397	67.74
45	JSW ENERGY (BARMER) LIMITED	1	1080.00	0.8972	0.8468	94.38
46	JSW STEEL LIMITED	1	90.00	0.0094	0.0094	100.30
47	JHABUA POWER LIMITED	1	600.00	1.0217	0.5690	55.69
48	Karnataka Power Corporation Ltd.(K.P.C.L.)	2	3420.00	3.7161	3.2506	87.47
49	Kanti Bijlee Utpadan Nigam Limited	1	610.00	0.7890	1.3230	167.68
50	KSK MAHANADI POWER COMPANY LIMITED	1	1800.00	2.0586	2.2392	108.77
51	LANCO AMARKANTAK POWER LIMITED	1	600.00	1.1070	0.8297	74.95

52	LALITPUR POWER GENERATION COMPANY LIMITED	1	1980.00	2.0943	1.8855	90.03
53	LANCO ANPARA POWER LIMITED	1	1200.00	1.7101	0.2191	12.81
54	MAITHON POWER LIMITED	1	1050.00	1.8518	1.6577	89.52
55	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	4	5400.00	5.8844	3.3801	57.44
56	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	7	9540.00	14.2085	32.7349	230.39
57	MARUTI CLEAN COAL AND POWER LIMITED	1	300.00	0.6756	0.6756	100.00
58	SAI WARDHA POWER GENERATION PVT LTD.	1	540.00	0.4221	0.4221	100.00
59	MEENAKSHI ENERGY LIMITED	1	300.00	0.0172	0.0016	9.51
60	MB POWER (MADHYA PRADESH) LIMITED	1	1200.00	2.1848	2.1894	100.21
61	MEJA URJA NIGAM PRIVATE LIMITED (NTPC-JV)	1	1320.00	1.8226	1.3207	72.47
62	NPGC (NTPC-JV)	1	1320.00	1.6838	0.8596	51.06
63	NLC INDIA LIMITED	5	3640.00	1.2904	2.2134	171.53
64	NLC TAMIL NADU POWER LIMITED	1	1000.00	1.1385	1.1385	100.00
65	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	4	814.00	2.0264	1.4130	69.73
66	NTECL (Tamil Nadu)	1	1500.00	2.4466	1.9107	78.10
67	N.T.P.C. LTD.	23	48010.00	71.0290	57.1382	80.44
68	NABHA POWER LIMITED	1	1400.00	1.9556	1.9570	100.07
69	NATIONAL ALUMINIUM COMPANY LIMITED	1	1200.00	2.6936	2.3066	85.63
70	ODISHA POWER GENERATION CORPORATION LIMITED	1	1740.00	3.5855	0.9812	27.37
71	OPG POWER GENERATION PRIVATE LIMITED	1	414.00	0.1030	0.1030	100.00
72	Punjab State Power Corporation Ltd. (P.S.P.C.L).	4	2760.00	1.3577	2.3617	173.94
73	PRAYAGRAJ POWER GENERATION COMPANY LTD.	1	1980.00	2.4194	2.1075	87.11
74	R.K.M. POWERGEN PVT. LTD	1	1440.00	2.4624	2.4602	99.91
75	Rajasthan Rajya Vidyut Utpadan Nigam Ltd. (R.R.V.U.N.L.)	6	6510.00	6.0498	6.7646	111.81

76	ROSA POWER SUPPLY COMPANY LIMITED	1	1200.00	1.3284	1.0491	78.98
77	RATTANINDIA POWER LTD.	1	1350.00	2.3922	1.9421	81.19
78	RAICHUR POWER CORPORATION LIMITED	1	1600.00	1.3131	1.1415	86.93
79	RASHTRIYA ISPAT NIGAM LIMITED	1	315.00	0.5111	0.4667	91.31
80	RAIGARH ENERGY GENERATION LIMITED	1	600.00	1.0950	0.4100	37.44
81	RAIPUR ENERGEN LIMITED	1	1370.00	2.0409	2.0013	98.06
82	REILIANCE POWER LIMITED	1	3960.00	5.3475	2.7994	52.35
83	SAI LILAGAR POWER GENERATION LIMITED	1	86.00	0.0041	0.0041	-
84	SEMBCORP ENERGY INDIA LTD.	1	1320.00	1.6994	1.6999	100.03
85	SWASTIK POWER & MINERALS RESOURCES PVT. LTD.	1	25.00	0.0000	0.0000	-
86	SKS POWER GENERATION (CHHATTISGARH) LIMITED	1	600.00	0.5571	0.5317	95.43
87	THE DURGAPUR PROJECTS LIMITED	1	550.00	0.7238	0.4812	66.48
88	THE SINGARENI COLLIERIES COMPANY LIMITED	1	1200.00	1.9320	2.2660	117.29
89	TAQA NEYVELLY POWER CO.PVT. LTD.	1	250.00	0.0761	0.0639	83.98
90	THE TATA POWER COMPANY LIMITED	2	1297.50	1.0590	1.0688	100.92
91	TORRENT POWER LTD.	1	362.00	0.3739	0.3739	100.00
92	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	5	4320.00	6.1932	5.8409	94.31
93	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	6	2962.50	4.4217	3.1596	71.46
94	TRN ENERGY PRIVATE LIMITED	1	600.00	0.2273	0.1139	50.12
95	TENUGHAT VIDHYUT NIGAM LIMITED	1	420.00	0.3973	0.4478	112.70
96	TALWANDI SABO POWER LTD.	1	1980.00	2.4013	2.1702	90.38
97	Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd.(U.P.R.V.U.N.L.)	4	5820.00	7.0255	2.1171	30.13
98	UDUPI POWER CORPORATION LIMITED	1	1200.00	0.0572	0.0587	102.62
99	VIDARBHA INDUSTRIES POWER LTD.	1	600.00	0.0000	0.0000	-

100	VS LIGNITE POWER PRIVATE LIMITED	1	135.00	0.2265	0.2265	100.00
101	VEDANTA LIMITED	2	3615.00	4.7471	9.4964	200.05
102	West Bengal Power Development Corporation Limited (W.B.P.D.C.L)	5	4745.00	7.5790	5.4168	71.47
103	ZUARI CEMENT LIMITED	1	43.00	0.1017	0.1017	100.00
	GRAND TOTAL	200	213620.50	270.8216	259.8628	95.95

It may be seen from the Table-IV above that: the data of fly ash generation and utilization for the year 2021-22 was received from 103 Power Utilities out of which 50 Power Utilities have achieved fly ash utilization level of 100% or more and 10 Power Utilities have achieved fly ash utilization level in the range of 90% to less than 100

2.5 State wise Status of Fly Ash Generation & its Utilization during the Year 2021-22:

The state-wise status of fly ash generation & utilization in the country based on the data received from Thermal Power Stations / Power Utilities has also been assessed and the same is given in Table-V below:

TABLE-V
STATE WISE FLY ASH GENERATION AND ITS UTILIZATION DURING
THE YEAR 2021-22

Sl. No.	Name of State	Nos. of TPS	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	Percentage Utilization (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	ANDHRA PRADESH	8	9985.00	13.4400	13.1251	97.66
2	ASSAM	1	750.00	0.7573	0.4393	58.01
3	BIHAR	6	7860.00	11.0736	10.3099	93.10
4	CHHATISGARH	30	25720.00	44.9589	35.2808	78.47
5	GUJARAT	13	16542.00	6.5377	7.6626	117.21
6	HARYANA	5	5330.00	5.7010	15.0976	264.82
7	JHARKHAND	7	4557.50	8.1525	7.6726	94.11

Sl. No.	Name of State	Nos. of TPS	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	Percentage Utilization (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
8	KARNATAKA	7	9530.00	6.6901	5.4373	81.27
9	MADHYA PRADESH	13	21860.00	28.8311	16.9291	58.72
10	MAHARASHTRA	20	23136.00	28.9307	46.4023	160.39
11	ODISHA	12	14615.00	28.1828	24.3030	86.23
12	PUNJAB	6	6140.00	5.7147	6.4889	113.55
13	RAJASTHAN	10	9295.00	8.9270	9.5937	107.47
14	TAMILNADU	17	13412.50	11.2293	11.2550	100.23
15	TELANGANA	9	6805.50	10.3937	11.0774	106.58
16	UTTAR PRADESH	19	24080.00	29.0602	20.6000	70.89
17	WEST BENGAL	17	14002.00	22.2412	18.1884	81.78
	GRAND TOTAL	200	213620.50	270.8216	259.8628	95.95

It may be seen from **Table-V** above that:

- (i) 10 states namely Andhra Pradesh, Bihar, Chhattisgarh, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Telangana, Uttar Pradesh and West Bengal have generated more than 10 Million-tonnes of fly ash each with Chhattisgarh highest 44.9589 Million Tonnes during the Year 2021-22
- (ii) During the Year 2021-22, states of, Gujarat, Haryana, Maharashtra, Punjab, Rajasthan, Tamil Nadu and Telangana have achieved fly ash utilization level of more than 100 %. Similarly, Andhra Pradesh, Bihar and Jharkhand have achieved the fly ash utilization level of more than 90 % but less than 100 %.
- (iii) All States have utilized more than 50% of fly ash.

3.0 TARGETS FOR FLY ASH UTILIZATION AS PER MoEF'S NOTIFICATION OF 3rd NOVEMBER, 2009:

The notification set the target for the thermal power stations which were in operation before the date of notification i.e. 3.11.2009 as well as the new thermal power

stations to be commissioned after the notification i.e. 3.11.2009. The same has been brought out below:

3.1 Thermal Power Station in Operation as on 3rd November, 2009:

All Coal / Lignite based Thermal Power Stations / Expansion units in operation before the date of MoEF's notification i.e. 03.11.2009 were to achieve the target of fly ash utilization as per the Table-VI given below:

TABLE-VI

**TARGETS FOR FLY ASH UTILIZATION FOR THERMAL POWER STATIONS IN
OPERATION BEFORE 3rd NOVEMBER 2009**

Sl. No.	Target of Fly Ash Utilization (In Percentage)	Target Date
(1)	(2)	(3)
1	At least 50% of Fly Ash generation	One year from the date of issue of notification
2	At least 60% of Fly Ash generation	Two years from the date of issue of notification
3	At least 75% of Fly Ash generation	Three years from the date of issue of notification
4	At least 90% of Fly Ash generation	Four years from the date of issue of notification
5	100% of Fly Ash generation	Five years from the date of issue of notification

The unutilized fly ash, if any, in relation to the target during a year would be required to be utilized within next two years in addition to the targets stipulated for those years and the balance unutilized fly ash accumulated during the first five years (the difference between the generation and the utilization target) would be required to be utilized progressively over the next five years in addition to 100% utilization of current generation of fly ash.

3.2 Thermal Power Station Commissioned after 3rd November, 2009:

New Coal / Lignite based Thermal Power Stations / Expansion Units commissioned after the issue of MoEF's notification of 3rd November 2009 are to achieve the target of fly ash utilization as per Table-VII given below:

TABLE-VII
TARGETS FOR FLY ASH UTILIZATION FOR THERMAL POWER STATION
COMMISSIONED AFTER 3rd NOVEMBER, 2009

SI No.	Fly Ash Utilization Level	Target Date
(1)	(2)	(3)
1	At least 50% of fly ash generation	One year from the date of Commissioning
2	At least 70% of fly ash generation	Two years from the date of Commissioning
3	At least 90% of fly ash generation	Three years from the date of Commissioning
4	At least 100% of fly ash generation	Four years from the date of commissioning

The unutilized fly ash, if any, in relation to the target during a year would be required to be utilized within the next two years in addition to the targets stipulated for these years and the balance unutilized fly ash accumulated during the first four years (the difference between the generation and utilization target) would be required to be utilized progressively over next five years in addition to 100% utilization of current generation of fly ash.

4.0 TARGET OF FLY ASH UTILIZATION DURING 2021-22 AS PER MoEF's NOTIFICATION OF 3rd NOVEMBER 2009:

Fly ash generation and utilization data received from Thermal Power Stations/Power Utilities in the country for the year 2021-22 has been broadly analysed to ascertain the power stations which have achieved the targets of fly ash utilization as prescribed in MoEF's notification of 3rd November 2009.

During the Year 2021-22, all those thermal power stations which were in operation on the date of issue of MoEF's notification (i.e. 3rd November 2009) should have achieved the target of fly ash utilization of 100% within five years from the date of notification i.e. by 3rd November 2009. All those thermal power stations which have come in operation after the date of issue of MoEF's notification (i.e. 3rd November 2009) should have achieved the target of fly ash utilization in four years from the date of Commissioning as specified in **Table-VII** above.

4.1 Status of Utilization of Fly Ash during the Year 2021-22:

Based on the target indicated under Para 4.0 above, the status of achievement of fly ash utilization for the Year 2021-22 has been assessed and the same is given in **Table-VIII** below.

TABLE-VIII
STATUS OF UTILIZATION OF FLY ASH AS PER MOEF'S NOTIFICATION DATED
3rd NOVEMBER 2009 FOR THE YEAR 2021-22

Sl. No.	Description	No. of TPS
(1)	(2)	(3)
1	No. of TPS which have achieved the Target of fly ash utilization as per MoEF's Notification of 3 rd November, 2009 (Refer Table XVI)	93
2	No. of TPS which have not been able to achieve the target of fly ash utilization as per MoEF's Notification of 3 rd November, 2009 (Refer Table- XVII)	98
3	No. of TPS which have not generated any significant fly ash or any fly ash (Refer Table- XV)	9
	Total	200

It may be seen from **Table-VIII** above that during the Year 2021-22, out of 200 (Two Hundred) thermal power stations for which data was received, 97 (Ninety and seven) power stations have achieved the targets of fly ash utilization as stipulated in MoEF's Notification of 3rd November 2009.

4.2 Range of Fly Ash Utilization during the Year 2021-22

Based on the fly ash utilization data received from Thermal Power Stations / Power Utilities, the Thermal Power Stations have been grouped into 6 (Six) categories as noted below depending upon the range of utilization of fly ash by the stations:

TABLE-IX
RANGE OF PERCENTAGE FLY ASH UTILIZATION DURING
THE YEAR 2021-22

Sl. No.	Level of Fly Ash utilization	No. of Power Stations
(1)	(2)	(3)
1	100 % and more than 100 % (Refer Table- X)	92
2	90 % to less than 100 % (Refer Table- XI)	19
3	70 % to less than 90 % (Refer Table- XII)	34
4	50 % to less than 70 % (Refer Table- XIII)	28
5	Less than 50 % (Refer Table- XIV)	18
6	No. of TPS which have not generated any significant fly ash or any fly ash (Refer Table- XV)	9
	Total	200

4.3 Thermal Power Stations that have achieved Fly Ash utilization level of 100% or more during the Year 2021-22:

The Thermal Power Stations with fly ash utilization in the range of 100% or more during the year 2021-22 is given in **Table-X** below:

TABLE-X
THERMAL POWER STATIONS WITH FLY ASH UTILIZATION LEVEL OF 100% OR MORE
DURING THE YEAR 2021 – 22

Sl. No.	Name of TPS	Power Utility	Installed Capacity (MW)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	Percentage Utilization (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	AARTI STEELS LIMITED	AARTI STEELS LIMITED	80.00	0.2612	0.2612	100.00
2	Dr. N.T.R TPS	APGENCO	1760.00	4.1629	4.1664	100.08

Sl.	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No.			(MW)	(Million Tonnes)	(Million Tonnes)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
3	CHAKABURA TPP	ACB (INDIA) Ltd.	30.00	0.0881	0.0881	100.00
4	CHAKABURA TPP (EXTN)	ACB (INDIA) Ltd.	30.00	0.0895	0.0895	100.00
5	RATIJA TPS	ACB (INDIA) Ltd.	100.00	0.4558	0.4558	100.00
6	MUNDRA TPS	ADANI POWER (MUNDRA) LIMITED	4620.00	0.3448	0.3566	103.41
7	KAWAI	ADANI POWER RAJASTHAN LTD.	1320.00	1.5625	1.5648	100.15
8	ADANI DAHANU	ADANI ELECTRICITY MUMBAI LIMITED	500.00	0.6346	0.6710	105.74
9	BARKHERA	Bajaj Energy Limited	90.00	0.0566	0.0567	100.20
10	KUNDARKI	Bajaj Energy Limited	90.00	0.0741	0.0742	100.11
11	BALCO CPP	BALCO	540.00	0.9948	1.2077	121.40
12	BALCO TPP	BALCO	1200.00	2.1398	2.8268	132.11
13	BHADRESHWAR VIDYUT PRIVATE LTD TPS	BHADRESHWAR VIDYUT PRIVATE LIMITED	300.00	0.0215	0.0215	100.41
14	Budge Budge Generating Station	CESC Ltd.	750.00	1.0818	1.0818	100.00
15	Southern Generating Station	CESC Ltd.	135.00	0.0317	0.0317	100.00
16	MUTIARA	COASTAL ENERGEN PVT. LTD	1200.00	0.0674	0.0704	104.47
17	MUNDRA UMPP	COASTAL ENERGEN PVT. LTD	4150.00	0.0360	0.0420	116.67
18	CHEMPLAST LIMITED TPS	CHEMPLAST LIMITED	48.50	0.0192	0.0192	100.26
19	DB POWER	DB POWER LIMITED	1200.00	2.9851	3.4076	114.15
20	CHANDRAPURA	Damodar Valley Corporation	500.00	1.0576	1.0702	101.19
21	DHARIWAL INFRASTRUCTURE Ltd.	DHARIWAL INFRASTRUCTURE LIMITED	600.00	0.9511	0.9511	100.00
22	SURAT LIGNITE	Gujarat Industries Power Company Limited	500.00	0.4719	0.4719	100.00
23	AKRIMOTA	Gujarat Mineral Development Corporation Limited	250.00	0.1158	0.2246	193.91
24	GANDHINAGAR	Gujarat State Electricity Corporation Limited	630.00	0.7560	1.7979	237.82
25	KUTCH LIGNITE	Gujarat State Electricity Corporation Limited	150.00	0.1818	0.3085	169.69

Sl.	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No.			(MW)	(Million Tonnes)	(Million Tonnes)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
26	SIKKA	Gujarat State Electricity Corporation Limited	500.00	0.0431	0.4209	976.57
27	BHAVNAGAR LIGNITE	Gujarat State Electricity Corporation Limited	500.00	0.1880	0.1935	102.93
28	GMR WARORA ENERGY LTD.	GMR WARORA ENERGY LTD.	600.00	0.8208	1.0294	125.41
29	GMR KAMALANGA TPP	GMR KAMALANGA ENERGY LTD.	1050.00	2.3240	3.1018	133.47
30	RAJIV GANDHI TPP, Hissar	Haryana Power Generation Corporation Limited	1200.00	0.7219	1.1491	159.18
31	Deen Bandhu Chhotu Ram TPS, YAMUNANAGAR	Haryana Power Generation Corporation Limited	600.00	0.7770	1.2766	164.29
32	PANIPAT	Haryana Power Generation Corporation Limited	710.00	0.7555	8.2513	1092.10
33	HALDIA ENERGY LIMITED	HALDIA ENERGY LIMITED	600.00	1.0940	1.0940	100.00
34	HINDUJA NATIONAL POWER CORPORATION LIMITED	HINDUJA NATIONAL POWER CORPORATION LIMITED	1040.00	0.0845	0.4047	478.97
35	DISHERGARH POWER STATION	INDIA POWER CORPORATION LTD.	12.00	0.0166	0.0166	100.00
36	INDIAN METALS & FERRO ALLOYS LTD.	INDIAN METALS & FERRO ALLOYS LTD.	200.00	0.5201	0.5201	100.00
37	IL & FS TAMIL NADU POWER COMPANY LTD.	IL & FS TAMIL NADU POWER COMPANY LIMITED	1200.00	0.0766	0.0766	100.00
38	JK CAPTIVE POWER PLANT	JK CEMENT WORKS MUDDAPUR	50.00	0.0141	0.0141	100.00
39	MAHATMA GANDHI TPP	JHAJJAR POWER LIMITED	1320.00	1.8045	1.8045	100.00
40	RATNAGIRI	JSW ENERGY LIMITED	1200.00	0.3599	0.3600	100.02
41	JSW STEEL LIMITED CPP-II	JSW STEEL LIMITED	90.00	0.0094	0.0094	100.30
42	JINDAL STEEL AND POWER LIMITED (CPP)	JINDAL STEEL AND POWER LIMITED	299.00	0.3299	0.3299	100.00
43	KMPCL - NARIYARA	KSK MAHANADI POWER COMPANY LIMITED	1800.00	2.0586	2.2392	108.77
44	BHUSAWAL	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	1210.00	1.9071	1.9251	100.94
45	NASHIK	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	630.00	0.6670	5.3617	803.91
46	PARLI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	750.00	0.7856	19.0800	2428.62

Sl.	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No.			(MW)	(Million Tonnes)	(Million Tonnes)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
47	PARAS	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	500.00	0.8072	1.2009	148.78
48	MCCPL BANDHAKHAR	MARUTI CLEAN COAL AND POWER LIMITED	300.00	0.6756	0.6756	100.00
49	SAI WARDHA POWER Ltd., WARORA	SAI WARDHA POWER GENERATION PVT LTD.	540.00	0.4221	0.4221	100.00
50	ANUPPUR TPS	MB POWER (MADHYA PRADESH) LIMITED	1200.00	2.1848	2.1894	100.21
51	NEYVELI - I EXPN	NLC INDIA LIMITED	420.00	0.0195	0.0195	100.00
52	NEYVELI - II	NLC INDIA LIMITED	1470.00	0.6339	1.5598	246.09
53	NEYVELI NEW THERMAL POWER STATION	NLC INDIA LIMITED	1000.00	0.3127	0.3127	100.00
54	BARSINGSAR LIGNITE	NLC INDIA LIMITED	250.00	0.1910	0.1910	100.00
55	NLC TAMILNADU POWER Ltd	NLC TAMIL NADU POWER LIMITED	1000.00	1.1385	1.1385	100.00
56	RAMAGUNDAM SUPER	NTPC LTD.	2600.00	3.9383	5.5501	140.92
57	FARAKKA SUPER	NTPC LTD.	2100.00	2.7881	3.8222	137.09
58	DADRI	NTPC LTD.	1820.00	1.2853	1.2869	100.13
59	FEROZE GANDHI UNCHAHAR	NTPC LTD.	1550.00	2.0848	3.3188	159.19
60	SIMHADRI SUPER	NTPC LTD.	2000.00	3.5916	4.0174	111.86
61	TANDA	NTPC LTD.	1760.00	2.2564	3.0558	135.43
62	MOUDA SUPER TPS	NTPC LTD.	2320.00	3.4059	3.7864	111.17
63	BARH SUPER TPS	NTPC LTD.	1980.00	2.1564	3.4101	158.14
64	DURGAPUR CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	120.00	0.2774	0.2906	104.75
65	KANTI BIJLEE UTPADAN NIGAM LIMITED	KANTI BIJLEE UTPADAN NIGAM LIMITED (NTPC-JV)	610.00	0.7890	1.3230	167.68
66	INDIRA GANDHI	ARAVALI POWER CORPORATION PVT LTD (NTPC-JV)	1500.00	1.6420	2.6160	159.32
67	RAJPURA TPS	NABHA POWER LIMITED	1400.00	1.9556	1.9570	100.07
68	OPG POWER GENERATION PRIVATE LIMITED	OPG POWER GENERATION PRIVATE LIMITED	414.00	0.1030	0.1030	100.00
69	GURU GOBIND SINGH TPP, ROPAR	PUNJAB STATE POWER	840.00	0.4240	1.3636	321.62

Sl.	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No.			(MW)	(Million Tonnes)	(Million Tonnes)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		CORPORATION LIMITED				
70	SURATGARH	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1500.00	0.9786	1.8438	188.42
71	KALISINDH SUPER TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1200.00	1.4069	1.4298	101.62
72	KOTA SUPER THERMAL POWER STATION	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1240.00	1.7071	2.0508	120.13
73	SAI LILAGAR POWER GENERATION LTD.	SAI LILAGAR POWER GENERATION LIMITED	86.00	0.0041	0.0041	100.00
74	SEMBCORP ENERGY INDIA LTD.	SEMBCORP ENERGY INDIA LTD.	1320.00	1.6994	1.6999	100.03
75	SINGARENI TPP	THE SINGARENI COLLIERIES COMPANY LIMITED	1200.00	1.9320	2.2660	117.29
76	JOJOBERA	THE TATA POWER COMPANY LIMITED	547.50	1.0042	1.0140	100.97
77	TROMBAY	THE TATA POWER COMPANY LIMITED	750.00	0.0548	0.0548	100.00
78	SABARMATI TPS	TORRENT POWER LTD.	362.00	0.3739	0.3739	100.00
79	METTUR-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	840.00	1.4106	1.4286	101.28
80	METTUR-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	600.00	0.7632	0.7632	100.00
81	NORTH CHENNAI-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	630.00	1.0188	1.4507	142.40
82	NORTH CHENNAI-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	1200.00	1.4890	1.5591	104.71
83	RAMAGUNDAM 'B'	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	62.50	0.0881	0.2298	260.94
84	TENUGHAT TPS	TENUGHAT VIDHYUT NIGAM LIMITED	420.00	0.3973	0.4478	112.70
85	HARDUAGANJ	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	1270.00	0.5519	1.1912	215.84
86	UDUPI	UDUPI POWER CORPORATION LIMITED	1200.00	0.0572	0.0587	102.62

Sl.	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No.			(MW)	(Million Tonnes)	(Million Tonnes)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
87	VS LIGNITE POWER PRIVATE LTD	VS LIGNITE POWER PRIVATE LIMITED	135.00	0.2265	0.2265	100.00
88	VEDANTA LTD TPP	VEDANTA LIMITED	2400.00	4.4006	5.2762	119.90
89	VEDANTA LTD CPP	VEDANTA LIMITED	1215.00	0.3464	4.2202	1218.21
90	KOLAGHAT	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	1260.00	1.4819	1.6494	111.30
91	BANDEL	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	335.00	0.5836	0.6317	108.24
92	SITAPURAM TPS	ZUARI CEMENT LIMITED	43.00	0.1017	0.1017	100.00

It may be seen from the **Table-X** above that during the Year 2021-22, 92 Thermal Power Stations have achieved a fly ash utilization of 100% or more. More than 100% fly ash utilization means utilization of ash generated during the current year and utilization of un-utilized accumulated ash before the current year.

4.4 Thermal Power Stations with Fly Ash Utilization in the Range of 90 % to less than 100 % during the Year 2021-22:

The Thermal Power Stations with fly ash utilization in the range of 90% to less than 100% during the year 2021-22 are given in **Table-XI** below:

TABLE-XI

THERMAL POWER STATIONS WITH FLY ASH UTILIZATION IN THE RANGE OF 90% TO LESS THAN 100% DURING THE YEAR 2021 – 22

Sl	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No.			(MW)	(MT)	(MT)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	KASAIPALI	ACB (INDIA) Ltd.	270.00	0.8801	0.8799	99.98

Sl	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No.			(MW)	(MT)	(MT)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2	KHAMBHAR KHERA	Bajaj Energy Limited	90.00	0.0517	0.0517	99.93
3	MAQSOODAPUR	Bajaj Energy Limited	90.00	0.0545	0.0545	99.90
4	UTRAULA	Bajaj Energy Limited	90.00	0.0635	0.0634	99.80
5	DURGAPUR STEEL	Damodar Valley Corporation	1000.00	1.9194	1.8460	96.17
6	KODERMA	Damodar Valley Corporation	1000.00	1.9661	1.8303	93.09
7	UKAI	Gujarat State Electricity Corporation Limited	1110.00	1.2540	1.2358	98.55
8	VIJAYANAGAR	JSW ENERGY LIMITED	860.00	0.2545	0.2545	99.99
9	DONGAMAHUA CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	576.00	0.9551	0.9548	99.97
10	JSW ENERGY (BARMER) LIMITED	JSW ENERGY (BARMER) LIMITED	1080.00	0.8972	0.8468	94.38
11	RAICHUR POWER PLANT	KARNATAKA POWER CORPORATION LIMITED	1720.00	2.0131	1.9668	97.70
12	LALITPUR	LALITPUR POWER GENERATION COMPANY LIMITED	1980.00	2.0943	1.8855	90.03
13	SATPURA	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	1330.00	0.8970	0.8954	99.82
14	NEYVELI - II EXPN	NLC INDIA LIMITED	500.00	0.1334	0.1304	97.79
15	R.K.M. POWERGEN PVT. LTD	R.K.M. POWERGEN PVT. LTD	1440.00	2.4624	2.4602	99.91
16	RINL CAPTIVE TPP	RASHTRIYA ISPAT NIGAM LIMITED	315.00	0.5111	0.4667	91.31
17	RAIPUR TPP	RAIPUR ENERGEN LIMITED	1370.00	2.0409	2.0013	98.06
18	SKS POWER GENERATION (CH) LTD.	SKS POWER GENERATION (CHHATTISGARH) LIMITED	600.00	0.5571	0.5317	95.43
19	TALWANDI SABO POWER LTD	TALWANDI SABO POWER LTD.	1980.00	2.4013	2.1702	90.38

It may be seen from the **Table-XI** above that 19 thermal power stations, during the year 2021-22, have achieved a fly ash utilization level in the range of 90% to less than 100%.

4.5 Thermal Power Stations with Fly Ash Utilization in the Range of 70% to less than 90% during the Year 2021-22

The Thermal Power Stations with fly ash utilization in the range of 70% to less than 90% during the year 2021-22 are given in **Table-XII** below:

TABLE-XII

THERMAL POWER STATIONS WITH FLY ASH UTILIZATION IN THE RANGE OF 70% TO LESS THAN 90% DURING THE YEAR 2021 – 22

Sl. No.	Name of TPS	Power Utility	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	Percentage Utilization (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	RAYALSEEMA	APGENCO	1650.00	2.1404	1.5652	73.12
2	TIRODA	ADANI POWER MAHARASHTRA LTD.	3300.00	4.5451	3.5557	78.23
3	ADHUNIK POWER & NATURAL RESOURCES LTD.	ADHUNIK POWER & NATURAL RESOURCES LTD.	540.00	1.1199	0.9762	87.17
4	BOKARO	Damodar Valley Corporation	500.00	0.7555	0.6764	89.53
5	MEJIA	Damodar Valley Corporation	2340.00	4.7724	3.9267	82.28
6	WANAKBORI	Gujarat State Electricity Corporation Limited	2270.00	2.7509	2.2155	80.54
7	O.P. Jindal Super TPP (Stage-I)	JINDAL POWER LIMITED	1000.00	1.8349	1.5543	84.71
8	TAMNAR TPP	JINDAL POWER LIMITED	2400.00	3.5688	3.1956	89.54
9	JAYPEE BINA TPP	JAIPRAKSH POWER VENTURES LIMITED	500.00	0.6873	0.5611	81.64
10	JAYPEE NIGRIE SUPER TPP	JAIPRAKSH POWER VENTURES LIMITED	1320.00	1.5794	1.4143	89.55
11	BALLARI	KARNATAKA POWER CORPORATION LIMITED	1700.00	1.7030	1.2838	75.39
12	LANCO AMARKANTAK TPS	LANCO AMARKANTAK POWER LIMITED	600.00	1.1070	0.8297	74.95

Sl.	Name of TPS	Power Utility	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	Percentage Utilization (%)
No.						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
13	MAITHON RIGHT BANK TPP	MAITHON POWER LIMITED	1050.00	1.8518	1.6577	89.52
14	SANJAY GANDHI	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	1340.00	1.8895	1.3509	71.50
15	KHAPARKHEDA	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	1340.00	2.5825	1.8908	73.22
16	KORADI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	2190.00	2.957939	2.39974	81.13
17	KAHALGAON SUPER	NTPC LTD.	2340.00	4.2309	3.3273	78.64
18	SOLAPUR SUPER TPS	NTPC LTD.	1320.00	1.1357	0.8579	75.54
19	BARAUNI	NTPC LTD.	610.00	0.6011	0.4772	79.39
20	ROURKELA CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	120.00	0.4263	0.3539	83.01
21	VALLUR	NTPC TAMILNADU ENERGY COMPANY LTD (NTECL) (NTPC-JV)	1500.00	2.4466	1.9107	78.10
22	MEJA TPP	MEJA URJA NIGAM PRIVATE LIMITED (NTPC-JV)	1320.00	1.8226	1.3207	72.47
23	NALCO, CPP ANGUL	NATIONAL ALUMINIUM COMPANY LIMITED	1200.00	2.6936	2.3066	85.63
24	GURU HARGOBIND TPP, LEHRA MOHABAT	PUNJAB STATE POWER CORPORATION LIMITED	920.00	0.4945	0.3483	70.44
25	GVK POWER (GOINDWALSAHIB) LTD.	PUNJAB STATE POWER CORPORATION LIMITED	540.00	0.4392	0.3452	78.60
26	PRAYAGRAJ TPS	PRAYAGRAJ POWER GENERATION COMPANY LTD.	1980.00	2.4194	2.1075	87.11
27	CHHABRA SUPER CRITICAL TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1320.00	0.9949	0.8180	82.22
28	ROSA TPP	ROSA POWER SUPPLY COMPANY LIMITED	1200.00	1.3284	1.0491	78.98

Sl. No.	Name of TPS	Power Utility	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	Percentage Utilization (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
29	AMARAVATI TPS	RATTANINDIA POWER LTD.	1350.00	2.3922	1.9421	81.19
30	YERAMARUS TPS	RAICHUR POWER CORPORATION LIMITED	1600.00	1.3131	1.1415	86.93
31	CUDDALORE - TAQA	TAQA NEYVELLY POWER CO.PVT. LTD.	250.00	0.0761	0.0639	83.98
32	KAKATIYA (Stage-I)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	500.00	0.7773	0.6475	83.30
33	KAKATIYA (Stage-II)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	600.00	0.7602	0.6493	85.42
34	SAGARDIGHI	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	1600.00	2.3600	1.8778	79.57

It may be seen from the **Table - XII** above, that 34 thermal power stations, during the year 2021-22, have achieved a fly ash utilization level in the range of 70 % to less than 90%.

4.6 Thermal Power Stations with Fly Ash Utilization in the range 50% to less than 70% during the Year 2021-22:

The Thermal Power Stations with fly ash utilization in the range of 50% to less than 70% during the year 2021-22 are given in **Table-XIII**:

TABLE-XIII

**THERMAL POWER STATIONS WITH FLY ASH UTILIZATION IN THE RANGE OF
50% TO LESS THAN 70% DURING THE YEAR 2021-22**

Sl. No	Name of TPS	Power Utility	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	Percentage Utilization (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	SRI DAMODARAM SANJEEVAIAH	Andhra Pradesh Power Development Company Limited	1600.00	1.2329	0.8031	65.14
2	Atal Bihari Vajpayee TPP	Chattisgarh State Power Generation Company Ltd.	1000.00	1.5134	1.0379	68.58
3	DERANG TPP	JINDAL INDIA THERMAL POWER LIMITED	1200.00	2.4016	1.2906	53.74
5	JHABUA POWER LIMITED	JHABUA POWER LIMITED	600.00	1.0217	0.5690	55.69
4	SINGRAULI	NTPC LTD.	2000.00	3.0245	1.740384	57.54
6	KORBA SUPER	NTPC LTD.	2600.00	5.0667	2.8895	57.03
7	VINDHYACHAL	NTPC LTD.	4760.00	8.2382	4.3700	53.05
8	RIHAND	NTPC LTD.	3000.00	3.7085	2.1983	59.28
9	TALCHER - KANIHA	NTPC LTD.	3000.00	6.8777	3.7592	54.66
10	SIPAT SUPER	NTPC LTD.	2980.00	5.1977	3.0803	59.26
11	BONGAIGAON	NTPC LTD.	750.00	0.7573	0.4393	58.01
12	KUDGI	NTPC LTD.	2400.00	1.3351	0.7179	53.77
13	LARA SUPER TPS	NTPC LTD.	1600.00	3.2342	1.8232	56.37
14	KHARGONE SUPER THERMAL POWER STATION	NTPC LTD.	1320.00	1.3669	0.79871	58.43
15	DARLIPALI SUPER TPS	NTPC LTD.	1600.00	3.0627	1.7770	58.02
16	BHILAI PP-II	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	74.00	0.1806	0.1083	59.98
17	BHILAI PP - III	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	500.00	1.1421	0.66023	57.81
18	NABINAGAR- BRBCL	BHARATIYA RAIL BIJLEE COMPANY LIMITED (NTPC-JV)	1000.00	1.6124	0.9127	56.60
19	NABINAGAR-NPGC	NPGC (NTPC-JV)	1320.00	1.6838	0.8596	51.06

Sl.	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No			(Mega Watts)	(Million Tonnes)	(Million Tonnes)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
20	CHHABRA	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1000.00	0.9623	0.6222	64.65
21	SASAN UMPP TPP	REILIANCE POWER LIMITED	3960.00	5.3475	2.7994	52.35
22	THE DURGAPUR PROJECTS POWER STATION	THE DURGAPUR PROJECTS LIMITED	550.00	0.7238	0.4812	66.48
23	KOTHAGUDEM-V	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	500.00	1.1731	0.6750	57.54
24	KOTHAGUDEM-VI	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	500.00	0.6761	0.4390	64.93
25	KOTHAGUDEM-VII	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	800.00	0.9470	0.5190	54.80
26	RAIGARH TPP	TRN ENERGY PRIVATE LIMITED	600.00	0.2273	0.1139	50.12
27	PARICHHA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	920.00	1.1066	0.7457	67.39
28	SANTALDIH TPS	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	500.00	1.4024	0.7772	55.42

It may be seen from the **Table - XIII** above that, **28** thermal power stations during the year 2021-22 have achieved a fly ash utilization level in the range of 50% to less than 70%.

4.7 Thermal Power Stations with Fly Ash Utilization below 50% during the Year 2021-22:

The Thermal Power Stations with fly ash utilization less than 50% during the year 2021-22 are given in **Table – XIV**:

TABLE - XIV
THERMAL POWER STATIONS WITH FLY ASH UTILIZATION BELOW 50%
DURING THE YEAR 2021-22

SI	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No.			(Mega Watts)	(Million Tonnes)	(Million Tonnes)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Dr. Shyama Prasad Mukharjee TPP	Chattisgarh State Power Generation Company Ltd.	500.00	1.2289	0.2581	21.00
2	Hasdeo TPP	Chattisgarh State Power Generation Company Ltd.	1340.00	2.8455	1.1676	41.03
3	DURGAPUR	Damodar Valley Corporation	210.00	0.1285	0.0579	45.03
4	RAGHUNATHPUR	Damodar Valley Corporation	1200.00	1.8285	0.1231	6.73
5	ANGUL CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	810.00	1.2830	0.4550	35.46
6	ANPARA 'C' TPS	LANCO ANPARA POWER LIMITED	1200.00	1.7101	0.2191	12.81
7	MAHAN	MAHAN ENERGEN LTD.	1200.00	0.8359	0.2128	25.46
8	AMARKANTAK	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	210.00	0.3582	0.1400	39.09
9	SHREE SINGAJI TPS	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	2520.00	2.7398	0.9937	36.27
10	CHANDRAPUR	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	2920.00	4.5013	0.8767	19.48
11	MEENAKSHI ENERGY LIMITED	MEENAKSHI ENERGY LIMITED	300.00	0.0172	0.0016	9.51
12	GADARWARA SUPER	NTPC LTD.	1600.00	1.6850	0.6343	37.64
13	IB VALLEY	ODISHA POWER GENERATION CORPORATION LIMITED	1740.00	3.5855	0.9812	27.37
14	RAIGARH TPP	RAIGARH ENERGY GENERATION LIMITED	600.00	1.0950	0.4100	37.44

Sl	Name of TPS	Power Utility	Installed Capacity	Fly ash Generation	Fly ash Utilization	Percentage Utilization
No.			(Mega Watts)	(Million Tonnes)	(Million Tonnes)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
15	TUTICORIN	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	1050.00	1.5117	0.6393	42.29
16	ANPARA 'A' & 'B'	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	2630.00	3.9928	0.1048	2.62
17	OBRA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	1000.00	1.3742	0.0755	5.49
18	BAKRESWAR	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	1050.00	1.7510	0.4807	27.45

It may be seen from the **Table - XIV** above, that 18 Thermal Power Stations have achieved a fly ash utilization level in the range of less than 50% during the year 2021-22.

4.8 THERMAL POWER STATIONS WITH NO ASH GENERATION DURING THE YEAR 2021-22:

The Thermal Power Stations with NO FLY ASH generation during the year 2021-22 are given in **Table – XV**:

TABLE - XV
LIST OF THERMAL POWER STATIONS WITH NO ASH GENERATION
DURING THE YEAR 2021-22

Sl.	Name of TPS	Power Utility	Date of Commissioning	Installed Capacity (Mega Watts)	Remarks
No.					
(1)	(2)	(3)	(4)	(5)	(6)
1	SVPPL Renki	ACB (INDIA) Ltd.	12.10.2011	60.00	
2	MIHAN	Abhijeet MADC Nagpur Energy Pvt. Ltd.	05.01.2011	246.00	
3	Titagarh Generating Station	CESC Ltd.	05.03.1983	240.00	

Sl. No.	Name of TPS	Power Utility	Date of Commissioning	Installed Capacity (Mega Watts)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
4	SALAYA TPS	ESSAR POWER GUJARAT LTD.	29.2.2012	1200.00	closed since 26.06.2020
5	BELA TPS	IDEAL ENERGY PROJECTS LIMITED	18.07.2013	270.00	
6	GURU NANAKDEV TPS, BATHINDA	PUNJAB STATE POWER CORPORATION LIMITED	22.09.1974	460.00	
7	GIRAL TPS	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	2007	250.00	
8	SWASTIK POWER & MINERALS RESOURCES PVT. LTD.	SWASTIK POWER & MINERALS RESOURCES PVT. LTD.	02.05.2015	25.00	
9	BUTIBORI	VIDARBHA INDUSTRIES POWER LTD.	04.04.2013	600.00	

It may be seen from the **Table - XV** above, that 09 Thermal power stations during the year 2021-22 have not generated any fly ash.

5.0 FLY ASH UTILIZATION STATUS AS PER NOTIFICATION OF 3RD NOVEMBER, 2009 DURING THE YEAR 2021-22 (TARGET ACHIEVED AND NOT ACHIEVED):

As per the targets mandated by the MoEF's notification dated 3rd November 2009 for fly ash utilization by the power stations, a total of 93 stations achieved their target and as many as 98 Nos. could not reach the targets. The details are given at **Table - XVI** and **Table - XVII** respectively. However, the date of achieving the 100% ash utilization target is now extended to 31st December 2017 as per the new amendment notification dated 25th January 2016.

TABLE-XVI

FLY ASH UTILIZATION STATUS AS PER NOTIFICATION OF 3RD NOVEMBER, 2009
DURING THE YEAR 2021-22 (TARGET ACHIEVED)

Sl. No.	Name of TPS	Name of Power Utility	Date of Commissioning	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	% Utilization	Target in %	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	AARTI STEELS LIMITED	AARTI STEELS LIMITED	01.03.2010	80.00	0.2612	0.2612	100.00	100	Achieved
2	Dr. N.T.R TPS	APGENCO	01.11.1979	1760.00	4.1629	4.1664	100.08	100	Achieved
3	CHAKABU RA TPP	ACB (INDIA) Ltd.	27.02.2007	30.00	0.0881	0.0881	100.00	100	Achieved
4	CHAKABU RA TPP (EXTN)	ACB (INDIA) Ltd.	28.03.2014	30.00	0.0895	0.0895	100.00	100	Achieved
5	RATIJA TPS	ACB (INDIA) Ltd.	27.02.2013	100.00	0.4558	0.4558	100.00	100	Achieved
6	MUNDRA TPS	ADANI POWER (MUNDRA) LIMITED	04.08.2009	4620.00	0.3448	0.3566	103.41	100	Achieved
7	KAWAI	ADANI POWER RAJASTHAN LTD.	31.05.2013	1320.00	1.5625	1.5648	100.15	100	Achieved
8	ADANI DAHANU	ADANI ELECTRICITY MUMBAI LIMITED	01.07.1995	500.00	0.6346	0.6710	105.74	100	Achieved
9	BARKHERA	Bajaj Energy Limited	27.10.2011	90.00	0.0566	0.0567	100.20	100	Achieved
10	KUNDARKI	Bajaj Energy Limited	03.01.2012	90.00	0.0741	0.0742	100.11	100	Achieved
11	BALCO CPP	BALCO	June-2006	540.00	0.9948	1.2077	121.40	100	Achieved
12	BALCO TPP	BALCO	Aug-2015	1200.00	2.1398	2.8268	132.11	100	Achieved
13	BHADRESHWAR VIDYUT PRIVATE LTD TPS	BHADRESHWAR VIDYUT PRIVATE LIMITED	04.01.2015	300.00	0.0215	0.0215	100.41	100	Achieved
14	Budge Budge Generating Station	CESC Ltd.	16.09.1997	750.00	1.0818	1.0818	100.00	100	Achieved
15	Southern Generating Station	CESC Ltd.	12.08.1990	135.00	0.0317	0.0317	100.00	100	Achieved
16	MUTIARA	COASTAL ENERGEN PVT. LTD	23.12.2014	1200.00	0.0674	0.0704	104.47	100	Achieved

Sl. No.	Name of TPS	Name of Power Utility	Date of Commissioning	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
17	MUNDRA UMPP	Coastal Gujarat Power Limited	07.03.2012	4150.00	0.0360	0.0420	116.67	100	Achieved
18	CHEMPLAST LIMITED TPS	CHEMPLAST LIMITED	07.03.2012	48.50	0.0192	0.0192	100.26	100	Achieved
19	DB POWER	DB POWER LIMITED	03.11.2014	1200.00	2.9851	3.4076	114.15	100	Achieved
20	CHANDRAPURA	Damodar Valley Corporation	07.07.1968	500.00	1.0576	1.0702	101.19	100	Achieved
21	DHARIWAL INFRASTRUCTURE Ltd.	DHARIWAL INFRASTRUCTURE LIMITED	11.2.2014	600.00	0.9511	0.9511	100.00	100	Achieved
22	SURAT LIGNITE	Gujarat Industries Power Company Limited	15.02.2000	500.00	0.4719	0.4719	100.00	100	Achieved
23	AKRIMOTA	Gujarat Mineral Development Corporation Limited	31.03.2005	250.00	0.1158	0.2246	193.91	100	Achieved
24	GANDHINAGAR	Gujarat State Electricity Corporation Limited	20.03.1990	630.00	0.7560	1.7979	237.82	100	Achieved
25	KUTCH LIGNITE	Gujarat State Electricity Corporation Limited	09.01.1990	150.00	0.1818	0.3085	169.69	100	Achieved
26	SIKKA	Gujarat State Electricity Corporation Limited	14.09.2015	500.00	0.0431	0.4209	976.57	100	Achieved
27	BHAVNAGAR LIGNITE	Gujarat State Electricity Corporation Limited	16.05.2016	500.00	0.1880	0.1935	102.93	100	Achieved
28	GMR WARORA ENERGY LTD.	GMR WARORA ENERGY LTD.	19.03.2013	600.00	0.8208	1.0294	125.41	100	Achieved
29	GMR KAMALANGA TPP	GMR KAMALANGA ENERGY LTD.	30.04.2013	1050.00	2.3240	3.1018	133.47	100	Achieved
30	RAJIV GANDHI TPP, Hissar	Haryana Power Generation Corporation Limited	24.08.2010	1200.00	0.7219	1.1491	159.18	100	Achieved

Sl. No.	Name of TPS	Name of Power Utility	Date of Commissioning	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
31	Deen Bandhu Chhotu Ram TPS, YAMUNAN AGAR	Haryana Power Generation Corporation Limited	14.04.2008	600.00	0.7770	1.2766	164.29	100	Achieved
32	PANIPAT	Haryana Power Generation Corporation Limited	28.03.1989	710.00	0.7555	8.2513	1092.10	100	Achieved
33	HALDIA ENERGY LIMITED	HALDIA ENERGY LIMITED	28.01.2015	600.00	1.0940	1.0940	100.00	100	Achieved
34	HINDUJA NATIONAL POWER CORPORATION LIMITED	HINDUJA NATIONAL POWER CORPORATION LIMITED	11.01.2016	1040.00	0.0845	0.4047	478.97	100	Achieved
35	DISHERGA RH POWER STATION	INDIA POWER CORPORATION LTD.	25.09.2012	12.00	0.0166	0.0166	100.00	100	Achieved
36	INDIAN METALS & FERRO ALLOYS LTD.	INDIAN METALS & FERRO ALLOYS LTD.	Feb-1989	200.00	0.5201	0.5201	100.00	100	Achieved
37	IL & FS TAMIL NADU POWER COMPANY LTD.	IL & FS TAMIL NADU POWER COMPANY LIMITED	29.09.2015	1200.00	0.0766	0.0766	100.00	100	Achieved
38	JK CAPTIVE POWER PLANT	JK CEMENT WORKS MUDDAPUR	02.11.2009	50.00	0.0141	0.0141	100.00	100	Achieved
39	MAHATMA GANDHI TPP	JHAJJAR POWER LIMITED	29.03.2012	1320.00	1.8045	1.8045	100.00	100	Achieved
40	RATNAGIRI	JSW ENERGY LIMITED	01.09.2010	1200.00	0.3599	0.3600	100.02	100	Achieved
41	JSW STEEL LIMITED CPP-II	JSW STEEL LIMITED	24.07.2006	90.00	0.0094	0.0094	100.30	100	Achieved
42	JINDAL STEEL AND POWER LIMITED (CPP)	JINDAL STEEL AND POWER LIMITED	1996	299.00	0.3299	0.3299	100.00	100	Achieved
43	KMPCL - NARIYARA	KSK MAHANADI POWER	Sept,2013	1800.00	2.0586	2.2392	108.77	100	Achieved

Sl. No.	Name of TPS	Name of Power Utility	Date of Commissioning	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		COMPANY LIMITED							
44	BHUSAWAL	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	18.09.1982	1210.00	1.9071	1.9251	100.94	100	Achieved
45	NASHIK	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	26.04.1979	630.00	0.6670	5.3617	803.91	100	Achieved
46	PARLI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	01.11.2007	750.00	0.7856	19.0800	2428.62	100	Achieved
47	PARAS	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	31.03.2008	500.00	0.8072	1.2009	148.78	100	Achieved
48	MCCPL BANDHAKHAR	MARUTI CLEAN COAL AND POWER LIMITED	30.07.2015	300.00	0.6756	0.6756	100.00	100	Achieved
49	SAI WARDHA POWER Ltd., WARORA	SAI WARDHA POWER GENERATION PVT LTD.	15.04.2010	540.00	0.4221	0.4221	100.00	100	Achieved
50	ANUPPUR TPS	MB POWER (MADHYA PRADESH) LIMITED	20.05.2015	1200.00	2.1848	2.1894	100.21	100	Achieved
51	NEYVELI - I EXPN	NLC INDIA LIMITED	21.10.2002	420.00	0.0195	0.0195	100.00	100	Achieved
52	NEYVELI - II	NLC INDIA LIMITED	29.03.1986	1470.00	0.6339	1.5598	246.09	100	Achieved
53	NEYVELI NEW THERMAL POWER STATION	NLC INDIA LIMITED	28.12.2019	1000.00	0.3127	0.3127	100.00	70	Achieved
54	BARSINGAR LIGNITE	NLC INDIA LIMITED	27.10.2009	250.00	0.1910	0.1910	100.00	100	Achieved
55	NLC TAMILNADU POWER Ltd	NLC TAMIL NADU POWER LIMITED	08.03.2015	1000.00	1.1385	1.1385	100.00	100	Achieved

Sl. No.	Name of TPS	Name of Power Utility	Date of Commissioning	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
56	RAMAGUNDAM SUPER	NTPC LTD.	11/1/1983	2600.00	3.9383	5.5501	140.92	100	Achieved
57	FARAKKA SUPER	NTPC LTD.	1/1/1986	2100.00	2.7881	3.8222	137.09	100	Achieved
58	DADRI	NTPC LTD.	Oct,1991	1820.00	1.2853	1.2869	100.13	100	Achieved
59	FEROZE GANDHI UNCHAHAR	NTPC LTD.	11/1/1988	1550.00	2.0848	3.3188	159.19	100	Achieved
60	SIMHADRI SUPER	NTPC LTD.	2/1/2002	2000.00	3.5916	4.0174	111.86	100	Achieved
61	TANDA	NTPC LTD.	1/1/2000	1760.00	2.2564	3.0558	135.43	100	Achieved
62	MOUDA SUPER TPS	NTPC LTD.	4/1/2012	2320.00	3.4059	3.7864	111.17	100	Achieved
63	BARH SUPER TPS	NTPC LTD.	11/1/2014	1980.00	2.1564	3.4101	158.14	100	Achieved
64	DURGAPUR CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	17.02.1987	120.00	0.2774	0.2906	104.75	100	Achieved
65	KANTI BIJLEE UTPADAN NIGAM LIMITED	KANTI BIJLEE UTPADAN NIGAM LIMITED (NTPC-JV)	11.2013	610.00	0.7890	1.3230	167.68	100	Achieved
66	INDIRA GANDHI	ARAVALI POWER CORPORATION PVT LTD (NTPC-JV)	31.10.2010	1500.00	1.6420	2.6160	159.32	100	Achieved
67	MEJA TPP	MEJA URJA NIGAM PRIVATE LIMITED (NTPC-JV)	30.04.2019	1320.00	1.8226	1.3207	72.47	70	Achieved
68	RAJPURA TPS	NABHA POWER LIMITED	24.01.2014	1400.00	1.9556	1.9570	100.07	100	Achieved
69	OPG POWER GENERATION PRIVATE LIMITED	OPG POWER GENERATION PRIVATE LIMITED	01.08.2010	414.00	0.1030	0.1030	100.00	100	Achieved
70	GURU GOBIND SINGH TPP, ROPAR	PUNJAB STATE POWER CORPORATION LIMITED	31.03.1988	840.00	0.4240	1.3636	321.62	100	Achieved

Sl. No.	Name of TPS	Name of Power Utility	Date of Commissioning	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
71	SURATGARH	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	31.10.1998	1500.00	0.9786	1.8438	188.42	100	Achieved
72	KALISINDH SUPER TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	07.05.2014	1200.00	1.4069	1.4298	101.62	100	Achieved
73	KOTA SUPER THERMAL POWER STATION	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	17.01.1983	1240.00	1.7071	2.0508	120.13	100	Achieved
74	SAI LILAGAR POWER GENERATION LTD.	SAI LILAGAR POWER GENERATION LIMITED	2009	86.00	0.0041	0.0041	100.00	100	Achieved
75	SEMBCORP ENERGY INDIA LTD.	SEMBCORP ENERGY INDIA LTD.	Mar-15	1320.00	1.6994	1.6999	100.03	100	Achieved
76	SINGARENI TPP	THE SINGARENI COLLIERIES COMPANY LIMITED	25.09.2016	1200.00	1.9320	2.2660	117.29	100	Achieved
77	JOJOBERRA	THE TATA POWER COMPANY LIMITED	April,1996	547.50	1.0042	1.0140	100.97	100	Achieved
78	TROMBAY	THE TATA POWER COMPANY LIMITED	1984	750.00	0.0548	0.0548	100.00	100	Achieved
79	SABARMATI TPS	TORRENT POWER LTD.	12.10.1978	362.00	0.3739	0.3739	100.00	100	Achieved
80	METTUR-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	07.01.1987	840.00	1.4106	1.4286	101.28	100	Achieved
81	METTUR-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	11.10.2012	600.00	0.7632	0.7632	100.00	100	Achieved
82	NORTH CHENNAI-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	25.10.1994	630.00	1.0188	1.4507	142.40	100	Achieved

Sl. No.	Name of TPS	Name of Power Utility	Date of Commissioning	Installed Capacity (MW)	Fly Ash Generation (Million-tonne)	Fly Ash Utilization (Million-tonne)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
83	NORTH CHENNAI-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Mar-13	1200.00	1.4890	1.5591	104.71	100	Achieved
84	RAMAGUNDAM 'B'	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	17.10.1971	62.50	0.0881	0.2298	260.94	100	Achieved
85	TENUGHAT TPS	TENUGHAT VIDHYUT NIGAM LIMITED	14.04.1994	420.00	0.3973	0.4478	112.70	100	Achieved
86	HARDUAGANJ	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	28.05.1978	1270.00	0.5519	1.1912	215.84	100	Achieved
87	UDUPI	UDUPI POWER CORPORATION LIMITED	11.11.2010	1200.00	0.0572	0.0587	102.62	100	Achieved
88	VS LIGNITE POWER PRIVATE LTD	VS LIGNITE POWER PRIVATE LIMITED	FEB 2010	135.00	0.2265	0.2265	100.00	100	Achieved
89	VEDANTA LTD TPP	VEDANTA LIMITED	09.11.2010	2400.00	4.4006	5.2762	119.90	100	Achieved
90	VEDANTA LTD CPP	VEDANTA LIMITED	30.07.2008	1215.00	0.3464	4.2202	1218.21	100	Achieved
91	KOLAGHAT	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	16.08.1990	1260.00	1.4819	1.6494	111.30	100	Achieved
92	BANDEL	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	04.09.1965	335.00	0.5836	0.6317	108.24	100	Achieved
93	SITAPURAM TPS	ZUARI CEMENT LIMITED	01.03.2008	43.00	0.1017	0.1017	100.00	100	Achieved

Note: Target of fly ash utilization as per MoEF Notification 3rd NOVEMBER, 2009:

(1) At least 50% of fly ash generation – One year from the date of Commissioning

At least 70% of fly ash generation - Two years from the date of Commissioning

At least 90% of fly ash generation - Three years from the date of Commissioning

At least 100% of fly ash generation - Four years from the date of Commissioning

(2)*(Less than 50% for Thermal Power Stations commissioned within one year from the date of commissioning)

(3) Cut-off Date for utilization target was 31.12.2017

TABLE-XVII

FLY ASH UTILIZATION STATUS AS PER NOTIFICATION OF 3RD NOVEMBER, 2009 **DURING THE YEAR 2021-22 (THERMAL POWER STATIONS** **WHO HAVE NOT MET THEIR TARGET)**

Sl No.	Name of TPS	Power Utility	Date of Commissioning	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	% Utilization	Target in %	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	RAYALSEEMA	APGENCO	16.11.1994	1650.00	2.1404	1.5652	73.12	100	Not Achieved
2	SRI DAMODARAM SANJEEVAIAH	Andhra Pradesh Power Development Company Limited	05.02.2015	1600.00	1.2329	0.8031	65.14	100	Not Achieved
3	KASAIPALI	ACB (INDIA) Ltd.	13.12.2011	270.00	0.8801	0.8799	99.98	100	Not Achieved
4	TIRODA	ADANI POWER MAHARASHTRA LTD.	23.09.2012	3300.00	4.5451	3.5557	78.23	100	Not Achieved
5	ADHUNIK POWER & NATURAL RESOURCES LTD.	ADHUNIK POWER & NATURAL RESOURCES LTD.	21.01.2013	540.00	1.1199	0.9762	87.17	100	Not Achieved
6	KHAMBHAR KHERA	Bajaj Energy Limited	30.09.2011	90.00	0.0517	0.0517	99.93	100	Not Achieved
7	MAQSOODAPUR	Bajaj Energy Limited	27.10.2011	90.00	0.0545	0.0545	99.90	100	Not Achieved
8	UTRAULA	Bajaj Energy Limited	30.01.2012	90.00	0.0635	0.0634	99.80	100	Not Achieved
9	Atal Bihari Vajpayee TPP	Chattisgarh State Power Generation Company Ltd.	31.03.2016	1000.00	1.5134	1.0379	68.58	100	Not Achieved
10	Dr. Shyama Prasad Mukharjee TPP	Chattisgarh State Power Generation Company Ltd.	21.10.2007	500.00	1.2289	0.2581	21.00	100	Not Achieved
11	Hasdeo TPP	Chattisgarh State Power Generation Company Ltd.	21.03.1983	1340.00	2.8455	1.1676	41.03	100	Not Achieved
12	BOKARO	Damodar Valley Corporation	31.03.1993	500.00	0.7555	0.6764	89.53	100	Not Achieved

SI	Name of TPS	Power Utility	Date of Commissioning	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	% Utilization	Target in % age	Status
No.									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
13	DURGAPUR	Damodar Valley Corporation	Sep,1982	210.00	0.1285	0.0579	45.03	100	Not Achieved
14	MEJIA	Damodar Valley Corporation	01.12.1997	2340.00	4.7724	3.9267	82.28	100	Not Achieved
15	DURGAPUR STEEL	Damodar Valley Corporation	15.05.2012	1000.00	1.9194	1.8460	96.17	100	Not Achieved
16	KODERMA	Damodar Valley Corporation	18.07.2013	1000.00	1.9661	1.8303	93.09	100	Not Achieved
17	RAGHUNATHPUR	Damodar Valley Corporation	31.03.2016	1200.00	1.8285	0.1231	6.73	100	Not Achieved
18	UKAI	Gujarat State Electricity Corporation Limited	21.01.1979	1110.00	1.2540	1.2358	98.55	100	Not Achieved
19	WANAKBORI	Gujarat State Electricity Corporation Limited	23.03.1982	2270.00	2.7509	2.2155	80.54	100	Not Achieved
20	O.P. Jindal Super TPP (Stage-I)	JINDAL POWER LIMITED	08.12.2007	1000.00	1.8349	1.5543	84.71	100	Not Achieved
21	TAMNAR TPP	JINDAL POWER LIMITED	14.03.2014	2400.00	3.5688	3.1956	89.54	100	Not Achieved
22	JAYPEE BINA TPP	JAIPRAKSH POWER VENTURES LIMITED	31.08.2012	500.00	0.6873	0.5611	81.64	100	Not Achieved
23	JAYPEE NIGRIE SUPER TPP	JAIPRAKSH POWER VENTURES LIMITED	03.09.2014	1320.00	1.5794	1.4143	89.55	100	Not Achieved
24	VIJAYANAGAR	JSW ENERGY LIMITED	18.01.2000	860.00	0.2545	0.2545	99.99	100	Not Achieved
25	DERANG TPP	JINDAL INDIA THERMAL POWER LIMITED	05.06.2014	1200.00	2.4016	1.2906	53.74	100	Not Achieved
26	DONGAMAHUA CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	04.09.2010	576.00	0.9551	0.9548	99.97	100	Not Achieved
27	ANGUL CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	13.05.2011	810.00	1.2830	0.4550	35.46	100	Not Achieved
28	JSW ENERGY (BARMER) LIMITED	JSW ENERGY (BARMER) LIMITED	26.11.2009	1080.00	0.8972	0.8468	94.38	100	Not Achieved
29	JHABUA POWER LIMITED	JHABUA POWER LIMITED	03.05.2016	600.00	1.0217	0.5690	55.69	100	Not Achieved
30	BALLARI	KARNATAKA POWER CORPORATION LIMITED	25.03.2008	1700.00	1.7030	1.2838	75.39	100	Not Achieved
31	RAICHUR POWER PLANT	KARNATAKA POWER CORPORATION LIMITED	29.03.1985	1720.00	2.0131	1.9668	97.70	100	Not Achieved
32	LANCO AMARKANTAK TPS	LANCO AMARKANTAK POWER LIMITED	01.05.2009	600.00	1.1070	0.8297	74.95	100	Not Achieved

SI	Name of TPS	Power Utility	Date of Commissioning	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
33	LALITPUR	LALITPUR POWER GENERATION COMPANY LIMITED	08.01.2016	1980.00	2.0943	1.8855	90.03	100	Not Achieved
34	ANPARA 'C' TPS	LANCO ANPARA POWER LIMITED	10.12.2011	1200.00	1.7101	0.2191	12.81	100	Not Achieved
35	MAHAN	MAHAN ENERGEN LTD.	29.04.2013	1200.00	0.8359	0.2128	25.46	100	Not Achieved
36	MAITHON RIGHT BANK TPP	MAITHON POWER LIMITED	01.09.2011	1050.00	1.8518	1.6577	89.52	100	Not Achieved
37	SANJAY GANDHI	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	07.10.1993	1340.00	1.8895	1.3509	71.50	100	Not Achieved
38	SATPURA	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	07.01.1979	1330.00	0.8970	0.8954	99.82	100	Not Achieved
39	AMARKANTAK	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	10.09.2009	210.00	0.3582	0.1400	39.09	100	Not Achieved
40	SHREE SINGAJI TPS	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	01.02.2014	2520.00	2.7398	0.9937	36.27	100	Not Achieved
41	CHANDRAPUR	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	03.05.1985	2920.00	4.5013	0.8767	19.48	100	Not Achieved
42	KHAPARKHEDA	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	26.03.1989	1340.00	2.5825	1.8908	73.22	100	Not Achieved
43	KORADI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	30.03.1982	2190.00	2.9579	2.3997	81.13	100	Not Achieved
44	MEENAKSHI ENERGY LIMITED	MEENAKSHI ENERGY LIMITED	07.10.2012	300.00	0.0172	0.0016	9.51	100	Not Achieved
45	NEYVELI - II EXPN	NLC INDIA LIMITED	18.05.2011	500.00	0.1334	0.1304	97.79	100	Not Achieved
46	SINGRAULI	NTPC LTD.	Feb-1982	2000.00	3.0245	1.7404	57.54	100	Not Achieved
47	KORBA SUPER	NTPC LTD.	03.01.1983	2600.00	5.0667	2.8895	57.03	100	Not Achieved
48	VINDHYACHAL	NTPC LTD.	10.01.1987	4760.00	8.2382	4.3700	53.05	100	Not Achieved
49	RIHAND	NTPC LTD.	March 1988	3000.00	3.7085	2.1983	59.28	100	Not Achieved
50	KAHALGAON SUPER	NTPC LTD.	03.01.1992	2340.00	4.2309	3.3273	78.64	100	Not Achieved

SI	Name of TPS	Power Utility	Date of Commissioning	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
51	TALCHER - KANIHA	NTPC LTD.	02.01.1995	3000.00	6.8777	3.7592	54.66	100	Not Achieved
52	SIPAT SUPER	NTPC LTD.	05.01.2007	2980.00	5.1977	3.0803	59.26	100	Not Achieved
53	BONGAIGAON	NTPC LTD.	June,2015	750.00	0.7573	0.4393	58.01	100	Not Achieved
54	KUDGI	NTPC LTD.	1.12.2016	2400.00	1.3351	0.7179	53.77	100	Not Achieved
55	SOLAPUR SUPER TPS	NTPC LTD.	01.04.2017	1320.00	1.1357	0.8579	75.54	100	Not Achieved
56	LARA SUPER TPS	NTPC LTD.	23.03.2018	1600.00	3.2342	1.8232	56.37	100	Not Achieved
57	BARAUNI	NTPC LTD.	01.05.1983	610.00	0.6011	0.4772	79.39	100	Not Achieved
58	GADARWARA SUPER	NTPC LTD.	29.03.2019	1600.00	1.6850	0.6343	37.64	90	Not Achieved
59	KHARGONE SUPER THERMAL POWER STATION	NTPC LTD.	29.09.2019	1320.00	1.3669	0.7987	58.43	70	Not Achieved
60	DARLIPALI SUPER TPS	NTPC LTD.	01.03.2020	1600.00	3.0627	1.7770	58.02	70	Not Achieved
61	ROURKELA CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	01.03.2001	120.00	0.4263	0.3539	83.01	100	Not Achieved
62	BHILAI PP-II	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	25.08.1982	74.00	0.1806	0.1083	59.98	100	Not Achieved
63	BHILAI PP - III	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	05.01.2009	500.00	1.1421	0.6602	57.81	100	Not Achieved
64	VALLUR	NTPC TAMILNADU ENERGY COMPANY LTD (NTECL) (NTPC-JV)	09.03.2012	1500.00	2.4466	1.9107	78.10	100	Not Achieved
65	NABINAGAR-BRBCL	BHARATIYA RAIL BIJLEE COMPANY LIMITED (NTPC-JV)	16.01.2017	1000.00	1.6124	0.9127	56.60	100	Not Achieved
66	NABINAGAR-NPGC	NPGC (NTPC-JV)	06.09.2019	1320.00	1.6838	0.8596	51.06	70	Not Achieved
67	NALCO, CPP ANGUL	NATIONAL ALUMINIUM COMPANY LIMITED	29.09.1986	1200.00	2.6936	2.3066	85.63	100	Not Achieved
68	IB VALLEY	ODISHA POWER GENERATION CORPORATION LIMITED	21.12.1994	1740.00	3.5855	0.9812	27.37	100	Not Achieved
69	GURU HARGOBIND TPP, LEHRA MOHABAT	PUNJAB STATE POWER CORPORATION LIMITED	25.05.1998	920.00	0.4945	0.3483	70.44	100	Not Achieved
70	GVK POWER (GOINDWALS AHIB) LTD.	PUNJAB STATE POWER	2016	540.00	0.4392	0.3452	78.60	100	Not Achieved

SI	Name of TPS	Power Utility	Date of Commissioning	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		CORPORATION LIMITED							
71	PRAYAGRAJ TPS	PRAYAGRAJ POWER GENERATION COMPANY LTD.	29.02.2016	1980.00	2.4194	2.1075	87.11	100	Not Achieved
72	R.K.M. POWERGEN PVT. LTD	R.K.M. POWERGEN PVT. LTD	23.11.2015	1440.00	2.4624	2.4602	99.91	100	Not Achieved
73	CHHABRA	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	11.06.2010	1000.00	0.9623	0.6222	64.65	100	Not Achieved
74	CHHABRA SUPER CRITICAL TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	09.08.2018	1320.00	0.9949	0.8180	82.22	90	Not Achieved
75	ROSA TPP	ROSA POWER SUPPLY COMPANY LIMITED	12.03.2010	1200.00	1.3284	1.0491	78.98	100	Not Achieved
76	AMARAVATI TPS	RATTANINDIA POWER LTD.	03.06.2013	1350.00	2.3922	1.9421	81.19	100	Not Achieved
77	YERAMARUS TPS	RAICHUR POWER CORPORATION LIMITED	07.03.2017	1600.00	1.3131	1.1415	86.93	100	Not Achieved
78	RINL CAPTIVE TPP	RASHTRIYA ISPAT NIGAM LIMITED	12.03.1989	315.00	0.5111	0.4667	91.31	100	Not Achieved
79	RAIGARH TPP	RAIGARH ENERGY GENERATION LIMITED	31.03.2014	600.00	1.0950	0.4100	37.44	100	Not Achieved
80	RAIPUR TPP	RAIPUR ENERGEN LIMITED	1.06.2015	1370.00	2.0409	2.0013	98.06	100	Not Achieved
81	SASAN UMPPTPP	REILIANCE POWER LIMITED	16.08.2013	3960.00	5.3475	2.7994	52.35	100	Not Achieved
82	SKS POWER GENERATION (CH) LTD.	SKS POWER GENERATION (CHHATTISGARH) LIMITED	06.10.2017	600.00	0.5571	0.5317	95.43	100	Not Achieved
83	THE DURGAPUR PROJECTS POWER STATION	THE DURGAPUR PROJECTS LIMITED	30.04.2008	550.00	0.7238	0.4812	66.48	100	Not Achieved
84	CUDDALORE - TAQA	TAQA NEYVELLY POWER CO.PVT. LTD.	15.12.2002	250.00	0.0761	0.0639	83.98	100	Not Achieved
85	TUTICORIN	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	09.07.1979	1050.00	1.5117	0.6393	42.29	100	Not Achieved
86	KOTHAGUDE M-V	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	01.10.1997	500.00	1.1731	0.6750	57.54	100	Not Achieved
87	KOTHAGUDE M-VI	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	23.10.2011	500.00	0.6761	0.4390	64.93	100	Not Achieved

SI No.	Name of TPS	Power Utility	Date of Commissioning	Installed Capacity (Mega Watts)	Fly ash Generation (Million Tonnes)	Fly ash Utilization (Million Tonnes)	% Utilization	Target in % age	Status
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
88	KOTHAGUDE M-VII	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	26.12.2018	800.00	0.9470	0.5190	54.80	90	Not Achieved
89	KAKATIYA (Stage-I)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	14.09.2010	500.00	0.7773	0.6475	83.30	100	Not Achieved
90	KAKATIYA (Stage-II)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	24.03.2016	600.00	0.7602	0.6493	85.42	100	Not Achieved
91	RAIGARH TPP	TRN ENERGY PRIVATE LIMITED	14.08.2016	600.00	0.2273	0.1139	50.12	100	Not Achieved
92	TALWANDI SABO POWER LTD	TALWANDI SABO POWER LTD.	05.07.2014	1980.00	2.4013	2.1702	90.38	100	Not Achieved
93	ANPARA 'A' & 'B'	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	01.01.1987	2630.00	3.9928	0.1048	2.62	100	Not Achieved
94	OBRA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	26.01.1980	1000.00	1.3742	0.0755	5.49	100	Not Achieved
95	PARICHHA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	31.03.1984	920.00	1.1066	0.7457	67.39	100	Not Achieved
96	SAGARDIGHI	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	07.09.2008	1600.00	2.3600	1.8778	79.57	100	Not Achieved
97	SANTALDIH TPS	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	01.04.2009	500.00	1.4024	0.7772	55.42	100	Not Achieved
98	BAKRESWAR	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	18.07.1999	1050.00	1.7510	0.4807	27.45	100	Not Achieved

From the above table, it may be seen that 98 Thermal Power Stations have failed to achieve the utilization target.

6.0 MODES OF FLY ASH UTILIZATION DURING THE YEAR 2021-22:

The data on fly ash utilization received from Thermal Power Stations / Power Utilities for the year 2021-22 has been analysed to ascertain the modes in which fly ash was utilized and the quantity utilized in each mode.

The modes in which fly ash were utilized during the year 2021-22 along with utilization in each mode are given in **Table - XVIII** below:

TABLE- XVIII

MODES OF FLY ASH UTILIZATION DURING THE YEAR 2021-22

Sl. No.	Mode of Utilization	Quantity of Fly Ash Utilized in the Mode of Utilization	Percentage (%)
		(Million tonnes)	
(1)	(2)	(3)	(4)
1	Cement	68.8283	25.41
2	Mine Filling	18.3799	6.79
3	Bricks & Tiles	31.6237	11.68
4	Reclamation of Low Lying Area	35.5694	13.13
5	Ash Dyke Raising	14.8201	5.47
6	Roads & Flyovers	45.9899	16.98
7	Agriculture	0.1541	0.06
8	Concrete	2.2191	0.82
9	Hydro Power Sector	0.0006	0.00
10	Others	42.2778	15.61
11	Unutilised Ash	10.9588	4.05
	Total	270.8216	100.00

The pie diagram showing the modes of utilization of fly ash during the Year 2021-22 is given in Figure-1 below:

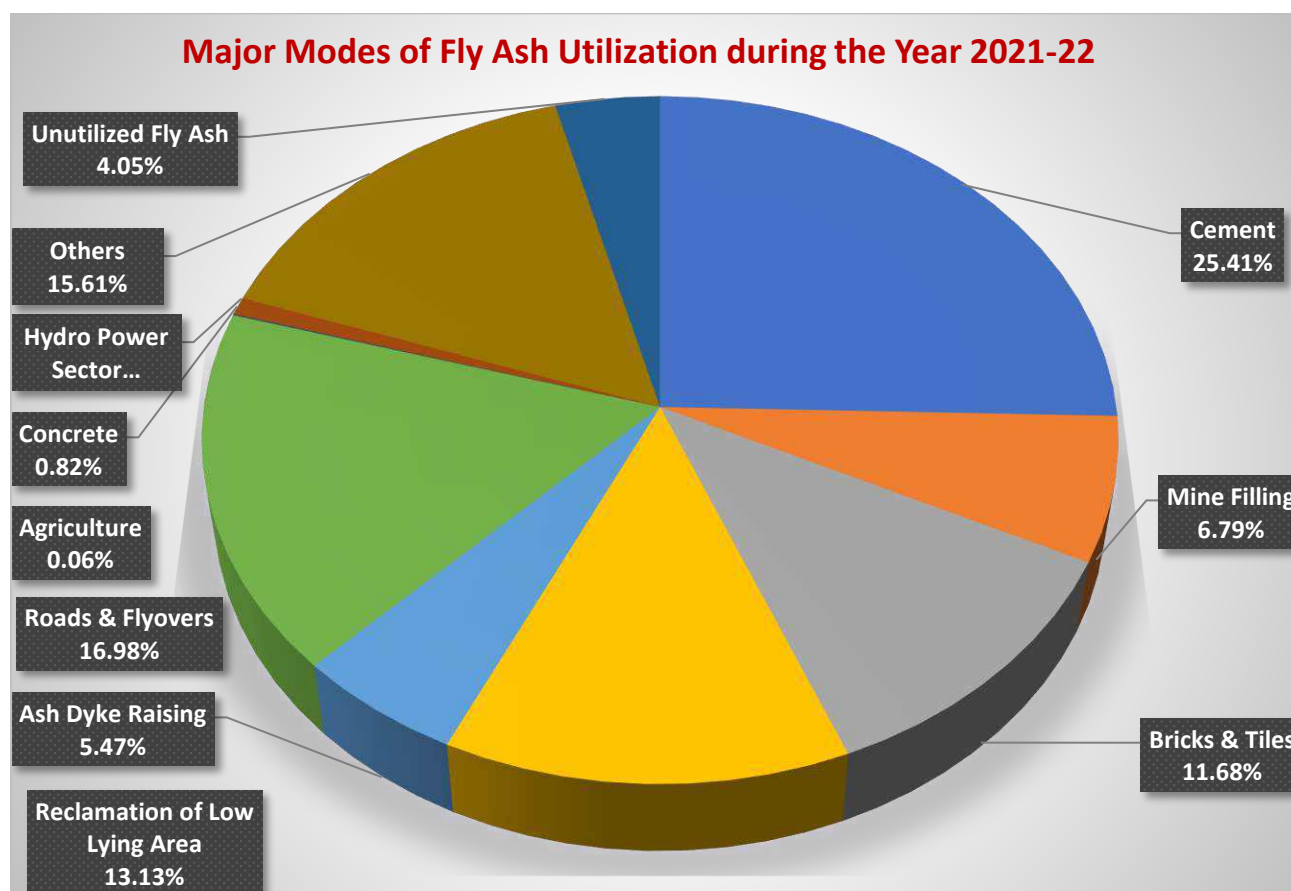


FIGURE-1

During the Year 2021-22, the maximum utilization of fly ash to the extent of 25.41 % of total fly ash generated was in the Cement sector, followed by 16.98 % in Roads & Flyovers, 13.13 % in Reclamation of Low lying area, 11.68 % in Bricks & Tiles, 6.79 % in Mine Filling, 5.47 % in Ash Dyke Raising, 0.82 % in Concrete, 0.06 % in Agriculture, 0.00 % in Hydro Power Sector, 15.61 % in Others and 4.05 % remained as unutilized fly ash.

7.0 PROGRESSIVE FLY ASH GENERATION & UTILIZATION DURING THE PERIOD FROM 1996-97 TO 2021-22:

Central Electricity Authority has been monitoring since 1996-1997, the fly ash generation and its utilization at Coal / Lignite based thermal power stations in the country. Based on data of fly ash generation and utilization received from Thermal Power Stations / Power Utilities since 1996-97, the progressive fly ash generation and its utilization for the period from 1996-97 to 2021-22 are given in Table-XIX below:

TABLE-XIX

PROGRESSIVE FLY ASH GENERATION AND ITS UTILIZATION DURING THE PERIOD
FROM 1996-97 TO 2021-22

SI No.	Year	No. of TPS who provided data	Fly Ash Generation	Fly Ash Utilization	Fly Ash Utilization in Percentage
			(Million-tonnes)	(Million-tonnes)	%
(1)	(2)	(3)	(4)	(5)	(6)
1	1996-97	-	68.88	6.64	9.63
2	1997-98	-	78.06	8.43	10.8
3	1998-99	-	78.99	9.22	11.7
4	1999-2000	-	74.03	8.91	12.03
5	2000-01	-	86.29	13.54	15.7
6	2001-02	-	82.81	15.57	18.8
7	2002-03	-	91.65	20.79	22.68
8	2003-04	-	96.28	28.29	29.39
9	2004-05	-	98.57	37.49	38.04
10	2005-06	-	98.97	45.22	45.69
11	2006-07	-	108.15	55.01	50.86
12	2007-08	-	116.94	61.98	53
13	2008-09	-	116.69	66.64	57.11
14	2009-10	-	123.54	77.33	62.6
15	2010-11	88	131.09	73.13	55.79
16	2011-12	124	145.41	85.05	58.48
17	2012-13	138	163.56	100.37	61.37
18	2013-14	143	172.87	99.62	57.63

Sl No.	Year	No. of TPS who provided data	Fly Ash Generation	Fly Ash Utilization	Fly Ash Utilization in Percentage
			(Million-tonnes)	(Million-tonnes)	%
(1)	(2)	(3)	(4)	(5)	(6)
19	2014-15	145	184.14	102.54	55.69
20	2015-16	151	176.74	107.77	60.97
21	2016-17	155	169.25	107.1	63.28
22	2017-18	167	196.44	131.87	67.13
23	2018-19	195	217.04	168.40	77.59
24	2019-20	197	226.95	189.01	83.28
25	2020-21	202	232.56	214.91	92.41
26	2021-22	200	270.82	259.86	95.95

A graph showing progressive fly ash generation and its utilization for the period from 1996-97 to 2021-22 is given in **Figure-2** below:

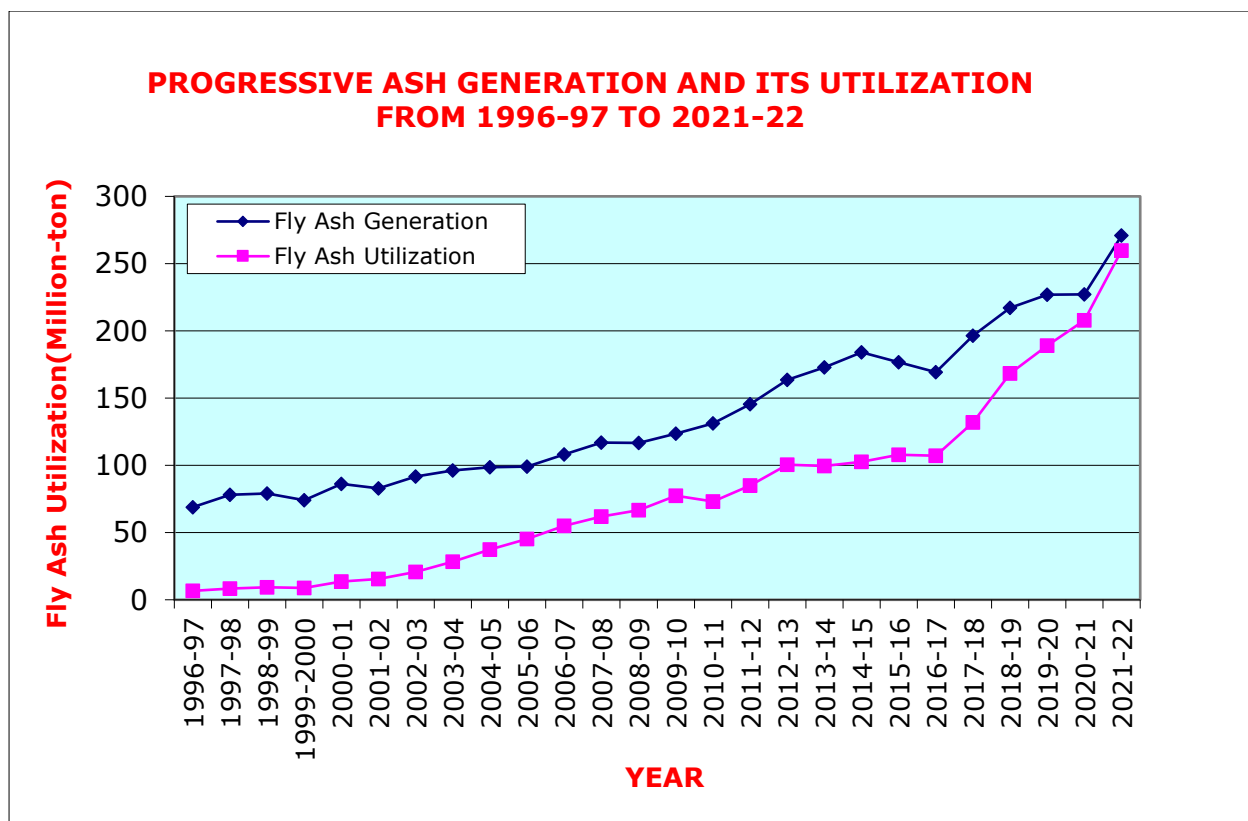


FIGURE-2

It may be seen from **Table-XIX** and **Figure-2** above that:

- (i) The fly ash generation as well as utilization has generally been increasing since 1996-97. However, the Fly ash generation has shown a slight downtrend for the year 2016-17 due to lesser coal utilization than 2015-16.
- (ii) Fly ash utilization has increased from 9.63% in 1996-97 to the highest level of 95.95 % during 2021-22.
- (iii) The fly ash generation has increased from 68.88 Million Tonnes in 1996-97 to 270.82 Million Tonnes in 2021-22 i.e. nearly 3.93 times.
- (iv) However, fly ash utilization has increased from 6.64 Million Tonnes in 1996-97 to a level of 259.86 Million Tonnes in 2021-22 i.e. nearly more than 39.14 times over the same period.
- (v) From **Table XIX**, it is seen that quantities of fly ash generation during 2016-17, 2017-18, 2018-19, 2019-20, 2020-21 and 2021-22 have been 169.25, 196.44, 217.04, 226.95, 232.56 and 270.82 Million Tonnes respectively. Fly ash utilization during the said Six years are 107.10, 131.87, 168.40, 189.01, 214.91 and 259.86 Million Tonnes respectively. The utilization of fly ash during 2021-22 is the highest ever so far.
- (vi) The number of Thermal Power Stations that are providing data has been increasing during successive years.

8.0 PROGRESSIVE FLY ASH UTILIZATION IN VARIOUS MODES DURING THE PERIOD FROM 1998-99 TO 2021-22:

8.1 Cement Industry

Fly ash is being used by Cement Industry as a pozzolanic material in the manufacture of Portland Pozzolana Cement. It saves both precious Lime stone and Coal. The utilization of fly ash in the manufacture of cement is highly value-added use. A graph showing progressive utilization of fly ash by the Cement Industry for the period from 1998-99 to 2021-22 is given in Figure-3 below:

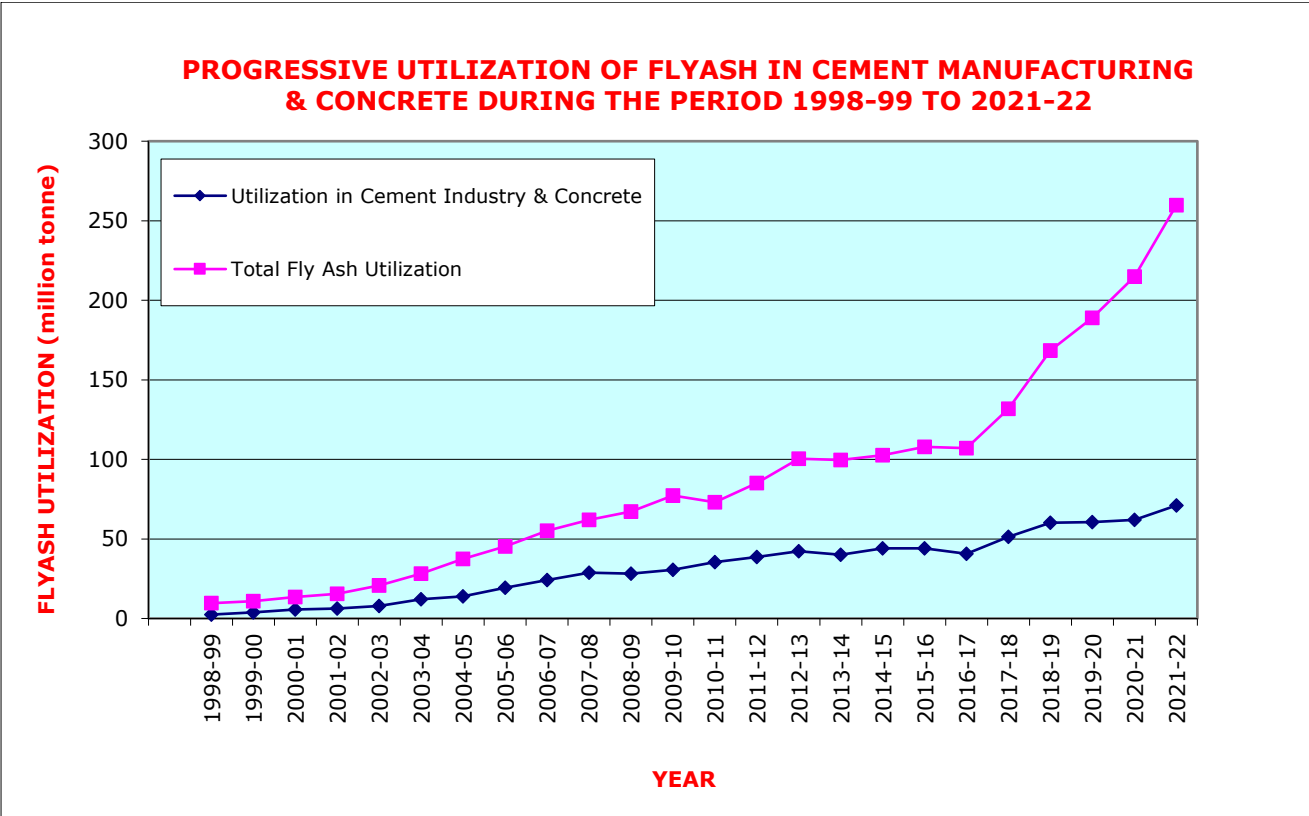


FIGURE-3

It may be seen from Figure-3 above that, 2.45 Million Tonnes of fly ash was used by Cement & Concrete Industry in 1998-99 which increased to 71.05 Million Tonnes during 2021-22 and constituted about 26.23 % of total fly ash generation in the aforesaid year.

8.2 Reclamation of Low Lying Areas

Fly ash as a substitute for Soil / Sand is used for reclamation of low lying areas, thereby saving top soil. A graph showing the progressive utilization of fly ash in the reclamation of Low lying Area for the period from 1998-99 to 2021-22 is given in **Figure-4**.

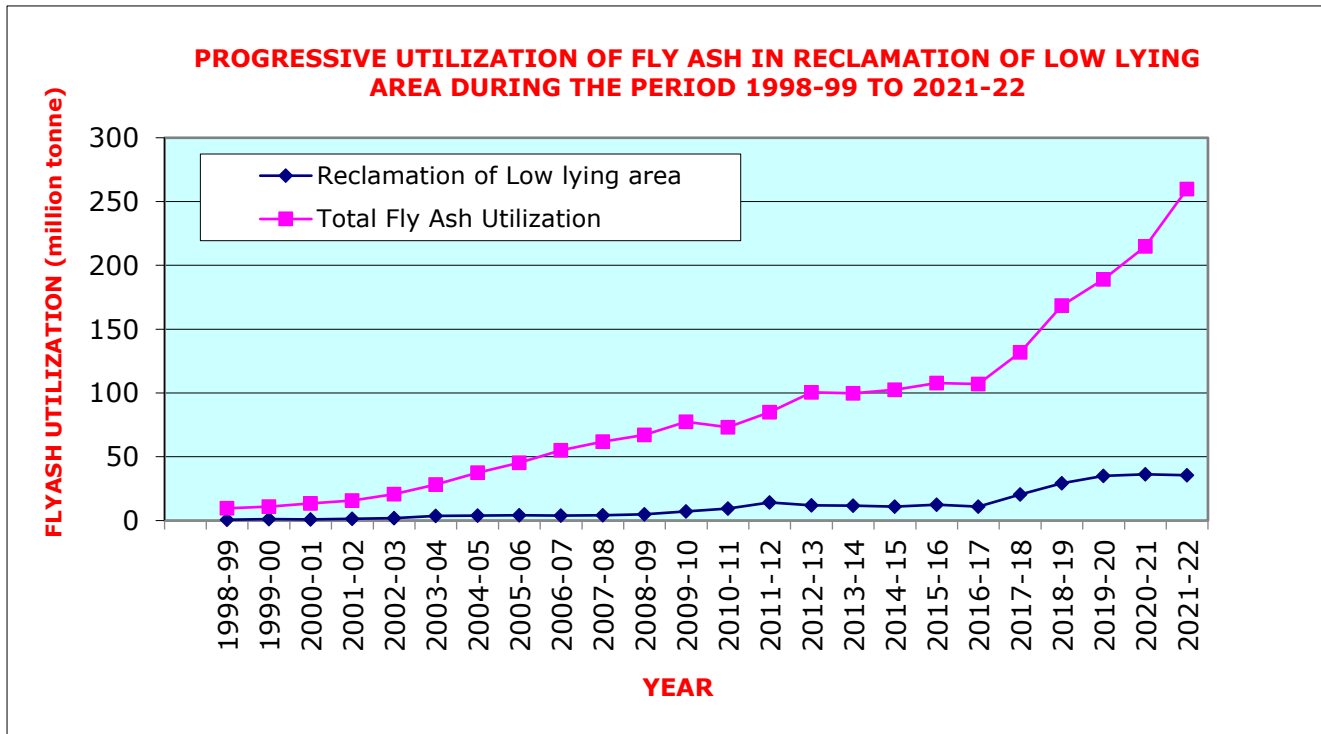


FIGURE-4

It may be seen from **Figure-4** above, that 0.65 Million Tonnes of fly ash was used for the Reclamation of Low Lying Area in 1998-99 which has increased to 35.57 Million Tonnes in 2021 - 22 constituting about 13.13 % of total fly ash generation during the aforesaid year.

8.3 Construction of Roads / Embankments / Flyovers and Raising of Ash Dykes

Fly ash is being used in the construction of Roads / Embankments / Flyovers and the Raising of Ash Dykes. It has a large potential for fly ash utilization. A graph showing the progressive utilization of fly ash in the construction of roads & embankments and the raising of ash dykes for the period from 1998-99 to 2021-22 is given in **Figure-5** below:

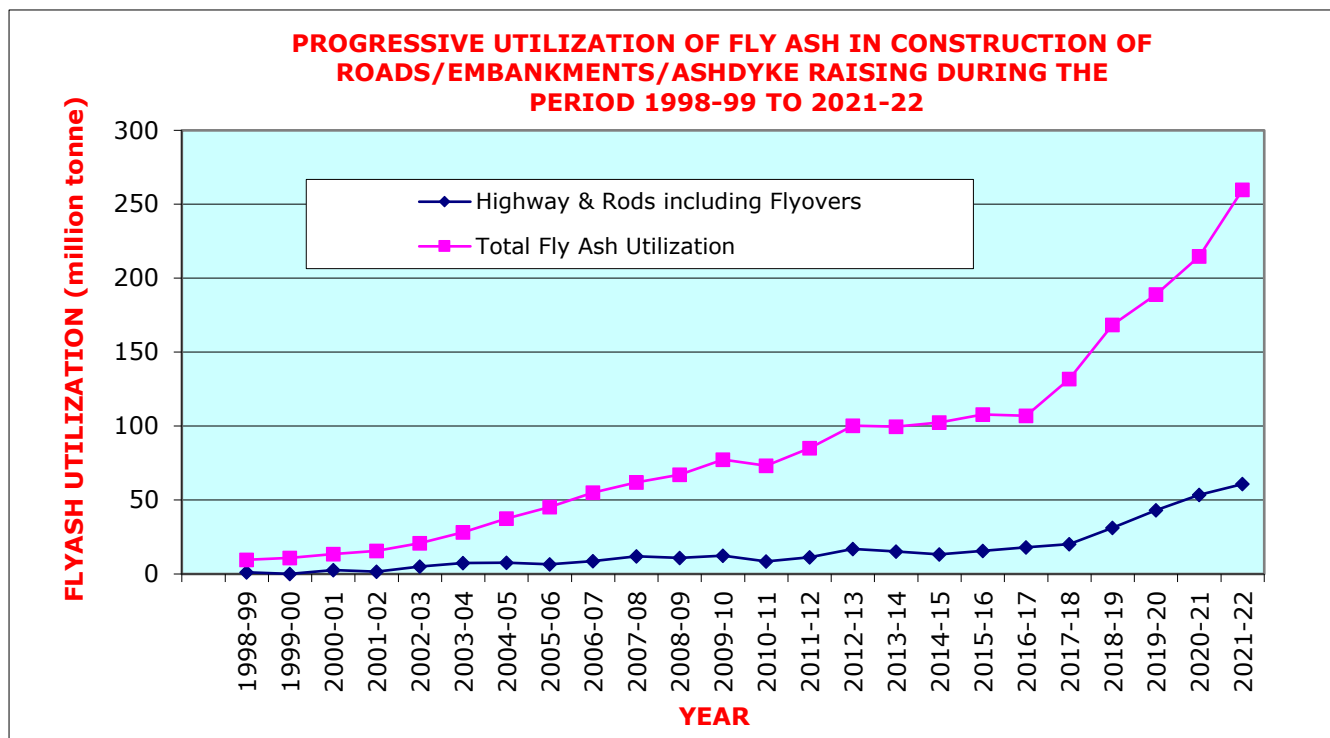


FIGURE-5

It may be seen from **Figure-5** above that 1.055 Million Tonnes of fly ash was used in the construction of roads /embankments / flyovers and raising of ash dykes etc. during 1998-99 which increased to 60.81 Million Tonnes in 2021-22 and constituted about 22.45 % of total fly ash generation in the aforesaid year.

8.4 Back Filling / Stowing of Mines :

Fly ash is being used for the backfilling of open cast mines and stowing of underground mines which result in the saving of top fertile soil and precious river sand. It has a large potential for fly ash utilization especially for pit head thermal power stations. A graph showing the progressive utilization of fly ash in the backfilling / stowing of mines for the period from 1998-99 to 2021-22 is given in **Figure-6**:

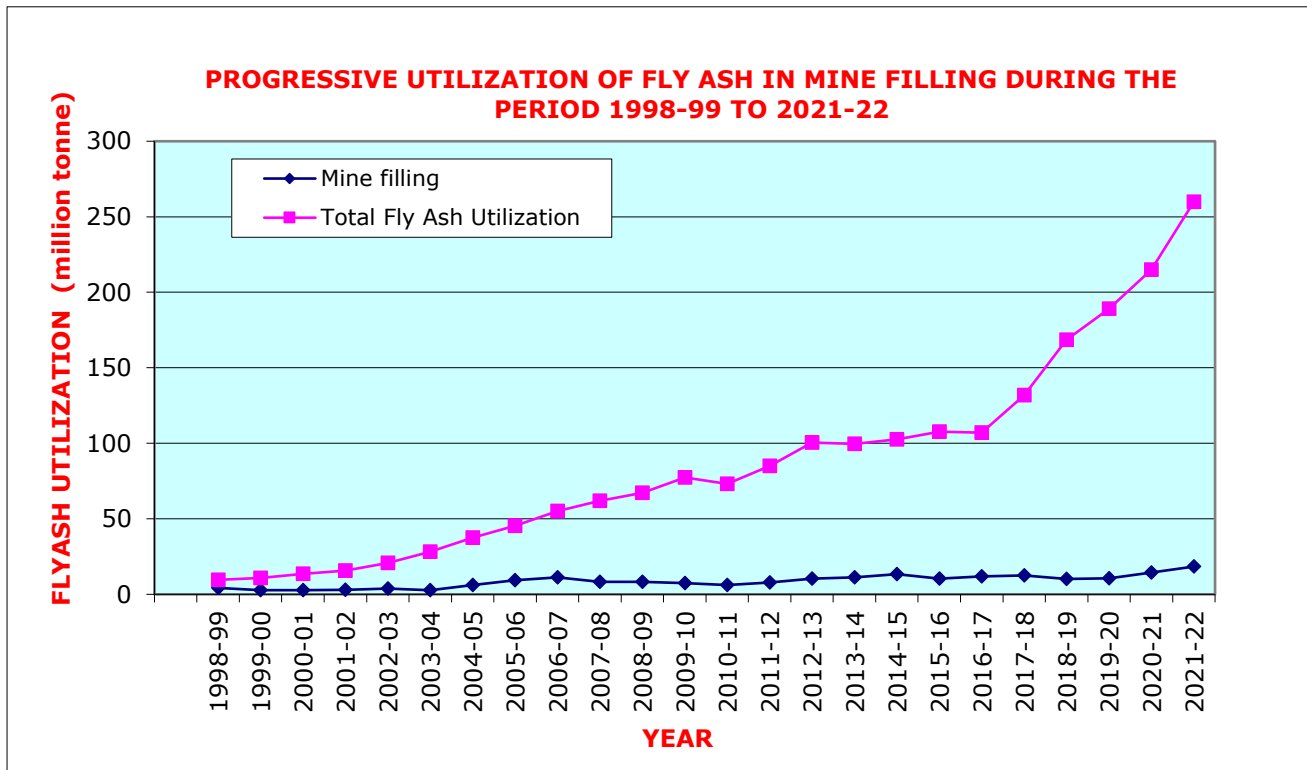


FIGURE-6

It may be seen from **Figure-6** above that 4.17 Million tonnes of fly ash was used for backfilling / stowing of open cast and underground mines during 1998-99 to 18.38 Million Tonnes in 2021-22, constituting about 6.79 % of total fly ash generation in the aforesaid year.

8.5 Building Materials like Bricks, Blocks and Tiles etc.

Fly ash is used in the manufacturing of fly ash based building products like bricks, blocks, tiles, etc. which results in the saving of fertile topsoil. Fly ash based Bricks / Blocks / Tiles are as good as clay-based conventional building products. It has substantial potential of fly ash utilization especially for thermal power stations located near load centers. A graph showing progressive utilization of fly ash in making of fly ash based building products for the period from 1998-99 to 2021-22 is given in Figure - 7.

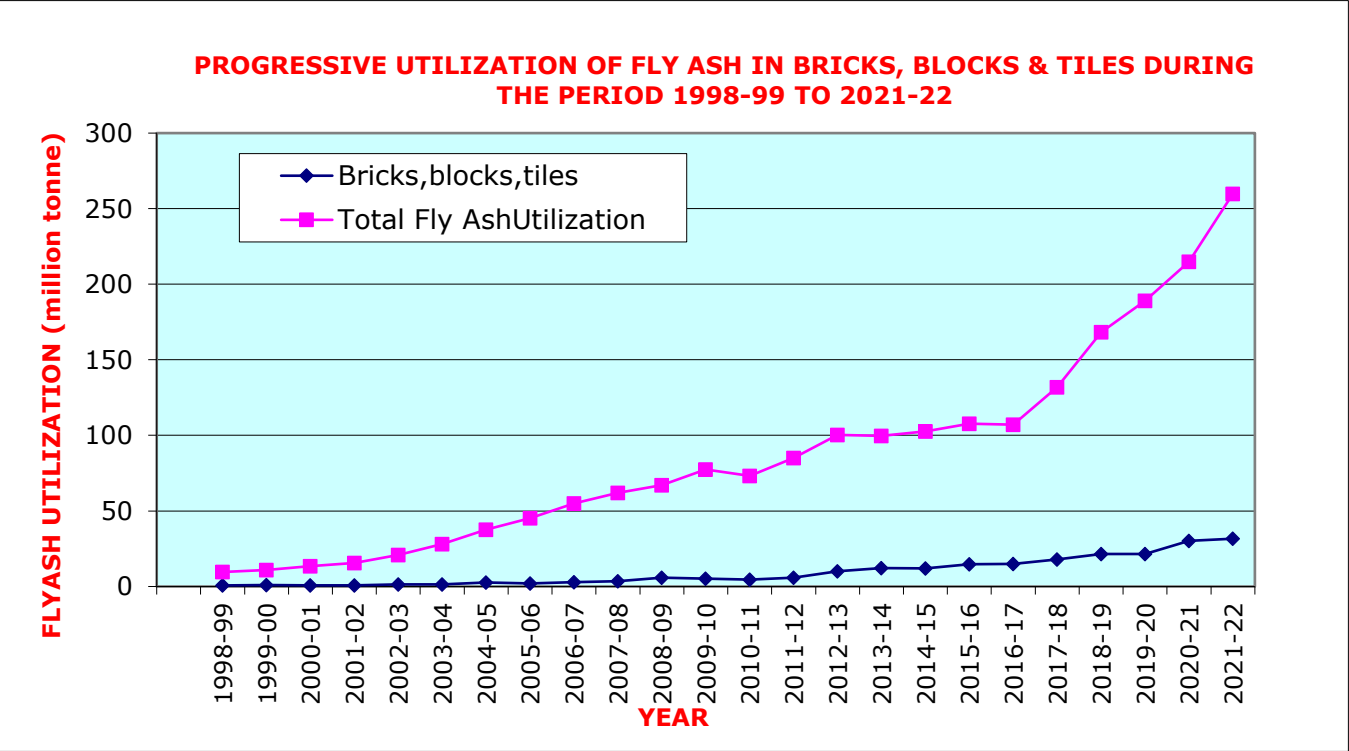


FIGURE-7

It may be seen from Figure-7 above that 0.70 Million Tonnes of fly ash was used for making fly ash based bricks / blocks / tiles etc. during 1998-99 which increased to 31.62 Million Tonnes in 2021-22 and constituted about 11.68 % of total fly ash generation in the aforesaid year.

8.6 Agriculture:

Fly ash is being used as manure in the agricultural sector as it has many micro nutrients. The progressive utilization of fly ash in the Agricultural Sector for the period from 1998-99 to 2021-22 is given in Figure-8.

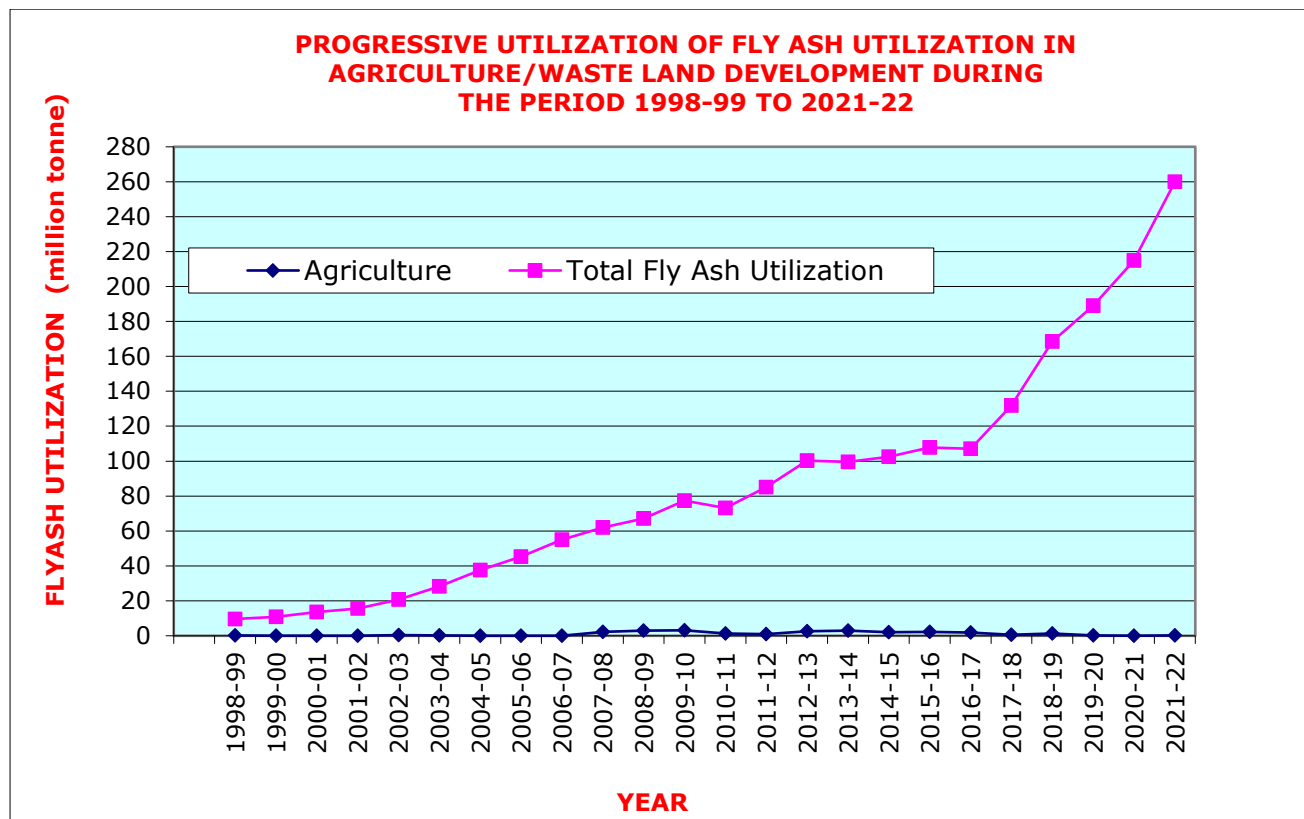


FIGURE-8

It may be seen from Figure-8 above that 0.13 Million Tonnes of fly ash was used in the agricultural sector during 1998-99, which has decreased to 0.15 Million Tonnes in 2021-22 constituted about 0.06 % of total fly ash generation in the aforesaid year.

9.0 LEGACY ASH As on 31.03.2022 :

The Ash Stock (Legacy Ash) details as provided by the Thermal Power Plants as on 31.03.2022 is shown below:

(Total Ash Stock Position as on 31.3.202
1, 30.9.2021 & 31.3.2022)

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	AARTI STEELS LIMITED	AARTI STEELS LIMITED	ODISHA	80.00	0.0012	0.0000	0.0000
2	Dr. N.T.R TPS	APGENCO	Andhra Pradesh	1760.00	42.1770	42.1089	42.0210
3	RAYALSEEMA	APGENCO	Andhra Pradesh	1650.00	15.6520	15.8310	16.2252
4	SRI DAMODARAM SANJEEVAIAH	Andhra Pradesh Power Development Company Limited	Andhra Pradesh	1600.00	2.7930	2.9706	3.2228
5	KASAIPALI	ACB (INDIA) Ltd.	Chhattisgarh	270.00	0.6872	0.6872	0.6872
6	SVPL Renki	ACB (INDIA) Ltd.	Chhattisgarh	60.00	0.0000	0.0000	0.0000
7	CHAKABURA TPP	ACB (INDIA) Ltd.	Chhattisgarh	30.00	0.0000	0.0000	0.0000
8	CHAKABURA TPP (EXTN)	ACB (INDIA) Ltd.	Chhattisgarh	30.00	0.0000	0.0000	0.0000
9	RATIJA TPS	ACB (INDIA) Ltd.	Chhattisgarh	100.00	0.4110	0.4100	0.4110
10	MUNDRA TPS	ADANI POWER (MUNDRA) LIMITED	Gujarat	4620.00	0.0443	0.0400	0.0324
11	TIRODA	ADANI POWER MAHARASHTRA LTD.	Maharashtra	3300.00	6.8922	7.6682	4.4340
12	KAWAI	ADANI POWER RAJASTHAN LTD.	Rajasthan	1320.00	0.1536	0.2578	0.1512
13	MIHAN	Abhijeet MADC Nagpur Energy Pvt. Ltd.	Maharashtra	246.00	0.0000	0.0580	0.0210
14	ADANI DAHANU	ADANI ELECTRICITY MUMBAI LIMITED	Maharashtra	500.00	2.4460	2.2210	2.1500
15	ADHUNIK POWER & NATURAL RESOURCES LTD.	Adhunik Power & Resources Ltd.	Jharkhand	540.00	0.0000	0.0000	0.1436
16	BARKHERA	Bajaj Energy Limited	Uttar Pradesh	90.00	0.0002	0.0001	0.0001
17	KHAMBHAR KHERA	Bajaj Energy Limited	Uttar Pradesh	90.00	0.0000	0.0004	0.0002
18	KUNDARKI	Bajaj Energy Limited	Uttar Pradesh	90.00	0.0002	0.0003	0.0001
19	MAQSOODAPUR	Bajaj Energy Limited	Uttar Pradesh	90.00	0.0001	0.0006	0.0002
20	UTRAULA	Bajaj Energy Limited	Uttar Pradesh	90.00	0.0001	0.0001	0.0002
21	BALCO CPP	BALCO	Chhattisgarh	540.00	10.0384	10.1412	9.8255

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
22	BALCO TPP	BALCO	Chhattisgarh	1200.00	2.6220	2.7753	1.9343
23	BHADRESHWAR VIDYUT PRIVATE LTD TPS	BHADRESHWAR VIDYUT PRIVATE LIMITED	Gujarat	300.00	0.0083	0.0046	0.0083
24	Budge Budge Generating Station	CESC Ltd.	West Bengal	750.00	0.0000	0.0000	0.0000
25	Southern Generating Station	CESC Ltd.	West Bengal	135.00	0.0000	0.0000	0.0000
26	Titagarh Generating Station	CESC Ltd.	West Bengal	240.00	0.0000	0.0000	0.0000
27	Atal Bihari Vajpayee TPP	Chattisgarh State Power Generation Company Ltd.	Chhattisgarh	1000.00	4.1340	4.5880	4.6090
28	Dr. Shyama Prasad Mukharjee TPP	Chattisgarh State Power Generation Company Ltd.	Chhattisgarh	500.00	18.0990	18.6276	19.0775
29	Hasdeo TPP	Chattisgarh State Power Generation Company Ltd.	Chhattisgarh	1340.00	56.4160	57.4030	58.0946
30	MUTIARA	COASTAL ENERGEN PVT. LTD	Tamil Nadu	1200.00	0.0030	0.0030	0.0000
31	MUNDRA UMPP	Coastal Gujarat Power Limited	Gujarat	4150.00	1.7600	1.7500	1.7300
32	CHEMPLAST LIMITED TPS	CHEMPLAST LIMITED	Tamil Nadu	48.50	0.0002	0.0001	0.0001
33	DB POWER	DB POWER LIMITED	Chhattisgarh	1200.00	2.3289	2.6511	1.9074
34	BOKARO	Damodar Valley Corporation	Jharkhand	500.00	0.7974	0.8700	0.8765
35	CHANDRAPURA	Damodar Valley Corporation	Jharkhand	500.00	4.2394	4.2054	4.2303
36	DURGAPUR	Damodar Valley Corporation	West Bengal	210.00	3.1280	3.1481	3.1989
37	MEJIA	Damodar Valley Corporation	West Bengal	2340.00	18.3070	18.9010	19.1520
38	DURGAPUR STEEL	Damodar Valley Corporation	West Bengal	1000.00	5.2330	5.4740	5.3060
39	KODERMA	Damodar Valley Corporation	Jharkhand	1000.00	1.1096	1.3108	2.7865
40	RAGHUNATHPUR	Damodar Valley Corporation	West Bengal	1200.00	3.7304	4.8965	5.5914
41	DHARIWAL INFRASTRUCTURE Ltd.	DHARIWAL INFRASTRUCTURE LIMITED	Maharashtra	600.00	0.0000	0.0126	0.0000
42	SALAYA TPS	ESSAR POWER GUJARAT LTD.	Gujarat	1200.00	0.0000	0.0000	0.0000

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
43	SURAT LIGNITE	Gujarat Industries Power Company Limited	Gujarat	500.00	0.0000	0.0000	0.0000
44	AKRIMOTA	Gujarat Mineral Development Corporation Limited	Gujarat	250.00	0.0001	0.0006	0.0006
45	GANDHINAGAR	Gujarat State Electricity Corporation Limited	Gujarat	630.00	5.7000	5.2870	4.7040
46	KUTCH LIGNITE	Gujarat State Electricity Corporation Limited	Gujarat	150.00	1.2000	0.9060	0.8390
47	SIKKA	Gujarat State Electricity Corporation Limited	Gujarat	500.00	0.9600	0.8140	0.5820
48	UKAI	Gujarat State Electricity Corporation Limited	Gujarat	1110.00	13.0000	12.9980	12.9730
49	WANAKBORI	Gujarat State Electricity Corporation Limited	Gujarat	2270.00	38.1000	38.5580	38.6650
50	BHAVNAGAR LIGNITE	Gujarat State Electricity Corporation Limited	Gujarat	500.00	0.0060	0.0254	0.0000
51	GMR WARORA ENERGY LTD.	GMR WARORA ENERGY LTD.	Maharashtra	600.00	0.2630	0.2967	0.2150
52	GMR KAMALANGA TPP	GMR KAMALANGA ENERGY LTD.	Odisha	1050.00	1.0740	0.6520	0.2970
53	RAJIV GANDHI TPP, Hissar	Haryana Power Generation Corporation Limited	Haryana	1200.00	4.8010	4.6780	4.3730
54	Deen Bandhu Chhotu Ram TPS, YAMUNANAGAR	Haryana Power Generation Corporation Limited	Haryana	600.00	1.8008	1.5790	1.2995
55	PANIPAT	Haryana Power Generation Corporation Limited	Haryana	710.00	29.9000	26.1900	22.4070
56	HALDIA ENERGY LIMITED	HALDIA ENERGY LIMITED	West Bengal	600.00	0.0000	0.0000	0.0000
57	HINDUJA NATIONAL POWER CORPORATION LIMITED	HINDUJA NATIONAL POWER CORPORATION LIMITED	Andhra Pradesh	1040.00	1.1945	1.1330	0.8469

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
58	DISHERGARH POWER STATION	INDIA POWER CORPORATION LTD.	West Bengal	12.00	0.0000	0.0000	0.0000
59	INDIAN METALS & FERRO ALLOYS LTD.	INDIAN METALS & FERRO ALLOYS LTD.	Odisha	200.00	0.0000	0.0000	0.0000
60	IL & FS TAMIL NADU POWER COMPANY LTD.	IL & FS TAMIL NADU POWER COMPANY LIMITED	Tamil Nadu	1200.00	0.0347	0.0347	0.0347
61	BELA TPS	IDEAL ENERGY PROJECTS LIMITED	Maharashtra	270.00	0.1168	0.0584	0.0584
62	JK CAPTIVE POWER PLANT	JK CEMENT WORKS MUDDAPUR	Karnataka	50.00	0.0000	0.0000	0.0000
63	MAHATMA GANDHI TPP	JHAJJAR POWER LIMITED	Haryana	1320.00	0.0003	0.0172	0.0003
64	O.P. Jindal Super TPP (Stage-I)	JINDAL POWER LIMITED	Chhattisgarh	1000.00	10.1420	10.5140	10.4230
65	TAMNAR TPP	JINDAL POWER LIMITED	Chhattisgarh	2400.00	5.3570	5.9980	5.7270
66	JAYPEE BINA TPP	JAIPRAKSH POWER VENTURES LIMITED	Madhya Pradesh	500.00	2.0000	0.3808	2.1262
67	JAYPEE NIGRIE SUPER TPP	JAIPRAKSH POWER VENTURES LIMITED	Madhya Pradesh	1320.00	0.2185	0.5401	0.3835
68	RATNAGIRI	JSW ENERGY LIMITED	Maharashtra	1200.00	0.0479	0.0478	0.0047
69	VIJAYANAGAR	JSW ENERGY LIMITED	Karnataka	860.00	0.1197	0.1197	0.0352
70	DERANG TPP	JINDAL INDIA THERMAL POWER LIMITED	Odisha	1200.00	9.1548	5.1926	5.6885
71	DONGAMAHUA CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	Chhattisgarh	576.00	0.0011	0.0012	0.0014
72	ANGUL CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	Odisha	810.00	0.4550	1.0200	1.0190
73	JSW ENERGY (BARMER) LIMITED	JSW ENERGY (BARMER) LIMITED	Rajasthan	1080.00	0.1416	0.1690	0.1920
74	JSW STEEL LIMITED CPP-II	JSW STEEL LIMITED	Tamil Nadu	90.00	0.0001	0.0001	0.0001
75	JINDAL STEEL AND POWER LIMITED (CPP)	JINDAL STEEL AND POWER LIMITED	Chhattisgarh	299.00	12.9830	13.1463	13.3020
76	JHABUA POWER LIMITED	JHABUA POWER LIMITED	Madhya Pradesh	600.00	0.8926	1.0953	1.0493
77	BALLARI	KARNATAKA POWER CORPORATION LIMITED	Karnataka	1700.00	6.2540	6.4764	6.6808

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
78	RAICHUR POWER PLANT	KARNATAKA POWER CORPORATION LIMITED	Karnataka	1720.00		39.9441	39.9775
79	KMPCL - NARIYARA	KSK MAHANADI POWER COMPANY LIMITED	Chhattisgarh	1800.00	0.4856	0.4794	0.3050
80	LANCO AMARKANTAK TPS	LANCO AMARKANTAK POWER LIMITED	Chhattisgarh	600.00	6.4730	6.5866	2.0060
81	LALITPUR	LALITPUR POWER GENERATION COMPANY LIMITED	Uttar Pradesh	1980.00	0.0719	0.1543	0.2806
82	ANPARA 'C' TPS	LANCO ANPARA POWER LIMITED	Uttar Pradesh	1200.00	13.5845	14.3329	15.0755
83	MAHAN	MAHAN ENERGEN LTD.	Madhya Pradesh	1200.00	0.5280	0.8200	1.1511
84	MAITHON RIGHT BANK TPP	MAITHON POWER LIMITED	Jharkhand	1050.00	0.0893	0.3633	0.2834
85	SANJAY GANDHI	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	Madhya Pradesh	1340.00	15.6467	15.7370	16.1852
86	SATPURA	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	Madhya Pradesh	1330.00	85.0450	85.0325	85.0465
87	AMARKANTAK	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	Madhya Pradesh	210.00	3.3176	3.4470	3.5357
88	SHREE SINGAJI TPS	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	Madhya Pradesh	2520.00	7.7184	8.3032	9.4646
89	BHUSAWAL	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	1210.00	6.7496	6.7277	6.4374
90	CHANDRAPUR	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	2920.00	77.3275	78.9750	80.9590
91	KHAPARKHEDA	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	1340.00	26.8896	27.5350	27.5813
92	KORADI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	2190.00	31.2103	31.6945	31.7685

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
93	NASHIK	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	630.00	10.3792	9.0009	5.6844
94	PARLI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	750.00	20.4196	0.0000	2.1252
95	PARAS	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	500.00	1.7653	1.6290	1.3596
96	MCCPL BANDHAKHAR	MARUTI CLEAN COAL AND POWER LIMITED	Chhattisgarh	300.00	0.3286	0.3286	0.3286
97	SAI WARDHA POWER Ltd., WARORA	SAI WARDHA POWER GENERATION PVT LTD.	Maharashtra	540.00	0.0000	0.0000	0.0000
98	MEENAKSHI ENERGY LIMITED	MEENAKSHI ENERGY LIMITED	Andhra Pradesh	300.00	0.0000	0.0213	0.0213
99	ANUPPUR TPS	MB POWER (MADHYA PRADESH) LIMITED	Madhya Pradesh	1200.00	1.4233	1.4209	1.4188
100	NEYVELI - I EXPN	NLC INDIA LIMITED	Tamil Nadu	420.00	0.0000	0.0000	0.0000
101	NEYVELI - II	NLC INDIA LIMITED	Tamil Nadu	1470.00	8.1900	7.3570	7.2453
102	NEYVELI - II EXPN	NLC INDIA LIMITED	Tamil Nadu	500.00	0.0000	0.0030	0.0550
103	NEYVELI NEW THERMAL POWER STATION	NLC INDIA LIMITED	Tamil Nadu	1000.00	0.0000	0.0000	0.0000
104	BARSINGSAR LIGNITE	NLC INDIA LIMITED	Rajasthan	250.00	0.0000	0.0000	0.0000
105	NLC TAMILNADU POWER Ltd	NLC TAMIL NADU POWER LIMITED	Tamil Nadu	1000.00	0.0000	0.0005	0.0000
106	SINGRAULI	NTPC LTD.	Uttar Pradesh	2000.00	75.6100	76.7600	76.9833
107	KORBA SUPER	NTPC LTD.	Chhattisgarh	2600.00	53.5900	54.5440	55.8660
108	RAMAGUNDAM SUPER	NTPC LTD.	Telangana	2600.00	69.2280	69.1400	67.6162
109	FARAKKA SUPER	NTPC LTD.	West Bengal	2100.00	39.2847	38.8387	38.2537
110	VINDHYACHAL	NTPC LTD.	Madhya Pradesh	4760.00	80.1700	82.6340	84.0428
111	RIHAND	NTPC LTD.	Uttar Pradesh	3000.00	38.6310	39.7329	40.1388
112	KAHALGAON SUPER	NTPC LTD.	Bihar	2340.00	66.5000	58.1000	67.4036
113	DADRI	NTPC LTD.	Uttar Pradesh	1820.00	0.0185	0.0080	0.0000
114	TALCHER - KANIHA	NTPC LTD.	Odisha	3000.00	88.0565	89.4240	91.1972

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
115	FEROZE GANDHI UNCHAHAR	NTPC LTD.	Uttar Pradesh	1550.00	7.2040	6.8510	5.9700
116	SIMHADRI SUPER	NTPC LTD.	Andhra Pradesh	2000.00	15.1500	2.0960	15.5250
117	TANDA	NTPC LTD.	Uttar Pradesh	1760.00	3.5826	3.4771	2.7800
118	SIPAT SUPER	NTPC LTD.	Chhattisgarh	2980.00	37.2840	39.2765	39.3894
119	MOUDA SUPER TPS	NTPC LTD.	Maharashtra	2320.00	1.0400	1.1050	0.6590
120	BARH SUPER TPS	NTPC LTD.	Bihar	1980.00	6.2111	6.1875	4.9530
121	BONGAIGAON	NTPC LTD.	Assam	750.00	1.3583	1.5100	1.6560
122	KUDGI	NTPC LTD.	Karnataka	2400.00	1.3529	1.4732	1.9701
123	SOLAPUR SUPER TPS	NTPC LTD.	Maharashtra	1320.00	0.0150	0.0400	0.2920
124	LARA SUPER TPS	NTPC LTD.	Chhattisgarh	1600.00	0.9134	1.9316	2.3220
125	BARAUNI	NTPC LTD.	Bihar	610.00	0.1957	0.2150	0.2925
126	GADARWARA SUPER	NTPC LTD.	Madhya Pradesh	1600.00	1.1543	1.9580	2.2040
127	KHARGONE SUPER THERMAL POWER STATION	NTPC LTD.	Madhya Pradesh	1320.00	0.5479	0.8180	1.1140
128	DARLIPALI SUPER TPS	NTPC LTD.	Odisha	1600.00	1.4014	2.4540	2.8920
129	DURGAPUR CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	West Bengal	120.00	4.1177	4.1834	4.1050
130	ROURKELA CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	Odisha	120.00	1.8200	1.8196	1.7594
131	BHILAI PP-II	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	Chhattisgarh	74.00	0.9225	0.9341	0.9955
132	BHILAI PP - III	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	Chhattisgarh	500.00	3.6705	3.9556	4.1536
133	KANTI BIJLEE UTPADAN NIGAM LIMITED	KANTI BIJLEE UTPADAN NIGAM LIMITED (NTPC-JV)	Bihar	610.00	1.9440	1.8020	1.0130
134	INDIRA GANDHI	ARAVALI POWER CORPORATION PVT LTD (NTPC-JV)	Haryana	1500.00	4.0413	4.0900	3.0560
135	VALLUR	NTPC TAMILNADU ENERGY COMPANY LTD (NTECL) (NTPC-JV)	Tamil Nadu	1500.00	3.6470	3.6470	4.1830

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
136	NABINAGAR- BRBCL	BHARATIYA RAIL BIJLEE COMPANY LIMITED (NTPC-JV)	Bihar	1000.00	1.6436	2.0858	2.3460
137	MEJA TPP	MEJA URJA NIGAM PRIVATE LIMITED (NTPC-JV)	Uttar Pradesh	1320.00	0.6972	1.0231	1.1940
138	NABINAGAR-NPGC	NPGC (NTPC-JV)	Bihar	1320.00	0.8173	1.1418	1.6801
139	RAJPURA TPS	NABHA POWER LIMITED	Punjab	1400.00	0.0140	0.0040	0.0130
140	NALCO, CPP ANGUL	NATIONAL ALUMINIUM COMPANY LIMITED	Odisha	1200.00	18.7750	19.1590	19.1620
141	IB VALLEY	ODISHA POWER GENERATION CORPORATION LIMITED	Odisha	1740.00	23.6780	25.1270	26.2823
142	OPG POWER GENERATION PRIVATE LIMITED	OPG POWER GENERATION PRIVATE LIMITED	Tamil Nadu	414.00	0.0000	0.0000	0.0000
143	GURU NANAKDEV TPS, BATHINDA	PUNJAB STATE POWER CORPORATION LIMITED	Punjab	460.00	20.6786	20.5217	20.3645
144	GURU HARGOBIND TPP, LEHRA MOHABAT	PUNJAB STATE POWER CORPORATION LIMITED	Punjab	920.00	6.6315	6.7080	6.7780
145	GURU GOBIND SINGH TPP, ROPAR	PUNJAB STATE POWER CORPORATION LIMITED	Punjab	840.00	20.6207	20.1531	19.6012
146	GVK POWER (GOINDWALSAHIB) LTD.	PUNJAB STATE POWER CORPORATION LIMITED	Punjab	540.00	0.3320	0.4030	0.4264
147	PRAYAGRAJ TPS	PRAYAGRAJ POWER GENERATION COMPANY LTD.	Uttar Pradesh	1980.00	1.9572	2.3293	2.2690
148	R.K.M. POWERGEN PVT. LTD	R.K.M. POWERGEN PVT. LTD	Chhattisgarh	1440.00	0.0000	0.0000	1.1840
149	CHHABRA	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1000.00	0.4386	0.5813	0.7787
150	CHHABRA SUPER CRITICAL TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1320.00	1.5594	1.7061	1.7363
151	SURATGARH	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1500.00	7.8970	7.2296	7.2300

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
152	KALISINDH SUPER TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1200.00	0.0544	0.1406	0.0361
153	KOTA SUPER THERMAL POWER STATION	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1240.00	1.0006	0.9760	0.7928
154	GIRAL TPS	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	250.00	0.0000	0.0000	0.0000
155	ROSA TPP	ROSA POWER SUPPLY COMPANY LIMITED	Uttar Pradesh	1200.00	1.0054	1.1540	1.2847
156	AMARAVATI TPS	RATTANINDIA POWER LTD.	Maharashtra	1350.00	0.6704	1.3837	0.4501
157	YERAMARUS TPS	RAICHUR POWER CORPORATION LIMITED	Karnataka	1600.00	0.0036	0.7773	0.8857
158	RINL CAPTIVE TPP	RASHTRIYA ISPAT NIGAM LIMITED	Andhra Pradesh	315.00	0.7100	7.0028	7.1493
159	RAIGARH TPP	RAIGARH ENERGY GENERATION LIMITED	Chhattisgarh	600.00	1.5320	1.9070	1.9070
160	RAIPUR TPP	RAIPUR ENERGEN LIMITED	Chhattisgarh	1370.00	0.1275	1.8487	0.1605
161	SASAN UMPP TPP	RELIANCE POWER LIMITED	Madhya Pradesh	3960.00	22.1585	22.8793	24.7066
162	SAI LILAGAR POWER GENERATION LTD.	SAI LILAGAR POWER GENERATION LIMITED	Chhattisgarh	86.00	0.0000	0.0000	0.0000
163	SEBMCORP ENERGY INDIA LTD.	SEBMCORP ENERGY INDIA LTD.	Andhra Pradesh	1320.00	2.8320	2.8320	2.8320
164	SWASTIK POWER & MINERALS RESOURCES PVT. LTD.	SWASTIK POWER & MINERALS RESOURCES PVT. LTD.	Chhattisgarh	25.00	0.0000	0.0000	0.0000
165	SKS POWER GENERATION (CH) LTD.	SKS POWER GENERATION (CHHATTISGARH) LIMITED	Chhattisgarh	600.00	0.3840	0.3950	0.4100
166	THE DURGAPUR PROJECTS POWER STATION	THE DURGAPUR PROJECTS LIMITED	West Bengal	550.00	0.7675	0.8392	1.0084
167	SINGARENI TPP	THE SINGARENI COLLIERIES COMPANY LIMITED	Telangana	1200.00	0.4000	0.3760	0.1000
168	CUDDALORE - TAQA	TAQA NEYVELLY POWER CO.PVT. LTD.	Tamil Nadu	250.00	0.2450	0.1572	0.2535
169	JOJOBERA	THE TATA POWER COMPANY LIMITED	Jharkhand	547.50	0.0447	0.4836	0.4369

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
170	TROMBAY	THE TATA POWER COMPANY LIMITED	Maharashtra	750.00	0.0000	0.0028	0.0000
171	SABARMATI TPS	TORRENT POWER LTD.	Gujarat	362.00	1.0033	1.0536	0.9482
172	TUTICORIN	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	1050.00	40.9380	41.1820	41.8104
173	METTUR-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	840.00	18.7484	18.8055	18.7283
174	METTUR-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	600.00	0.0000	0.0000	0.0014
175	NORTH CHENNAI-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	630.00	11.4960	5.7769	0.7177
176	NORTH CHENNAI-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	1200.00	6.3690	0.8439	0.8477
177	RAMAGUNDAM 'B'	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	62.50	0.8870	0.8810	0.7457
178	KOTHAGUDEM-V	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	500.00	77.7000	78.0940	78.4360
179	KOTHAGUDEM-VI	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	500.00	0.0000	0.0000	
180	KOTHAGUDEM-VII	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	800.00	1.1746	1.4696	1.6026
181	KAKATIYA (Stage-I)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	500.00	3.4720	3.4720	2.1895
182	KAKATIYA (Stage-II)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	600.00	1.1040	1.1040	2.6275

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
183	RAIGARH TPP	TRN ENERGY PRIVATE LIMITED	Chhattisgarh	600.00	1.3643	1.4131	1.4098
184	TENUGHAT TPS	TENUGHAT VIDHYUT NIGAM LIMITED	Jharkhand	420.00	0.0000	0.0291	0.0000
185	TALWANDI SABO POWER LTD	TALWANDI SABO POWER LTD.	Punjab	1980.00	3.2670	3.1153	3.4923
186	ANPARA 'A' & 'B'	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	Uttar Pradesh	2630.00	57.3283	59.0200	61.2163
187	HARDUAGANJ	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	Uttar Pradesh	1270.00	7.7542	7.7308	7.1150
188	OBRA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	Uttar Pradesh	1000.00	12.8651	13.5390	14.1600
189	PARICHHA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	Uttar Pradesh	920.00	8.5667	8.8198	8.9275
190	UDUPI	UDUPI POWER CORPORATION LIMITED	Karnataka	1200.00	0.0327	0.0356	0.0303
191	BUTIBORI	VIDARBHA INDUSTRIES POWER LTD.	Maharashtra	600.00	0.0000	0.0000	0.0000
192	VS LIGNITE POWER PRIVATE LTD	VS LIGNITE POWER PRIVATE LIMITED	Rajasthan	135.00	0.0000	0.0000	0.0000
193	VEDANTA LTD TPP	VEDANTA LIMITED	Odisha	2400.00	5.6000	6.5300	4.7244
194	VEDANTA LTD CPP	VEDANTA LIMITED	Odisha	1215.00	9.2000	6.2200	5.3262
195	KOLAGHAT	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	1260.00	0.0111	1.1723	1.0625
196	SAGARDIGHI	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	1600.00	7.4166	7.7054	7.8989
197	BANDEL	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	335.00	0.1958	0.2420	0.1289

SI No.	Name of TPS	Power Utility	State	Installed Capacity	Ash Stock as on 31.3.2021	Ash stock as on 30.9.2021	Ash stock as on 31.3.2022
				(Mega Watts)	Million Tonnes	Million Tonnes	Million Tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
198	SANTALDIH TPS	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	500.00	3.8047	3.6511	3.9321
199	BAKRESWAR	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	1050.00	8.5700	9.1784	9.6410
200	SITAPURAM TPS	ZUARI CEMENT LIMITED	Telangana	43.00	0.0000	0.0000	0.0000
	TOTAL			213620.50	1701.9805	1718.2580	1734.0172

From the above table it may be seen that a total of 1734.02 Million Tonnes of Legacy Ash is available as reported by 200 Thermal Power Plants as on 31.03.2022.

10.0 WEB BASED MONITORING SYSTEM AND A MOBILE APPLICATION FOR UTILIZATION OF FLY ASH:

Annual Fly ash utilization has remained 95.95 % of the fly ash generated and therefore, it has become a matter of concern because of its environmental effect. Besides, progressive accumulation may lead to a situation when ash pond may not be in a position to accommodate fly ash further.

Due to the importance of utilization of fly ash & slag for reducing the burden on the environment, NITI AAYOG convened several meetings on policy framework on utilization of fly ash and slag. In a meeting held on 17.03.2017, it was decided by NITI AAYOG that an online repository of the fly ash generated by thermal power plants indicating the following parameters should be launched by Ministry of Power by 15th April, 2017:

- Cumulative amount of fly ash available in the ash ponds as on 31.03.2017
- Quantum of fly ash generated for the respective month (Ex. For the month of April 2017)
- Number of ash ponds available and their approved capacity in metric tonnes
- Cumulative stock of fly ash available in the ponds for the month as on 30th April 2017
- Total quantum of fly ash disposed to the consuming industries, which is located within the vicinity of 100 Kms., 101-300 Kms., etc. along with the details of the consumers. In this detail, it should also be indicated whether the transportation was paid by the thermal power or not. Similarly, it should also indicate whether fly ash has been given free or it has been charged. If it has been charged then the rate should also be indicated for each consumer
- Balance stock of fly ash available in the ash ponds for the month ending April, 2017

Accordingly, a web-based monitoring system and a mobile application (ASH TRACK) was developed by CEA in collaboration with M/s NTPC Limited. Login ID and password have been issued to those Power Utilities / Thermal Power Stations for uploading the monthly data of fly ash generation and its utilization.

11.0 RECOMMANDATIONS OF THE EXPERT COMMITTEE

NITI Aayog vide O.M. No. 25(11)/2014-Minerals dated 12.06.2018 has constituted an Expert Committee under the chairmanship of Joint Secretary, MoEF & CC and represented by various concerned Ministries for developing a focus strategy for best utilization of fly ash to manufacture end products.

Expert Committee held two meetings on 5th September and 1st October 2018 and finalized its recommendations. An inter-ministerial consultation meeting was also held on 21st January 2018 under the chairmanship of Secretary, MoEF&CC to review the recommendations of the Expert Committee for effective utilization of fly ash, wherein the recommendations of the Committee were accepted.

The expert Committee had recommended the following recommendations for implementation by all Thermal Power Plants for effective utilization of fly ash:

- i. Tender / auction for the sale of fly ash should be done by TPPs initially for end-user / industry and not for traders. If fly ash is not taken by end-user / industry, then it could be

given to traders. TPPs should also consider entering into longer-term contracts with end-users.

- ii. TPPs may explore the possibility that once a tender for utilization of fly ash is allotted to a company, any unit / plant of the same company should be allowed to purchase and utilize the fly ash and TPPs can also directly raised the invoice to such Unit / Plant.
- iii. Creation of fly ash parks / hubs on public-private-partnership mode. Such parks will act as facilities for enabling quality control of fly ash made ash-made products, generate employment and act as models which will promote the use of innovative fly ash products that can be replicated at other locations.
- iv. TPPs should give incentive to entities which can (through R&D) come up with fly ash products with ash content of at least 75% and established sustainable application of those fly ash products in the industry. The incentive could be given from the money available with the TPPs from auctioning of fly ash.
- v. Ministry of Power should come up with Awards / Incentives for TPPs that innovate new methodology in fly ash disposal keeping all the environment and pollution norms in Consideration.

12.0 CONCLUSIONS & RECOMMENDATIONS:

1. The fly ash generation during 2021-22 was 270.82 Million Tonnes due to a combustion of 759.02 Million Tonnes of Coal / Lignite. During 2020-21, 232.56 Million Tonnes of fly ash was generated due to combustion of 686.34 Million Tonnes of coal / lignite. However, the fly ash utilization during 2020-21 and 2021-22 were 214.91 Million Tonnes and 259.86 Million Tonnes, respectively. It is seen that the absolute quantity of fly ash utilization has increased as compared to last year and similarly the percentage utilization of fly ash has also increased.
2. The highest level of fly ash utilization of about 95.95 % is achieved during the year 2021-22. It would require a lot of efforts to achieve the target of 100 % utilization of fly ash. The stipulations of notification of 2009 and the subsequent amendments should be effectively implemented. About 4.05 % un-utilized fly ash was dumped at the various Thermal Power Stations in the country during 2021-22.
3. A few strategies which need to be adopted to further increase the utilization level of fly ash are given below:
 - Renovation and modernization of Coal / Lignite based Thermal Power Stations need to include the technological advancement required to ensure the development of dry fly ash collection, storage and disposal facilities so that fly ash in dry form could be made available to its users. Renovation and modernization should also include a marketing strategy for the development of fly ash based industries and making available fly ash and fly ash based building products in the nearby markets.
 - As per MoEF& CC's Amendment Notification dated 25.01.2016, Para 2 (14) "The coal or lignite based thermal power plants shall within a radius of three hundred kilometres bear the entire cost of transportation of ash to the site of road construction projects under Pradhan Mantri Gramin Sadak Yojana and asset creation programmes of the Government involving the construction of buildings, roads, dams, and embankments". The meaning of the words "Asset Creation Programme of the Government" may be read in the context of projects carried out under a certain plan schemes of the Government Departments. In this regard, the Ministry of Environment, Forest, and

climate change (MoEF & CC) has clarified that road being constructed by NHAI as well as the State Government are covered by the Notification dated 25.01.2016 in order to fully utilize the fly ash.

- Use of fly ash in the construction of embankments for laying railway lines has also significant potential for large scale utilization of fly ash. There are safety concerns in the use of fly ash in the construction of railway embankments having passenger traffic. There is a need to address these concerns by carrying out necessary studies by organizations like RDSO, a research organization under the Ministry of Railways.
- Thermal Power Stations have to ensure the utilization of fly ash and fly ash based building products within the thermal power station for the development of infrastructure like construction of buildings & roads, reclamation of low lying areas, etc.
- A large number of technologies have been developed for gainful utilization and safe management of fly ash through research projects funded by Fly Ash Mission / Fly Ash Unit under the Ministry of Science & Technology, GoI since 1994. Propagation of these technologies by establishing 'Self-sustaining technology demonstration centers would facilitate and accelerate the fly ash utilization in the country.
- Thermal Power Stations have to explore and promote all possible modes of fly ash utilization at their respective thermal power station for increasing the fly ash utilization in the country in line with MoEF's notifications.
- There is a need to encourage 'Industry Institute Interactions' for entrepreneur development, creating awareness, and organizing training programmes and workshops.
- Induction of 'Fly Ash' as a subject in the academic curriculum of Engineering and Architecture is needed.

13.0 Abbreviations

CEA	:	Central Electricity Authority
MoEF	:	Ministry of Environment & Forest
MoEF&CC	:	Ministry of Environment & Forest and Climate Change
MW	:	Mega Watt
MoP	:	Ministry of Power
MT	:	Million Tonnes
TPS	:	Thermal Power Stations
APGENCO	:	Andhra Pradesh Power Generation Corporation Ltd.
APPDCL	:	Andhra Pradesh Power Distribution Company Limited
ACBPL	:	Aryan Coal Beneficiation Private Ltd.
APL	:	Adani Power Ltd.,
APCPL	:	Aravali Power Corporation Pvt. Ltd.
AMNEPL	:	Abhijet MADC Nagpur energy Pvt. Ltd.
BEPL	:	Bajaj Energy Pvt. Ltd.
BSPGC	:	Bihar State Power Generation Company
CESC	:	Calcutta Electric Supply Company
CGPL	:	Coastal Gujarat Power Ltd.
CSPGCL	:	Chhattisgarh State Power Generation Company Ltd.
DVC	:	Damodar Valley Corporation
DPL	:	Durgapur Project Ltd.
DPSC	:	Dishergarh Power Supply Company Ltd.
EPGL	:	Essar Power Gujarat Ltd.
GIPCL	:	Gujarat Industries Power Corporation Ltd.
GMDCL	:	Gujarat Mineral Development Corporation Ltd.
GSECL	:	Gujarat State Electric Corporation Ltd.
HPGCL	:	Haryana Power generating company Ltd.
IPGCL	:	Indraprastha Power Generation Company Ltd.
IPCL	:	IL&FS Tamil Nadu Power Company Ltd.
JSEB	:	Jharkhand State Electricity Board.
JHPL	:	Jhajjar Power Ltd.
JPL	:	Jindal Power Ltd.
JSW	:	Jindal Steel Works
KPCL	:	Karnataka Power Corporation Ltd.

KBUNL	:	Kanti Bijlee Utpadan Nigam Ltd.
MPPGCL	:	Madhya Pradesh Power Generating Company Ltd.
MPL	:	Maithon Power Ltd.
MSPGCL	:	Maharashtra State Power Generating Company Ltd.
NLC	:	Neyveli Lignite Corporation
NSPCL	:	NTPC -SAIL Power Corporation Ltd.
NTPC	:	National thermal Power Corporation
NTECL	:	NTPC – Tamil Nadu Electric Company Ltd.
OPGCL	:	Odisha Power Generation Corporation Ltd.
PSPCL	:	Punjab State Power Corporation Ltd.
RRVUNL	:	Rajasthan Rajya Vidyut Utpadan Nigam Ltd.
RIL	:	Reliance Infrastructure Ltd.
RPSCL	:	Rosa Power Supply Company Ltd.
RWPL	:	Raj West Power Ltd.
SEL	:	Sterlite energy Ltd.
SVPL	:	Shri Vardhman Power Pvt. Ltd.
ST-CMS	:	ST-CMS
TPCO	:	Tata Power Company Ltd.
TVNL	:	Tenughat Vidyut Nigam Ltd.
TNG&D	:	Tamil Nadu Generating and Distribution Corporation Ltd.
UPCI	:	Udupi Power Company Ltd.
UPRVUNL	:	Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd.
VESPL	:	Vandana Energy Supply Power Ltd.
WBPDC	:	West Bengal Power Development Corporation Ltd.
WPCL	:	Wardha Power Company Ltd.
GEPL	:	Gupta Power Company Ltd.
VIP	:	Vidarbha Industries Power Ltd.
EPL	:	Essar Power Ltd.
ACB	:	Aryan Coal Beneficiary Ltd.
AP	:	Andhra Pradesh
MP	:	Madhya Pradesh
TN	:	Tamil Nadu
UP	:	Uttar Pradesh
WB	:	West Bengal

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021 - 22 (APRIL - 2021 TO MARCH - 2022)

(POWER UTILITY WISE)

Index
No.

Sl No.	Name of TPS	Name of Power Utility	State	Installed Capacity	Coal Consumed	Ash Content of coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
				(MW)	(MT)	%	(MT)	(MT)	%	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1	AARTI STEELS LIMITED	AARTI STEELS LIMITED	ODISHA	80.00	0.4743	55.08	0.2612	0.2612	100.00	0.2026	0.0271	0.0007	0.0000	0.0000	0.0041	0.0268	0.0000	0.0000	0.0000	0.2612
2	Dr. N.T.R TPS	APGENCO	Andhra Pradesh	1760.00	9.1956	45.27	4.1629	4.1664	100.08	2.0266	1.4276	0.5112	0.0469	0.0000	0.0000	0.0032	0.0000	0.0000	0.1509	4.1664
3	RAYALSEEMA	APGENCO	Andhra Pradesh	1650.00	5.1228	41.78	2.1404	1.5652	73.12	0.3190	1.2462	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.5652	
4	SRI DAMODARAM SANJEEVAIAH	Andhra Pradesh Power Development Company Limited	Andhra Pradesh	1600.00	3.6194	34.06	1.2329	0.8031	65.14	0.2519	0.4394	0.0765	0.0000	0.0000	0.0000	0.0353	0.0000	0.0000	0.0000	0.8031
5	KASAIPALI	ACB (INDIA) Ltd.	Chhattisgarh	270.00	1.5530	56.67	0.8801	0.8799	99.98	0.0601	0.0000	0.4822	0.0000	0.0000	0.0000	0.3376	0.0000	0.0000	0.0000	0.8799
6	SVPPL Renki	ACB (INDIA) Ltd.	Chhattisgarh	60.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	CHAKABURA TPP	ACB (INDIA) Ltd.	Chhattisgarh	30.00	0.1458	60.41	0.0881	0.0881	100.00	0.0062	0.0000	0.0641	0.0000	0.0000	0.0000	0.0178	0.0000	0.0000	0.0000	0.0881
8	CHAKABURA TPP (EXTN)	ACB (INDIA) Ltd.	Chhattisgarh	30.00	0.1486	60.23	0.0895	0.0895	100.00	0.0067	0.0000	0.0656	0.0000	0.0000	0.0000	0.0172	0.0000	0.0000	0.0000	0.0895
9	RATIJA TPS	ACB (INDIA) Ltd.	Chhattisgarh	100.00	0.8169	55.80	0.4558	0.4558	100.00	0.0149	0.0000	0.2658	0.0000	0.0000	0.0000	0.1752	0.0000	0.0000	0.0000	0.4558
10	MUNDRA TPS	ADANI POWER (MUNDRA) LIMITED	Gujarat	4620.00	6.5830	5.24	0.3448	0.3566	103.41	0.0000	0.2279	0.0159	0.0000	0.0000	0.0000	0.0193	0.0000	0.0000	0.0935	0.3566
11	TIRODA	ADANI POWER MAHARASHTRA LTD.	Maharashtra	3300.00	14.1826	32.05	4.5451	3.5557	78.23	0.2627	1.2381	0.1244	0.0000	0.0000	0.0000	1.8199	0.1015	0.0012	0.0079	3.5557
12	KAWAI	ADANI POWER RAJASTHAN LTD.	Rajasthan	1320.00	4.8560	32.18	1.5625	1.5648	100.15	0.3637	1.0225	0.0000	0.0000	0.0000	0.0000	0.1786	0.0000	0.0000	0.0000	1.5648
13	MIHAN	Abhijeet MADC Nagpur Energy Pvt. Ltd.	Maharashtra	246.00	0.0000	-	0.0000	0.0370	-	0.0000	0.0000	0.0370	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0370
14	ADANI DAHANU	ADANI ELECTRICITY MUMBAI LIMITED	Maharashtra	500.00	1.9890	31.91	0.6346	0.6710	105.74	0.0000	0.0000	0.0000	0.3704	0.0000	0.0000	0.0000	0.0000	0.0000	0.3007	0.6710
15	ADHUNIK POWER & NATURAL RESOURCES LTD.	ADHUNIK POWER & NATURAL RESOURCES LTD.	Jharkhand	540.00	2.5476	43.96	1.1199	0.9762	87.17	0.0687	0.5773	0.0000	0.0387	0.0000	0.0000	0.2915	0.0000	0.0000	0.0000	0.9762
16	BARKHERA	Bajaj Energy Limited	Uttar Pradesh	90.00	0.1599	35.38	0.0566	0.0567	100.20	0.0052	0.0507	0.0000	0.0000	0.0000	0.0000	0.0008	0.0000	0.0000	0.0000	0.0567
17	KHAMBHAR KHERA	Bajaj Energy Limited	Uttar Pradesh	90.00	0.1588	32.58	0.0517	0.0517	99.93	0.0059	0.0435	0.0000	0.0000	0.0000	0.0000	0.0023	0.0000	0.0000	0.0000	0.0517
18	KUNDARKI	Bajaj Energy Limited	Uttar Pradesh	90.00	0.2127	34.83	0.0741	0.0742	100.11	0.0074	0.0625	0.0000	0.0000	0.0000	0.0000	0.0043	0.0000	0.0000	0.0000	0.0742
19	MAQSODAPUR	Bajaj Energy Limited	Uttar Pradesh	90.00	0.1565	34.86	0.0545	0.0545	99.90	0.0045	0.0499	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0545
20	UTRAULA	Bajaj Energy Limited	Uttar Pradesh	90.00	0.1891	33.60	0.0635	0.0634	99.80	0.0067	0.0567	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0634
21	BALCO CPP	BALCO	Chhattisgarh	540.00	2.4532	40.55	0.9948	1.2077	121.40	0.0246	0.0303	0.1499	0.0000	0.0000	0.0000	0.9096	0.0000	0.0000	0.0933	1.2077
22	BALCO TPP	BALCO	Chhattisgarh	1200.00	5.3075	40.32	2.1398	2.8268	132.11	0.0560	0.0573	0.3857	0.0000	0.0000	0.0000	2.1038	0.0000	0.0000	0.2240	2.8268
23	BHADRESHWAR VIDYUT PRIVATE LTD TPS	BHADRESHWAR VIDYUT PRIVATE LIMITED	Gujarat	300.00	0.3138	6.84	0.0215	0.0215	100.41	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0215	0.0215
24	Budge Budge Generating Station	CESC Ltd.	West Bengal	750.00	3.2350	33.44	1.0818	1.0818	100.00	0.0413	0.8898	0.0000	0.0000	0.0000	0.0000	0.1506	0.0000	0.0000	0.0000	1.0818
25	Southern Generating Station	CESC Ltd.	West Bengal	135.00	0.1312	24.16	0.0317	0.0317	100.00	0.0029	0.0245	0.0000	0.0001	0.0000	0.0000	0.0042	0.0000	0.0000	0.0000	0.0317
26	Titagarh Generating Station	CESC Ltd.	West Bengal	240.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
27	Atal Bihari Vajpayee TPP	Chattisgarh State Power Generation Company Ltd.	Chhattisgarh	1000.00	3.5722	42.37	1.5134	1.0379	68.58	0.0922	0.0187	0.4220	0.0000	0.0000	0.0000	0.5051	0.0000	0.0000	0.0000	1.0379
28	Dr. Shyama Prasad Mukharjee TPP	Chattisgarh State Power Generation Company Ltd.	Chhattisgarh	500.00	2.8052	43.81	1.2289	0.2581	21.00	0.0000	0.0000	0.0042	0.0000	0.0000	0.0820	0.1395	0.0325	0.0000	0.0000	0.2581

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31	29	Hasdeo TPP	Chhattisgarh State Power Generation Company Ltd.	Chhattisgarh	1340.00	6.7233	42.32	2.8455	1.1676	41.03	0.0368	0.0000	0.1287	0.0004	0.0000	0.3863	0.4558	0.1595	0.0000	0.0000	1.1676
33	30	MUTIARA	COASTAL ENERGEN PVT. LTD	Tamil Nadu	1200.00	0.8012	8.41	0.0674	0.0704	104.47	0.0437	0.0148	0.0000	0.0000	0.0000	0.0000	0.0119	0.0000	0.0000	0.0000	0.0704
34	31	MUNDRA UMPP	Coastal Gujarat Power Limited	Gujarat	4150.00	0.3700	9.73	0.0360	0.0420	116.67	0.0001	0.0234	0.0085	0.0064	0.0000	0.0000	0.0000	0.0000	0.0000	0.0036	0.0420
35	32	CHEMPLAST LIMITED TPS	CHEMPLAST LIMITED	Tamil Nadu	48.50	0.2396	8.00	0.0192	0.0192	100.26	0.0192	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0192
36	33	DB POWER	DB POWER LIMITED	Chhattisgarh	1200.00	6.4731	46.11	2.9851	3.4076	114.15	0.0230	0.5666	0.0000	0.0000	0.0000	0.0000	0.5476	2.2703	0.0000	0.0000	3.4076
37	34	BOKARO	Damodar Valley Corporation	Jharkhand	500.00	1.7299	43.68	0.7555	0.6764	89.53	0.0003	0.1065	0.1625	0.0000	0.0000	0.0000	0.4071	0.0000	0.0000	0.0000	0.6764
38	35	CHANDRAPURA	Damodar Valley Corporation	Jharkhand	500.00	2.3490	45.02	1.0576	1.0702	101.19	0.0041	0.3638	0.5796	0.0000	0.000	0.0000	0.0169	0.1057	0.0000	0.0000	1.0702
39	36	DURGAPUR	Damodar Valley Corporation	West Bengal	210.00	0.2507	51.25	0.1285	0.0579	45.03	0.0000	0.0044	0.0000	0.0000	0.0000	0.0000	0.0535	0.0000	0.0000	0.0000	0.0579
40	37	MEJIA	Damodar Valley Corporation	West Bengal	2340.00	9.6699	49.35	4.7724	3.9267	82.28	0.2149	1.2928	0.0000	0.0000	0.0000	0.0000	0.0000	2.4190	0.0000	0.0000	3.9267
41	38	DURGAPUR STEEL	Damodar Valley Corporation	West Bengal	1000.00	4.1214	46.57	1.9194	1.8460	96.17	0.2927	0.5854	0.0609	0.0000	0.0000	0.0000	0.8899	0.0171	0.0000	0.0000	1.8460
42	39	KODERMA	Damodar Valley Corporation	Jharkhand	1000.00	4.2420	46.35	1.9661	1.8303	93.09	0.0044	0.3178	0.3860	0.0000	0.0000	0.0000	0.3211	0.8009	0.0000	0.0000	1.8303
43	40	RAGHUNATHPUR	Damodar Valley Corporation	West Bengal	1200.00	3.9377	46.44	1.8285	0.1231	6.73	0.0082	0.1150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1231
45	41	DHARIWAL INFRASTRUCTURE Ltd.	DHARIWAL INFRASTRUCTURE LIMITED	Maharashtra	600.00	2.7210	34.96	0.9511	0.9511	100.00	0.0811	0.8381	0.0013	0.0000	0.0000	0.0000	0.0148	0.0158	0.0000	0.0000	0.9511
48	42	SALAYA TPS	ESSAR POWER GUJARAT LTD.	Gujarat	1200.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
49	43	SURAT LIGNITE	Gujarat Industries Power Company Limited	Gujarat	500.00	3.1951	14.77	0.4719	0.4719	100.00	0.4256	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0463	0.4719
50	44	AKRIMOTA	Gujarat Mineral Development Corporation Limited	Gujarat	250.00	0.5752	20.13	0.1158	0.2246	193.91	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2246	0.0000	0.0000	0.2246
51	45	GANDHINAGAR	Gujarat State Electricity Corporation Limited	Gujarat	630.00	2.2187	34.07	0.7560	1.7979	237.82	0.4897	1.1012	0.1204	0.0866	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.7979
52	46	KUTCH LIGNITE	Gujarat State Electricity Corporation Limited	Gujarat	150.00	0.6692	27.17	0.1818	0.3085	169.69	0.0000	0.1267	0.0000	0.0000	0.0000	0.0000	0.0000	0.1818	0.0000	0.0000	0.3085
53	47	SIKKA	Gujarat State Electricity Corporation Limited	Gujarat	500.00	0.4674	9.22	0.0431	0.4209	976.57	0.3010	0.1199	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4209
54	48	UKAI	Gujarat State Electricity Corporation Limited	Gujarat	1110.00	3.4334	36.52	1.2540	1.2358	98.55	0.5946	0.3342	0.0000	0.0060	0.0000	0.0000	0.0000	0.0090	0.0000	0.2920	1.2358
55	49	WANAKBORI	Gujarat State Electricity Corporation Limited	Gujarat	2270.00	7.5827	36.28	2.7509	2.2155	80.54	0.1840	1.1412	0.0000	0.0000	0.0000	0.0000	0.0000	0.3740	0.0000	0.5163	2.2155
56	50	BHAVNAGAR LIGNITE	Gujarat State Electricity Corporation Limited	Gujarat	500.00	1.7861	10.53	0.1880	0.1935	102.93	0.0951	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0984	0.0000	0.0000	0.1935
57	51	GMR WARORA ENERGY LTD.	GMR WARORA ENERGY LTD.	Maharashtra	600.00	2.3192	35.39	0.8208	1.0294	125.41	0.3165	0.2103	0.5025	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0294
58	52	GMR KAMALANGA TPP	GMR KAMALANGA ENERGY LTD.	Odisha	1050.00	5.4578	42.58	2.3240	3.1018	133.47	0.8172	0.0706	2.1918	0.0000	0.0000	0.0000	0.0222	0.0000	0.0000	0.0000	3.1018
60	53	RAJIV GANDHI TPP, Hissar	Haryana Power Generation Corporation Limited	Haryana	1200.00	1.8506	39.01	0.7219	1.1491	159.18	0.0715	0.3769	0.7007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1491
61	54	Deen Bandhu Chhotu Ram TPS, YAMUNANAGAR	Haryana Power Generation Corporation Limited	Haryana	600.00	1.8405	42.22	0.7770	1.2766	164.29	0.0969	0.4478	0.0014	0.0000	0.0000	0.0000	0.6963	0.0000	0.0000	0.0342	1.2766
62	55	PANIPAT	Haryana Power Generation Corporation Limited	Haryana	710.00	1.8820	40.15	0.7555	8.2513	1092.10	0.0580	1.6858	6.3820	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1255	8.2513
63	56	HALDIA ENERGY LIMITED	HALDIA ENERGY LIMITED	West Bengal	600.00	2.9388	37.22	1.0940	1.0940	100.00	0.0309	0.9836	0.0000	0.0000	0.0000	0.0000	0.0795	0.0000	0.0000	0.0000	1.0940

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64	57	HINDUJA NATIONAL POWER CORPORATION LIMITED	HINDUJA NATIONAL POWER CORPORATION LIMITED	Andhra Pradesh	1040.00	0.2098	40.28	0.0845	0.4047	478.97	0.2241	0.0119	0.1679	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4047
66	58	DISHERGARH POWER STATION	INDIA POWER CORPORATION LTD.	West Bengal	12.00	0.0328	50.68	0.0166	0.0166	100.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0166	0.0000	0.0000	0.0166
67	59	INDIAN METALS & FERRO ALLOYS LTD.	INDIAN METALS & FERRO ALLOYS LTD.	Odisha	200.00	1.1271	46.14	0.5201	0.5201	100.00	0.1324	0.1174	0.0000	0.0000	0.0000	0.0000	0.2698	0.0000	0.0000	0.0006	0.5201
68	60	IL & FS TAMIL NADU POWER COMPANY LTD.	IL & FS TAMIL NADU POWER COMPANY LIMITED	Tamil Nadu	1200.00	1.6653	4.60	0.0766	0.0766	100.00	0.0000	0.0766	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0766
69	61	BELA TPS	IDEAL ENERGY PROJECTS LIMITED	Maharashtra	270.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
209	62	JK CAPTIVE POWER PLANT	JK CEMENT WORKS MUDDAPUR	Karnataka	50.00	0.0752	18.71	0.0141	0.0141	100.00	0.0000	0.0127	0.0013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0141
70	63	MAHATMA GANDHI TPP	JHAJJAR POWER LIMITED	Haryana	1320.00	4.7383	38.08	1.8045	1.8045	100.00	0.1682	1.4809	0.0000	0.0201	0.0000	0.0000	0.0000	0.0000	0.0000	0.1353	1.8045
71	64	O.P. Jindal Super TPP (Stage-I)	JINDAL POWER LIMITED	Chhattisgarh	1000.00	4.1450	44.27	1.8349	1.5543	84.71	0.0000	0.1892	0.0000	0.0000	0.0000	0.1152	0.6250	0.6250	0.0000	0.0000	1.5543
72	65	TAMNAR TPP	JINDAL POWER LIMITED	Chhattisgarh	2400.00	7.8620	45.39	3.5688	3.1956	89.54	0.0027	0.0009	0.0000	0.0000	0.0000	0.2348	0.5099	2.4474	0.0000	0.0000	3.1956
73	66	JAYPEE BINA TPP	JAIPRAKSH POWER VENTURES LIMITED	Madhya Pradesh	500.00	1.7846	38.51	0.6873	0.5611	81.64	0.0007	0.2802	0.0000	0.0000	0.0000	0.0000	0.2802	0.0000	0.0000	0.0000	0.5611
74	67	JAYPEE NIGRIE SUPER TPP	JAIPRAKSH POWER VENTURES LIMITED	Madhya Pradesh	1320.00	4.9685	31.79	1.5794	1.4143	89.55	0.0316	1.0205	0.0000	0.0000	0.0000	0.0000	0.3622	0.0000	0.0000	0.0000	1.4143
75	68	RATNAGIRI	JSW ENERGY LIMITED	Maharashtra	1200.00	2.7286	13.19	0.3599	0.3600	100.02	0.0923	0.0871	0.0000	0.1497	0.0000	0.0310	0.0000	0.0000	0.0000	0.0000	0.3600
76	69	VIJAYANAGAR	JSW ENERGY LIMITED	Karnataka	860.00	1.3431	18.95	0.2545	0.2545	99.99	0.0400	0.1187	0.0000	0.0000	0.0000	0.0838	0.0000	0.0000	0.0000	0.0121	0.2545
77	70	DERANG TPP	JINDAL INDIA THERMAL POWER LIMITED	Odisha	1200.00	5.8576	41.00	2.4016	1.2906	53.74	0.2382	0.0017	0.0000	0.0000	0.0000	0.3846	0.6661	0.0000	0.0000	0.0000	1.2906
78	71	DONGAMAHUA CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	Chhattisgarh	576.00	1.9487	49.01	0.9551	0.9548	99.97	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.9541	0.0000	0.0000	0.9548
79	72	ANGUL CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	Odisha	810.00	2.9280	43.82	1.2830	0.4550	35.46	0.0370	0.0000	0.0000	0.0000	0.0000	0.0000	0.4180	0.0000	0.0000	0.0000	0.4550
80	73	JSW ENERGY (BARMER) LIMITED	JSW ENERGY (BARMER) LIMITED	Rajasthan	1080.00	6.0669	14.79	0.8972	0.8468	94.38	0.1997	0.5806	0.0000	0.0000	0.0000	0.0000	0.0000	0.0664	0.0000	0.0000	0.8468
81	74	JSW STEEL LIMITED CPP-II	JSW STEEL LIMITED	Tamil Nadu	90.00	0.1433	6.57	0.0094	0.0094	100.30	0.0094	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0094
82	75	JINDAL STEEL AND POWER LIMITED (CPP)	JINDAL STEEL AND POWER LIMITED	Chhattisgarh	299.00	0.6655	49.57	0.3299	0.3299	100.00	0.1147	0.0150	0.0000	0.0000	0.0000	0.0000	0.2002	0.0000	0.0000	0.0000	0.3299
83	76	JHABUA POWER LIMITED	JHABUA POWER LIMITED	Madhya Pradesh	600.00	2.5542	40.00	1.0217	0.5690	55.69	0.0663	0.3509	0.0077	0.0000	0.0000	0.0000	0.1441	0.0000	0.0000	0.0000	0.5690
84	77	BALLARI	KARNATAKA POWER CORPORATION LIMITED	Karnataka	1700.00	4.3615	39.05	1.7030	1.2838	75.39	0.2294	1.0544	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.2838
85	78	RAICHUR POWER PLANT	KARNATAKA POWER CORPORATION LIMITED	Karnataka	1720.00	4.7382	42.49	2.0131	1.9668	97.70	0.7856	1.1793	0.0018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.9668
87	79	KMPCL - NARIYARA	KSK MAHANADI POWER COMPANY LIMITED	Chhattisgarh	1800.00	5.8487	35.20	2.0586	2.2392	108.77	0.0199	1.0871	0.0002	0.0000	0.0000	0.0000	0.9364	0.1955	0.0000	0.0000	2.2392
88	80	LANCO AMARKANTAK TPS	LANCO AMARKANTAK POWER LIMITED	Chhattisgarh	600.00	2.7643	40.05	1.1070	0.8297	74.95	0.0164	0.3609	0.0416	0.0000	0.0000	0.0000	0.4109	0.0000	0.0000	0.0000	0.8297
89	81	LALITPUR	LALITPUR POWER GENERATION COMPANY LIMITED	Uttar Pradesh	1980.00	5.8691	35.68	2.0943	1.8855	90.03	0.0000	1.3095	0.0000	0.0000	0.0000	0.0000	0.5760	0.0000	0.0000	0.0000	1.8855
90	82	ANPARA 'C' TPS	LANCO ANPARA POWER LIMITED	Uttar Pradesh	1200.00	5.2435	32.61	1.7101	0.2191	12.81	0.0170	0.2022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2191
47	83	MAHAN	MAHAN ENERGEN LTD.	Madhya Pradesh	1200.00	2.3755	35.19	0.8359	0.2128	25.46	0.0000	0.0532	0.0000	0.0000	0.0000	0.0000	0.1596	0.0000	0.0000	0.0000	0.2128
91	84	MAITHON RIGHT BANK TPP	MAITHON POWER LIMITED	Jharkhand	1050.00	4.5775	40.45	1.8518	1.6577	89.52	0.1080	0.4272	0.0000	0.0000	0.0000	0.0000	0.0127	1.1098	0.0000	0.0000	1.6577
92	85	SANJAY GANDHI	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	Madhya Pradesh	1340.00	4.9303	38.32	1.8895	1.3509	71.50	0.0337	0.7035	0.0213	0.0000	0.0006	0.0000	0.0000	0.0000	0.0000	0.5918	1.3509
93	86	SATPURA	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	Madhya Pradesh	1330.00	2.2246	40.32	0.8970	0.8954	99.82	0.3870	0.0611	0.0006	0.0421	0.0000	0.0861	0.0000	0.0000	0.0000	0.3185	0.8954

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94	87	AMARKANTAK	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	Madhya Pradesh	210.00	0.9913	36.13	0.3582	0.1400	39.09	0.0479	0.0549	0.0035	0.0000	0.0000	0.0000	0.0338	0.0000	0.0000	0.0000	0.1400
	88	SHREE SINGAJI TPS	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	Madhya Pradesh	2520.00	6.8838	39.80	2.7398	0.9937	36.27	0.0031	0.6375	0.0000	0.0000	0.0000	0.2068	0.0000	0.0000	0.0000	0.1462	0.9937
96	89	BHUSAWAL	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	1210.00	4.7446	40.19	1.9071	1.9251	100.94	0.1706	0.8522	0.1576	0.0000	0.0000	0.0000	0.0000	0.0000	0.0007	0.7440	1.9251
97	90	CHANDRAPUR	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	2920.00	11.5712	38.90	4.5013	0.8767	19.48	0.0717	0.8010	0.0000	0.0000	0.0000	0.0000	0.0009	0.0000	0.0000	0.0032	0.8767
98	91	KHAPARKHEDA	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	1340.00	6.2042	41.62	2.5825	1.8908	73.22	0.6069	0.0000	0.5399	0.0000	0.0000	0.7440	0.0000	0.0000	0.0000	0.0000	1.8908
99	92	KORADI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	2190.00	8.1874	36.13	2.9579	2.3997	81.13	0.8531	0.0674	0.8542	0.0000	0.0000	0.6182	0.0068	0.0000	0.0000	0.0000	2.3997
100	93	NASHIK	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	630.00	1.6781	39.75	0.6670	5.3617	803.91	4.8709	0.3315	0.1593	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.3617
101	94	PARLI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	750.00	1.9664	39.95	0.7856	19.0800	2428.62	0.1286	0.1718	0.0000	0.1545	0.0000	0.0000	0.0000	0.0000	0.0550	18.5701	19.0800
102	95	PARAS	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	Maharashtra	500.00	1.9981	40.40	0.8072	1.2009	148.78	0.9449	0.0277	0.2283	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.2009
103	96	MCCPL BANDHAKHAR	MARUTI CLEAN COAL AND POWER LIMITED	Chhattisgarh	300.00	1.5200	44.45	0.6756	0.6756	100.00	0.0000	0.0000	0.6756	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6756
104	97	SAI WARDHA POWER Ltd., WARORA	SAI WARDHA POWER GENERATION PVT LTD.	Maharashtra	540.00	1.4753	28.61	0.4221	0.4221	100.00	0.0359	0.3006	0.0000	0.0131	0.0000	0.0000	0.0000	0.0725	0.0000	0.0000	0.4221
105	98	MEENAKSHI ENERGY LIMITED	MEENAKSHI ENERGY LIMITED	Andhra Pradesh	300.00	0.3049	5.63	0.0172	0.0016	9.51	0.0016	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0016
107	99	ANUPPUR TPS	MB POWER (MADHYA PRADESH) LIMITED	Madhya Pradesh	1200.00	5.4355	40.20	2.1848	2.1894	100.21	0.0156	0.9340	0.0000	0.0000	0.0000	0.0000	1.2397	0.0000	0.0000	0.0000	2.1894
110	100	NEYVELI - I EXPN	NLC INDIA LIMITED	Tamil Nadu	420.00	0.3302	5.89	0.0195	0.0195	100.00	0.0035	0.0102	0.0000	0.0000	0.0000	0.0011	0.0001	0.0024	0.0022	0.0000	0.0195
111	101	NEYVELI - II	NLC INDIA LIMITED	Tamil Nadu	1470.00	10.7011	5.92	0.6339	1.5598	246.09	0.2457	0.1825	0.8675	0.0000	0.0000	0.0175	0.0000	0.1882	0.0000	0.0584	1.5598
112	102	NEYVELI - II EXPN	NLC INDIA LIMITED	Tamil Nadu	500.00	1.9771	6.75	0.1334	0.1304	97.79	0.1006	0.0024	0.0000	0.0000	0.0000	0.0030	0.0000	0.0223	0.0000	0.0021	0.1304
112 - A	103	NEYVELI NEW THERMAL POWER STATION	NLC INDIA LIMITED	Tamil Nadu	1000.00	6.1809	5.06	0.3127	0.3127	100.00	0.0807	0.1847	0.0000	0.0003	0.0000	0.0123	0.0000	0.0347	0.0000	0.0000	0.3127
113	104	BARSINGSAR LIGNITE	NLC INDIA LIMITED	Rajasthan	250.00	1.3712	13.93	0.1910	0.1910	100.00	0.0389	0.1204	0.0000	0.0000	0.0000	0.0000	0.0000	0.0317	0.0000	0.0000	0.1910
114	105	NLC TAMILNADU POWER Ltd	NLC TAMIL NADU POWER LIMITED	Tamil Nadu	1000.00	3.0423	37.42	1.1385	1.1385	100.00	0.2755	0.8542	0.0088	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1385
121	106	SINGRAULI	NTPC LTD.	Uttar Pradesh	2000.00	9.4205	32.11	3.0245	1.7404	57.54	0.0092	0.0002	0.3390	0.0000	0.0000	0.1380	0.0000	0.0000	0.0000	1.2540	1.7404
125	107	KORBA SUPER	NTPC LTD.	Chhattisgarh	2600.00	13.9488	36.32	5.0667	2.8895	57.03	0.0802	0.0008	0.5987	0.0000	0.0000	1.4893	0.2354	0.4852	0.0000	0.0000	2.8895
128	108	RAMAGUNDAM SUPER	NTPC LTD.	Telangana	2600.00	10.8164	36.41	3.9383	5.5501	140.92	0.8766	0.8253	2.1044	0.0000	0.0000	0.0887	0.0139	0.4412	0.0000	1.2000	5.5501
130	109	FARAKKA SUPER	NTPC LTD.	West Bengal	2100.00	8.1047	34.40	2.7881	3.8222	137.09	0.0372	0.2481	2.7359	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8010	3.8222
126	110	VINDHYACHAL	NTPC LTD.	Madhya Pradesh	4760.00	24.2778	33.93	8.2382	4.3700	53.05	0.2942	0.1412	0.3620	0.0000	0.0000	1.1179	1.1686	0.1458	0.0000	1.1403	4.3700
122	111	RIHAND	NTPC LTD.	Uttar Pradesh	3000.00	13.4828	27.51	3.7085	2.1983	59.28	0.0948	0.1511	0.7721	0.0000	0.0000	0.4186	0.5318	0.0000	0.0000	0.2300	2.1983
131	112	KAHALGAON SUPER	NTPC LTD.	Bihar	2340.00	11.8333	35.75	4.2309	3.3273	78.64	0.2483	0.8560	1.7629	0.0000	0.0000	0.3701	0.0000	0.0000	0.0480	0.0420	3.3273
120	113	DADRI	NTPC LTD.	Uttar Pradesh	1820.00	3.6991	34.75	1.2853	1.2869	100.13	0.2347	0.9688	0.0000	0.0000	0.0000	0.0000	0.0537	0.0000	0.0000	0.0298	1.2869
135	114	TALCHER - KANIHA	NTPC LTD.	Odisha	3000.00	16.8814	40.74	6.8777	3.7592	54.66	0.1282	0.0000	1.4016	0.0000	0.0000	1.6763	0.1463	0.4069	0.0000	0.0000	3.7592
123	115	FEROZE GANDHI UNCHAHAR	NTPC LTD.	Uttar Pradesh	1550.00	5.5278	37.72	2.0848	3.3188	159.19	0.0611	0.6859	1.7762	0.1644	0.0000	0.0000	0.0000	0.0000	0.0000	0.6313	3.3188
129	116	SIMHADRI SUPER	NTPC LTD.	Andhra Pradesh	2000.00	8.9448	40.15	3.5916	4.0174	111.86	0.6649	0.2936	2.4720	0.0869	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000	4.0174
124	117	TANDA	NTPC LTD.	Uttar Pradesh	1760.00	5.4560	41.36	2.2564	3.0558	135.43	0.0045	0.6576	1.7966	0.0000	0.0000	0.0000	0.0971	0.0000	0.0000	0.5000	3.0558

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No.

Sl No.	Name of TPS	Name of Power Utility	State	Installed Capacity	Coal Consumed	Ash Content of coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
				(MW)	(MT)	%	(MT)	(MT)	%	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)
118	SIPAT SUPER	NTPC LTD.	Chhattisgarh	2980.00	14.0872	36.90	5.1977	3.0803	59.26	0.2713	0.0686	0.6795	0.0000	0.0000	0.9112	0.3409	0.0000	0.0000	0.8089	3.0803
119	MOUDA SUPER TPS	NTPC LTD.	Maharashtra	2320.00	8.6862	39.21	3.4059	3.7864	111.17	0.4486	0.3853	1.5560	0.0000	0.0000	0.1171	0.1954	0.0034	0.0000	1.0807	3.7864
120	BARH SUPER TPS	NTPC LTD.	Bihar	1980.00	5.6746	38.00	2.1564	3.4101	158.14	0.2342	0.3343	2.1527	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.6886	3.4101
121	BONGAIGAON	NTPC LTD.	Assam	750.00	2.4930	30.38	0.7573	0.4393	58.01	0.0634	0.3759	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4393
122	KUDGI	NTPC LTD.	Karnataka	2400.00	3.9734	33.60	1.3351	0.7179	53.77	0.0091	0.5773	0.0000	0.0344	0.0000	0.0000	0.0000	0.0000	0.0000	0.0971	0.7179
123	SOLAPUR SUPER TPS	NTPC LTD.	Maharashtra	1320.00	3.2532	34.91	1.1357	0.8579	75.54	0.2807	0.5532	0.0000	0.0216	0.0000	0.0000	0.0000	0.0000	0.0000	0.0023	0.8579
124	LARA SUPER TPS	NTPC LTD.	Chhattisgarh	1600.00	7.8073	41.42	3.2342	1.8232	56.37	0.0050	0.0000	0.8964	0.0000	0.0000	0.8241	0.0266	0.0000	0.0000	0.0710	1.8232
125	BARAUNI	NTPC LTD.	Bihar	610.00	1.5121	39.75	0.6011	0.4772	79.39	0.0164	0.2904	0.1699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0000	0.4772
126	GADARWARA SUPER	NTPC LTD.	Madhya Pradesh	1600.00	5.1421	32.77	1.6850	0.6343	37.64	0.0047	0.1087	0.0119	0.0000	0.0000	0.0000	0.1530	0.0000	0.0000	0.3560	0.6343
127	KHARGONE SUPER THERMAL POWER STATION	NTPC LTD.	Madhya Pradesh	1320.00	3.8405	35.59	1.3669	0.7987	58.43	0.0170	0.6606	0.0211	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1000	0.7987
128	DARLIPALI SUPER TPS	NTPC LTD.	Odisha	1600.00	6.5578	46.70	3.0627	1.7770	58.02	0.0000	0.0009	0.8427	0.0000	0.0000	0.0000	0.0000	0.0311	0.0000	0.9023	1.7770
129	DURGAPUR CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	West Bengal	120.00	0.7292	38.04	0.2774	0.2906	104.75	0.1373	0.0116	0.0000	0.0000	0.0000	0.0000	0.1417	0.0000	0.0000	0.0000	0.2906
130	ROURKELA CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	Odisha	120.00	0.9464	45.04	0.4263	0.3539	83.01	0.0889	0.0000	0.0905	0.0167	0.0000	0.0000	0.0730	0.0848	0.0000	0.0000	0.3539
131	BHILAI PP-II	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	Chhattisgarh	74.00	0.4423	40.84	0.1806	0.1083	59.98	0.0104	0.0253	0.0025	0.0000	0.0000	0.0003	0.0699	0.0000	0.0000	0.0000	0.1083
132	BHILAI PP - III	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	Chhattisgarh	500.00	2.6638	42.87	1.1421	0.6602	57.81	0.1406	0.3940	0.1214	0.0000	0.0000	0.0000	0.0042	0.0000	0.0000	0.0000	0.6602
133	KANTI BIJLEE UTPADAN NIGAM LIMITED	KANTI BIJLEE UTPADAN NIGAM LIMITED (NTPC-JV)	Bihar	610.00	2.0640	38.23	0.7890	1.3230	167.68	0.0567	0.0000	0.6842	0.0649	0.0000	0.0000	0.2036	0.0000	0.0000	0.3136	1.3230
134	INDIRA GANDHI	ARAVALI POWER CORPORATION PVT LTD (NTPC-JV)	Haryana	1500.00	4.6690	35.17	1.6420	2.6160	159.32	0.4780	1.0100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1280	2.6160
135	VALLUR	NTPC TAMILNADU ENERGY COMPANY LTD (NTECL) (NTPC-JV)	Tamil Nadu	1500.00	5.9563	41.08	2.4466	1.9107	78.10	0.2083	0.4553	0.4553	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7918	1.9107
136	NABINAGAR- BRBCL	BHARATIYA RAIL BIJLEE COMPANY LIMITED (NTPC-JV)	Bihar	1000.00	3.9439	40.88	1.6124	0.9127	56.60	0.0298	0.3545	0.3883	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1400	0.9127
137	MEJA TPP	MEJA URJA NIGAM PRIVATE LIMITED (NTPC-JV)	Uttar Pradesh	1320.00	5.0488	36.10	1.8226	1.3207	72.47	0.0086	0.9305	0.0000	0.0000	0.0000	0.0000	0.0008	0.0000	0.0000	0.3808	1.3207
138	NABINAGAR-NPGC	NPGC (NTPC-JV)	Bihar	1320.00	4.9505	34.01	1.6838	0.8596	51.06	0.0121	0.8445	0.0000	0.0000	0.0000	0.0000	0.0030	0.0000	0.0000	0.0000	0.8596
139	RAJPURA TPS	NABHA POWER LIMITED	Punjab	1400.00	5.4363	35.97	1.9556	1.9570	100.07	0.0871	1.3932	0.3025	0.1743	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.9570
140	NALCO, CPP ANGUL	NATIONAL ALUMINIUM COMPANY LIMITED	Odisha	1200.00	5.6832	47.40	2.6936	2.3066	85.63	0.5719	0.0000	0.2597	0.0000	0.0000	0.1674	0.5344	0.7732	0.0000	0.0000	2.3066
141	IB VALLEY	ODISHA POWER GENERATION CORPORATION LIMITED	Odisha	1740.00	8.0133	44.74	3.5855	0.9812	27.37	0.0079	0.3529	0.0000	0.0000	0.0000	0.2663	0.3493	0.0000	0.0000	0.0048	0.9812
142	OPG POWER GENERATION PRIVATE LIMITED	OPG POWER GENERATION PRIVATE LIMITED	Tamil Nadu	414.00	0.9740	10.57	0.1030	0.1030	100.00	0.0206	0.0824	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1030
143	GURU NANAKDEV TPS, BATHINDA	PUNJAB STATE POWER CORPORATION LIMITED	Punjab	460.00	0.0000	-	0.0000	0.3045	-	0.0636	0.2408	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3045
144	GURU HARGOBIND TPP, LEHRA MOHABAT	PUNJAB STATE POWER CORPORATION LIMITED	Punjab	920.00	1.3176	37.53	0.4945	0.3483	70.44	0.0570	0.2914	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3483
145	GURU GOBIND SINGH TPP, ROPAR	PUNJAB STATE POWER CORPORATION LIMITED	Punjab	840.00	1.1760	36.06	0.4240	1.3636	321.62	0.0164	0.9254	0.1572	0.0000	0.0000	0.0000	0.2631	0.0000	0.0016	0.0000	1.3636
146	GVK POWER (GOINDWALSAHIB) LTD.	PUNJAB STATE POWER CORPORATION LIMITED	Punjab	540.00	1.3049	33.66	0.4392	0.3452	78.60	0.0870	0.2479	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0104	0.3452
147	PRAYAGRAJ TPS	PRAYAGRAJ POWER GENERATION COMPANY LTD.	Uttar Pradesh	1980.00	7.2152	33.53	2.4194	2.1075	87.11	0.0003	1.3473	0.0000	0.0000	0.0000	0.3419	0.1306	0.2875	0.0000	0.0000	2.1075

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					(MW)	(MT)	%	(MT)	(MT)	%	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)
155	148	R.K.M. POWERGEN PVT. LTD	R.K.M. POWERGEN PVT. LTD	Chhattisgarh	1440.00	5.2652	46.77	2.4624	2.4602	99.91	0.0000	0.1210	0.0911	0.0000	0.0000	0.0000	0.0603	1.4043	0.0000	0.7835	2.4602
156	149	CHHABRA	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1000.00	2.9575	32.54	0.9623	0.6222	64.65	0.1412	0.3711	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1098	0.6222
157	150	CHHABRA SUPER CRITICAL TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1320.00	3.2046	31.05	0.9949	0.8180	82.22	0.1007	0.3962	0.0000	0.0000	0.0000	0.0000	0.3211	0.0000	0.0000	0.0000	0.8180
158	151	SURATGARH	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1500.00	2.4975	39.18	0.9786	1.8438	188.42	0.0000	0.2608	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.5830	1.8438
159	152	KALISINDH SUPER TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1200.00	4.3679	32.21	1.4069	1.4298	101.62	0.1317	0.6142	0.0000	0.0000	0.0000	0.0000	0.1131	0.0000	0.0000	0.5708	1.4298
160	153	KOTA SUPER THERMAL POWER STATION	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	1240.00	4.9127	34.75	1.7071	2.0508	120.13	0.5615	1.2824	0.1226	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0834	2.0508
161	154	GIRAL TPS	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	Rajasthan	250.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
162	155	ROSA TPP	ROSA POWER SUPPLY COMPANY LIMITED	Uttar Pradesh	1200.00	3.6516	36.38	1.3284	1.0491	78.98	0.0164	0.8086	0.0000	0.0002	0.0000	0.0000	0.2112	0.0000	0.0000	0.0128	1.0491
163	156	AMARAVATI TPS	RATTANINDIA POWER LTD.	Maharashtra	1350.00	5.9049	40.51	2.3922	1.9421	81.19	0.8225	0.0000	0.0000	0.0434	0.0000	0.0000	1.0687	0.0075	0.0000	0.0000	1.9421
164	157	YERAMARUS TPS	RAICHUR POWER CORPORATION LIMITED	Karnataka	1600.00	3.2876	39.94	1.3131	1.1415	86.93	0.3671	0.7744	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1415
165	158	RINL CAPTIVE TPP	RASHTRIYA ISPAT NIGAM LIMITED	Andhra Pradesh	315.00	1.3955	36.63	0.5111	0.4667	91.31	0.0000	0.1404	0.0000	0.0000	0.0000	0.0000	0.3263	0.0000	0.0000	0.0000	0.4667
106	159	RAIGARH TPP	RAIGARH ENERGY GENERATION LIMITED	Chhattisgarh	600.00	2.7684	39.55	1.0950	0.4100	37.44	0.0000	0.0000	0.0000	0.0000	0.0000	0.0410	0.3690	0.0000	0.0000	0.0000	0.4100
166	160	RAIPUR TPP	RAIPUR ENERGEN LIMITED	Chhattisgarh	1370.00	6.1867	32.99	2.0409	2.0013	98.06	0.0395	1.0231	0.0487	0.0000	0.0000	0.0000	0.1727	0.7173	0.0000	0.0000	2.0013
167	161	SASAN UMPP TPP	RELIANCE POWER LIMITED	Madhya Pradesh	3960.00	18.3084	29.21	5.3475	2.7994	52.35	0.0360	0.0000	0.0000	0.0010	0.0000	2.7624	0.0000	0.0000	0.0000	0.0000	2.7994
169	162	SAI LILAGAR POWER GENERATION LTD.	SAI LILAGAR POWER GENERATION LIMITED	Chhattisgarh	86.00	0.0102	40.00	0.0041	0.0041	100.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0041	0.0000	0.0000	0.0000	0.0041
170	163	SEBICORP ENERGY INDIA LTD.	SEBICORP ENERGY INDIA LTD.	Andhra Pradesh	1320.00	5.6517	30.07	1.6994	1.6999	100.03	0.1685	1.2658	0.0045	0.0197	0.0000	0.1453	0.0961	0.0000	0.0000	0.0000	1.6999
171	164	SWASTIK POWER & MINERALS RESOURCES PVT. LTD.	SWASTIK POWER & MINERALS RESOURCES PVT. LTD.	Chhattisgarh	25.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
172	165	SKS POWER GENERATION (CH) LTD.	SKS POWER GENERATION (CHHATTISGARH) LIMITED	Chhattisgarh	600.00	1.2299	45.30	0.5571	0.5317	95.43	0.0114	0.0466	0.0011	0.0000	0.0000	0.0000	0.0000	0.4726	0.0000	0.0000	0.5317
44	166	THE DURGAPUR PROJECTS POWER STATION	THE DURGAPUR PROJECTS LIMITED	West Bengal	550.00	1.7782	40.70	0.7238	0.4812	66.48	0.0000	0.4660	0.0000	0.0000	0.0000	0.0000	0.0151	0.0000	0.0000	0.0000	0.4812
173	167	SINGARENI TPP	THE SINGARENI COLLIERIES COMPANY LIMITED	Telangana	1200.00	5.3570	36.06	1.9320	2.2660	117.29	0.4216	0.6827	0.2138	0.4192	0.0000	0.0000	0.0198	0.4278	0.0000	0.0811	2.2660
174	168	CUDDALORE - TAQA	TAQA NEYVELLY POWER CO.PVT. LTD.	Tamil Nadu	250.00	1.5391	4.95	0.0761	0.0639	83.98	0.0128	0.0390	0.0000	0.0000	0.0000	0.0000	0.0000	0.0122	0.0000	0.0000	0.0639
175	169	JOJOBERA	THE TATA POWER COMPANY LIMITED	Jharkhand	547.50	2.5463	39.44	1.0042	1.0140	100.97	0.0126	0.5810	0.2490	0.0921	0.0000	0.0000	0.0793	0.0000	0.0000	0.0000	1.0140
176	170	TROMBAY	THE TATA POWER COMPANY LIMITED	Maharashtra	750.00	2.3100	2.37	0.0548	0.0548	100.00	0.0079	0.0000	0.0000	0.0413	0.0000	0.0000	0.0000	0.0000	0.0015	0.0041	0.0548
177	171	SABARMATI TPS	TORRENT POWER LTD.	Gujarat	362.00	1.3768	27.16	0.3739	0.3739	100.00	0.0000	0.2909	0.1037	0.0000	0.0000	-0.0550	0.0000	0.0000	0.0344	0.0000	0.3739
178	172	TUTICORIN	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	1050.00	4.2787	35.33	1.5117	0.6393	42.29	0.1288	0.5063	0.0000	0.0000	0.0000	0.0000	0.0042	0.0000	0.0000	0.00000	0.6393
179	173	METTUR-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	840.00	3.8621	36.52	1.4106	1.4286	101.28	0.2400	0.1063	0.0000	0.0000	0.0000	0.0871	0.0581	0.0000	0.0000	0.9372	1.4286
180	174	METTUR-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	600.00	2.1625	35.29	0.7632	0.7632	100.00	0.0213	0.4277	0.0000	0.0000	0.0000	0.3142	0.0000	0.0000	0.0000	0.0000	0.7632

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021 - 22 (APRIL - 2021 TO MARCH - 2022)

(POWER UTILITY WISE)

Index No.	Sl No.	Name of TPS	Name of Power Utility	State	Installed Capacity	Coal Consumed	Ash Content of coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
					(MW)	(MT)	%	(MT)	(MT)	%	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)
181	175	NORTH CHENNAI-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	630.00	2.4931	40.86	1.0188	1.4507	142.40	0.0466	0.0928	1.2389	0.0724	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.4507
182	176	NORTH CHENNAI-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	Tamil Nadu	1200.00	3.6840	40.42	1.4890	1.5591	104.71	0.3987	0.7054	0.4550	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.5591
184	177	RAMAGUNDAM 'B'	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	62.50	0.2080	42.34	0.0881	0.2298	260.94	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2298	0.2298
185	178	KOTHAGUDEM-V	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	500.00	2.4468	47.94	1.1731	0.6750	57.54	0.0491	0.2866	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3393	0.6750
186	179	KOTHAGUDEM-VI	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	500.00	1.7673	38.26	0.6761	0.4390	64.93	0.0249	0.3464	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0091	0.0586	0.4390
187	180	KOTHAGUDEM-VII	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	800.00	2.9038	32.61	0.9470	0.5190	54.80	0.1736	0.3453	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5190
188	181	KAKATIYA (Stage-I)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	500.00	2.0798	37.38	0.7773	0.6475	83.30	0.4559	0.1621	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0296	0.6475
189	182	KAKATIYA (Stage-II)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	Telangana	600.00	2.0443	37.19	0.7602	0.6493	85.42	0.2977	0.1754	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1763	0.6493
190	183	RAIGARH TPP	TRN ENERGY PRIVATE LIMITED	Chhattisgarh	600.00	0.5500	41.32	0.2273	0.1139	50.12	0.0246	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0893	0.0000	0.0000	0.1139
191	184	TENUGHAT TPS	TENUGHAT VIDHYUT NIGAM LIMITED	Jharkhand	420.00	1.2714	31.25	0.3973	0.4478	112.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4478	0.0000	0.0000	0.0000	0.4478
192	185	TALWANDI SABO POWER LTD	TALWANDI SABO POWER LTD.	Punjab	1980.00	6.0191	39.89	2.4013	2.1702	90.38	0.7452	0.8311	0.4039	0.0157	0.0000	0.0000	0.1743	0.0000	0.0000	0.0000	2.1702
193	186	ANPARA 'A' & 'B'	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	Uttar Pradesh	2630.00	11.3914	35.05	3.9928	0.1048	2.62	0.0001	0.0860	0.0000	0.0000	0.0000	0.0098	0.0088	0.0000	0.0000	0.0000	0.1048
194	187	HARDUAGANJ	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	Uttar Pradesh	1270.00	1.2795	43.13	0.5519	1.1912	215.84	0.0349	0.1393	0.0000	0.0000	0.0000	0.5000	0.5169	0.0000	0.0000	0.0000	1.1912
195	188	OBRA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	Uttar Pradesh	1000.00	3.4499	39.83	1.3742	0.0755	5.49	0.0006	0.0749	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0755
197	189	PARICHHA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	Uttar Pradesh	920.00	2.6527	41.71	1.1066	0.7457	67.39	0.1187	0.5832	0.0071	0.0000	0.0000	0.0000	0.0367	0.0000	0.0000	0.0000	0.7457
198	190	UDUPI	UDUPI POWER CORPORATION LIMITED	Karnataka	1200.00	0.7265	7.88	0.0572	0.0587	102.62	0.0097	0.0231	0.0000	0.0139	0.0000	0.0000	0.0000	0.0000	0.0000	0.0120	0.0587
199	191	BUTIBORI	VIDARBHA INDUSTRIES POWER LTD.	Maharashtra	600.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
200	192	VS LIGNITE POWER PRIVATE LTD	VS LIGNITE POWER PRIVATE LIMITED	Rajasthan	135.00	0.9105	24.88	0.2265	0.2265	100.00	0.0304	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1961	0.2265
201	193	VEDANTA LTD TPP	VEDANTA LIMITED	Odisha	2400.00	10.2404	42.97	4.4006	5.2762	119.90	0.0463	0.1549	0.2030	0.0000	0.0000	0.0000	4.3834	0.0000	0.0000	0.4886	5.2762
202	194	VEDANTA LTD CPP	VEDANTA LIMITED	Odisha	1215.00	7.7857	4.45	0.3464	4.2202	1218.21	0.0131	0.0349	0.0143	0.0000	0.0000	0.0000	3.2730	0.0000	0.0000	0.8847	4.2202
203	195	KOLAGHAT	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	1260.00	3.3744	43.92	1.4819	1.6494	111.30	0.0803	0.5587	0.1864	0.0000	0.0000	0.0000	0.8240	0.0000	0.0000	0.0000	1.6494
204	196	SAGARDIGHI	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	1600.00	7.2902	32.37	2.3600	1.8778	79.57	0.0760	0.9787	0.0000	0.0000	0.0000	0.0000	0.8231	0.0000	0.0000	0.0000	1.8778
205	197	BANDEL	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	335.00	1.3854	42.12	0.5836	0.6317	108.24	0.0162	0.3249	0.1652	0.0000	0.0000	0.0000	0.1254	0.0000	0.0000	0.0000	0.6317

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021 - 22 (APRIL - 2021 TO MARCH - 2022) (POWER UTILITY WISE)

Index No.	Sl No.	Name of TPS	Name of Power Utility	State	Installed Capacity	Coal Consumed	Ash Content of coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
					(MW)	(MT)	%	(MT)	(MT)	%	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)	(MT)
206	198	SANTALDIH TPS	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	500.00	2.7777	50.49	1.4024	0.7772	55.42	0.0321	0.5393	0.0000	0.0000	0.0000	0.0774	0.1284	0.0000	0.0000	0.0000	0.7772
	199	BAKRESWAR	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	West Bengal	1050.00	5.1987	33.68	1.7510	0.4807	27.45	0.0504	0.3767	0.0000	0.0000	0.0000	0.0000	0.0402	0.0134	0.0000	0.0000	0.4807
208	200	SITAPURAM TPS	ZUARI CEMENT LIMITED	Telangana	43.00	0.2017	50.41	0.1017	0.1017	100.00	0.0000	0.0816	0.0000	0.0000	0.0000	0.0000	0.0201	0.0000	0.0000	0.0000	0.1017
			Grand Total		213620.50	759.0151	35.68	270.8216	259.8628	95.95	31.6237	68.8283	45.9899	2.2191	0.0006	14.8201	35.5694	18.3799	0.1541	42.2778	259.8628

ANNEXURE - II

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	(MT) $\Sigma_{(10)}$ to (19)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	ANDHRA PRADESH																		
1	Dr. N.T.R TPS	APGENCO	1760.00	9.1956	45.27	4.1629	4.1664	100.08	2.0266	1.4276	0.5112	0.0469	0.0000	0.0000	0.0032	0.0000	0.0000	0.1509	4.1664
2	RAYALSEEMA	APGENCO	1650.00	5.1228	41.78	2.1404	1.5652	73.12	0.3190	1.2462	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.5652
3	SRI DAMODARAM SANJEEVAIAH	Andhra Pradesh Power Development Company Limited	1600.00	3.6194	34.06	1.2329	0.8031	65.14	0.2519	0.4394	0.0765	0.0000	0.0000	0.0000	0.0353	0.0000	0.0000	0.0000	0.8031
4	HINDUJA NATIONAL POWER CORPORATION LIMITED	HINDUJA NATIONAL POWER CORPORATION LIMITED	1040.00	0.2098	55.80	0.0845	0.4047	478.97	0.2241	0.0119	0.1679	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4047
5	MEENAKSHI ENERGY LIMITED	MEENAKSHI ENERGY LIMITED	300.00	0.3049	5.63	0.0172	0.0016	9.51	0.0016	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0016
6	SIMHADRI SUPER	NTPC LTD.	2000.00	8.9448	40.15	3.5916	4.0174	111.86	0.6649	0.2936	2.4720	0.0869	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000	4.0174
7	RINL CAPTIVE TPP	RASHTRIYA ISPAT NIGAM LIMITED	315.00	1.3955	36.63	0.5111	0.4667	91.31	0.0000	0.1404	0.0000				0.3263				0.4667
8	SEBMCORP ENERGY INDIA LTD.	SEBMCORP ENERGY INDIA LTD.	1320.00	5.6517	30.07	1.6994	1.6999	100.03	0.1685	1.2658	0.0045	0.0197	0.0000	0.1453	0.0961	0.0000	0.0000	0.0000	1.6999
		SUB TOTAL	9985.00	34.4444	39.02	13.4400	13.1251	97.66	3.6567	4.8249	3.2321	0.1544	0.0000	0.1453	0.4610	0.0000	0.0000	0.6509	13.1251
	ASSAM																		
1	BONGAIGAON	NTPC LTD.	750.00	2.4930	30.38	0.7573	0.4393	58.01	0.0634	0.3759	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4393
		SUB TOTAL	750.00	2.4930	30.38	0.7573	0.4393	58.01	0.0634	0.3759	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4393
	BIHAR																		
1	NABINAGAR- BRBCL	BHARATIYA RAIL BIJLEE COMPANY LIMITED (NTPC-JV)	1000.00	3.9439	40.88	1.6124	0.9127	56.60	0.0298	0.3545	0.3883	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1400	0.9127
2	KANTI BIJLEE UTPADAN NIGAM LIMITED	KANTI BIJLEE UTPADAN NIGAM LIMITED	610.00	2.0640	38.23	0.7890	1.3230	167.68	0.0567	0.0000	0.6842	0.0649	0.0000	0.0000	0.2036	0.0000	0.0000	0.3136	1.3230
3	KAHALGAON SUPER	NTPC LTD.	2340.00	11.8333	35.75	4.2309	3.3273	78.64	0.2483	0.8560	1.7629	0.0000	0.0000	0.3701	0.0000	0.0000	0.0480	0.0420	3.3273
4	BARH SUPER TPS	NTPC LTD.	1980.00	5.6746	38.00	2.1564	3.4101	158.14	0.2342	0.3343	2.1527	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000	0.6886	3.4101
5	BARAUNI	NTPC LTD.	610.00	1.5121	39.75	0.6011	0.4772	79.39	0.0164	0.2904	0.1699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0000	0.4772
6	NABINAGAR-NPGC	NPGC (NTPC-JV)	1320.00	4.9505	34.01	1.6838	0.8596	51.06	0.0121	0.8445	0.0000	0.0000	0.0000	0.0000	0.0030	0.0000	0.0000	0.0000	0.8596
		SUB TOTAL	7860.00	29.9784	36.94	11.0736	10.3099	93.10	0.5975	2.6797	5.1580	0.0649	0.0000	0.3701	0.2069	0.0000	0.0485	1.1842	10.3099
	CHHATTISGARH																		
1	KASAI PALI	ACB (INDIA) Ltd.	270.00	1.5530	56.67	0.8801	0.8799	99.98	0.0601	0.0000	0.4822	0.0000	0.0000	0.0000	0.3376	0.0000	0.0000	0.0000	0.8799
2	SVPL Renki	ACB (INDIA) Ltd.	60.00	0.0000	0.00	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	CHAKABURA TPP	ACB (INDIA) Ltd.	30.00	0.1458	60.41	0.0881	0.0881	100.00	0.0062	0.0000	0.0641	0.0000	0.0000	0.0000	0.0178	0.0000	0.0000	0.0000	0.0881
4	CHAKABURA TPP (EXTN)	ACB (INDIA) Ltd.	30.00	0.1486	60.23	0.0895	0.0895	100.00	0.0067	0.0000	0.0656	0.0000	0.0000	0.0000	0.0172	0.0000	0.0000	0.0000	0.0895
5	BALCO CPP	BALCO	540.00	2.4532	40.55	0.9948	1.2077	121.40	0.0246	0.0303	0.1499	0.0000	0.0000	0.0000	0.9096	0.0000	0.0000	0.0933	1.2077
6	Atal Bihari Vajpayee TPP	Chattisgarh State Power Generation Company Ltd.	1000.00	3.5722	42.37	1.5134	1.0379	68.58	0.0922	0.0187	0.4220	0.0000	0.0000	0.0000	0.5051	0.0000	0.0000	0.0000	1.0379

ANNEXURE - II

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT
7	Dr. Shyama Prasad Mukharjee TPP	Chattisgarh State Power Generation Company Ltd.	500.00	2.8052	43.81	1.2289	0.2581	21.00	0.0000	0.0000	0.0042	0.0000	0.0000	0.0820	0.1395	0.0325	0.0000	0.0000	0.2581
8	Hasdeo TPP	Chattisgarh State Power Generation Company Ltd.	1340.00	6.7233	42.32	2.8455	1.1676	41.03	0.0368	0.0000	0.1287	0.0004	0.0000	0.3863	0.4558	0.1595	0.0000	0.0000	1.1676
9	BALCO TPP	BALCO	1200.00	5.3075	40.32	2.1398	2.8268	132.11	0.0560	0.0573	0.3857	0.0000	0.0000	0.0000	2.1038	0.0000	0.0000	0.2240	2.8268
10	O.P.Jindal Super TPP (Stage-I)	JINDAL POWER LIMITED	1000.00	4.1450	44.27	1.8349	1.5543	84.71	0.0000	0.1892	0.0000	0.0000	0.0000	0.1152	0.6250	0.6250	0.0000	0.0000	1.5543
11	TAMNAR TPP	JINDAL POWER LIMITED	2400.00	7.8620	45.39	3.5688	3.1956	89.54	0.0027	0.0009	0.0000	0.0000	0.0000	0.2348	0.5099	2.4474	0.0000	0.0000	3.1956
12	DONGAMAHUA CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	576.00	1.9487	49.01	0.9551	0.9548	99.97	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.9541	0.0000	0.0000	0.9548
13	KMPCL - NARIYARA	KSK MAHANADI POWER COMPANY LIMITED	1800.00	5.8487	35.20	2.0586	2.2392	108.77	0.0199	1.0871	0.0002	0.0000	0.0000	0.0000	0.9364	0.1955	0.0000	0.0000	2.2392
14	LANCO AMARKANTAK TPS	LANCO AMARKANTAK POWER LIMITED	600.00	2.7643	40.05	1.1070	0.8297	74.95	0.0164	0.3609	0.0416	0.0000	0.0000	0.0000	0.4109	0.0000	0.0000	0.0000	0.8297
15	MCCPL BANDHAKHAR	MARUTI CLEAN COAL AND POWER LIMITED	300.00	1.5200	44.45	0.6756	0.6756	100.00	0.0000	0.0000	0.6756	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6756
16	BHILAI PP-II	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	74.00	0.4423	40.84	0.1806	0.1083	59.98	0.0104	0.0253	0.0025	0.0000	0.0000	0.0003	0.0699	0.0000	0.0000	0.0000	0.1083
17	BHILAI PP - III	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	500.00	2.6638	42.87	1.1421	0.6602	57.81	0.1406	0.3940	0.1214	0.0000	0.0000	0.0000	0.0042	0.0000	0.0000	0.0000	0.6602
18	KORBA SUPER	NTPC LTD.	2600.00	13.9488	36.32	5.0667	2.8895	57.03	0.0802	0.0008	0.5987	0.0000	0.0000	1.4893	0.2354	0.4852	0.0000	0.0000	2.8895
19	SIPAT SUPER	NTPC LTD.	2980.00	14.0872	36.90	5.1977	3.0803	59.26	0.2713	0.0686	0.6795	0.0000	0.0000	0.9112	0.3409	0.0000	0.0000	0.8089	3.0803
20	R.K.M. POWERGEN PVT. LTD	R.K.M. POWERGEN PVT. LTD	1440.00	5.2652	46.77	2.4624	2.4602	99.91	0.0000	0.1210	0.0911	0.0000	0.0000	0.0000	0.0603	1.4043	0.0000	0.7835	2.4602
21	RAIPUR TPP	RAIPUR ENERGEN LIMITED	1370.00	6.1867	32.99	2.0409	2.0013	98.06	0.0395	1.0231	0.0487	0.0000	0.0000	0.0000	0.1727	0.7173	0.0000	0.0000	2.0013
22	RATIJA TPS	ACB (INDIA) Ltd.	100.00	0.8169	55.80	0.4558	0.4558	100.00	0.0149	0.0000	0.2658	0.0000	0.0000	0.0000	0.1752	0.0000	0.0000	0.0000	0.4558
23	SAI LILAGAR POWER GENERATION LTD.	SAI LILAGAR POWER GENERATION LIMITED	86.00	0.0102	0.00	0.0041	0.0041	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0041	0.0000	0.0000	0.0000	0.0041
24	SWASTIK POWER & MINERALS RESOURCES PVT. LTD.	SWASTIK POWER & MINERALS RESOURCES PVT. LTD.	25.00	0.0000	0.00	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	SKS POWER GENERATION (CH) LTD.	SKS POWER GENERATION (CHHATTISGARH) LIMITED	600.00	1.2299	45.30	0.5571	0.5317	95.43	0.0114	0.0466	0.0011	0.0000	0.0000	0.0000	0.0000	0.4726	0.0000	0.0000	0.5317
26	RAIGARH TPP	TRN ENERGY PRIVATE LIMITED	600.00	0.5500	41.32	0.2273	0.1139	50.12	0.0246	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0893	0.0000	0.0000	0.1139
27	LARA SUPER TPS	NTPC LTD.	1600.00	7.8073	41.42	3.2342	1.8232	56.37	0.0050	0.0000	0.8964	0.0000	0.0000	0.8241	0.0266	0.0000	0.0000	0.0710	1.8232
28	JINDAL STEEL AND POWER LIMITED (CPP)	JINDAL STEEL AND POWER LIMITED	299.00	0.6655	49.57	0.3299	0.3299	100.00	0.1147	0.0150	0.0000	0.0000	0.0000	0.0000	0.2002	0.0000	0.0000	0.0000	0.3299
29	RAIGARH TPP	RAIGARH ENERGY GENERATION LIMITED	600.00	2.7684	39.55	1.0950	0.4100	37.44	0.0000	0.0000	0.0000	0.0000	0.0000	0.0410	0.3690	0.0000	0.0000	0.0000	0.4100
30	DB POWER	DB POWER LIMITED	1200.00	6.4731	46.11	2.9851	3.4076	114.15	0.0230	0.5666	0.0000	0.0000	0.0000	0.0000	0.5476	2.2703	0.0000	0.0000	3.4076
		SUB TOTAL	25720.00	109.7130	40.98	44.9589	35.2808	78.47	1.0578	4.0053	5.1248	0.0004	0.0000	4.0842	9.1745	9.8529	0.0000	1.9808	35.2808
		GUJARAT																	

ANNEXURE - II

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	(MT) $\Sigma_{(10)}$ to (19)
1	MUNDRA TPS	ADANI POWER (MUNDRA) LIMITED	4620.00	6.5830	5.24	0.3448	0.3566	103.41	0.0000	0.2279	0.0159	0.0000	0.0000	0.0000	0.0193	0.0000	0.0000	0.0935	0.3566
2	BHADRESHWAR VIDYUT PRIVATE LTD TPS	BHADRESHWAR VIDYUT PRIVATE LIMITED	300.00	0.3138	6.84	0.0215	0.0215	100.41	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0215	0.0215
3	MUNDRA UMPP	Coastal Gujarat Power Limited	4150.00	0.3700	9.73	0.0360	0.0420	116.67	0.0001	0.0234	0.0085	0.0064	0.0000	0.0000	0.0000	0.0000	0.0000	0.0036	0.0420
4	SURAT LIGNITE	Gujarat Industries Power Company Limited	500.00	3.1951	14.77	0.4719	0.4719	100.00	0.4256	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0463	0.4719
5	AKRIMOTA	Gujarat Mineral Development Corporation Limited	250.00	0.5752	20.13	0.1158	0.2246	193.91	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2246	0.0000	0.0000	0.2246
6	GANDHINAGAR	Gujarat State Electricity Corporation Limited	630.00	2.2187	34.07	0.7560	1.7979	237.82	0.4897	1.1012	0.1204	0.0866	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.7979
7	KUTCH LIGNITE	Gujarat State Electricity Corporation Limited	150.00	0.6692	27.17	0.1818	0.3085	169.69	0.0000	0.1267	0.0000	0.0000	0.0000	0.0000	0.0000	0.1818	0.0000	0.0000	0.3085
8	SIKKA	Gujarat State Electricity Corporation Limited	500.00	0.4674	9.22	0.0431	0.4209	976.57	0.3010	0.1199	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4209
9	UKAI	Gujarat State Electricity Corporation Limited	1110.00	3.4334	36.52	1.2540	1.2358	98.55	0.5946	0.3342	0.0000	0.0060	0.0000	0.0000	0.0000	0.0090	0.0000	0.2920	1.2358
10	WANAKBORI	Gujarat State Electricity Corporation Limited	2270.00	7.5827	36.28	2.7509	2.2155	80.54	0.1840	1.1412	0.0000	0.0000	0.0000	0.0000	0.0000	0.3740	0.0000	0.5163	2.2155
11	BHAVNAGAR LIGNITE	Gujarat State Electricity Corporation Limited	500.00	1.7861	10.53	0.1880	0.1935	102.93	0.0951	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0984	0.0000	0.0000	0.1935
12	SABARMATI TPS	TORRENT POWER LTD.	362.00	1.3768	27.16	0.3739	0.3739	100.00	0.0000	0.2909	0.1037	0.0000	0.0000	-0.0550	0.0000	0.0000	0.0344	0.0000	0.3739
13	SALAYA TPS	ESSAR POWER GUJARAT LTD.	1200.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		SUB TOTAL	16542.00	28.5714	22.88	6.5377	7.6626	117.21	2.0901	3.3654	0.2485	0.0990	0.0000	-0.0550	0.0193	0.8878	0.0344	0.9732	7.6626
		HARYANA																	
1	INDIRA GANDHI	ARAVALI POWER CORPORATION PVT LTD (ATDC JV)	1500.00	4.6690	35.17	1.6420	2.6160	159.32	0.4780	1.0100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1280	2.6160
2	RAJIV GANDHI TPP, Hissar	Haryana Power Generation Corporation Limited	1200.00	1.8506	39.01	0.7219	1.1491	159.18	0.0715	0.3769	0.7007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1491
3	Deen Bandhu Chhotu Ram TPS, YAMUNANAGAR	Haryana Power Generation Corporation Limited	600.00	1.8405	42.22	0.7770	1.2766	164.29	0.0969	0.4478	0.0014	0.0000	0.0000	0.0000	0.6963	0.0000	0.0000	0.0342	1.2766
4	PANIPAT	Haryana Power Generation Corporation Limited	710.00	1.8820	40.15	0.7555	8.2513	1092.10	0.0580	1.6858	6.3820	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1255	8.2513
5	MAHATMA GANDHI TPP	JHAJJAR POWER LIMITED	1320.00	4.7383	38.08	1.8045	1.8045	100.00	0.1682	1.4809	0.0000	0.0201	0.0000	0.0000	0.0000	0.0000	0.0000	0.1353	1.8045
		SUB TOTAL	5330.00	14.9804	38.06	5.7010	15.0976	264.82	0.8727	5.0013	7.0841	0.0201	0.0000	0.0000	0.6963	0.0000	0.0000	1.4230	15.0976
		JHARKHAND																	
1	ADHUNIK POWER & NATURAL RESOURCES LTD.	ADHUNIK POWER & NATURAL RESOURCES LTD.	540.00	2.5476	43.96	1.1199	0.9762	87.17	0.0687	0.5773	0.0000	0.0387	0.0000	0.0000	0.2915	0.0000	0.0000	0.0000	0.9762
2	BOKARO	Damodar Valley Corporation	500.00	1.7299	43.68	0.7555	0.6764	89.53	0.0003	0.1065	0.1625	0.0000	0.0000	0.0000	0.4071	0.0000	0.0000	0.0000	0.6764
3	CHANDRAPURA	Damodar Valley Corporation	500.00	2.3490	45.02	1.0576	1.0702	101.19	0.0041	0.3638	0.5796	0.0000	0.0000	0.0000	0.0169	0.1057	0.0000	0.0000	1.0702

ANNEXURE - II

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT
4	KODERMA	Damodar Valley Corporation	1000.00	4.2420	46.35	1.9661	1.8303	93.09	0.0044	0.3178	0.3860	0.0000	0.0000	0.0000	0.3211	0.8009	0.0000	0.0000	1.8303
5	MAITHON RIGHT BANK TPP	MAITHON POWER LIMITED	1050.00	4.5775	40.45	1.8518	1.6577	89.52	0.1080	0.4272	0.0000	0.0000	0.0000	0.0000	0.0127	1.1098	0.0000	0.0000	1.6577
6	JOJOBERA	THE TATA POWER COMPANY LIMITED	547.50	2.5463	39.44	1.0042	1.0140	100.97	0.0126	0.5810	0.2490	0.0921	0.0000	0.0000	0.0793	0.0000	0.0000	0.0000	1.0140
7	TENUGHAT TPS	TENUGHAT VIDHYUT NIGAM LIMITED	420.00	1.2714	31.25	0.3973	0.4478	112.70	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4478	0.0000	0.0000	0.0000	0.4478
		SUB TOTAL	4557.50	19.2635	42.32	8.1525	7.6726	94.11	0.1981	2.3736	1.3771	0.1309	0.0000	0.0000	1.5765	2.0164	0.0000	0.0000	7.6726
	KARNATAKA																		
1	VIJAYANAGAR	JSW ENERGY LIMITED	860.00	1.3431	18.95	0.2545	0.2545	99.99	0.0400	0.1187	0.0000	0.0000	0.0000	0.0838	0.0000	0.0000	0.0000	0.0121	0.2545
2	JK CAPTIVE POWER PLANT	JK CEMENT WORKS MUDDAPUR	50.00	0.0752	18.71	0.0141	0.0141	100.00	0.0000	0.0127	0.0013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0141
3	RAICHUR POWER PLANT	KARNATAKA POWER CORPORATION LIMITED	1720.00	4.7382	42.49	2.0131	1.9668	97.70	0.7856	1.1793	0.0018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.9668
4	BALLARI	KARNATAKA POWER CORPORATION LIMITED	1700.00	4.3615	39.05	1.7030	1.2838	75.39	0.2294	1.0544	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.2838
5	KUDGI	NTPC LTD.	2400.00	3.9734	33.60	1.3351	0.7179	53.77	0.0091	0.5773	0.0000	0.0344	0.0000	0.0000	0.0000	0.0000	0.0000	0.0971	0.7179
6	YERAMARUS TPS	RAICHUR POWER CORPORATION LIMITED	1600.00	3.2876	39.94	1.3131	1.1415	86.93	0.3671	0.7744	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1415
7	UDUPI	UDUPI POWER CORPORATION LIMITED	1200.00	0.7265	7.88	0.0572	0.0587	102.62	0.0097	0.0231	0.0000	0.0139	0.0000	0.0000	0.0000	0.0000	0.0000	0.0120	0.0587
		SUB TOTAL	9530.00	18.5056	36.15	6.6901	5.4373	81.27	1.4410	3.7399	0.0031	0.0482	0.0000	0.0838	0.0000	0.0000	0.0000	0.1212	5.4373
	MADHYA PRADESH																		
1	MAHAN	MAHAN ENERGEN LTD.	1200.00	2.3755	35.19	0.8359	0.2128	25.46	0.0000	0.0532	0.0000	0.0000	0.0000	0.0000	0.1596	0.0000	0.0000	0.0000	0.2128
2	JAYPEE BINA TPP	JAIPRAKSH POWER VENTURES LIMITED	500.00	1.7846	38.51	0.6873	0.5611	81.64	0.0007	0.2802	0.0000	0.0000	0.0000	0.0000	0.2802	0.0000	0.0000	0.0000	0.5611
3	JAYPEE NIGRIE SUPER TPP	JAIPRAKSH POWER VENTURES LIMITED	1320.00	4.9685	31.79	1.5794	1.4143	89.55	0.0316	1.0205	0.0000	0.0000	0.0000	0.0000	0.3622	0.0000	0.0000	0.0000	1.4143
4	SANJAY GANDHI	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	1340.00	4.9303	38.32	1.8895	1.3509	71.50	0.0337	0.7035	0.0213	0.0000	0.0006	0.0000	0.0000	0.0000	0.0000	0.5918	1.3509
5	SATPURA	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	1330.00	2.2246	40.32	0.8970	0.8954	99.82	0.3870	0.0611	0.0006	0.0421	0.0000	0.0861	0.0000	0.0000	0.0000	0.3185	0.8954
6	AMARKANTAK	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	210.00	0.9913	36.13	0.3582	0.1400	39.09	0.0479	0.0549	0.0035	0.0000	0.0000	0.0000	0.0338	0.0000	0.0000	0.0000	0.1400
7	SHREE SINGAJI TPS	MADHYA PRADESH POWER GENERATING COMPANY LIMITED	2520.00	6.8838	39.80	2.7398	0.9937	36.27	0.0031	0.6375	0.0000	0.0000	0.0000	0.2068	0.0000	0.0000	0.0000	0.1462	0.9937
8	JHABUA POWER LIMITED	JHABUA POWER LIMITED	600.00	2.5542	40.00	1.0217	0.5690	55.69	0.0663	0.3509	0.0077	0.0000	0.0000	0.0000	0.1441	0.0000	0.0000	0.0000	0.5690
9	ANUPPUR TPS	MB POWER (MADHYA PRADESH) LIMITED	1200.00	5.4355	40.20	2.1848	2.1894	100.21	0.0156	0.9340	0.0000	0.0000	0.0000	0.0000	1.2397	0.0000	0.0000	0.0000	2.1894
10	VINDHYACHAL	NTPC LTD.	4760.00	24.2778	33.93	8.2382	4.3700	53.05	0.2942	0.1412	0.3620	0.0000	0.0000	1.1179	1.1686	0.1458	0.0000	1.1403	4.3700
11	GADARWARA SUPER	NTPC LTD.	1600.00	5.1421	32.77	1.6850	0.6343	37.64	0.0047	0.1087	0.0119	0.0000	0.0000	0.0000	0.1530	0.0000	0.0000	0.3560	0.6343
12	SASAN UMPP TPP	REILIANCE POWER LIMITED	3960.00	18.3084	29.21	5.3475	2.7994	52.35	0.0360	0.0000	0.0000	0.0010	0.0000	2.7624	0.0000	0.0000	0.0000	0.0000	2.7994
13	KHARGONE SUPER THERMAL POWER STATION	NTPC LTD.	1320.00	3.8405	35.59	1.3669	0.7987	58.43	0.0170	0.6606	0.0211	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1000	0.7987
		SUB TOTAL	21860.00	83.7172	34.44	28.8311	16.9291	58.72	0.9378	5.0064	0.4280	0.0431	0.0006	4.1733	3.5411	0.1458	0.0000	2.6529	16.9291
	MAHARASHTRA																		

ANNEXURE - II

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	(MT) $\Sigma_{(10)}$ to (19)
1	TIRODA	ADANI POWER MAHARASHTRA LTD.	3300.00	14.1826	32.05	4.5451	3.5557	78.23	0.2627	1.2381	0.1244	0.0000	0.0000	0.0000	1.8199	0.1015	0.0012	0.0079	3.5557
2	MIHAN	Abhijeet MADC Nagpur Energy Pvt. Ltd.	246.00	0.0000	-	0.0000	0.0370	-	0.0000	0.0000	0.0370	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0370
3	ADANI DAHANU	ADANI ELECTRICITY MUMBAI LIMITED	500.00	1.9890	31.91	0.6346	0.6710	105.74	0.0000	0.0000	0.0000	0.3704	0.0000	0.0000	0.0000	0.0000	0.0000	0.3007	0.6710
4	DHARIWAL INFRASTRUCTURE Ltd.	DHARIWAL INFRASTRUCTURE LIMITED	600.00	2.7210	34.96	0.9511	0.9511	100.00	0.0811	0.8381	0.0013	0.0000	0.0000	0.0000	0.0148	0.0158	0.0000	0.0000	0.9511
5	GMR WARORA ENERGY LTD.	GMR WARORA ENERGY LTD.	600.00	2.3192	35.39	0.8208	1.0294	125.41	0.3165	0.2103	0.5025	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0294
6	BELA TPS	IDEAL ENERGY PROJECTS LIMITED	270.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	RATNAGIRI	JSW ENERGY LIMITED	1200.00	2.7286	13.19	0.3599	0.3600	100.02	0.0923	0.0871	0.0000	0.1497	0.0000	0.0310	0.0000	0.0000	0.0000	0.0000	0.3600
8	BHUSAWAL	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	1210.00	4.7446	40.19	1.9071	1.9251	100.94	0.1706	0.8522	0.1576	0.0000	0.0000	0.0000	0.0000	0.0000	0.0007	0.7440	1.9251
9	CHANDRAPUR	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	2920.00	11.5712	38.90	4.5013	0.8767	19.48	0.0717	0.8010	0.0000	0.0000	0.0000	0.0000	0.0009	0.0000	0.0000	0.0032	0.8767
10	KHAPARKHEDA	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	1340.00	6.2042	41.62	2.5825	1.8908	73.22	0.6069	0.0000	0.5399	0.0000	0.0000	0.7440	0.0000	0.0000	0.0000	0.0000	1.8908
11	KORADI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	2190.00	8.1874	36.13	2.9579	2.3997	81.13	0.8531	0.0674	0.8542	0.0000	0.0000	0.6182	0.0068	0.0000	0.0000	0.0000	2.3997
12	NASHIK	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	630.00	1.6781	39.75	0.6670	5.3617	803.91	4.8709	0.3315	0.1593	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.3617
13	PARLI	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	750.00	1.9664	39.95	0.7856	19.0800	2428.62	0.1286	0.1718	0.0000	0.1545	0.0000	0.0000	0.0000	0.0000	0.0550	18.5701	19.0800
14	PARAS	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	500.00	1.9981	40.40	0.8072	1.2009	148.78	0.9449	0.0277	0.2283	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.2009
15	MOUDA SUPER TPS	NTPC LTD.	2320.00	8.6862	39.21	3.4059	3.7864	111.17	0.4486	0.3853	1.5560	0.0000	0.0000	0.1171	0.1954	0.0034	0.0000	1.0807	3.7864
16	SOLAPUR SUPER TPS	NTPC LTD.	1320.00	3.2532	34.91	1.1357	0.8579	75.54	0.2807	0.5532	0.0000	0.0216	0.0000	0.0000	0.0000	0.0000	0.0000	0.0023	0.8579
17	AMARAVATI TPS	RATTANINDIA POWER LTD.	1350.00	5.9049	40.51	2.3922	1.9421	81.19	0.8225	0.0000	0.0000	0.0434	0.0000	0.0000	1.0687	0.0075	0.0000	0.0000	1.9421
18	TROMBAY	THE TATA POWER COMPANY LIMITED	750.00	2.3100	2.37	0.0548	0.0548	100.00	0.0079	0.0000	0.0000	0.0413	0.0000	0.0000	0.0000	0.0000	0.0015	0.0041	0.0548
19	BUTIBORI	VIDARBHA INDUSTRIES POWER LTD.	600.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	SAI WARDHA POWER Ltd., WARORA	SAI WARDHA POWER GENERATION PVT LTD.	540.00	1.4753	28.61	0.4221	0.4221	100.00	0.0359	0.3006	0.0000	0.0131	0.0000	0.0000	0.0000	0.0725	0.0000	0.0000	0.4221
		SUB TOTAL	23136.00	81.9200	35.32	28.9307	46.4023	160.39	9.9949	5.8644	4.1605	0.7941	0.0000	1.5102	3.1065	0.2006	0.0584	20.7129	46.4023
		ODISHA																	
1	Aarti Steels Limited	Aarti Steels Limited	80.00	0.4743	55.08	0.2612	0.2612	100.00	0.2026	0.0271	0.0007	0.0000	0.0000	0.0041	0.0268	0.0000	0.0000	0.0000	0.2612
2	GMR KAMALANGA TPP	GMR KAMALANGA ENERGY LTD.	1050.00	5.4578	42.58	2.3240	3.1018	133.47	0.8172	0.0706	2.1918	0.0000	0.0000	0.0000	0.0222	0.0000	0.0000	0.0000	3.1018
3	INDIAN METALS & FERRO ALLOYS LTD.	INDIAN METALS & FERRO ALLOYS LTD.	200.00	1.1271	46.14	0.5201	0.5201	100.00	0.1324	0.1174	0.0000	0.0000	0.0000	0.0000	0.2698	0.0000	0.0000	0.0006	0.5201

ANNEXURE - II

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT
4	DERANG TPP	JINDAL INDIA THERMAL POWER LIMITED	1200.00	5.8576	41.00	2.4016	1.2906	53.74	0.2382	0.0017	0.0000	0.0000	0.0000	0.3846	0.6661	0.0000	0.0000	0.0000	1.2906
5	ANGUL CAPTIVE POWER PLANT	JINDAL STEEL AND POWER LIMITED	810.00	2.9280	43.82	1.2830	0.4550	35.46	0.0370	0.0000	0.0000	0.0000	0.0000	0.0000	0.4180	0.0000	0.0000	0.0000	0.4550
6	ROURKELA CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	120.00	0.9464	45.04	0.4263	0.3539	83.01	0.0889	0.0000	0.0905	0.0167	0.0000	0.0000	0.0730	0.0848	0.0000	0.0000	0.3539
7	TALCHER - KANIHA	NTPC LTD.	3000.00	16.8814	40.74	6.8777	3.7592	54.66	0.1282	0.0000	1.4016	0.0000	0.0000	1.6763	0.1463	0.4069	0.0000	0.0000	3.7592
8	NALCO, CPP ANGUL	NATIONAL ALUMINIUM COMPANY LIMITED	1200.00	5.6832	47.40	2.6936	2.3066	85.63	0.5719	0.0000	0.2597	0.0000	0.0000	0.1674	0.5344	0.7732	0.0000	0.0000	2.3066
9	IB VALLEY	ODISHA POWER GENERATION CORPORATION LIMITED	1740.00	8.0133	44.74	3.5855	0.9812	27.37	0.0079	0.3529	0.0000	0.0000	0.0000	0.2663	0.3493	0.0000	0.0000	0.0048	0.9812
10	VEDANTA LTD TPP	VEDANTA LIMITED	2400.00	10.2404	42.97	4.4006	5.2762	119.90	0.0463	0.1549	0.2030	0.0000	0.0000	0.0000	4.3834	0.0000	0.0000	0.4886	5.2762
11	VEDANTA LTD CPP	VEDANTA LIMITED	1215.00	7.7857	4.45	0.3464	4.2202	1218.21	0.0131	0.0349	0.0143	0.0000	0.0000	0.0000	3.2730	0.0000	0.0000	0.8847	4.2202
12	DARLIPALI SUPER TPS	NTPC LTD.	1600.00	6.5578	46.70	3.0627	1.7770	58.02	0.0000	0.0009	0.8427	0.0000	0.0000	0.0000	0.0000	0.0311	0.0000	0.9023	1.7770
		SUB TOTAL	14615.00	71.9530	39.17	28.1828	24.3030	86.23	2.2837	0.7603	5.0043	0.0167	0.0000	2.4987	10.1623	1.2959	0.0000	2.2811	24.3030
	PUNJAB																		
1	RAJPURA TPS	NABHA POWER LIMITED	1400.00	5.4363	35.97	1.9556	1.9570	100.07	0.0871	1.3932	0.3025	0.1743	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.9570
2	GURU NANAKDEV TPS, BATHINDA	PUNJAB STATE POWER CORPORATION LIMITED	460.00	0.0000	-	0.0000	0.3045	-	0.0636	0.2408	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3045
3	GURU HARGOBIND TPP, LEHRA MOHABAT	PUNJAB STATE POWER CORPORATION LIMITED	920.00	1.3176	37.53	0.4945	0.3483	70.44	0.0570	0.2914	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3483
4	GURU GOBIND SINGH TPP, ROPAR	PUNJAB STATE POWER CORPORATION LIMITED	840.00	1.1760	36.06	0.4240	1.3636	321.62	0.0164	0.9254	0.1572	0.0000	0.0000	0.0000	0.2631	0.0000	0.0016	0.0000	1.3636
5	GVK POWER (GOINDWALSAHIB) LTD.	PUNJAB STATE POWER CORPORATION LIMITED	540.00	1.3049	33.66	0.4392	0.3452	78.60	0.0870	0.2479	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0104	0.3452
6	TALWANDI SABO POWER LTD	TALWANDI SABO POWER LTD.	1980.00	6.0191	39.89	2.4013	2.1702	90.38	0.7452	0.8311	0.4039	0.0157	0.0000	0.0000	0.1743	0.0000	0.0000	0.0000	2.1702
		SUB TOTAL	6140.00	15.2538	37.46	5.7147	6.4889	113.55	1.0563	3.9296	0.8636	0.1900	0.0000	0.0000	0.4374	0.0000	0.0016	0.0104	6.4889
	RAJASTHAN																		
1	KAWAI	ADANI POWER RAJASTHAN LTD.	1320.00	4.8560	32.18	1.5625	1.5648	100.15	0.3637	1.0225	0.0000	0.0000	0.0000	0.0000	0.1786	0.0000	0.0000	0.0000	1.5648
2	JSW ENERGY (BARMER) LIMITED	JSW ENERGY (BARMER) LIMITED	1080.00	6.0669	14.79	0.8972	0.8468	94.38	0.1997	0.5806	0.0000	0.0000	0.0000	0.0000	0.0000	0.0664	0.0000	0.0000	0.8468
3	BARSINGSAR LIGNITE	NLC INDIA LIMITED	250.00	1.3712	13.93	0.1910	0.1910	100.00	0.0389	0.1204	0.0000	0.0000	0.0000	0.0000	0.0000	0.0317	0.0000	0.0000	0.1910
4	CHHABRA	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1000.00	2.9575	32.54	0.9623	0.6222	64.65	0.1412	0.3711	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1098	0.6222
5	SURATGARH	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1500.00	2.4975	39.18	0.9786	1.8438	188.42	0.0000	0.2608	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.5830	1.8438

ANNEXURE - II

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	(MT) $\Sigma_{(10)}$ to (19)
6	KALISINDH SUPER TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1200.00	4.3679	32.21	1.4069	1.4298	101.62	0.1317	0.6142	0.0000	0.0000	0.0000	0.0000	0.1131	0.0000	0.0000	0.5708	1.4298
7	VS LIGNITE POWER PRIVATE LTD	VS LIGNITE POWER PRIVATE LIMITED	135.00	0.9105	24.88	0.2265	0.2265	100.00	0.0304	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1961	0.2265
8	KOTA SUPER THERMAL POWER STATION	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1240.00	4.9127	34.75	1.7071	2.0508	120.13	0.5615	1.2824	0.1226	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0834	2.0508
9	GIRAL TPS	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	250.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10	CHHABRA SUPER CRITICAL TPP	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	1320.00	3.2046	31.05	0.9949	0.8180	82.22	0.1007	0.3962	0.0000	0.0000	0.0000	0.0000	0.3211	0.0000	0.0000	0.0000	0.8180
		SUB TOTAL	9295.00	31.1446	28.66	8.9270	9.5937	107.47	1.5680	4.6482	0.1226	0.0009	0.0000	0.0000	0.6128	0.0981	0.0000	2.5431	9.5937
	TAMIL NADU																		
1	MUTIARA	COASTAL ENERGEN PVT. LTD	1200.00	0.8012	8.41	0.0674	0.0704	104.47	0.0437	0.0148	0.0000	0.0000	0.0000	0.0000	0.0119	0.0000	0.0000	0.0000	0.0704
2	CHEMPLAST LIMITED TPS	CHEMPLAST LIMITED	48.50	0.2396	8.00	0.0192	0.0192	100.26	0.0192	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0192
3	IL & FS TAMIL NADU POWER COMPANY LTD.	IL & FS TAMIL NADU POWER COMPANY LIMITED	1200.00	1.6653	4.60	0.0766	0.0766	100.00	0.0000	0.0766	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0766
4	JSW STEEL LIMITED CPP-II	JSW STEEL LIMITED	90.00	0.1433	6.57	0.0094	0.0094	100.30	0.0094	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0094
5	NEYVELI - I EXPN	NLC INDIA LIMITED	420.00	0.3302	5.89	0.0195	0.0195	100.00	0.0035	0.0102	0.0000	0.0000	0.0000	0.0011	0.0001	0.0024	0.0022	0.0000	0.0195
6	NEYVELI - II	NLC INDIA LIMITED	1470.00	10.7011	5.92	0.6339	1.5598	246.09	0.2457	0.1825	0.8675	0.0000	0.0000	0.0175	0.0000	0.1882	0.0000	0.0584	1.5598
7	NEYVELI - II EXPN	NLC INDIA LIMITED	500.00	1.9771	6.75	0.1334	0.1304	97.79	0.1006	0.0024	0.0000	0.0000	0.0000	0.0030	0.0000	0.0223	0.0000	0.0021	0.1304
8	NLC TAMILNADU POWER Ltd	NLC TAMIL NADU POWER LIMITED	1000.00	3.0423	37.42	1.1385	1.1385	100.00	0.2755	0.8542	0.0088	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.1385
9	VALLUR	NTPC TAMILNADU ENERGY COMPANY LTD (NTECL) (NTPC-JV)	1500.00	5.9563	41.08	2.4466	1.9107	78.10	0.2083	0.4553	0.4553	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7918	1.9107
10	OPG POWER GENERATION PRIVATE LIMITED	OPG POWER GENERATION PRIVATE LIMITED	414.00	0.9740	10.57	0.1030	0.1030	100.00	0.0206	0.0824	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1030
11	CUDDALORE - TAQA	TAQA NEYVELLY POWER CO.PVT. LTD.	250.00	1.5391	4.95	0.0761	0.0639	83.98	0.0128	0.0390	0.0000	0.0000	0.0000	0.0000	0.0000	0.0122	0.0000	0.0000	0.0639
12	TUTICORIN	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	1050.00	4.2787	35.33	1.5117	0.6393	42.29	0.1288	0.5063	0.0000	0.0000	0.0000	0.0000	0.0042	0.0000	0.0000	0.0000	0.6393
13	METTUR-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	840.00	3.8621	36.52	1.4106	1.4286	101.28	0.2400	0.1063	0.0000	0.0000	0.0000	0.0871	0.0581	0.0000	0.0000	0.9372	1.4286
14	METTUR-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	600.00	2.1625	35.29	0.7632	0.7632	100.00	0.0213	0.4277	0.0000	0.0000	0.0000	0.3142	0.0000	0.0000	0.0000	0.0000	0.7632
15	NORTH CHENNAI-I	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	630.00	2.4931	40.86	1.0188	1.4507	142.40	0.0466	0.0928	1.2389	0.0724	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.4507
16	NORTH CHENNAI-II	TAMIL NADU GENERATION AND DISTRIBUTION LIMITED	1200.00	3.6840	40.42	1.4890	1.5591	104.71	0.3987	0.7054	0.4550	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.5591
17	NEYVELI NEW THERMAL POWER STATION	NLC INDIA LIMITED	1000.00	6.1809	5.06	0.3127	0.3127	100.00	0.0807	0.1847	0.0000	0.0003	0.0000	0.0123	0.0000	0.0347	0.0000	0.0000	0.3127
		SUB TOTAL	13412.50	50.0306	22.44	11.2293	11.2550	100.23	1.8555	3.7404	3.0256	0.0727	0.0000	0.4351	0.0743	0.2597	0.0022	1.7896	11.2550

ANNEXURE - II

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	(MT) $\Sigma_{(10)}$ to (19)
	TELANGANA																		
1	RAMAGUNDAM SUPER	NTPC LTD.	2600.00	10.8164	36.41	3.9383	5.5501	140.92	0.8766	0.8253	2.1044	0.0000	0.0000	0.0887	0.0139	0.4412	0.0000	1.2000	5.5501
2	SINGARENI TPP	THE SINGARENI COLLIERIES COMPANY LIMITED	1200.00	5.3570	36.06	1.9320	2.2660	117.29	0.4216	0.6827	0.2138	0.4192	0.0000	0.0000	0.0198	0.4278	0.0000	0.0811	2.2660
3	RAMAGUNDAM 'B'	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	62.50	0.2080	42.34	0.0881	0.2298	260.94	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2298	0.2298
4	KOTHAGUDEM-V	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	500.00	2.4468	47.94	1.1731	0.6750	57.54	0.0491	0.2866	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3393	0.6750
5	KOTHAGUDEM-VI	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	500.00	1.7673	38.26	0.6761	0.4390	64.93	0.0249	0.3464	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0091	0.0586	0.4390
6	KOTHAGUDEM-VII	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	800.00	2.9038	32.61	0.9470	0.5190	54.80	0.1736	0.3453	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5190
7	KAKATIYA (Stage-I)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	500.00	2.0798	37.38	0.7773	0.6475	83.30	0.4559	0.1621	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0296	0.6475
8	KAKATIYA (Stage-II)	TELANGANA STATE POWER GENERATION CORPORATION LIMITED	600.00	2.0443	37.19	0.7602	0.6493	85.42	0.2977	0.1754	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1763	0.6493
9	SITAPURAM TPS	ZUARI CEMENT LIMITED	43.00	0.2017	50.41	0.1017	0.1017	100.00	0.0000	0.0816	0.0000	0.0000	0.0000	0.0000	0.0201	0.0000	0.0000	0.0000	0.1017
		SUB TOTAL	6805.50	27.8251	37.35	10.3937	11.0774	106.58	2.2993	2.9053	2.3182	0.4192	0.0000	0.0887	0.0539	0.8690	0.0091	2.1147	11.0774
	UTTAR PRADESH																		
1	BARKHERA	Bajaj Energy Limited	90.00	0.1599	35.38	0.0566	0.0567	100.20	0.0052	0.0507	0.0000	0.0000	0.0000	0.0000	0.0008	0.0000	0.0000	0.0000	0.0567
2	KHAMBHAR KHERA	Bajaj Energy Limited	90.00	0.1588	32.58	0.0517	0.0517	99.93	0.0059	0.0435	0.0000	0.0000	0.0000	0.0000	0.0023	0.0000	0.0000	0.0000	0.0517
3	KUNDARKI	Bajaj Energy Limited	90.00	0.2127	34.83	0.0741	0.0742	100.11	0.0074	0.0625	0.0000	0.0000	0.0000	0.0000	0.0043	0.0000	0.0000	0.0000	0.0742
4	MAQSODAPUR	Bajaj Energy Limited	90.00	0.1565	34.86	0.0545	0.0545	99.90	0.0045	0.0499	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0545
5	UTRAULA	Bajaj Energy Limited	90.00	0.1891	33.60	0.0635	0.0634	99.80	0.0067	0.0567	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0634
6	LALITPUR	LALITPUR POWER GENERATION COMPANY LIMITED	1980.00	5.8691	35.68	2.0943	1.8855	90.03	0.0000	1.3095	0.0000	0.0000	0.0000	0.0000	0.5760	0.0000	0.0000	0.0000	1.8855
7	ANPARA 'C' TPS	LANCO ANPARA POWER LIMITED	1200.00	5.2435	32.61	1.7101	0.2191	12.81	0.0170	0.2022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2191
8	MEJA TPP	MEJA URJA NIGAM PRIVATE LIMITED (NTPC-JV)	1320.00	5.0488	36.10	1.8226	1.3207	72.47	0.0086	0.9305	0.0000	0.0000	0.0000	0.0000	0.0008	0.0000	0.0000	0.3808	1.3207
9	DADRI	NTPC LTD.	1820.00	3.6991	34.75	1.2853	1.2869	100.13	0.2347	0.9688	0.0000	0.0000	0.0000	0.0000	0.0537	0.0000	0.0000	0.0298	1.2869
10	SINGRAULI	NTPC LTD.	2000.00	9.4205	32.11	3.0245	1.7404	57.54	0.0092	0.0002	0.3390	0.0000	0.0000	0.1380	0.0000	0.0000	0.0000	1.2540	1.7404
11	RIHAND	NTPC LTD.	3000.00	13.4828	27.51	3.7085	2.1983	59.28	0.0948	0.1511	0.7721	0.0000	0.0000	0.4186	0.5318	0.0000	0.0000	0.2300	2.1983
12	FEROZE GANDHI UNCHAHAR	NTPC LTD.	1550.00	5.5278	37.72	2.0848	3.3188	159.19	0.0611	0.6859	1.7762	0.1644	0.0000	0.0000	0.0000	0.0000	0.0000	0.6313	3.3188
13	TANDA	NTPC LTD.	1760.00	5.4560	41.36	2.2564	3.0558	135.43	0.0045	0.6576	1.7966	0.0000	0.0000	0.0000	0.0971	0.0000	0.0000	0.5000	3.0558
14	PRAYAGRAJ TPS	PRAYAGRAJ POWER GENERATION COMPANY LTD.	1980.00	7.2152	33.53	2.4194	2.1075	87.11	0.0003	1.3473	0.0000	0.0000	0.0000	0.3419	0.1306	0.2875	0.0000	0.0000	2.1075

ANNEXURE - II

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Generation	Fly Ash Utilization	Percentage utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	(MT) $\Sigma_{(10)}$ to (19)
15	ROSA TPP	ROSA POWER SUPPLY COMPANY LIMITED	1200.00	3.6516	36.38	1.3284	1.0491	78.98	0.0164	0.8086	0.0000	0.0002	0.0000	0.0000	0.2112	0.0000	0.0000	0.0128	1.0491
16	ANPARA 'A' & 'B'	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	2630.00	11.3914	35.05	3.9928	0.1048	2.62	0.0001	0.0860	0.0000	0.0000	0.0000	0.0098	0.0088	0.0000	0.0000	0.0000	0.1048
17	HARDUAGANJ	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	1270.00	1.2795	43.13	0.5519	1.1912	215.84	0.0349	0.1393	0.0000	0.0000	0.0000	0.5000	0.5169	0.0000	0.0000	0.0000	1.1912
18	OBRA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	1000.00	3.4499	39.83	1.3742	0.0755	5.49	0.0006	0.0749	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0755
19	PARICHHA	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	920.00	2.6527	41.71	1.1066	0.7457	67.39	0.1187	0.5832	0.0071	0.0000	0.0000	0.0000	0.0367	0.0000	0.0000	0.0000	0.7457
		SUB TOTAL	24080.00	84.2649	34.49	29.0602	20.6000	70.89	0.6306	8.2082	4.6910	0.1645	0.0000	1.4083	2.1712	0.2875	0.0000	3.0387	20.6000
	WEST BENGAL																		
1	Budge Budge Generating Station	CESC Ltd.	750.00	3.2350	33.44	1.0818	1.0818	100.00	0.0413	0.8898	0.0000	0.0000	0.0000	0.0000	0.1506	0.0000	0.0000	0.0000	1.0818
2	Southern Generating Station	CESC Ltd.	135.00	0.1312	24.16	0.0317	0.0317	100.00	0.0029	0.0245	0.0000	0.0001	0.0000	0.0000	0.0042	0.0000	0.0000	0.0000	0.0317
3	Titagarh Generating Station	CESC Ltd.	240.00	0.0000	-	0.0000	0.0000	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	DURGAPUR	Damodar Valley Corporation	210.00	0.2507	51.25	0.1285	0.0579	45.03	0.0000	0.0044	0.0000	0.0000	0.0000	0.0000	0.0535	0.0000	0.0000	0.0000	0.0579
5	MEJIA	Damodar Valley Corporation	2340.00	9.6699	49.35	4.7724	3.9267	82.28	0.2149	1.2928	0.0000	0.0000	0.0000	0.0000	0.0000	2.4190	0.0000	0.0000	3.9267
6	DURGAPUR STEEL	Damodar Valley Corporation	1000.00	4.1214	46.57	1.9194	1.8460	96.17	0.2927	0.5854	0.0609	0.0000	0.0000	0.0000	0.8899	0.0171	0.0000	0.0000	1.8460
7	RAGHUNATHPUR	Damodar Valley Corporation	1200.00	3.9377	46.44	1.8285	0.1231	6.73	0.0082	0.1150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1231
8	THE DURGAPUR PROJECTS POWER STATION	THE DURGAPUR PROJECTS LIMITED	550.00	1.7782	40.70	0.7238	0.4812	66.48	0.0000	0.4660	0.0000	0.0000	0.0000	0.0000	0.0151	0.0000	0.0000	0.0000	0.4812
9	HALDIA ENERGY LIMITED	HALDIA ENERGY LIMITED	600.00	2.9388	37.22	1.0940	1.0940	100.00	0.0309	0.9836	0.0000	0.0000	0.0000	0.0000	0.0795	0.0000	0.0000	0.0000	1.0940
10	DISHERGARH POWER STATION	INDIA POWER CORPORATION LTD.	12.00	0.0328	50.68	0.0166	0.0166	100.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0166	0.0000	0.0000	0.0166
11	DURGAPUR CPP	NTPC - SAIL POWER COMPANY LIMITED (NTPC-JV)	120.00	0.7292	38.04	0.2774	0.2906	104.75	0.1373	0.0116	0.0000	0.0000	0.0000	0.0000	0.1417	0.0000	0.0000	0.0000	0.2906
12	FARAKKA SUPER	NTPC LTD.	2100.00	8.1047	34.40	2.7881	3.8222	137.09	0.0372	0.2481	2.7359	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8010	3.8222
13	KOLAGHAT	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	1260.00	3.3744	43.92	1.4819	1.6494	111.30	0.0803	0.5587	0.1864	0.0000	0.0000	0.0000	0.8240	0.0000	0.0000	0.0000	1.6494
14	SAGARDIGHI	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	1600.00	7.2902	32.37	2.3600	1.8778	79.57	0.0760	0.9787	0.0000	0.0000	0.0000	0.0000	0.8231	0.0000	0.0000	0.0000	1.8778
15	BANDEL	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	335.00	1.3854	42.12	0.5836	0.6317	108.24	0.0162	0.3249	0.1652	0.0000	0.0000	0.0000	0.1254	0.0000	0.0000	0.0000	0.6317

FLY ASH GENERATION AND ITS UTILIZATION AT COAL / LIGNITE BASED THERMAL POWER STATIONS IN THE COUNTRY FOR THE YEAR 2021-22 (APRIL - 2021 TO MARCH - 2022) (State WISE)

Sl no.	Name of TPS	Power Utility & State	Installed Capacity	Coal Consumed	Ash Content of Coal	Fly Ash Genaration	Fly Ash Utilization	Percentagea ge utilization	In the manufacture of Fly Ash based Bricks / Blocks / Tiles etc.	In the manufacture of Portland Pozzolana Cement	In the construction of Highways & Roads including Flyovers	Part Replacement of Cement in Concrete	In Hydro Power Sector in RCC Dams Construction	In Ash Dyke Raising	In the Reclamation of Low lying Area	In Mine Filling	In Agriculture / Waste Land Development	Others	Total Utilization
			(MW)	MT	%	MT	MT	%	MT	MT	MT	MT	MT	MT	MT	MT	MT	MT	(MT) $\Sigma_{(10)}$ to (19)
16	SANTALDIH TPS	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	500.00	2.7777	50.49	1.4024	0.7772	55.42	0.0321	0.5393	0.0000	0.0000	0.0000	0.0774	0.1284	0.0000	0.0000	0.0000	0.7772
17	BAKRESWAR	THE WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED	1050.00	5.1987	33.68	1.7510	0.4807	27.45	0.0504	0.3767	0.0000	0.0000	0.0000	0.0000	0.0402	0.0134	0.0000	0.0000	0.4807
		SUB TOTAL	14002.00	54.9561	40.47	22.2412	18.1884	81.78	1.0203	7.3994	3.1484	0.0001	0.0000	0.0774	3.2757	2.4662	0.0000	0.8010	18.1884
		GRAND TOTAL	213620.50	759.0151	35.68	270.8216	259.8628	95.95	31.6237	68.8283	45.9899	2.2191	0.0006	14.8201	35.5694	18.3799	0.1541	42.2778	259.8628



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केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

Email / Speed Post

IPC-II/TPP/CP-11/76/2022/

February 20, 2024

To,

The Director (HSM Division),
Ministry of Environment, Forest & Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, New Delhi – 110 003

Sub: Status of compliance of Ash Notification dated 31.12.2021 (and subsequent amendments) by thermal power plants across the country – reg.

Sir,

Please refer to the Ash Notification dated 31.12.2021 (and subsequent amendments) and the decisions taken in the meetings of Fly Ash Management and Utilization Mission, held from time to time under the chairmanship of Secretary, MoEF&CC regarding effective implementation of the mandate of 100% utilisation of ash by thermal power plants across the country.

In the above context, the status of compliance of the Ash Notification, comprising ash generation and utilization status and details of ash ponds, by independent thermal power plants across the country during the first year (FY 2022-23) of the first compliance cycle, is enclosed. The status of compliance of the Ash Notification by the thermal power plants is being provided to the concerned SPCBs for information and appropriate action w.r.t. the shortcomings in compliance of the provisions of the Ash Notification by a few thermal power plants.

Encl: as above

Yours faithfully,

(Nazimuddin)

Sc. 'F' & Division Head IPC-II

Copy to:

1. The Director (Civil Design Division) : for information.
Central Electricity Authority,
Sewa Bhawan, R. K. Puram - 1,
New Delhi – 110 066
2. The Member Secretary : for information and necessary action.
State Pollution Control Boards,
(As per list enclosed)

‘परिवेश भवन’ पूर्वी अर्जुन नगर, दिल्ली-110032

Parivesh Bhawan, East Arjun Nagar, New Delhi - 110032

दूरभाष/Tel: 43102030, 22305792, वेबसाइट/Website : www.cpcb.nic.in

List of State Pollution Control Boards

1. The Member Secretary,
Andhra Pradesh Pollution Control Board
D. No. 33-26-14 D/2, Near Sunrise Hospital,
Pushpa Hotel Centre, Chalamalavari Street,
Kasturibaipet, **Vijayawada – 520 010**
2. The Member Secretary,
Pollution Control Board- Assam,
Bamunimaidam, **Guwahati – 781 021**,
Assam
3. The Member Secretary,
Bihar State Pollution Control Board
Parivesh Bhawan, Plot No. NS-B/2,
Paliputra Industrial Area, Patliputra,
Patna – 800 023, Bihar
4. The Member Secretary,
Chhattisgarh Environment Conservation Board,
Paryavas Bhavan, North Block Sector-19,
Atal Nagar, **Raipur – 492 002**,
Chhattisgarh
5. The Member Secretary,
Gujarat Pollution Control Board
Paryavaran Bhavan, Sector 10-A,
Gandhi Nagar - 382 010, Gujarat
6. The Member Secretary,
Haryana State Pollution Control Board
C-11, Sector-6, **Panchkula- 134109**,
Haryana
7. The Member Secretary,
Jharkhand State Pollution Control Board,
T.A. Bldg., HEC, P. O. Dhurwa,
Ranchi – 834 004, Jharkhand
8. The Member Secretary,
Karnataka State Pollution Control Board
“Parisara Bhavan”, #49,4th & 5th Floor,
Church Street, **Bangalore 560 001**
9. The Member Secretary,
Madhya Pradesh Pollution Control Board,
Paryavaran Parisar, E-5, Arera Colony,
Bhopal – 462 016, Madhya Pradesh

10. The Member Secretary,
Maharashtra Pollution Control Board,
Kalpataru Points, 3rd & 4th Floor,
Road No. 8, Sion Circle, Opp. PVR Theatre,
Mumbai – 400 022, Maharashtra
11. The Member Secretary,
Odisha State Pollution Control Board,
Paribesh Bhawan, A-118,
Nilakantha Nagar, Unit - VIII,
Bhubaneswar – 751 012, Odisha
12. The Member Secretary,
Punjab Pollution Control Board
Vatavaran Bhawan, Nabha Road
Patiala 147 001, Punjab
13. The Member Secretary,
Rajasthan Pollution Control Board,
A-4, Institutional Area, Jalana Dungri,
Jaipur 302 004, Rajasthan
14. The Member Secretary,
Tamil Nadu Pollution Control Board
76, Anna Salai, Guindy Industrial Estate,
Race View Colony, Guindy,
Chennai – 600 032, Tamil Nadu
15. The Member Secretary,
Telangana State Pollution Control Board,
Paryavaran Bhawan, A-III, Industrial Estate,
Sanathnagar, **Hyderabad – 500 018**
16. The Member Secretary,
Uttar Pradesh Pollution Control Board,
H. No. TC-12 V, Vibhuti Khand, Gomti Nagar,
Lucknow - 226 010, Uttar Pradesh
17. The Member Secretary,
West Bengal Pollution Control Board,
Paribesh Bhawan, 10A, Block-LA, Sector-III,
Bidhannagar, **Kolkata-700 106**,
West Bengal

Status of compliance of the Ash Notification dated 31.12.2021 by independent thermal power plants across the country during FY 2022-23

The status of generation and utilization of ash and details of ash ponds of 188 independent thermal power plants across the country during the first year (i.e. FY 2022-23) of the first compliance cycle has been compiled on the basis of annual reports submitted by the thermal power plants (enclosed). Summary of ash generation and utilization by independent thermal power plants is as below:

- No. of thermal power plants : 188
- Total installed capacity : 2,12,675 MW
- Total coal consumed : 820.5127 Mill. Tons
- Total ash generation : 291.7548 Mill. Tons
- Total ash utilization : 266.9444 Mill. Tons
- Average ash utilization % : 91.50%

- Out of 188 thermal power plants, 166 thermal power plants of 1,71,055 MW capacity are non-pithead, and 22 thermal power plants of 41,620 MW capacity are pithead (Pithead/non-pithead status as per TPPs registration on Ash Portal).

- Average ash utilisation percentage of 166 non-pithead thermal power plants was 98.01%, whereas, that of 22 pithead thermal power plants was 71.40%.

As per the Para A (4) of the Ash Notification dated 31.12.2021, ash utilization targets for current ash is prescribed as 100% in every 3-year cycle (4 or 5-year cycle in cases of thermal power plants having less than 80% or 60% utilization during FY 2021-22), with minimum 80% utilization in any year of the cycle (applicable after 1st or 2nd years of the first cycle in cases of thermal power plants having less than 80% or 60% utilization during FY 2021-22).

Out of 188 thermal power plants, 9 thermal power plants were non-operational since FY 2021-22 or before. The periods of first compliance cycle to be followed in respect of 179 operational thermal power plants are as below:

- 3-year cycle : 118 thermal power plants (ash utilization >80% in FY 2021-22)
- 4-year cycle : 21 thermal power plants (ash utilization 60-80% in FY 2021-22)
- 5-year cycle : 40 thermal power plants (ash utilization <60% in FY 2021-22)

Summary of status of compliance of various provisions of the Ash Notification by 179 operational thermal power plants during FY 2022-23 is as below:

- 96 thermal power plants have achieved 100% or more ash utilization. Whereas, 26 and 09 thermal power plants have achieved respectively 90 to <100% and 80 to <90% ash utilization.

- Out of 118 operational thermal power plants having first 3-year compliance cycle, 109 thermal power plants have complied with minimum annual target of 80% ash utilization (including 84 plants with 100% or more ash utilization) and 08 thermal power plants have failed to comply with minimum annual target of 80% ash utilization. Whereas, 01 thermal power plant i.e. Shirpur TPP 150 MW, SPPL, Maharashtra, has not submitted annual ash report for FY 2022-23 and CPCB has requested Maharashtra SPCB to take appropriate action in the matter [Para A (4)]
- 20 thermal power plants are exceeding the permitted limit of operational ash pond or dyke for temporary storage of ash i.e. area of 0.1 hectare/MW [Para A (6)]
- 85 thermal power plants are yet to complete installation of dedicated silos for storage of dry fly ash silos for at least sixteen hours of ash based on installed capacity (time limit not prescribed in the Ash Notification) [Para A (8)]

CPCB vide letter dated 02.08.2023 and directions dated 13.09.2023 (followed up on 19.01.2024) has instructed SPCBs to ensure registration and regular uploading of ash data by all thermal power plants on the Ash Portal.

Further, for effective enforcement and monitoring of compliance of various provisions of the Ash Notification, access to Ash Portal has been provided to SPCBs.

Status of generation and utilization of ash and details of ash ponds in independent thermal power plants across the country during FY 2022-23																									
Sl. No.	Name of Thermal Power Plant	State	Pithead/Non-pithead	Capacity (MW) (7)	Date of Comm. (For Pre/Post 03.11.2009)	Plant Load Factor (PLF) (8)	Total area under power plant Ha (10)	Coal / Lignite Consump. (MT) during 2022-23 (11)	Capacity of dry fly ash silos (MT) (14)	Capacity of dry fly ash silos (Hours) (15)	Total Ash Gen. (MT) during 2022-23 (13)	Total Ash Utilization (MT) during 2022-23	Total Ash Utilization % during 2022-23	Target Ash Utilization % during 2022-23	1st compliance cycle (3 /4 /5 year)	Unutilized Current Ash stored in ash ponds up to 31.03.2023 (MT)	No. of Active ash ponds (17(d)(i))	Area of Active ash ponds (Hec)	No. of Exhausted ash ponds (yet to be reclaimed) (17(d)(ii))	Area of Exhausted ash ponds (yet to be reclaimed) (Hec)	No. of ash ponds reclaimed (17(d)(iii))	Area of ash ponds reclaimed (Hec)	Total area under ash ponds 17(e)	Area of active ash pond (Hec)/MW	Legacy ash (Ash in Exhausted Ash Ponds (MT)
1	Dr. Narla Tata Rao TPS, Vijaywada, APGENCO	A.P.	NPH	1760	1/11/1979	72.16	1101.18	9324652	3500	5.15275696	4293673.5	5154555	120.05	80	3-year	0	1	431.98	1	80.97	0	0.00	512.96	0.245443182	13806000 m3
2	Rayalseema, APGENCO	A.P.	NPH	1650	31/3/1994	64.13	1177.50	7102815	7506	14.0730342	2996306	2883681	96.24	None	4-year	112625	1	160.00	0	0.00	0	0.00	160.00	0.096969697	0.00
3	Damodaran Sanjeeviah, APGENCO	A.P.	NPH	1600	28/8/2014	41.97	493.07	3791193	4000	11.3784278	1292471	1150158	88.99	None	4-year	142313	1	40.47	2	74.84	0	0.00	115.31	0.02529375	3362227.00
4	Simhadri, NTPC	A.P.	NPH	2000	22/2/2002	72.15	1369.00	9712000	8000	14.4878854	3490000	6170000	176.79	80	3-year	0	4	163.84	0	0.00	0	0.00	161.00	0.08192	0.00
5	Simhapuri Energy Limited	A.P.	NPH	600	24/3/2012	56.06	162.59	83560	3000	1576.66556	9344.13	8439.71	90.32	80	3-year	904.42	1	10.12	0	0.00	0	0.00	10.12	0.016861833	0.00
6	Thamminapatnam, Meenakshi Energy Pvt. Ltd.	A.P.	NPH	300	9/9/2012	N.O.	N.O.	N.O.	N.O.	#VALUE!	0	0	#DIV/0!	None	5-year	0	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	#VALUE!	N.O.
7	Sembcorp Enrgy India Ltd. P-2 (Sembcorp Gavatri TPP)	A.P.	NPH	1320	12/11/2016	70.06	350.05	4806709	6000	49.2912698	747060	800520	107.16	80	3-year	0	1	54.22	0	0.00	0	0.00	54.22	0.041075758	0.00
8	Sembcorp Energy India Ltd., P-1 Painampuram	A.P.	NPH	1320	7/2/2015	76.95	553.21	5598224	6000	23.2140553	1742260	1698738	97.50	80	3-year	43522	2	99.00	0	0.00	0	0.00	99.00	0.075	0.00
9	Vizag TPP, Hinduja NPCL	A.P.	NPH	1040	27/12/2015	53.11	454.46	3814664	6000	17.6055804	1585555	625334	39.44	80	3-year	960221	2	80.80	0	0.00	0	0.00	80.80	0.077692308	0.00
10	Bongaigaon Thermal Power Project, NTPC	Assam	NPH	750	22/6/2015	76.51	400.00	2978611	2250	14.7948613	1019281	577152	56.62	None	5-year	442129	1	83.00	0	0.00	0	0.00	83.00	0.110666667	0.00
11	Kahalgao, NTPC	Bihar	NPH	2340	31/3/1992	76.08	1360.00	10647586	5200	9.7697363	3547361	5219869.94	147.15	None	4-year	0	1	522.00	0	0.00	0	0.00	522.00	0.223076923	0.00
12	Muzaffarpur, NTPC Kanti Bijlee Utpadan Nigam Limited	Bihar	NPH	390	31/3/1985	87.58	500.80	1982547	0	0	753799	790406	104.86	80	3-year	0	2(3)	194.10	0(1)	60.71	0	0.00	254.81	0.497692308	62447.00
13	Barh, NTPC	Bihar	NPH	1980	30/10/2021	75.79	1090.00	8567798	5020	10.2368643	3255763	5246177	161.14	80	3-year	0	1	690.00	0	0.00	0	0.00	690.00	0.348484848	0.00
14	Nabi Nagar TPS, BRBCL	Bihar	NPH	1000	20/3/2016	79.07	627.26	4891702	1500	5.78431812	1796201	1363925	75.93	None	5-year	432276	1	139.80	0	0.00	0	0.00	123.00	0.1398	0.00
15	Nabi Nagar Power G.C. NPGC Ltd.	Bihar	NPH	1980	12/7/2019	78.51	1012.00	7681000	2100	5.53996916	2607000	1752196	67.21	None	5-year	854804	1	190.00	0	0.00	0	0.00	190.00	0.095959596	0.00
16	Barauni TPS, NTPC	Bihar	NPH	720	1/5/1983	58.61	255.19	2429598	2600	12.4927926	1068537.2	1019801.16	95.44	None	4-year	48736.04	1	22.66	0	0.00	0	0.00	22.66	0.031472222	0.00
17	Korba, NTPC	Chhattisgarh	PH	2600	28/2/1983	90.00	2205.54	14445854	2200	3.17828778	5457278	1601296	29.34	None	5-year	3855982	1	671.62	0	0.00	0	0.00	671.62	0.258313462	0.00
18	Sipat, NTPC	Chhattisgarh	PH	2980	27/6/2011	81.09	1794.78	13984154	11950	17.5371005	4840403	3115434	64.36	None	5-year	1724969	3	431.48	0	0.00	0	0.00	431.48	0.144791946	0.00
19	Lara STPP, NTPC	Chhattisgarh	PH	1600	23/3/2018	83.37	1004.97	8576811	2100	4.25532909	3604126.7	1370701	38.03	None	5-year	2233425.7	1	144.00	0	0.00	0	0.00	144.00	0.09	0.00
20	Bhilai TPS, NTPC & SAIL	Chhattisgarh	NPH	500	20/4/2008	86.57	286.92	2727985	4500	31.6811838	1077166	1445066	134.15	None	5-year	0	1	89.03	0	0.00	0	0.00	89.40	0.17806	0.00
21	Hasdeo Thermal Power Station, Korba West, CSPGCL	Chhattisgarh	NPH	1340	30/3/1984	82.52	631.24	7027321	7600	19.3502777	2839159	1975618.37	69.58	None	5-year	863540.63	2	218.45	2	234.01	0	0.00	452.46	0.163022388	37444185.00
22	Marwa, CSPGCL Atal Bihari Vajpayee, TPS	Chhattisgarh	NPH	1000	30/3/2014	49.95	700.40	3384442	7200	22.1051103	1425211.8	1619555.44	113.64	None	4-year	0	1	132.80	0	0.00	0	0.00	132.80	0.1328	0.00
23	Dr. Shyama Prasad Mukherjee TPS, Korba, CSPGCL	Chhattisgarh	NPH	500	30/3/2007	83.29	343.36	2592104	2200	14.1398181	1135209	979217.5	86.26	None	5-year	155991.5	1	133.18	1	108.25	0	0.00	241.43	0.266368	16824000.00
24	Raigarh Energy Gen. (KWPC), Adani Power	Chhattisgarh	NPH	600	31/3/2014	75.50	433.02	2970228	3500	18.5735732	1246303	1197979	96.12	None	5-year	48324	1	70.43	0	0.00	0	0.00	70.43	0.117383333	0.00
25	Jindal Power Tamnar, OP Jindal Power STPP Stage-1	Chhattisgarh	NPH	1000	2/9/2007	68.39	279.00	4840660	3200	8.86199998	2163291	2140174	98.93	80	3-year	23117	1	198.00	0	0.00	0	0.00	198.00	0.198	0.00
26	Tamnar, OP Jindal Power STPP Stage-2	Chhattisgarh	NPH	2400	10/3/2014	61.72	279.00	10175777	9200	10.8578731	4581135	4528175	98.84	80	3-year	52960	0	0.00	0	0.00	0	0.00	0.00	0	0.00
27	D. B. Power	Chhattisgarh	PH	1200	23/2/2014	72.61	254.95	5421936	6400	17.1774882	2369850	3720869	128.50	80	3-year	0	1	48.56	0	0.00	0	0.00	48.56	0.040466667	0.00
28	Akaltara, Mahanadi Power	Chhattisgarh	NPH	1800	13/8/2013	66.83	828.46	6823056	7600	18.4955551	2405591														

Sl. No.	Name of Thermal Power Plant	State	Pithead/Non-pithead	Capacity (MW) (7)	Date of Comm. (For Pre/Post 03.11.2009)	Plant Load Factor (PLF) (8)	Total area under power plant Ha (10)	Coal / Lignite Consump. (MT) during 2022-23 (11)	Capacity of dry fly ash silos (MT) (14)	Capacity of dry fly ash silos (Hours) (15)	Total Ash Gen. (MT) during 2022-23 (13)	Total Ash Utilization (MT) during 2022-23	Total Ash Utilization % during 2022-23	Target Ash Utilization % during 2022-23	1st compliance cycle (3/4/5 year)	Unutilized Current Ash stored in ash ponds up to 31.03.2023 (MT)	No. of Active ash ponds (17(d)(i))	Area of Active ash ponds (Hec)	No. of Exhausted ash ponds (yet to be reclaimed) (17(d)(ii))	Area of Exhausted ash ponds (yet to be reclaimed) (Hec)	No. of ash ponds reclaimed (17(d)(iii))	Area of ash ponds reclaimed (Hec)	Total area under ash ponds (Hec) 17(e)	Area of active ash pond (Hec)/MW	Legacy ash (Ash in Exhausted Ash Ponds (MT)
64	Raichur, KPCL	Karnataka	NPH	1720	29/3/1985	43.69	1274.00	5306819.97	12750	20.5458748	2375044.21	2411353.11	101.53	80	3-year	0	1	215.00	1	192.00	0	0.00	407.00	0.125	39938576.56
65	Bellari, KPCL	Karnataka	NPH	1700	3/12/2007	60.05	744.00	5574086	8700	19.4295347	2355449.34	1463101.89	62.12	None	4-year	892347.45	1	84.00	0	0.00	0	0.00	84.00	0.049411765	0.00
66	Yermarus TPP, KPCL	Karnataka	PH	1600	29/3/2016	33.81	459.72	3088935	6000	13.9187841	1276730.49	1154644.66	90.44	80	3-year	122085.83	0	0.00	0	0.00	0	0.00	0.00	0	0.00
67	Torangullu TPS JSW Energy Ltd.	Karnataka	NPH	860	15/1/1999	51.00	95.78	1533544	1710	35.87389	212957	248117	116.51	80	3-year	0	1	3.50	0	0.00	0	0.00	3.50	0.004063953	0.00
68	NTPC Kudgi	Karnataka	NPH	2400	25/12/2016	53.90	1036.29	7032172	9600	20.37877	2224263	1775942	79.84	None	5-year	448321	1	242.81	0	0.00	0	0.00	242.81	0.101170833	0.00
69	Udupi Power Corp. Ltd., Adani	Karnataka	NPH	1200	23/7/2010	13.42	238.77	650296.15	6800	179.448672	44547.7	59654.16	133.91	80	3-year	0	1(2)	12.14	0	0.00	0(1)	6.07	53.42	0.010116667	0.00
70	Vindhyachal, NTPC	M.P.	PH	4760	10/10/1987	89.54	2347.18	23887406	8400	8.5973872	7663620.59	2859650.8	37.31	None	5-year	4803969.79	4	890.87	0	0.00	0	0.00	890.87	0.187157353	0.00
71	Gadarwara STPP, NTPC	M.P.	NPH	1600	29/3/2019	67.00	909.29	5841830	0	0	1958865	1431092	73.06	None	5-year	527773	3	110.00	0	0.00	0	0.00	110.00	0.06875	0.00
72	Khargone STPS, NTPC	M.P.	NPH	1320	29/9/2019	48.61	554.42	3588626	1500	4.91899093	1298509	1340998	103.27	None	5-year	0	1	132.00	0	0.00	0	0.00	132.00	0.1	0.00
73	Amarkantak, MPPGCL	M.P.	NPH	210	15/6/2008	77.95	811.70	896801	1500	32.494902	315207.29	173042.52	54.90	None	5-year	142164.77	2	27.40	0	0.00	0	0.00	27.40	0.130452381	0.00
74	Birsingpur, Sanjay Gandhi TPS, MPPGCL	M.P.	NPH	1340	26/3/1993	74.62	300.00	6051861	5000	14.9000635	2193518.17	1222996.68	55.76	None	4-year	970521.49	1	100.00	1	75.00	0	0.00	100.00	0.074626866	13548104.00
75	Satpura, MPPGCL	M.P.	NPH	1330	27/6/1979	34.06	3382.91	2418607	2400	7.71957098	927613	1261575	136.00	80	3-year	0	2	241.00	1	373.00	0	0.00	614.00	0.181203008	5414936.00
76	SHREE SINGAJI, MPPGCL	M.P.	NPH	2520	18/11/2013	59.65	1118.94	9460317	18480	25.4774236	3790190.28	1725194.39	45.52	None	5-year	2064995.89	2	340.37	0	0.00	0	0.00	340.37	0.13506746	0.00
77	Sasan UMPP, RPL	M.P.	PH	3960	30/5/2013	85.80	1506.65	16479274	12600	20.5894034	4599580	5034783	109.46	None	5-year	0	1	325.00	0	0.00	0	0.00	325.00	0.082070707	0.00
78	Mahan Energen, Adani Power	M.P.	NPH	1200	24/2/2013	35.99	372.31	2670937	6000	20.8221541	908472	909970	100.16	None	5-year	0	1	42.69	0	0.00	3	10.81	53.50	0.035575	0.00
79	Bina, J. P. Power	M.P.	NPH	500	12/8/2012	68.03	1604000.00	2111108	3000	22.3281041	800707.66	800707.66	100.00	80	3-year	0	2	37.00	0	0.00	0	0.00	37.00	0.074	0.00
80	Nigrie, J. P. Associates	M.P.	NPH	1320	29/8/2014	69.50	437.00	4791500	20000	83.7040291	1454697	1455937.13	100.09	80	3-year	0	1	21.20	0	0.00	0	0.00	21.20	0.016060606	0.00
81	Jhabua Power Ltd., Seoni	M.P.	NPH	600	22/3/2016	70.93	320.16	2705872	3500	20.0925376	1082349	1430533	132.17	None	5-year	0	2	56.40	0	0.00	0	0.00	56.40	0.094	0.00
82	M. B Power Annupur	M.P.	NPH	1200	20/4/2015	71.68	403.06	5434280.2	5000	14.8273682	2117475.21	2155390.612	101.79	80	3-year	0	1(2)	7.00	0	0.00	0(1)	14.77	21.78	0.005834167	0.00
83	Trombay, Tata Power	Maharashtra	NPH	750	25/1/1984	63.13	174.02	2191152.8	2540	203.972961	68865.39	68865.39	100.00	80	3-year	0	1	0.40	0	0.00	0	0.00	0.40	0.000533333	0.00
84	Khaperkheda, Mahagenco	Maharashtra	NPH	1340	26/3/1989	58.93	1068.00	6614202.71	3000	5.97958572	2590121.78	2380416.76	91.90	None	4-year	209705.02	2	541.00	0	0.00	0	0.00	646.00	0.403731343	0.00
85	Nasik, Mahagenco	Maharashtra	NPH	630	26/4/1979	45.80	574.00	2459721	0	0	1006041	1778513	176.78	80	3-year	0	2	297.00	0	0.00	0	0.00	297.00	0.471428571	0.00
86	Koradi, Mahagenco	Maharashtra	NPH	2190	30/3/1982	64.46	1593.37	9404177	3375	5.82969487	3269056	2362651	72.27	80	3-year	906405	2	417.20	0	0.00	0	0.00	417.20	0.190502283	0.00
87	Bhusawal, Mahagenco	Maharashtra	NPH	1210	18/9/1982	64.48	464.63	5677885	2250	5.6620779	2244583.74	3006957.14	133.97	80	3-year	0	1	115.00	2	55.00	0	0.00	170.00	0.095041322	5674989.99
88	Chandrapur Super TPS, Mahagenco	Maharashtra	NPH	2920	3/5/1985	50.02	11256.00	12180508	5630	5.4071788	4562317	1057628	23.18	None	5-year	3504689	1	2668.00	0	0.00	0	0.00	2668.00	0.91369863	0.00
89	Paras, Mahagenco	Maharashtra	NPH	500	31/5/2007	78.88	804.20	2376720	2700	19.3583582	963803	999886	103.74	80	3-year	0	1	29.30	0	0.00	0	0.00	29.30	0.0586	0.00
90	Parli, Mahagenco	Maharashtra	NPH	750	16/2/2007	59.79	435.04	3007374	4550	19.680163	1210859	1593275	131.58	80	3-year	0	1	196.66	0	0.00	0	0.00	196.66	0.262213333	0.00
91	Dahanu, Adani Power	Maharashtra	NPH	500	6/1/1995	79.88	821.58	2222916.2	690	6.60535582	730999	625333	85.54	80	3-year	105666	1	37.00	0	0.00	2	97.00	370.00	0.074	0.00
92	Sai Wardha, Warora	Maharashtra	NPH	540	5/6/2010	58.87	144.00	1880741.03	1904	17.9754044	546243.67	546243.66	100.00	80	3-year	0.01	1	5.00	0	0.00	0	0.00	5.00	0.009259259	0.00
93	Solapur NTPC	Maharashtra	NPH	1320	7/4/2017	50.85	765.87	3746097	0	0	1338025	1490052	111.36	None	4-year	0	2	148.35	0	0.00	0	0.00	174.00	0.112386364	0.00
94	Mouda, NTPC	Maharashtra	NPH	2320	19/4/2012	72.46	830.00	10025946	8800	16.4052716	3404879	3436930	100.94	80	3-year	0	2	288.00	0	0.00	0	0.00	288.00	0.124137931	0.00
95	JSW Ratnagiri, Nandiwade	Maharashtra	NPH	1200	24/8/2010	59.39	350.00	3058800	2000	49.4768406	210303	221622	105.38	80	3-year	0	1	10.00	0	0.00	0	0.00	10.00	0.008333333	0.00
96	Bela TPS, Ideal Energy Projects Limited	Maharashtra	NPH	270	20/3/2013	65.00	74.08	511075	1400	55.4994368	143633.89	23691.038	16.49	80	3-year	119942.852	1	14.16	0	0.00	0	0.00	14.16	0.052459259	0.00
97	Amarawati, RattanIndia	Maharashtra	PH	1350	25/3/2013	77.18	376.00	5875073	1800	5.27381856	2307577	2939598	127.39	80	3-year	0	1	50.65	0	0.00	0	0.00	50.65	0.037518519	0.00
98	Sinnar TPS, Nashik RattanIndia	Maharashtra	NPH	1350	25/2/2014	N.O.	N.O.	N.O.	N.O.	#VALUE!	0	0	#DIV/0!	None	N.O.	0	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	#VALUE!	N.O.
99	GMR Warora Energy Ltd.	Maharashtra	NPH	600	7/2/2013	82.90	174.00	2759731	4500	35.1365608	930062	1156180	124.31	80	3-year	0	1	14.00	0	0.00	0	0.00	14.00	0.023333333	0.00
100	Tirora, Adani Power	Maharashtra	NPH	3300	11/9/2012	78.36	565.84	14511692	11600	17.1653237	4638788	3980585.35	85.81	None	4-year	658202.65	3	123.70	0	0.00	1	33.00	156.70	0.037484848	0.00
101	Dhariwal, Dhariwal Infracore Ltd.	Maharashtra	NPH	600	3/11/2013	80.47	178.64	2796114	3200	21.1739106	1065337	1065337	100.00	80	3-year	0	1	39.70	0	0.00	0	0.00	39.70	0.066166667	0.00
102	Butibori, Vidarbha Ind. Pl.	Maharashtra	NPH	600	31/3/2014	N.O.	N.O.	N.O.	N.O.	#VALUE!	0	0	#DIV/0!	None	N.O.	0	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	#VALUE!	N.O.
103	Mihan TPS, Abhijeet MNEPL	Maharashtra	NPH	246	9/2/2012	N.O.	N.O.	N.O.	N.O.	#VALUE!	0	0	#DIV/0!	None	N.O.	0	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	#VALUE!	N.O.
104	Gupta Energy Pvt. Ltd.	Maharashtra	NPH	120	4/28/2012	N.O.	N.O.	N.O.	N.O.	#VALUE!	0	0	#DIV/0!	None	N.O.	0	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	#VALUE!	N.O.
105	Shirpur IPP, SPPL	Maharashtra	NPH	150	9/28/2017					#DIV/0!				80	3-year	0									
106	Vedanta Jharsuguda	Odisha	NPH	2400	14/10/2010	61.00	339.70	9659029.78	8000	10.458657	4087408.164	4395189.964	107.53	80	3-year	0	4	84.29	0	0.00	3	74.06	158.35	0.035122333	0.00
107	Kamalanga, GMR	Odisha	NPH	1050	29/3/2013	76.98	468.87	5124366	6400	19.4468592	2219282.13	3367979.26	151.76	80	3-year	0	1	74.90	0	0.00	0	0.00	85.80	0.071333333	0.00
108	Talcher Kaniha, NTPC	Odisha	PH	3000	19/2/1995	88.37	1097.84	16440173	9760	11.6515317	6484489	3230359	49.82	None	5-year	3254130	2	205.00	0	0.00	0	0.00	647.50	0.068333333	0.00
109	Daripalli STPP, NTPC Ltd.	Odisha	PH	1600	30/12/2019	80.75	811.00	8376640	2100	3.82271244	3885924	1024581	26.37	None	5-year	2861343	1	161.87	0	0.00	0	0.00	161.87	0.10116875	0.00
110	IB Valley, Jharsuguda, Stage-I	Odisha	PH	420	2/6/1994	75.63	453.00	2469575	480	2.7644473	1150353	464849	40.41	None	5-year	685504	2	107.61	1	97.93	0	0.00	204.36	0.256214286	12700000.00
111	IB Valley, Jharsuguda, Stage-II	Odisha	PH	1320	2/7/2019	77.24	394.00	6264081	6900	16.3338204	28														

Sl. No.	Name of Thermal Power Plant	State	Pithead/Non-pithead	Capacity (MW) (7)	Date of Comm. (For Pre/Post 03.11.2009)	Plant Load Factor (PLF) (8)	Total area under power plant Ha (10)	Coal / Lignite Consump. (MT) during 2022-23 (11)	Capacity of dry fly ash silos (MT) (14)	Capacity of dry fly ash silos (Hours) (15)	Total Ash Gen. (MT) during 2022-23 (13)	Total Ash Utilization (MT) during 2022-23	Total Ash Utilization % during 2022-23	Target Ash Utilization % during 2022-23	1st compliance cycle (3/4/5 year)	Unutilized Current Ash stored in ash ponds up to 31.03.2023 (MT)	No. of Active ash ponds (17(d)(i))	Area of Active ash ponds (Hec)	No. of Exhausted ash ponds (yet to be reclaimed) (17(d)(ii))	Area of Exhausted ash ponds (yet to be reclaimed) (Hec)	No. of ash ponds reclaimed (17(d)(iii))	Area of ash ponds reclaimed (Hec)	Total area under ash ponds (Hec) 17(e)	Area of active ash pond (Hec)/MW	Legacy ash (Ash in Exhausted Ash Ponds (MT)
141	Mutiara, Coastal Energy	Tamilnadu	NPH	1200	2/12/2014	22.36	323.75	1591747	3000	58.7264624	100060.65	100060.63	100.00	80	3-year	0.02	1	31.82	0	0.00	0	0.00	31.82	0.026516667	0.00
142	IL&FS TPP, Cuddalore	Tamilnadu	NPH	1200	19/9/2015	21.90	388.91	1388408	1155	38.434688	57651	65541.76	113.69	80	3-year	0	2	24.80	0	0.00	0	0.00	43.30	0.020666667	0.00
143	Tuticorin TPP ST-IV, SEPCPPL	Tamilnadu	NPH	525	11/30/2021	20.06	77.27	475151	4600	139.481608	57953	57953	100.00	80	3-year	0	1	2.81	0	0.00	0	0.00	2.81	0.005352381	0.00
144	Ind Bharath Thermal Power Ltd, Tuticorin	Tamilnadu	NPH	300	19/9/2015	N.O.	N.O.	N.O.	N.O.	#VALUE!	0	0	#DIV/0!	None	N.O.	0	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	#VALUE!	N.O.
145	Ramagundem, NTPC	Telangana	PH	2600	27/10/1983	70.51	4451.54	10724773	4969	7.09585891	4325326	4063238	93.94	80	3-year	262088	1	607.03	0	0.00	0	0.00	607.03	0.233473077	0.00
146	Rammagundam B, TSGENCO	Telangana	NPH	62.5	17/10/1971	49.55	284.00	200759.9	200	10.2752548	84486.08	41435.6	49.04	80	3-year	43050.48	1	28.30	0	0.00	1	0.00	51.39	0.4528	0.00
147	Kothagudem V Stage TPS, TSGENCO	Telangana	NPH	500	27/3/1997	83.49	403.07	2826260	900	4.65055352	1415391	606056.28	42.82	None	5-year	809334.72	1	141.64	2	196.67	0	0.00	338.32	0.28328	41656000.00
148	Kothagudem VI Stage TPS, TSGENCO	Telangana	NPH	500	26/6/2011	83.10	64.75	2198572	2300	18.4890168	905564	633977	70.01	None	4-year	271587	0	0.00	0	0.00	0	0.00	0.00	0	0.00
149	Kothagudem VII Stage TPS, TSGENCO	Telangana	NPH	800	26/12/2018	60.09	314.00	2226100	2000	13.7144622	767639.87	374174.21	48.74	None	5-year	393465.66	1	74.08	1	99.85	0	0.00	221.00	0.0925985	11600000.00
150	Kakatiya, TSGENCO (Stage-I, II)	Telangana	NPH	1100	27/5/2010	78.56	389.00	4416368	3300	13.8430008	1640549.27	1566945.45	95.51	80	3-year	73603.82	1	57.00	0	0.00	0	0.00	57.00	0.051818182	0.00
151	SINGARENI TPP, SCCL	Telangana	NPH	1200	13/3/2016	88.51	300.97	5358534	3600	13.4577287	2074088	2075150	100.05	80	3-year	0	2	60.00	0	0.00	0	0.00	60.00	0.05	0.00
152	Bhadradi TPS, TSGENCO	Telangana	NPH	1080	5/6/2020	65.51	477.12	4402246	2000	5.98311445	1918232	339627	17.71	None	5-year	1578605	2	87.41	0	0.00	0	0.00	87.41	0.080935185	0.00
153	Singrauli, NTPC	U.P.	PH	2000	14/2/1982	87.52	952.63	9740502	1500	3.82158133	3009259	1099107.177	36.52	None	5-year	1910151.823	2	535.39	0	0.00	0	0.00	535.39	0.267695	0.00
154	NTCPS, Dadri, NTPC	U.P.	NPH	1820	21/12/1991	74.57	997.55	6905000	17100	48.778549	2290000	2290000	100.00	80	3-year	0	0	0.00	0	0.00	0	0.00	0.00	0	0.00
155	Rihand, NTPC	U.P.	PH	3000	31/3/1988	88.92	402.80	14192118	9000	17.3655054	4036999	1895742	46.96	None	5-year	2141257	2	498.80	0	0.00	0	0.00	498.80	0.166266667	0.00
156	Unchahar, NTPC	U.P.	NPH	1550	21/11/1988	63.45	889.49	5718639	3500	9.63315918	2019459	2086131	103.30	80	3-year	0	2	320.00	0	0.00	0	0.00	320.00	0.206451613	0.00
157	Tanda, NTPC	U.P.	NPH	1760	21/3/1988	65.12	777.00	6578294	3025	6.63546436	2600594	3065060	117.86	80	3-year	0	2	381.52	0	0.00	0	0.00	381.00	0.216772727	0.00
158	NTPC Meja, MUNL	U.P.	NPH	1320	31/3/2018	63.71	1118.60	4751228	1575	5.58594	1573606	981851.3	62.39	None	4-year	591754.7	2	254.90	0	0.00	0	0.00	283.00	0.193106061	0.00
159	Paricha, UPVUNL	U.P.	NPH	920	31/3/1984	64.45	309.39	3732043	3200	11.2576489	1604831	991298	61.77	None	4-year	613533	2	88.00	0	0.00	0	0.00	88.00	0.095652174	0.00
160	Obra B, UPVUNL	U.P.	NPH	1000	14/12/1974	63.82	186.00	4335676	700	2.39752348	1632285.326	270997	16.60	None	5-year	1361288.326	1	72.00	0	0.00	5	140.00	72.00	0.072	0.00
161	Harduaganj TPS, UPVUNL	U.P.	NPH	610	31/3/1978	51.48	400.00	1817795	4000	25.1223725	718029	848743	118.20	80	3-year	0	1	204.24	0	0.00	1	50.00	254.00	0.334814754	0.00
162	Harduaganj Extn. TPS, UPVUNL	U.P.	NPH	660	1/1/2022	54.05	73.00	1823000	5000	32.8804167	720000	90000	12.50	None	5-year	630000	0	0.00	0	0.00	0	0.00	0.00	0	0.00
163	Anpara A, B & D, UPVUNL	U.P.	NPH	2630	24/3/1986	88.00	1950.00	12345456	3000	5.31423176	4351786.12	82257.75	1.89	None	5-year	4269528.37	1	480.00	0	0.00	0	0.00	480.39	0.182509506	0.00
164	Rosa, Power Supply RPL	U.P.	NPH	1200	10/2/2010	71.45	610.00	4612950	4000	14.6959332	1703606	1556111	91.34	None	4-year	147495	2	92.83	0	0.00	0	0.00	110.00	0.077358333	0.00
165	Anpara C, Lanco Power	U.P.	NPH	1200	12/11/2011	76.99	103.92	5165048.12	2000	7.9149489	1704199	198927.9	11.67	None	5-year	1505271.1	0	0.00	0	0.00	0	0.00	0.00	0	0.00
166	Barkhera, Piliphit,Bajaj Energy	U.P.	NPH	90	6/11/2011	36.82	11.19	245131	550	18.4264454	96274	96337	100.07	80	3-year	0	-	-	-	-	-	-	-	#VALUE!	-
167	Khambarkhera, Lakhimpur, Bajaj Energy	U.P.	NPH	90	17/10/2011	33.25	29.47	217646	550	20.5699153	77880	78037	100.20	80	3-year	0	-	-	-	-	-	-	-	#VALUE!	-
168	Kundarkhi, Bajaj Energy	U.P.	NPH	90	10/1/2012	40.68	12.47	265424	550	19.5657752	100173	99929	99.76	80	3-year	244	-	-	-	-	-	-	-	#VALUE!	-
169	Utraula, Balarampur,Bajaj Energy	U.P.	NPH	90	21/2/2012	35.81	-	238464	550	18.6241842	92639	92173	99.50	80	3-year	466	-	-	-	-	-	-	-	#VALUE!	-
170	Maqsoodpur, Shahjahnpur, Bajaj Energy	U.P.	NPH	90	3/11/2011	36.94	12.49	238784	550	19.4261895	91617	90881	99.20	80	3-year	736	-	-	-	-	-	-	-	#VALUE!	-
171	Lalitpur, Bajaj Energy	U.P.	NPH	1980	26/3/2016	65.35	419.66	7037362	6000	12.8617406	2670553	2636839	98.74	80	3-year	33714	1	82.00	0	0.00	0	0.00	82.00	0.041414141	0.00
172	Prayagraj PGCL, Tata Power	U.P.	NPH	1980	25/12/2015	72.13	573.17	7636066.81	62000	149.890197	2613596.24	2295578.6	87.83	80	3-year	318017.64	1	52.40	1	23.70	0	0.00	76.11	0.026464646	1170000.00
173	Farakka, NTPC	West Bengal	PH	2100	1/1/1986	67.42	724.65	7705851	2700	6.32486647	2521188.15	4984725.99	197.71	80	3-year	0	3	627.50	0	0.00	0	0.00	627.50	0.298809524	0.00
174	Mejia TPS Bankura, DVC	West Bengal	PH	2340	1/3/1996	76.44	1061.90	10801231	5340	6.51442687	5488957	4496912	81.93	80	3-year	992045	2	250.00	0	0.00	0	0.00	250.00	0.106837607	0.00
175	Durgapur Steel TPS, DVC Andal	West Bengal	PH	1000	29/7/2011	81.03	408.73	4594898	3000	11.5811851	1838731	4058009	220.70	80	3-year	0	2	35.73	0	0.00	0	0.00	58.00	0.03573	0.00
176	Raghunathpur, DVC	West Bengal	NPH	1200	24/8/2014	53.67	581.62	3683890	3000	7.90609641	1784000	84800	4.75	None	5-year	1699200	-	-	-	-	-	-	-	#VALUE!	-
177	Budge-Budge, CESCL	West Bengal	NPH	750	16/9/1997	81.14	125.00	3213171	5900	39.1265261	1071815	1071815	100.00	80	3-year	0	0	0.00	0	0.00	0	0.00	0.00	0	0.00
178	Southern, CESCL	West Bengal	NPH	135	10/4/1991	53.75	14.00	382497	2126	115.272582	86840	86840	100.00	80	3-year	0	0	0.00	0	0.00	0	0.00	0.00	0	0.00
179	Titagarh, CESCL	West Bengal	NPH	240	12/12/1982	N.O.	N.O.	N.O.	N.O.	#VALUE!	0	0	#DIV/0!	None	N.O.	0	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	N.O.	#VALUE!	N.O.
180	Durgapur Projects Ltd.	West Bengal	NPH	550	1/9/1982	56.19	230.64	1767361	4150	30.7676393	663922	727872	109.63	None	4-year	0	1	4.50	2	22.30	0	0.00	54.34	0.008181818	779285.00
181	Santalidih, WBPDCCL	West Bengal	NPH	500	7/11/2007	91.36	330.94	2850222	2000	11.3616435	1408799	1918117	136.15	None	5-year	0	2	51.06	0	0.00	0	0.00	109.74	0.10212	0.00
182	Sagardighi, WBPDCCL	West Bengal	NPH	1600	7/11/2007	89.39	550.00	7835476	10200	33.0588955	2416044.2	4299951.2	177.97	None	4-year	0	1	185.00	0	0.00	0	0.00	185.00	0.115625	0.00
183	Bakreswar, WBPDCCL	West Bengal	NPH	1050	17/7/1999	92.38	1652.14	4923724	2900	15.2252667	1541399.28	764832.8	49.62	None	5-year	776566.48	2(2)	148.11	0	0.00	0(1)	43.00	191.11	0.14106	0.00
184	Kolaghat, WBPDCCL	West Bengal	PH	840	24/1/1984	67.55	502.00	4046933.13	10000	35.1265085	1684591	1662137	98.67	80	3-year	22454	3	81.54	1	31.17	0	0.00	112.71	0.097071429	256033.00
185	Bandel, WBPDCCL	West Bengal	NPH	275	1/9/1965	77.01	169.38	1412168	2000	24.3163615	554859	609378	109.83	80	3-year	0	2	33.04	0	0.00	0	0.00	33.04	0.120138182	0.00
186	Hiranmaye Energy India Ltd.	West Bengal	NPH	300	7/6/2017	71.48	-	1475957	4000	39.4310166	635200.26	635200.26	100.00	80	3-year	0	2	8.90	0	0.00	0	0.00	8.90	0.029676933	0.00
187	Dishergarh TPS	West Bengal	NPH	12	25/9/2012	41.37	-	46100.29	350	52.6021995	24113.14	27452.94	113.85	80	3-year	0	0	0.00	0	0.00	0	0.00	0.00	0	0.00
188	Haldia Energy Limited	West Bengal	NPH	600	14/1/2015	80.28	151.70	3030051	4000	23.8647224	1178732	1178732	100.00	80	3-year	0	0	0.00	0	0.00	0	0.00	0.		

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
First	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.	CPCB	IPC-II Division looking after the fly ash management at CPCB is acting as the Secretariat.	Completed	
First	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.	All Organizations and industries	TPPs and Coal mines: Action plans have been received from 10 TPPs, 9 Coal mines. Stone crushers of M.P: Out of total 63 stone crushers, measures taken by 61 operational stone crushers are as: i) 33- dust containment system, 31-wind breaking wall, ii) 60- water sprinkling, iii) 43- greenbelt, iv) 3 crushers to be closed; remaining crushers to meet timelines for pollution control. Stone crushers of UP: 313 valid stone crushers are there in 02 major clusters. Air pollution control system installed in all Stone crushers. 38 stone crushers were inspected and actions were taken against 12 defaulters. No new stone crusher is allowed in this area.	Completed	
First	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.	CPCB, CEA	Action plans have been verified through the Oversight Committee and quarterly verification of implementation status is being done.	Completed	
First	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 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.	All Organizations and industries	CPCB: Implementation Committee meetings are held regularly. CPCB and CEA: Guidelines for technical specifications, O&M and annual certification of ash ponds/dykes prepared and uploaded on CPCB website.	Completed	
First	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.	Govt. of U.P. and M.P, DMs of Sonbhadra and Singrauli	Same as in respect of Decision no. 2 of 1st MoM. Action plans as submitted by the industries are being implemented, and status of compliance is verified periodically by SPCBs and quarterly by the Oversight Committees.	In-Process	Regular activity.
First	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.	M/s Anpara 'C' Lanco, Govt. of U.P.	Action plan submitted by M/s Anpara 'C' Lanco Power.	Completed	

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
First	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.	CPCB, State Govts of UP and MP, All stakeholders	The action plans which were submitted to MoEF&CC by power plants, coal mines, and industries in Singrauli and Sonbhadra Action Plan were shared with Oversight Committees members for MP and UP for scrutinizing on 12.12.2022. A web page - "Fly Ash Management and Utilization" – to place relevant information in public domain created on 13.12.2022 by CPCB.	Completed	
First	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.	State Governments of U.P. and M.P.	SPCBs are carrying out periodic inspections and taking follow up action to ensure compliance.	In-Process	Regular activity.
First	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.	State Governments of U.P. and M.P.	SPCBs are carrying out periodic inspections and taking follow up action to ensure compliance. Oversight Committees of M.P and U.P. are carrying out quarterly inspections to verify the status of compliance.	In-Process	Regular activity.
First	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.	State Governments of U.P. and M.P.	An account 'Voluntary Contribution Fund for Environmental Restoration & Relief' has been opened jointly by the Government of M.P. and MPPCB. Government of U.P. has also opened an account.	Completed	
First	11	Concerned State Governments to arrange for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries.	State Governments of U.P. and M.P.	MPPCB on 12.04.2023 nominated ICMR- National Institute for Research in Environmental Health (NIREH) and requested District Collector, Singrauli to take appropriate action. Further, 03 proposals sanctioned on 27.06.2023 to be taken up by AIIMS, Bhopal. UP: MoU has been signed with AIIMS Bhopal for conducting the "Public Health and Risk Impact Assessment study due to fly ash" consisting of 3 projects whose duration of completion is 6 month to 2 years. Study is being done.	In-Process	Same as MoM 2/3 and 3/14
Second	1	Government of U.P. to submit Action Plans regarding stone crushers in Sonbhadra District and the implementation report on the compliance of the conditions of CTOs as well as ECs in respect of all the industries.	Env. Dept. - Government of U.P.	Same as in respect of Decision no. 2 of 1st MoM.	Completed	Same as MoM 1/1&5

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Second	2	Government of U.P. to create a separate account to receive voluntary contributions and funds for environment restoration and relief. 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.	Env. Dept. - Government of U.P.	Same as in respect of Decision no. 10 of 1st MoM.	Completed	Same as MoM 1/10
Second	3	Concerned State Governments to arrange for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries, and share the report with CPCB.	State Governments of U.P. and M.P.	MPPCB on 12.04.2023 nominated ICMR- National Institute for Research in Environmental Health (NIREH) and requested District Collector, Singrauli to take appropriate action. Further, 03 proposals sanctioned on 27.06.2023 to be taken up by AIIMS, Bhopal. UP: MoU has been signed with AIIMS Bhopal for conducting the "Public Health and Risk Impact Assessment study due to fly ash" consisting of 3 projects whose duration of completion is 6 month to 2 years. Study is being done.	In-Process	Same as MoM 1/11, 3/14
Second	4	Oversight Committees comprising CPCB, concerned SPCB and respective DMs shall carry out continued verification of the implementation of action plans by industries in Singrauli & Sonbhadra, and furnish the status report once in quarter.	Oversight Committees of U.P. and M.P.	Oversight Committees of U.P. and M.P. carried out recent verification in January 2024 and issued appropriate instructions to industries for ensuring compliance.	In-Process	Regular activity. Same as MoM 1/9
Second	5	Northern Coalfields Ltd. (NCL) to conduct feasibility study in excavated portions of all its operational mines as well as abandoned mines, along with availability of volume for backfilling of ash in mine voids or mixing of ash with external Overburden dumps . A template comprising details of all the mines may be formulated and a report in this regard may be submitted.	Ministry of Coal	As per DGMS, mixing of ash with overburden to be carried out based on mine specific study by the mine management, which is to be conducted by the mine on receipt of notice from thermal power plants. Feasibility study is ongoing at Nigahi operational mine of NCL. CIMFR stated mixing of ash with Overburden in dumps of Gare Pelma mines successful.	In-Process	March 2024 for Nigahi mine. Same as MoM 3/20, 4/7, and 5/4
Second	6	Ministry of Coal and Ministry of Mines to take effective steps for identification of more mines and make them available to coal and lignite based thermal power plants for backfilling and mixing of ash with external overburden dumps, in line with the Ash Utilisation Notification, 2021.	Ministry of Coal, Ministry of Mines	MoC- 32 abandoned coal mines identified. Central Level Working Group has convened 05 meeting under AS, MoC. Out of 21 mine of CIL, 19 allocated, 01 is being used as water reservoir by local community, and 01 not allocated as coal reserve not exhausted. SCCL- 01 OC & 09 UG mines -100 lakh m3 bottom ash needed. New mines: CIL -18 new UG mines are being explored. MoM: 82 abandoned mines identified. (Later Ministry of Mines on 12.05.2023 & 23.05.2023 shared the list of additional non-coal mines: 56 mines surrendered to State Govt., 57 mines Part surrendered, Pits of 12 working mines available for backfilling with fly ash, and informed that Regional Controllers have been directed to identify more working mines).	In-Process	Regular activity. Same as MoM 3/2, 4/5, 5/2
Second	7	Director General, DGMS may be co-opted as member of the Mission.	MoEFCC	Director General, DGMS has been co-opted as a member of Fly Ash Management and Utilization Mission.	Completed	

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Second	8	Committee under the chairpersonship of Chairman, CPCB may convene a meeting for identification of mines as well as for the development of SOP for making operational/abandoned mines available to the TPPs with M/o Coal, NCL, DGMS, NTPC, Anpara-UPRVUNL and other stakeholders, and prepare the plan for studies(mine-wise/region wise or as deemed fit) regarding availability of mines with timelines along with parallel steps for the necessary approvals (as that of DGMS), for backfilling of ash and mixing of ash with OB in Singrauli and Sonbhadra region.	CPCB	Committee of Implementation and identification of mines was held under Chairman, CPCB on 18.02.2023. Recommendations: -MoC to update status of allocation and initiation of backfilling -MoC to undertake Mine (operational) specific studies for disposal of ash. -MoC to list out mines likely to be available. -MoC/MoM to simply procedure of allowing ash disposal in mine. Third meeting convened on 06.10.2023.	Completed	
Second	9	All thermal power plants shall scrupulously implement the action plans to achieve 100% ash utilization as per the compliance cycle prescribed under the Ash Utilisation Notification, 2021.	All TPPs in Singrauli and Sonbhadra region	All thermal power plants have submitted and implementing action plans to achieve 100% ash utilization as per the compliance cycle prescribed under the Ash Utilisation Notification, 2021. Status of ash utilization during 1st year of 1st compliance cycle i.e. 2022-23 submitted has been presented before the Mission.	Completed	
Second	10	Action plans of thermal power plants shall also include status of annual safety certification of ash dykes and measures taken to prevent breaches, designation of officer responsible in this regard.	All TPPs	Annual safety certification of ash dykes has been included in the action plans which is mandatory as per Ash Notification dated 31.12.2021..	Completed	
Second	11	Anpara TPP, UPRVUNL shall submit the time bound action plan for 100% utilization of ash vis-à-vis present utilization rates, backfilling of ash in Gorbi mines along with the concerns of MPPCB regarding pollution from transportation, and other plans for achieving 100% utilization of ash.	Govt. of U.P, UPRVUNL	Action plan submitted by Anpara TPP, UPRVUNL. Central Level Working Group in its third meeting allocated Gorbi Pit 3 to the plant.	Completed	
Second	12	Draft guidelines for technical specifications and annual certification of ash ponds/dykes may be finalised.	CPCB and CEA	Guidelines for technical specifications, O&M and annual certification of ash ponds/dykes prepared and uploaded on CPCB website.	Completed	
Second	13	A meeting with Ministry of Coal, NCL, NTPC, Indian Railways, other TPPs, owners of private railway siding may be convened to identify mitigation measures for prevention, control and abatement of dust pollution predominantly caused by mining activities and transportation of coal in Singrauli region and furnish a detailed report. Accountability of pollution generated from coal transportation, loading and unloading activities may be fixed on TPPs, coal mines and railway siding (private or public) based on the jurisdiction of activities.	MPPCB and UPPCB	> Based on the recommendation of Oversight Committee, MPPCB issued letter dated 17.03.2023 regarding imposition of Environmental Compensation on Railways (ECR & WCR) and NCL. > Review meeting chaired by Principal Secretary, Env. Deptt., M.P. held on 25.04.2023. > Railway sidings: ECR-3, WCR-3, NCL-2 SECL have been directed for air pollution control measures. > NGT recently ordered report on pollution from transportation by Committee of MoEFCC, CPCB and SPCB.	Completed	

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Second	14	Skilling and outreach programmes may be conducted on similar lines of training of SHGs by MPPCB for promoting switch over to ash based brick/product manufacturing.	State Governments of U.P. and M.P.	UP: 1) ADM Sonbhadra has held a meeting with TPPs and concerned District Officers on 27.06.2022 to increase Fly Ash utilization in Ash based products/ bricks in District Sonbhadra. At present 31 Fly Ash based brick manufacturing units are operational in Sonbhadra. 2) UPPCB has given directions vide letter dated 09.05.2023 and 21.06.2023 to TPPs for organizing Skilling and outreach programmes for promoting switch over to ash based brick/product manufacturing. 3) Workshop held on 07.10.2023 at UPRVUNL Obra, Sonbhadra to promote Ash Utilization in manufacturing of Fly Ash Bricks and in other sectors with representatives of Fly Ash Bricks Units, TPPs and District Administrative and SPCB. MP: MPPCB on 12.04.2023 requested District Collector to identify SHGs for promotion of manufacturing of ash based products. Workshop was organized on 24.06.2023 for identified SHGs. TPPs have been directed to ensure the availability of fly ash to SHGs.	Completed	Same as MoM 3/16, 4/14
Second	15	Enforcement measures regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs prescribed under Ash Utilisation Notification, 2021, shall be implemented to promote ash based product manufacturing.	UPPCB, MPPCB and concerned DMs	UP: Secretary, DoEF&CC, UP vide letter dated 28.04.2023 issued directions to concerned departments regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs, as per the provisions of Fly Ash notification dated 31.12.2021. MP: MPPCB directed all the concerned departments, District Collector to enforce the measures regarding mandatory use of ash based products/ bricks. Meetings held under CS on 09.05.2023 and under PS, Env. Dept. on 27.06.2023 for implementation of action plans.	Completed	Same as MoM 3/15 and 4/15
Second	16	NHAI may be requested to utilize the ash for the road construction project.	MoEFCC	MoEF&CC requested Chairman, NHAI to utilize ash in road construction projects.	Completed	
Second	17	As informed, studies found that red mud has alkaline in nature and is suitable for backfilling in acidic mines. Identification of an abandoned or working mine for disposal of red mud and boiler ash may be undertaken, if feasible.	NTPC, Hindalco and NCL	Central Laboratory, Bhopal has completed the study on mixing of red mud with fly ash in Gorbi mine. Based on the study report, MPPCB has recommended not to proceed further with such exercise as it may lead to the leaching of heavy metals embedded in the red mud besides treating the acidic water of mine voids.	Completed	Same as MoM 3/22, 4/16 and 5/18
Second	18	Effective implementation of the mandate of 100% utilisation of ash by TPPs across the country must be ensured. In this regard, the compliance matrix shared along with the minutes of the first meeting must be implemented in a time bound manner and on a regular basis.	All concerned stakeholders	M/o Power issued show-cause to 43 TPPs (37 <60% and 6 TPPs 60-80% utilisation). Out of 186 independent TPPs (FY 2021-22): 114, 21, 39 TPPs have respectively 3,4,5 year first compliance cycle, 12 TPPs: Non-operational. Out of 117 IPPs having first 3-year compliance cycle, 8 IPPs have failed to achieve minimum 80% annual ash utilization target.	In-Process	Regular activity. Same as MoM 3/22, 4/21

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Third	1	Allocation of pits no. 3 of Gorbi abandoned mine to Anpara TPP, UPRVUNL for backfilling within one month. Allotment of abandoned mine of SECL to Amarkantak TPP, M.P. to M/s MPPGCL and abandoned mine of WCL to TPPs.	Ministry of Coal, NCL, SECL and WCL	MoC on 19.5.2023 allocated: Gorbi Pit- 2 to NTPC Vindhyanchal, Gorbi Pit- 3 to Anpara TPS, UPRVUNL (MoU b/w NCL & UPRVUNL for Pit-3 executed on 15.07.2023, MoU b/w NCL & NTPC for Pit-2 under finalization), Sharda OC: MoU signed with MB Power (MP) Ltd., Murra, Anuppur. 2.03 lakh CuM tonne fly ash has been filled Void in Sarni UG of WCL has been allotted, draft MOU is with MPPGCL for acceptance	Completed	
Third	2	Updating the list of coal mines approaching for closure of mine in 3-5 years so that TPPs can engage with coal mines for setting up of infrastructure for transportation and disposal of ash in mine voids.	Ministry of Coal	NCL : As per the present scenario and available coal reserves in the mines, no mine of NCL will be closed in next 3-5 years. As per existing plan, life of the Kakri OCP and Krishnashila OCP is up to March, 2024 and March, 2028 respectively. However it is being planned to go for Expansion of Kakri OCP which will enhance the life of Kakri OCP. As per revised estimated balance coal reserve within same lease area of Krishnashila OCP, life of mine will be enhanced for further 2-3 years thereby enhancing the life of mine upto 2030-31. MoC has agreed to explore more mines to be closed in nearby future.	In-Process	Regular activity. Same as MoM 2/6, 4/5 and 5/2
Third	3	Updating information of 82 identified abandoned mines (other than coal) and setting-up procedure for signing of MoU between the identified mines and TPPs. Steps for identification of more mines for enabling TPPs achieve 100% ash utilisation.	Ministry of Mines	Ministry of Mines on 12.05.2023 & 23.05.2023 shared the list of 207 non-coal mines: 82 abandoned mines: list shared earlier, 56 mines: surrendered to State Govt., 57 mines: Part surrendered, Pits of 12 working mines: available for backfilling with fly ash. Regional Controllers have been directed to identify working mines.	Completed	Same as MoM 4/2
Third	4	Issue necessary instructions regarding not requiring permission from DGMS for filling up of mine voids and mixing of ash in OB dumps, and SOP for carrying out feasibility studies in respect of all mines.	Ministry of Coal and Ministry of Mines	DGMS vide letters dated 02.03.2022 and 12.09.2022 has informed that it has issued circular dated 16.01.2020 for backfilling or stowing of mine (abandoned or running) with fly ash, a mine-specific scientific study is required to be done and the study recommendations implemented, keeping in view the stability of dump slopes and safety factor for long time stability of dumps by the respective mine management.	Completed	Same as MoM 4/1, 4/9
Third	5	Stipulation of specific conditions in Environmental Clearances of coal mines and non-coal mines for conducting feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Ash Utilization Notification, 2021.	MoEF&CC	Under consideration/examination by EAC (Coal Mining).	In-Process	
Third	6	Utilization of ash in the road construction project NH39 from Sidhi to Waidhan, Singrauli, M.P. for 92 km. MoRTH may be requested to issue necessary instructions to NHAI to engage with TPPs for utilization of ash.	MoEF&CC and MoRTH	MoEF&CC issued DO letter to Chairman, NHAI on 04.05.2023 to utilize ash in all road construction projects.	Completed	
Third	7	Ministry of Coal may be apprised about the action initiated by MPPCB and UPPCB on environmental non-compliances of coal mines in Singrauli and Sonbhadra region.	MoEF&CC	SPCB report dated 30.06.2023 regarding non-compliances of coal mines will be shared.	Completed	

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Third	8	Examination of actions plans submitted by thermal power plants and stone crushers and carry out continued verification of the implementation of action plans of TPPs, Industries, mines and stone crushers in Singrauli and Sonbhadra region.	CPCB	MPPCB and UPPCB are regularly conducting inspections. Oversight Committees of M.P. and U.P. are carrying out quarterly verification of the implementation of action plans of TPPs, Industries, mines and stone crushers in Singrauli and Sonbhadra region. Last round of verification was conducted in May-June 2023. Next quarterly verification is to be done in Oct 2023.	Completed	Same as MoM 1/3
Third	9	Examine the inspection and compliance reports of Anpara and Obra TPPs w.r.t. desilting ash from Rihand Reservoir and Renu River and disposal of desilted ash in low lying areas.	CPCB	Inspection and compliance reports of Anpara and Obra TPPs were examined. CPCB requested UPPCB to verify the desilted quantity, direct Anpara TPS to desilt total quantity of deposited ash and time bound action plan, and verify action taken by Obra TPS for desilting of ash from Renu River.	Completed	
Third	10	Finalization of guidelines for technical specifications and annual certification of ash ponds/dykes.	CPCB and CEA	Guidelines for technical specifications, O&M and annual certification of ash ponds/dykes prepared and uploaded on CPCB website.	Completed	Same as MoM 2/12
Third	11	Dust containment and suppression measures are to be taken by the stone crushers. Carry out assessment of air quality in and around stone crushers on regular basis to verify the impact of mitigation measures taken by the stone crushers.	Stone crushers in Singrauli and Sonbhadra region, MPPCB & UPPCB	UPPCB: Out of 313 Stone crushers in Sonbhadra area, 215 stone crushers have adequate Air Pollution Control Systems (APCS) such as covered conveyer system, covered jaw crusher, water sprinkling arrangement, wind breaking wall, green belt, pucca roads. 98 Stone Crushers are yet to install adequate APCS. Board issued show cause notices to 98 nos. of stone crusher units U/s 31-A of Air Act 1981, on 28.06.2023, 22.09.2023 & 25.09.2023 in which APCS were not adequate. Out of 98 units, closure directions issued against 17 Nos. of stone crusher units. Air quality monitoring has been carried out. PM10 levels have improved in 2022-23 as compared to the last year. MPPCB: Out of 56 stone crushers in Singrauli region, 48 stone crushers have installed dust containment system, 41 have constructed wind breaking wall and 48 have arrangements for regular cleaning and wetting system. Further, 8 stone crushers were closed by Collector, Singrauli due to non-compliance. MPPCB conducted monitoring near stone crushers and PM10 levels were found within norms.	In-Process	Regular activity.
Third	12	All thermal power plants and stone crushers shall update the progress in regard to the implementation of action plans by respective stakeholders.	All TPPs and stone crushers in Singrauli and Sonbhadra region	TPPs of have submitted 3/5 year action plan for 100% ash utilization, and submitting latest compliance status of implementation of action plans, which is verified by Oversight Committees. MP: Review meetings held under CS on 09.05.2023 and under PS, Env. Dept. on 27.06.2023 and 13.09.2023 for monitoring implementation of action plans. UP: UPPCB vide letter dated 11.05.2023 & 21.06.2023 directed TPPs to submit progress report. Implementation status of action plans verified by OCs of M.P. and U.P. during its recent verification in January 2024.	In-Process	Regular activity.
Third	13	Creation of separate account to receive voluntary contributions and funds for environment restoration and relief. 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.	Env Dept. - Government of U.P.	Account has been opened by Government of U.P. Action will be initiated for providing relief to victims of damage in a manner as may be found appropriate from these funds.	Completed	Same as MoM 1/10

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Third	14	Submission of one-year action plan along with specific deliverables in respect of conducting health and risk impact assessment studies of operations of TPPs and ash generating industries, within one month.	Governments of U.P. and M.P.	MPPCB on 12.04.2023 nominated ICMR- National Institute for Research in Environmental Health (NIREH) and requested District Collector, Singrauli to take appropriate action. Further, 03 proposals sanctioned on 27.06.2023 to be taken up by AIIMS, Bhopal. UP: MoU has been signed with AIIMS Bhopal for conducting the "Public Health and Risk Impact Assessment study due to fly ash" consisting of 3 projects whose duration of completion is 6 month to 2 years. Study is being done.	In-Process	Same as MoM 1/11 and 2/3
Third	15	Enforcement measures regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs prescribed under Ash Utilisation Notification, 2021, shall be implemented.	UPPCB, MPPCB, concerned DMS	UP: Secretary, DoEF&CC, UP vide letter dated 28.04.2023 issued directions to concerned departments regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs, as per the provisions of Fly Ash notification dated 31.12.2021. MP: MPPCB directed all the concerned departments, District Collector to enforce the measures regarding mandatory use of ash based products/ bricks. Meetings held under CS on 09.05.2023 and under PS, Env. Dept. on 27.06.2023 for implementation of action plans.	Completed	Same as MoM 2/15 and 4/15
Third	16	Skilling and outreach programmes to be conducted on similar lines of training of SHGs by M.P. for promoting switch over to ash based brick/ product manufacturing.	Govts. of U.P. and M.P.	UP: 1) ADM Sonbhadra has held a meeting with TPPs and concerned District Officers on 27.06.2022 to increase Fly Ash utilization in Ash based products/ bricks in District Sonbhadra. At present 31 Fly Ash based brick manufacturing units are operational in Sonbhadra. 2) UPPCB has given directions vide letter dated 09.05.2023 and 21.06.2023 to TPPs for organizing Skilling and outreach programmes for promoting switch over to ash based brick/product manufacturing. 3) Workshop held on 07.10.2023 at UPRVUNL Obra, Sonbhadra to promote Ash Utilization in manufacturing of Fly Ash Bricks and in other sectors with representatives of Fly Ash Bricks Units, TPPs and District Administrative and SPCB. MP: MPPCB on 12.04.2023 requested District Collector to identify SHGs for promotion of manufacturing of ash based products. Workshop was organized on 24.06.2023 for identified SHGs. TPPs have been directed to ensure the availability of fly ash to SHGs.	Completed	Same as MoM 2/14, 4/14
Third	17	Anpara TPP and Obra TPP to desilt the remaining ash discharged in Rihand Reservoir and Renu River by May, 2023. Desilted ash disposed in low lying areas to be stabilized with soil cover and grass/ green belt to avoid pollution.	M/s UPRVUNL	Anpara TPP: An amount of 2,06,540.944 m3 visible ash Anpara TPP from side pocket of Rihand Reservoir has been removed and filled in low lying areas. Stabilization of ash in low lying area with soil cover has been completed and plantation work is in progress. Obra TPP: Total 58000 CuM ash is desilted from Renu river. Total ash removal work was completed by 31.05.2023. Desilted ash has been disposed in low lying areas in Obra Sec 2 & 3 and stabilized with soil cover. Above that Miyawaki plantation has been done.	In-Process	Same as MoM 3/18 and 4/20

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Third	18	Assessment and monitoring of desilting activities in water bodies where Anpara and Obra discharged ash, and stabilization activities of low lying area where desilted ash is filled up to verify the status of remedial measures taken, by June, 2023.	UPPCB and Forest Department - Govt. of U.P.	Assessment and monitoring completed. Stabilization of ash in low lying area with soil cover has been completed and plantation work is in progress in case of Anpara TPP, and desilted ash disposed in low lying areas in Obra Sec 2 & 3 has been stabilized with soil cover, and above that Miyawaki plantation has been done in case of Obra TPP. The status is being reviewed during quarterly visits of OC. <i>As per the observation made during OC's visit in January 2024, TPPs have been instructed to expedite the ongoing works.</i>	In-Process	Same as MoM 3/17 and 4/20
Third	19	Inter-state transportation of ash is to be permitted for utilization of ash in the specified eco-friendly purposes along with safeguards for pollution control and mitigation.	Govts. of U.P. and M.P.	Inter-state transportation of ash for eco-friendly purposes has not been banned.	Completed	
Third	20	Submission of action plan indicating the timelines for initiation and completion of feasibility studies for assessing the area and volume available for ash backfilling in mine voids and mixing of ash in OB dumps in all NCL mines.	NCL	> CSIR-CIMFR, Dhanbad has been requested to expedite the study of Nigahi. > CSIR-CIMFR, Dhanbad will present the findings of feasibility study of Nigahi mine till date in next meeting of the Fly Ash Mission. > The timeline of feasibility study along with the reason of field trial was not possible during monsoon season, submitted by CIMFR-Dhanbad through email dt 20.07.2023. > The feasibility for backfilling of fly ash and mixing of ash in OB dumps in operating mines of NCL shall be assessed on basis of CIMFR report for the ongoing study at Nigahi OCP.	In-Process	March 2024 Same as MoM 2/5, 4/7, and 5/4
Third	21	Submission of time-bound action plan for achieving 100% utilization of ash by TPPs. Cost-benefit analysis to be conducted for outweighing benefits of bearing ash transportation cost/promotion of ash based product manufacturing/coal transportation cost vis-à-vis environmental compensation.	UPRVUNL, NTPC and Anpara Lanco, All TPPs	TPPs have submitted 3/5 year action plan for 100% ash utilization. Status of ash utilization during 1st year of 1st compliance cycle i.e. 2022-23 submitted has been presented before the Mission. Cost-benefit analysis yet to be initiated by TPPs. As per the status of utilization of ash environmental compensation will be imposed on non-compliant TPPs at the end of 1st compliance cycle.	In-Process	
Third	22	A study on mixing of red mud with ash in Gorbi abandoned mine is to be carried out to neutralize acidic water of Gorbi mine pit.	NTPC and NCL	Central Laboratory, Bhopal has completed the study on mixing of red mud with fly ash in Gorbi mine. Based on the study report, MPPCB has recommended not to proceed further with such exercise as it may lead to the leaching of heavy metals embedded in the red mud besides treating the acidic water of mine voids.	Completed	Same as MoM 2/17, 4/16, and 5/18
Third	23	Effective implementation of the mandate of 100% utilisation of ash by TPPs across the country must be ensured. In this regard, the compliance matrix shared along with the minutes of the first meeting must be implemented in a time bound manner and on a regular basis.	All stakeholders	> Status of ash utilization during 1st year of 1st compliance cycle i.e. 2022-23 submitted has been presented before the Mission. > Necessary actions being taken in coordination with SPCBs, MoP, MoC. > 05 meetings of Central Level Working Group (Ministry of Coal) for allotment of coal mine pits held. 19 mines allocated, 01 is being used as water reservoir and 01 not allocated as coal reserve not exhausted. > Third joint meeting of Committees under Para E(3) and Para B(5i), scheduled on 06.10.2023. > SPCBs have been given access to portal to monitor compliance. Direction u/s 18(1)(b) have also been issued by CPCB to SPCBs. Further communication made with SPCBs vide letter dated 19.01.2024.	In-Process	Regular activity. Same as MoM 2/18, 4/21

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Fourth	1	SOP to be developed in respect of working mine (opencast and underground mines) for safety related issues in allocation of mines. Also, SOP to be formulated for carrying out feasibility studies for filling up of mine voids in respect of all mines.	Ministry of Labour and Employment, and DGMS	DGMS vide letters dated 02.03.2022 and 12.09.2022 has informed that for backfilling or stowing of mine (abandoned or running) with fly ash, a mine-specific scientific study is required to be done and the study recommendations implemented, keeping in view the stability of dump slopes and safety factor for long time stability of dumps by the respective mine management. The required guidelines/SOP have already been issued by DGMS.	Completed	Same as MoM 3/4
Fourth	2	Updating list of identified abandoned mines for enabling TPPs to approach the concerned mines for backfilling of mine voids with ash for achieving 100% ash utilisation. SOP for signing-up of MoU between the identified mines and TPPs to be finalised.	Ministry of Mines	Ministry of Mines on 12.05.2023 & 23.05.2023 shared the list of 207 non-coal mines: 82 abandoned mines: list shared earlier, 56 mines: surrendered to State Govt., 57 mines: Part surrendered, Pits of 12 working mines: available for backfilling with fly ash. Regional Controllers have been directed to identify working mines. SOP for signing-up of MoU between the identified mines and TPPs has been made by MoC and MoM.	Completed	Same as MoM 3/3
Fourth	3	Details of SOP followed for Singareni underground mine (SCCL) for ash filling in mine voids may be shared with WCL and NCL for adoption of similar SOP conditions in the MoU to be signed with TPPs. A copy may be shared with MoEFCC.	Ministry of Coal	SOP followed for Singareni underground mine (SCCL) for ash filling in mine voids shared with WCL and NCL, and MoEFCC.	Completed	
Fourth	4	Status regarding details of identified mine voids, allocation to TPPs, signing of MoU and quantity of ash filled up against the available volume may be shared and may be put up on the website and updated monthly.	Ministry of Coal	Status regarding details of identified mine voids, allocation to TPPs, signing of MoU and quantity of ash filled up against the available volume were presented before the Mission during the 5th meeting. Mine voids in which Fly Ash filling is ongoing/ completed: CIL 12 nos. (MCL-06; SECL-04; NCL-01;ECL-01), and SCCL 9 Mine voids where MoU is in process/signed: 06 nos. (NCL-02; BCCL-01, ECL - 2,WCL-01)	In-Process	Regular activity
Fourth	5	List of coal mines approaching for closure of mines in 3-5 years to be updated and shared with MoP & TPPs for making early allocation, signing of MoU and preparatory activities for initiation of backfilling of ash.	Ministry of Coal	NCL identified Kakri Opencast Project (March, 2024) and Krishnashila Opencast Project (March, 2027). Central Level Working Group has held 5 meetings so far and has instructed CIL and SCCL to explore more mines to be closed in nearby future. Further, TPPs have also been asked to locate nearby mines available for ash filling and submit requests for allocation.	In-Process	Regular activity. Same as MoM 2/6, 3/2 and 5/2
Fourth	6	A scientific methodology with GIS mapping may be evolved for allocation of mine voids/ mixing of OB dumps with ash to TPPs based on proximity to the mine and transportation distance so that the environmental impacts/ costs of transportation can be minimised. In case of Sharda OC mine (Trench -1, 2 & 3), existing allocation of 90,000 m3 to Amarkantak TPS, MPPGCL may be reviewed and it may be increased as the TPP is 16 kms from the said mine.	Ministry of Coal	MoC to initiate action for facilitating GIS mapping for allocation of mine voids/ mixing of OB dumps to nearby TPPs. Baiga OCM, Trench ABCD, Sharda OCM and Trench T-3 patch, Sharda OCM of SECL in Sohagpur area allocated to Amarkantak TPS by Central Level Working Group in its 5th meeting on 20.12.2023.	In-Process	Same as 5/6

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Fourth	7	Completion of feasibility study for Nigahi operational mine within two months and submission timelines for initiation and completion of feasibility studies for other working mines for assessment of area and volume available for ash backfilling in mine voids and mixing of ash in OB dumps in all NCL mines. Findings of feasibility study of Nigahi operational mine shall be presented during the next meeting of the Mission.	Ministry of Coal, NCL	> CSIR-CIMFR, Dhanbad has been requested to expedite the study of Nigahi. > CSIR-CIMFR, Dhanbad will present the findings of feasibility study of Nigahi mine till date in next meeting of the Fly Ash Mission. > The timeline of feasibility study along with the reason of field trial was not possible during monsoon season, submitted by CIMFR-Dhanbad through email dt 20.07.2023. > The feasibility for backfilling of fly ash and mixing of ash in OB dumps in operating mines of NCL shall be assessed on basis of CIMFR report for the ongoing study at Nigahi OCP.	In-Process	March 2024 for Nigahi mine. Same as MoM 2/5, 3/20, and 5/4
Fourth	8	Meeting with all TPPs to get the details about abandoned mines which may be geographically favourable to the TPPs and furnish the list of TPPs along with priority list of abandoned mines.	MoP, CEA	A meeting has been convened with all TPPs on 25.08.2023 to get the details about abandoned mines which may be geographically favourable to the TPPs, which was already forwarded to the TPPs. The requests of TPPs are reviewed for allocation of abandoned mines in the Central Level Working Group's meeting convened under AS, MoC.	Completed	
Fourth	9	M/o Labour and Employment and DGMS to be communicated regarding finalisation of SOP in regard to backfilling of ash in opencast and underground mines (for both abandoned as well as working mines) and mixing of ash with overburden in dumps. A separate meeting may be convened with DGMS, M/o Coal and M/o Mines in this regard.	MoEF&CC	DGMS vide letters dated 02.03.2022 and 12.09.2022 has informed that for backfilling or stowing of mine (abandoned or running) with fly ash, a mine-specific scientific study is required to be done and the study recommendations implemented, keeping in view the stability of dump slopes and safety factor for long time stability of dumps by the respective mine management. The required guidelines/SOP have already been issued by DGMS.	Completed	Same as MoM 3/4, 4/1
Fourth	10	Third-party audit for verification of implementation of action plans of TPPs, industries, stone crushers and coal mines in Singrauli and Sonbhadra region including desilting activities and reclamation of low lying areas carried out, may be undertaken through empanelled institutions/agencies and the report in this regard may be furnished during the next meeting of Mission. CPCB may workout the cost to be incurred by individual industry in case of unit specific audit and jointly by cluster of industries in case of cluster specific audit.	CPCB	Implementation of action plans is verified on quarterly basis by OCs empowered by NGT. Recent verification has been carried out in January 2024. Updated status of implementation of action plans were sought from the stakeholders, and the same has been compiled. The status of implementation of action plans and preliminary comments of OCs are attached.	In-Process	Regular activity
Fourth	11	In order to ensure 100% utilization of ash by all lignite and coal based thermal power plants across the country, effective monitoring and supervision of provisions of Ash Utilization Notification dated 31.12.2021 have to be scrupulously complied with. Respective stakeholders have been mapped in respect of the various activities mandated under the notification which has been shared with CPCB with the minutes of previous meeting. 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.	CPCB, MoP, CEA, All State Govts, All stakeholders	> Effective monitoring and supervision of provisions of Ash Utilization Notification dated 31.12.2021 are being carried out in coordination with SPCBs, MoP, MoC. > 05 meetings of the Central Level Working Group (Ministry of Coal) for allocation of coal mine pits have been held. Out of 21 mines of CIL, 19 mines allocated, 01 is being used as water reservoir and 01 not allocated as coal reserve not exhausted. > Third (joint) meeting of Committees under Para E(3) and Para B(5.i), convened on 06.10.2023. > SPCBs have been given access to the ash portal to monitor compliance. Directions u/s 18(1)(b) issued to SPCBs to ensure immediate registration of CPPs and regular monitoring of status uploaded by TPPs. Follow up made with SPCBs vide letter dated 19.01.2024.	In-Process	Regular activity

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Fourth	12	Directorate of Mines and Geology may update the list of abandoned mines available in their respective States and make it available on State Govts. website including abandoned stone crushers. This may be put up on the website and updated every month.	Govts. of U.P. and M.P.	UP: 1) UPPCB has sent letter dated 25.07.2023 to Mining Department, Sonbhadra and letter dated 13.10.2023 to Director, Geology and Mining Dept. U.P. to provide details of Abandoned Mines in district Sonbhadra regarding ash utilization. 2) Director, Geology and Mining Department, U.P. has sent the details of abandoned mines in district Sonbhadra (06 Nos.) and Jhansi (04 Nos.), vide letter dated 13.10.2023. 3) UPPCB has sent details of abandoned mines to TPPs for taking necessary steps for backfilling of abandoned mines, vide letter dated 16.10.2023. MP: MPPCB constituted a four-member Committee under the chairpersonship of District Collector of each District for identification and allotment of abandoned non-coal mines to TPPs. The list of mines available for ash disposal has been uploaded on Mining Department's website.	In-Process	Regular activity
Fourth	13	Environmental Compensation collected by respective SPCBs from the industries of Singrauli and Sonbhadra region prior to the opening of specific accounts and kept in common EC fund, may be transferred to respective accounts created by the State Govts, in addition to voluntary contributions. A mechanism to be put in place to utilise the funds received from this region to be used only for the said region for restoration of environment and relief. Further, State Forest Department may be engaged for carrying out measures for restoration of environment.	Govts. of U.P. and M.P.	UP: 1) Separate account for environment restoration and relief fund has been opened by District Administration with Account No. 01650110071496, IFSC-UCBA0000165 in UCO Bank Robertsganj, Sonbhadra . 2) District Administration of Sonbhadra has been asked to submit action plan detailing activities to be carried out from the said account. So that O.A. can be filed in Hon'ble NGT giving the details of action plan for transferring the EC fund into this account. MP: Voluntary contribution has not been received so far from any organization. Separate provision has been made for industries depositing environmental compensation and its utilization for improvement of environment.	Completed	
Fourth	14	Increase in utilisation of quantum of ash for making ash based products or ecobricks through SHGs may be assessed by comparing pre- and post-skilling and outreach programmes. This may be updated every three months. SHGs to be involved in making eco-bricks that can be used in tree plantation/afforestation, toilet construction activities of the public utility projects.	Govts. of U.P. and M.P.	UP: 1) ADM Sonbhadra has held a meeting with TPPs and concerned District Officers on 27.06.2022 to increase Fly Ash utilization in Ash based products/ bricks in District Sonbhadra. At present 31 Fly Ash based brick manufacturing units are operational in Sonbhadra. 2) UPPCB has given directions vide letter dated 09.05.2023 and 21.06.2023 to TPPs for organizing Skilling and outreach programmes for promoting switch over to ash based brick/product manufacturing. 3) Workshop held on 07.10.2023 at UPRVUNL Obra, Sonbhadra to promote Ash Utilization in manufacturing of Fly Ash Bricks and in other sectors with representatives of Fly Ash Bricks Units, TPPs and District Administrative and SPCB. Next workshop planned in Feb 2024. MP: MPPCB on 12.04.2023 requested District Collector to identify SHGs for promotion of manufacturing of ash based products. Workshop was organized on 24.06.2023 and 13.09.2024 for identified SHGs. TPPs have been directed to ensure the availability of fly ash to SHGs.	In-Process	Regular activity. Same as MoM 2/14, 3/16

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Fourth	15	Implementation of effective enforcement measures regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs as prescribed in Ash Utilisation Notification, 2021 and implementation of additional measures beyond the Notification, to minimise the disposal of ash in mine voids and low lying areas.	Govts. of U.P. and M.P.	UP: Secretary, DoEF&CC, UP vide letter dated 28.04.2023 issued directions to concerned departments regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs, as per the provisions of Fly Ash notification dated 31.12.2021. MP: MPPCB directed all the concerned departments, District Collector to enforce the measures regarding mandatory use of ash based products/ bricks. Meetings held under CS on 09.05.2023 and under PS, Env. Dept. on 27.06.2023 for implementation of action plans.	Completed	Same as MoM 2/15 and 3/15
Fourth	16	Study on mixing of red mud with ash and its environmental aspects such as leaching of heavy metals into ground and surface water may be conducted and the results may be shared with CPCB.	State Govt. of M.P., MPPCB	Central Laboratory, Bhopal has completed the study on mixing of red mud with fly ash in Gorbi mine. Based on the study report, MPPCB has recommended not to proceed further with such exercise as it may lead to the leaching of heavy metals embedded in the red mud besides treating the acidic water of mine voids.	Completed	Same as MoM 2/17, 3/22, and 5/18
Fourth	17	Ambient air quality monitoring in and around stone crushers to be conducted and baseline data of last two years (same season) be analysed to verify impact of mitigation measures taken by stone crushers. This may be carried out on a regular basis and data may be compiled in a continuous manner to assess the improvements as well as its sustainability. Carry out continuous evaluation of CEPI Score of Singrauli and Sonbhadra region and compile the data over the time in a continuous manner to assess the progress made. A presentation in this regard along with the implementation of CEPI action plan and verification/monitoring of desilting activities of Obra & Anpara (UPRVUNL) may be made during next meeting of the Mission.	Govts. of U.P. and M.P., UPPCB and MPPCB	UP: 1) The stone crushers are mainly located in clusters across various areas of Sonbhadra District, namely Dalla, Billi, Obra, Chopan Bardia, Sundariya Road. 2) Ambient Air Quality Monitoring carried out by UPPCB at difference location of the Stone Crusher region on dated 24.06.2023, 24.07.2023 & 22.9.2023. 3) The Ambient Air Quality report, shows that regular inspection carried out and action taken against defaulter units had resulted in improved ambient air quality of the region. UPPCB had previously inspected 155 units and recently 158 units, and has issued show cause notices and closure directions to non-compliant units. MP: Air quality analysis has been carried out in the Singrauli region during Dec, 2021- Sept, 2022 and Dec, 2022-Sept, 2023. Air Quality Index (AQI) has marginally improved from 157 in 2021-22 to 130 in 2022-23. There has been significant improvement in air quality during Jul-Sep.	In-Process	Regular activity. Same as MoM 5/17
Fourth	18	SOP to be laid down for stipulation of measures to be taken during road transportation of ash, in the permission/ Consent to Operate issued for backfilling of mine void with ash and mixing the ash with OB.	Govt. of U.P. and M.P., MPPCB and UPPCB	UP: UPPCB has directed NCL mines of Sonbhadra to submit compliance report of decision/ recommendation for maximum transportation of Fly ash through Rail/marry go round and in case of road transportation of Fly ash, it should be done through covered trucks vide letter dated 20.09.2023. MP: CPCB has issued "Guidelines for disposal/utilisation of Fly Ash for reclamation of Low Lying Areas and in Stowing Abandoned mines/ Quarries", which includes provisions for disposal of ash in mine voids in an environmentally sound manner. So, at present there is no need of any separate SOP.	Completed	

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Fourth	19	Finalization and signing of MoU with M/s NCL for initiation of backfilling activities in Gorbi Pit-3, within a week and timelines for commencing backfilling activities to be shared. Action taken report in this regard may be submitted to the MoEF&CC.	Govt. of U.P., Anpara TPP, UPRVUNL, MoC and NCL	> MoU between UPRVUNL – Anpara TPS and NCL has been signed on 15.07.2023 for backfilling of fly ash in pit 3 of abandoned Gorbi mine. > UPRVUNL – Anpara TPS has to share the timelines for commencing of backfilling in pit 3.	Completed	
Fourth	20	Carry out desiltation of remaining quantity of ash discharged in Rihand reservoir by Anpara TPP. Desilted ash disposed in low lying areas to be stabilized with soil cover and grass/ green belt . Progress to be updated on the website on monthly basis.	Govt. of U.P., Anpara and Obra TPP, UPRVUNL	UPPCB: Directed M/s Obra & M/s Anpara TPP to submit the current status/progress of desilting of ash from Rihand River & Rihand Reservoir respectively and for stabilization of desilted ash disposed in low lying areas with soil cover and grass/ green belt vide letter dt. 20.09.2023. Anpara TPP: An amount of 2,06,540.944 m3 visible ash Anpara TPP from side pocket of Rihand Reservoir has been removed and filled in low lying areas. Stabilization of ash in low lying area with soil cover has been completed and plantation work is in progress . Obra TPP: Total 58000 CuM ash is desilted from Renu river. Total ash removal work was completed by 31.05.2023. Desilted ash has been disposed in low lying areas in Obra Sec 2 & 3 and stabilized with soil cover. Above that Miyawaki plantation has been done.	In-Process	Same as MoM 3/17 and 3/18
Fourth	21	All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd and 3rd meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.	Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation	> Updated status of action taken on decisions of 1st, 2nd, and 3rd meetings have been sought from the stakeholders in a uniform format, and the same has been compiled (attached).	In-Process	Regular activity
Fifth	1	Effective implementation of the provisions of Ash Utilization Notification, 2021 for mandatory 100% utilisation of ash by TPPs must be ensured. Status in this regard may be presented in the next Mission meeting.	Ministry of Power and CEA	> “Guidelines on Design, Construction, O&M and Annual Certification of Coal Ash Ponds/Dykes” - Published by CEA & CPCB and it is available at both CPCB and CEA website. > CPCB has been informed about the changes required in the coal ash portal as it is the only window to look through at TPPs ash disposal performance. > Recently a Joint meeting of CEA, with CPCB and NTPC chaired by the Member (Thermal) CEA, advising CPCB to engage professional IT solutions agency for the upkeep of the portal.	In-Process	Regular activity
Fifth	2	Details regarding total volume of mine voids and quantum of ash that can be utilised and quantum of ash that has been utilised so far in mine void filling and mixing of ash in OB dumps along with the list of mines approaching for closure of in 3-5 years may be shared.	Ministry of Coal and Ministry of Mines	NCL : As per the present scenario and available coal reserves in the mines, no mine of NCL will be closed in next 3-5 years. Details of available mines already provided to allocation. MoC has agreed to explore more mines to be closed in nearby future. Ministry of Mines on 12.05.2023 & 23.05.2023 shared the list of 207 non-coal mines: 82 abandoned mines: list shared earlier, 56 mines: surrendered to State Govt., 57 mines: Part surrendered, Pits of 12 working mines: available for backfilling with fly ash. Regional Controllers have been directed to identify working mines.	In-Process	Regular activity. Same as MoM 2/6, 3/2 and 4/5

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Fifth	3	Stipulation of specific provisions in Mine Closure Plan for enabling activities of backfilling of ash in available/ remaining mine void and mixing it with OB dumps.	Ministry of Mines and Ministry of Coal	MOC: SOP has been made regarding specific provisions in Mine Closure Plan for enabling activities of backfilling of ash in available/ remaining mine void and mixing it with OB dumps. MOM: The matter is a safety-related issue. Therefore, stipulation of specific provisions in Final Mine Closure for enabling activities of backfilling of ash in available/remaining mine voids and mixing it with OB dumps may be considered subject to favourable recommendations of the scientific study carried out as per DGMS (Tech) circular No. 3 dated 16.01.2020 in respect of coal mines	Completed	
Fifth	4	Completion of feasibility study to assess the area/volume available for ash backfilling and mixing of ash in with OB of NCL mines at Nigahi operational mine by CIMFR within given timeframe. Findings of feasibility study of Nigahi operational mine to be presented during the next meeting of the Mission.	Ministry of Coal and NCL	> CSIR-CIMFR, Dhanbad has been requested to expedite the study of Nigahi. > CSIR-CIMFR, Dhanbad will present the findings of feasibility study of Nigahi mine till date in next meeting of the Fly Ash Mission. > The timeline of feasibility study along with the reason of field trial was not possible during monsoon season, submitted by CIMFR-Dhanbad through email dt 20.07.2023. > The feasibility for backfilling of fly ash and mixing of ash in OB dumps in operating mines of NCL shall be assessed on basis of CIMFR report for the ongoing study at Nigahi OCP.	In-Process	September 2024 Same as 2/5, 3/20, and 4/7
Fifth	5	NCL to make a presentation in the next meeting of the Mission regarding action plan and status of mine closure in terms of reclamation and restoration of biodiversity for the abandoned mines.	NCL	The presentation was made by NCL before the Mission during its 6th meeting.	Completed	
Fifth	6	Geo-tagging of Thermal Power Plants and Geo-tagging of mine voids may be undertaken.	Ministry of Power and Coal	Geo-tagging of Thermal Power Plants and mine voids is a planned feature of Ash Portal which will be available after launch of the updated Ash Portal by the IT Division, CPCB.	In-Process	
Fifth	7 (1)	SOP for allocation of mines in respect of safety and administrative related matters (both UG/OC, working as well as abandoned)	MoC and MoM	Required SOP has been made by MOC and MOM.	Completed	
Fifth	7 (2)	SOP for signing of MoU between identified mines and TPPs	MoC and MoM	Required SOP has been made by MOC and MOM.	Completed	
Fifth	7 (3)	SOP for carrying out feasibility studies for identification of mine voids or OB dumps mixing of ash with OB in operational mines.	MoC and MoM	Required SOP has been made by MOC and MOM.	Completed	
Fifth	7 (4)	SOP for carrying of scientific studies for backfilling of ash in mine voids of working U/G and Opencast mines.	MoC and MoM	Required SOP has been made by MOC and MOM.	Completed	
Fifth	8	M/o of Railways and Railway Board to be communicated for taking necessary air pollution control measures in respect of ECR (Mahadia) and WCR (Gajra Bahara, Gondawali and Bargawa) in Singrauli region of MP. Railway Board may be included as member of the Mission.	MoEF&CC	Chairman, Railway Board was requested to nominate an officer as a member of the Mission on 30.11.2023. MoEF&CC vide letter dated 17.01.2024 forwarded the recommendations of Mission w.r.t. air pollution control measures at ECR and WCR railway sidings.	Completed	
Fifth	9	Request of Hindalco TPP regarding allocation of abandoned stone quarry in Dala region may be forwarded to State Government and Committee for identification of mines under Ash Utilisation Notification, 2021.	MoEF&CC	Request of Hindalco TPP regarding allocation of abandoned stone quarry in Dala region was forwarded to PS, Dept. of Geology and Mining and Chairman, Committee for identification of mines on 21.12.2023. CPCB forwarded request to UPPCB for n.a.	Completed	

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Fifth	10	CEPI score estimated by MPPCB and UPPCB in the Singrauli and Sonbhadra regions may be re-validated by CPCB.	CPCB	CPCB has carried out CEPI re-validation exercise in February 2024. CEPI score of Singrauli was 60.88 (2024) as compared to 61.38 in 2022. CEPI score of Sonbhadra was 67.86 (2024) as compared to 67.88 in 2022. Both Singrauli and Sonbhadra region are under Severely Polluted Areas category.	Completed	
Fifth	11	An advisory may be issued to all SPCB/PCCs to circulate the latest technologies for adoption by Stone crushers for improved air pollution control measures.	CPCB	CPCB has published 'Environmental Guidelines for Stone Crushing Units' in July, 2023 to prevent fugitive dust emission and uploaded on CPCB's website. The guidelines were circulated to all the SPCBs/ PCCs.	Completed	
Fifth	12	Road map for value added products such as use of bottom ash/ fly ash as a substitute for sand, bottom ash use in concrete making in coastal infrastructure projects to be prepared in consultation with NTPC, National Test House and other stakeholders.	CPCB	Jadavpur University (JU) has been awarded study project on 15.03.2024 on value-added utilization of bottom ash generated from coal fired thermal power plants by developing innovative technologies for its use in concrete production as partial replacement of sand. The scheduled time limit of the study is 7 months. Out of 10 TPPs' sample collection, JU has collected samples from 5 TPPs and started analysis of these samples. Bottom ash samples from 3 more TPPs to be collected during 27 June 2024 to 06 July 2024.	Completed	
Fifth	13	Best available technologies/practices for ash based products to be prepared and made available on MoEFCC and CPCB website.	CPCB	Same as above.	Completed	
Fifth	14	Environmental compensation imposed on TPPs, coal mine, stone crushers in Singrauli and Sonbhadra to be monitored and action to be taken against non-compliance. Status in this regard may be shared in the next meeting.	CPCB, UPPCB and MPPCB	UPPCB: Environmental compensation of Rs. 13.473 cr. were imposed on 8 TPPs (Lanco Anpara, NTPC Rihandnagar, Shaktinagar, Anpara TPs, Obra TPS, Hindalco Ind. Aluminium re-processing unit, Hindalco-Al Division and Birla Carbon). Rs. 0.516 cr. have been deposited by 04 TPPs. Closure directions issued to 17 stone crushers out of 313 stone crushers. Environmental compensation of Rs. 9.954 crores imposed on 05 NCL projects (Bina, Duddhichua, Kakri, Khadia, Krishnshila). Amount is yet to be deposited. NCL Bina project deposited Rs. 2 crores for illegal dumping of coal at railway siding at Krishnshila as per Supreme Court and NGT directions. MPPCB: NEERI was engaged to conduct a study on environmental damage caused due to fly ash breach in Sasan Mega Power Ltd. in year 2020. Environmental compensation of Rs. 75 crore was estimated. The report was further forwarded to IIT BHU for re-evaluation and is under review. The final report is yet to be submitted to MPPCB. Further, the Joint Committee has imposed environmental compensation on various TPPs, coal mines and railway sidings for non-compliances. Hon'ble Supreme Court has referred the case to the Hon'ble NGT for re-consideration.	Completed	

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Fifth	15	Recommendations of Joint Committee as mentioned in the directions of Hon'ble NGT(PB) O.A. 862/2022 vide Order dated 25.11.2022 to be shared with MPPCB and UPPCB for submitting the details of action taken report regarding its compliance and implementation. All respective industries, TPPs, mines/ stone crushers and railway sidings to ensure the compliance of the recommendation of Joint Committee and submit the compliance report to respective SPCBs.	CPCB, SPCBs and respective Industries/ stakeholders	UPPCB: UPPCB vide letter dated 18.10.2023, 13.12.2023 & 09.1.2024 has issued directions in compliance to recommendations of Joint Committee to control of pollution caused by ash transportation in accordance with Hon'ble NGT(PB) O.A. 862/2022 order dated 25.11.2022. These directions are mainly related to appropriate storage, handling and covered and moistured transportation of ash, ash dyke maintenance, control of fugitive emissions, ash dyke stability, tyre washing, etc. MPPCB: MPPCB has issued directions in compliance to commendations of Joint Committee to control of pollution caused by ash transportation in accordance with Hon'ble NGT(PB) O.A. 862/2022 order dated 25.11.2022. These directions are mainly related to proper handling and covered and moistured transportation of ash and coal, control of fugitive emissions, monitoring of environmentally sound transportation, etc.	In-Process	Regular activity
Fifth	16	Abandoned mines which are not needed by TPPs and those completed backfilling activities may prepare plans for reclamation and restoration of biodiversity as part of mine closure plan and compliance of environmental clearance. Reclamation activities may be carried out under the supervision of State Forest Department.	Dept. of Mines and Forest Dept., Govt. of MP and UP	MPPCB has issued appropriate directions in the matter to Dept. of Mines and Forest Dept., Govt. of MP vide letter dated 14.12.2023. A meeting was also conducted under the chairmanship of Chief Secretary, Dept. of Environment on 09.01.2024, wherein appropriate directions were issued to concerned depts. UP: Status not received.	In-Process	Regular activity
Fifth	17	Ambient air quality monitoring in and around thermal power plants, coal mines and stone crushers may be conducted and base line data set of the same seasons collected over the past two years may be analysed. Continuous evaluation of CEPI Score of Singrauli and Sonbhadra region and compilation of data may be carried out to assess the progress made in respect of control of air pollution.	State Govts. of U.P. and M.P., UPPCB and MPPCB, CPCB	UPPCB: In Sonbhadra region, ambient air quality was analysed to assess the impact of implementation measures by various TPPs. PM10 level has improved to 146.3 µg/m3 in 2023-24 (till Dec.) from 167.3 µg/m3 in 2022-23. AQI improved to 135 in 2023-24 (till Dec.) as compared to 141 in 2022-23. MPPCB: In Singrauli region, ambient air quality is analysed through CAAQMS/NAMP stations to assess the impact of implementation measures by various TPPs and coal mines. Ambient air quality monitoring reports for FY 2021-22 and 2022-23 were sent vide letter dated 11.01.2024 to CPCB for re-validation of CEPI score.	In-Process	Regular activity. Same as MoM 4/17
Fifth	18	Study on mixing of red mud with ash and its environmental aspects may be conducted and the results may be shared with CPCB.	State Govt. of M.P., MPPCB	Central Laboratory, Bhopal has completed the study on mixing of red mud with fly ash in Gorbi mine. Based on the study report, MPPCB has recommended not to proceed further with such exercise as it may cause leaching of heavy metals embedded in the red mud besides treating the acidic water of mine voids.	Completed	Same as MoM 2/17, 3/22, and 4/16
Fifth	19	Necessary directions shall be issued for covering the trucks with tarpaulin sheets for transportation of coal and ash by road and not to use thin LDPE sheets/ green net only to prevent spillage and fugitive emission of coal dust and fly ash during transportation.	UPPCB and MPPCB	UPPCB and MPPCB have issued directions to TPPs to ensure covering the trucks with thick tarpaulin sheets, and other suitable measures for transportation of coal and ash by road to prevent spillage and fugitive emission of coal dust and fly ash during transportation.	Completed	

Status of compliance of decisions taken in the meetings of "Fly Ash Management and Utilization Mission"

Meeting No.	Decision Point	Decision taken	Concerned Agencies	Status of Action Taken / Compliance	Summary of Compliance	Time limit for compliance
Fifth	20	Identification of available low lying areas for disposal of ash by TPPs and monitoring of specific conditions stipulated in the consent granted for dumping of ash in it. Utilization of ash for filling allotted sites of low lying areas must be monitored through geo-tagging and/or Video monitoring. Ash disposed in low lying areas to be stabilized with soil cover and grass/ green belt.	All TPPs, UPPCB and MPPCB	UPPCB: Consent-to-Operate granted to 11 units for disposal of ash in low-lying areas. 38,56,784.05 MT ash have been disposed so far in low lying areas. MPPCB: Consent/permission has been obtained by TPPs in the State for disposal of ash in low-lying areas/abandoned mines in 67 areas of about 754.24 hectares area in which 221.76 LMT ash can be disposed of. 22 areas have been reclaimed with ash disposal on which plantation / parks/ other projects have been developed. Besides, consent to establish has been granted for disposal of ash in 22 low lying areas/mines.	In-Process	Regular activity
Fifth	21	Commencement of backfilling of ash in mine void of allotted Gorbi pit no. 3 by Anpara TPS by December, 2023. Progress in this regard may be shared with the concerned SPCB and CPCB.	Anpara TPP, UPRVUNL, UPPCB	Anpara TPS, UPRVUNL has sought permission from District Administration in Singrauli, M.P. regarding transportation of fly ash by road to the allotted Pit-3 of Gorbi mine for backfilling activities.	Select	
Fifth	22	All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd, 3rd and 4th meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.	Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)	> Updated status of action taken on decisions of 1st, 2nd, and 3rd meetings have been sought from the stakeholders in a uniform format, and the same has been compiled (attached).	In-Process	Regular activity

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
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 decanted ash pond water from OFL was for short period during monsoon period due to excessive rain. At present there is no discharge in to Rihand reservoir. NTPC Shakti Nagar have taken short-term and long-term remedial actions which are as under: Short-term: Additional pipe line to increase AWRS flow by 500 m3/hr has been installed. A Sump pit alongwith pump & line commissioned to re-circulate seepage if any. Long-term: Augmentation of AWRS capacity by installing another pump (2000 m3/hr capacity)	In-Process	March 2025 (Extended from July 2023)	UPPCB
		Relocation of the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter	OCEMS is working in NTPC Singrauli. Sampling is being done from ID Fan outlet as Chimney do not have landing platform. Provision of sampling from Chimney in Online Continuous Emission Monitoring System (OCEMS) will be installed along with FGD installation for obtaining iso-kinetic sample.	In-Process	December 2026 (As per FGD Timeline)	UPPCB/CPCB
		Completion of the installation of the third CAAQMS	Completed	Completed		UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Completed	Completed		UPPCB/CPCB
		Submission of a time-bound action plan for 100% fly ash utilization	Action plan submitted	Completed		UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	In progress. All three Chimneys construction has been completed. FGD work in progress. Civil: 89% completed. Mech. Work: 48% completed. Balance work in progress.	In-Process	December 2026 (As per FGD Timeline)	UPPCB/CPCB
		Treatment of the MSW generated from their residential colony	01. MSW generated from residential colony being segregated & collected through special motorized vehicle in a segregated manner. 02. Biodegradable waste is being processed in bio-methanation plant (Capacity 250 kg/day). Station has also awarded the contract for constructing permanent MSW facility with segregation & composting of domestic waste. Work to be started. 03. Non-biodegradable waste is being sent to registered recyclers.	In-Process	March 2024 (Extended from October 2023)	Municipal Corporation
		Undertake immediate measures to control fugitive emission in ash dyke area	Regular water sprinkling is being done to control fugitive dust in the dyke area. In addition to the above, a truck mounted FOG cannon is under award.	Completed	January' 2024	UPPCB
2	M/s NTPC Rihand Super Thermal Power (Power	Imposition and payment of environmental compensation (EC) of Rs 27,60,000/- for discharging ash pond overflow water into the Rihand reservoir	Ash pond overflow is being recycled through AWRS. Discharge observed was due to disturbance in system for a short period which was controlled and compliance of the same was submitted. Hon'ble Supreme Court referred the case to Hon'ble NGT. Case to be listed for re-consideration.	Completed		UPPCB/CPCB
		Connection of CAAQMS to the CPCB/SPCB server	Completed	Completed		UPPCB/CPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
	Plant)	Submission of a time-bound action plan for 100% fly ash utilization	Completed	Completed		UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	Civil and mechanical works for installation of FGD in all units are in progress in full swing. Stage - I: 42% Civil works completed. 48% of materials received at site for mechanical fabrication works. 27% Mechanical fabrication work completed. Stage - II & III: 85% Civil works completed; 35% mechanical works completed.	In-Process	December 2026 (As per FGD Timeline)	UPPCB/CPCB
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	Completed		MPPCB
		Explore possibilities for the construction of Ash mounds and submission of progress from time to time	Not applicable.	Select	Not applicable	MPPCB
		Conduct environmental damage assessment studies with CSIR-NEERI due to fly ash breach.	NTPC Vindhyachal : Study completed and report submitted to MPPCB and Oversight Committee. As per recommendation of NEERI study measure like Repair of OFL, Removal of spilled ash from land & drains are completed.	Completed		MPPCB
4	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 meters have been installed & Commissioned.	Completed		UPPCB
		Entrapment of wastewater discharge containing ash into the Rihand reservoir through the drain at power house area	Installation of ETP of 30 MLD capacity for Anpara A & B has been completed and treated water used in ash slurry and part of treated effluent is being used for horticulture.	Completed	Completed	UPPCB
		Submission of explanation for not achieving ZLD in ETP & STP	Anpara A & B are more than 25 years old and there were no provisions for ETP & STP. Domestic effluent in the Anpara TPS colony & CISF colony are being treated in existing STP of 4.8 MLD Capacity and treated wastewater from the existing STP is connected to the Ash Slurry Pit for reuse. Part of treated sewage is being reused for horticulture. D-TPS- Domestic effluent is being treated through STP-Plant (120-KLD) and being used for horticulture. All the plant effluent are connected to ETP and properly treated within norms and recycled and used at Ash Handling Plant & Coal Handling Plant as well for horticulture. DTPS has achieved ZLD. A & B-TPS- Domestic effluent inside Power Plant is of very low magnitude i.e. less (0.0250 MLD) and stabilized through septic tanks and soak pit. No domestic effluent from Plant area is discharged outside the premises or through storm drains. ETP of 30 MLD capacity has become operational. Treated water is used in ash slurry and part of treated effluent is being used for horticulture.	Completed	Completed	UPPCB
		Submission of a time-bound action plan for achieving ZLD	STP and ETP has been installed and in operational.	Completed	Completed	UPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Removal of deposited fly ash on the surface of the Rihand reservoir in time-bound manner	Anpara TPP has removed 206540.944 CuM quantity of visible ash from side pocket of Rihand reservoir before 26th July, 2023. The ash removed from Rihand reservoir has been filled in low lying area and stabilized with soil cover simultaneously. Removal of visible ash from side pocket of Rihand reservoir is under progress. Work is likely to be completed before 5th July, 2024.	In-Process	5th July 2024	UPPCB
		Submission of time-bound action plan for 100% fly ash utilization	Action plan has been submitted.	Completed		UPPCB
		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).	Completed		UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	Installation of FGD in Unit D under progress. Chimney construction has been completed. FGD system work in progress. Civil work: 53% completed. Electromechanical work: 2% Tender for installation of FGD in B-TPS has been floated/uploaded & scheduled Part -I Opening date is 13.06.2024.	In-Process	December 2025 (As per FGD Timeline)	UPPCB/CPCB
		Upgradation of Anpara TPP ash dyke so as to prevent discharge of water from Morcha Nala into the ash dyke.	LOI has been issued to M/s CWPRS, Pune for study of diversion of Morcha Nala and work is likely to be completed upto July, 2024.	In-Process		Concerned Irrigation Dept./UPPCB
		Establishment of ZLD. UPPCB to levy EC till ZLD is in place.	STP and ETP has been installed and is operational.	Completed	Completed	UPPCB
		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 was scheduled on 05.07.2023. Now the case has been disposed off by Hon'ble Supreme Court.	Completed	Completed	UPPCB/CPCB
5	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	AWRS capacity has been increased and has been made functional for recycling of ash water. There is no ash slurry flow in river Renu.	Completed		UPPCB
		Restoration of the river bed areas on which a huge deposition of ash is visible in time-bound manner	Total 58000 cum deposited Ash has been completely removed from the banks of Renu River through LOI No. 212/CMD-VI/OTPS/eT-11/AshRemoval /21-22 dated 04.08.2021 and 636/CMD-VI/OTPS/eT-08/22-23 dated 21.02.2023. Total ash removal work was completed by 31.05.2023. Desilted ash has been disposed in low lying areas in Obra Sec 2 & 3 and stabilized with soil cover. Above that Miyawaki plantation has been done.	Completed	Completed (Timeline - June 2023)	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.	Completed		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. ETP and STP are having effective effluent collection.	Completed		UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Already connected. Data is available on CPCB/SPCB server.	Completed		UPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progess	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Submission of time-bound action plan for 100% fly ash utilization	Action plan submitted.	Completed		UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	Construction work for installation of FGD System started on 15.03.2024. Currently the physical progress is 12.65%. Construction of electrical building, SBC storage building, Equipment building is in progress. Expected date of commissioning of FGD system for Unit # 9 is Jan 2025 and all 5 units of BTPS, Obra is May 2025.	In-Process	May 2025	UPPCB/CPCB
		Adoption of scientific approach for treatment and disposal of MSW	The work of segregation of dry & wet garbage is now in progress vide LOI No. 216 dated 27.02.2024 and the work is being executed accordingly. Work of conversion of wet biodegradable waste into compost is in process against LOI No. 312 dt. 03.04.2023 to M/s Shashank Enterprises. Work is under process. Work of Construction of MRF (Material Recycling Facility) by Obra TPS is in progress against LOI No.- 310 dt. 03.04.2023 through M/s OM Sai Construction. Construction of building such as control room, shed etc. has been completed. Procurement of machinery is under process and will be completed by July 2024.	In-Process	July 2024 (Extended from June 2023)	UPPCB
		Installation of flow meters for measuring amount of ash slurry discharged and water recycled through AWRS	Flow meters installed and is in operation.	Completed		UPPCB
		Installation of flow meters for measurement of amount of wastewater treated through the ETP and STP	Flow meters installed and is in operation.	Completed		UPPCB
		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.	Completed		
		Establishment of ZLD. UPPCB to levy EC till ZLD is in place.	ETP & STP are operational.	Completed	Completed	UPPCB
		Imposition and payment of EC of Rs. 01,36,80,000/- for discharging untreated wastewater and ash slurry into River Renu	Civil Appeal has been filed (4525/2022) against the order of Hon NGT in Hon. Supreme court. The final judgement has been issued by Hon'ble Supreme Court on date 05.07.2023 and the case has been disposed off.	Completed	Completed	UPPCB/CPCB
6	M/s Anpara 'C' Lanco Anpara Power Pvt. Ltd.	Action to avoid any kind of accident in pipeline carrying ash slurry near the Dibulganj area	As required the immediate action has been taken and the RCC Box Culvert above the ash pipeline has been constructed with adequate strength in such a manner that in future the ash pipe line can be saved.	Completed		UPPCB
		Installation of flow meters to measure the amount of ash slurry discharged into the ash pond and the amount of water recovered and recycled from it	The flow meters on all three lines carrying ash slurry have already been provided since 5.12.2021 and is operational. At recovery line of the Ash Water Recovery System (AWRS) the flow meter has already been provided since year 2017.	Completed		UPPCB
		Submission of a time-bound action plan for 100% fly ash utilization	Action plan has already been submitted.	Completed		UPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
7	M/s Renusagar Thermal Power Plant	Submission of a time-bound action plan for the installation of the 3rd CAAQMS	LANPL has already been installed the third CAAQMS.	Completed		UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	The all three CAAQMS are Connected with CPCB Server.	Completed		UPPCB/CPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	The tender document floated for EPC bidding purpose. All the bids received against the tender. Technical Evaluation already completed. Commercial bid opening and negotiations are under progress.	In-Process	December 2025 (As per FGD Timeline)	UPPCB/CPCB
		Installation of sludge drying beds in the existing ETP	Installation of 02 No. Filter Press (of modern technology sludge drying beds) has been completed. All parts of the machine are working satisfactorily. Commissioning of the Filter Press has been completed in May 2023. Filter clothes material got damaged and we have procured new Filter Clothes. It is Operational since Dec 2023.	Completed	Completed	UPPCB/CPCB
		Relocation of 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 Dec 2024. For rest boilers we are in process of doing the feasibility study for installation of OCEMS as per CPCB guidelines. However, OCEMS has already been installed on the ducts connecting to the stacks and it is connected with CPCB server. <i>OC's Comments : As informed by the unit for achieving isokinetic sampling for monitoring particulate matter relocation of 05 OCEMS has been completed and the other 05 are yet to be done. The unit is not taking any proactive measures to complete the work in a time-bound manner.</i>	In-Process	December 2024 (Extended from January 2023)	UPPCB/CPCB
		Submission of time bound action plan to relocate the existing CAAQMS	Relocated the existing 01 No. CAAQMS has been completed in March 2022. This is relocated near Civil Office(Colony) Data is linked with CPCB/SPCB server.	Completed		UPPCB
		Completion of installation of another 02 CAAQMS	02 nos. of CAAQMS machine have been installed & commissioned at Renusagar premises at the locations: Near Gurudwara(Colony) - N17/9 Near D&E Buildings.	Completed		UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	These are connected with CPCB/SPCB server.	Completed	Completed	UPPCB/CPCB
		Submission of time-bound action plan for 100% fly ash utilization	The fly ash utilization during in FY2022-23 & FY2023-24 is 122.89 % & 114.67% respectively. The Fly ash utilization the period of April 2024 to May 2024 is 140 %. Ash is being disposed of regularly to cement companies, low lying areas & bricks making units etc.	Completed		UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	Erection work is in progress. Installation is expected to be completed by March 2025	In-Process	March' 2025	UPPCB/CPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Adoption of 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. <i>OC's Comments : The Unit has in-house facility for disposal of MSW. Door to Door segregated Dry & Wet Waste collected by Unit. However, proper MSW facility need to established as per MSW, Rule, 2016..</i>	Completed		Municipal Corporation
		Undertake corrective measures to control the fugitive emissions from raw material storage and fly ash transportation areas	Adequate actions are regularly undertaken in CHP yard area to keep the fugitive emission to the minimum level. 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. Additional mechanical type water sprinkling systems installed along road side and are operational. <i>OC's Comments : Very huge fugitive dust was observed in the coal storage area during the recent visit of the committee. The installed water sprinkling system is inefficient to achieve the desired result.</i>	Completed		UPPCB
		Submission of explanation for dumping the fly ash in haphazard manner	Ash disposed in haphazard manner has been reclaimed and area has been cleaned. Now area is neat and clean.	Completed		UPPCB
		Undertake immediate action for proper disposal of fly ash	Same as above.	Completed		UPPCB
		Establishment of ZLD. UPPCB to levy EC till ZLD is in place.	M/s Renusagar Power has already achieved Zero Liquid Status long ago it is a ZLD unit. We have complete treatment, recycling and reuse of waste water generated to ETP, STP and AWRS (Ash water Recovery System)	Completed		UPPCB
		Imposition and payment of EC of Rs 27,60,000/- for causing the air pollution through burning of MSW and inadequate measures taken to control the fugitive emissions from raw material handling and fly ash transportation areas	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. Fugitive emissions has been controlled by operating by rain gun, water sprinklers in CHP area. We ensure Fly ash Transportation in closed Bulklers. Civil appeal has filed (4525/2022) against the order of Hon'ble NGT in Hon'ble Supreme Court. Hearing on IA for stay application is scheduled on January 17, 2023. Hon'ble Supreme Court vide order NO. 3856/2022 dated July 05, 2023 has disposed of the afforsiad appeal.	Completed		UPPCB/CPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
8	Aluminum Smelter: M/s HINDALCO Industries Ltd, Renukoot, Sonbhadra	Take corrective measures to achieve the ZLD	ZLD status achieved since November 23, 2021. <i>OC's Comments : 1) As prescribed in the consent condition issued by UPPCB, the unit was instructed to achieve ZLD for industrial effluent and reuse of domestic effluent. In no case, the unit is allowed to discharge effluent outside the premises. Similarly, the ZLD condition has also been imposed through the environmental clearance issued by MoEF&CC on 02.12.2011. 2) Though the unit has achieved ZLD for process effluent, yet to achieve ZLD for domestic effluent. The unit has installed STP for the treatment of 24 MLD sewage generated from the residential colony. However only 12 MLD sewage is been treated and partial quantity is being recycled. The unit is directly discharging some of the sewage generated from their residential colony without any treatment into the natural drain.</i>	In-Process	-	UPPCB
		Ensure environment friendly disposal for the huge quantity of bottom ash stored in open inside the plant premises	Total of approx. 4.87 Lacs MT of stored bottom ash has been utilized for developing low-lying areas. Currently, there is no bottom ash stored inside the plant premises.	Completed	-	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.	Completed	Completed (Timeline - March 2023)	Municipal Corporation
		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. <i>OC's Comments : Committee observed that the unit is very causal on the part of red mud Management (handling, storage, and transportation). They have still not procured/having sufficient mist gun/ fog cannons, specific water spraying system for dust suppression specially in the red mud dumping areas. Green belt (trees, shrubs, green cover) development in an around the red mud area is non-significant. It has been found that the some of the area of the red mud site is converted to garden by using ample amount of earthen soil. However, most of the red mud storage area is kept open without any dust suppression system, due to which huge airborne dust is generated during vehicular movement and during windy condition.</i>	In-Process	-	UPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Establishment of ZLD. UPPCB to levy EC till ZLD is in place.	ZLD for plant has been established and sustaining since November 23, 2021. A copy of communication to this effect given to RO, UPPCB vide dated 23.11.2021. <i>QC's Comments : Though the unit has achieved ZLD for process effluent, yet to achieve ZLD for domestic effluent.</i>	Completed		UPPCB
		Imposition of and payment EC of Rs. 1,36,80,000/- for not achieving the prescribed ZLD condition and discharging untreated sewage into the environment (Responsibility: CPCB/SPCB)	ZLD for plant has been established and sustaining since November 23, 2021. A copy of communication to this effect given to RO, UPPCB vide dated 23.11.2021. Civil appeal has filed (4525/2022) against the order of Hon'ble NGT in Hon'ble Supreme Court. Hearing on IA for stay application is scheduled on January 17, 2023. <i>Hon'ble Supreme Court vide order NO. 3856/2022 dated July 05, 2023 has disposed of the afforsiad appeal.</i>	Completed	Completed	UPPCB/CPCB
9	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	At present, there is no fire in coal stock yard at Bina project. However, to meet the above exigency following measures are there at the Bina project:- 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 near abandoned coal stock yard 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. In addition to this, 1 no. of fixed fog canon along with pipeline and pumping arrangement has been provided near coal stock yard no.2 for control of fire.	Completed		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 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.	Completed		UPPCB

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Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	Compliance of fully tarpaulin covered trucks is being ensured at Bina Project. Random inspections are being carried out to report default transporters. Further stringent action will be taken against any default transporter. 1) It is ensured that trucks exiting Bina Mine are fully covered with tarpaulin only. Strict action will be taken against those who are found not using tarpaulin sheets for covering the trucks. 2) For fugitive emissions along the public road (Auri Mode-Shakti Nagar), the following measures are taken by Bina Project management: • 1 no. of road sweeping machine is working at Bina Project for mechanized sweeping. • Apart from mechanized sweeping, manual sweeping of the public roads is being done on daily basis. • 2 no. of truck mounted mist spray guns are working in Bina Project for further reduction in the fugitive dust emission.	In-Process	Regular activity	UPPCB
		Effective tyre washing facility for transport vehicles	Construction work of tyre washing facility has been completed and it is now operational.	Completed	Completed (Timeline - March 2023)	UPPCB
		Treatment and disposal of MSW generated in the residential colony	Proper treatment and disposal of MSW generated in residential colony is ensured at Bina Project colony, with facilities of dust dumping/ waste collection, segregation/ composting yard.	Completed	Completed	Municipal Corporation

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Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		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.	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 into this mine void. The last Six year overburden and coal production figure of NCL Bina Project are as follows: S. No. Year Coal Production(MTPA) Overburden Removal (Million m3) Stripping ratio 1. 2023-24 10.05 49.83 4.74 2. 2022-23 10.5 52.52 5.01 3. 2021-22 9.00 44.37 4.93 4. 2020-21 8.413 36.35 4.32 5. 2019-20 7.500 38.42 5.12 6. 2018-19 7.500 29.73 3.96 It is evident from above table, Bina Mine operates at a high stripping ratio (ratio of volume of waste rock to be removed per ton of coal). The constraints in fly ash filling in Bina mines are as follows: 1. Bina Mine is working with only internal dumping of the overburden. The external dump has already achieved their capacity as per maximum permissible	In-Process	September 2024 (Extended from December 2023)	UPPCB/CPCB
		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.	Completed		UPPCB/CPCB
		Regular operations of ETP	Continous operation of ETP is ensured.	Completed		UPPCB
10	M/s Northern Coalfields Limited (NCL) (NCL Dudhichuwa Project, Sonbhadra)	Utilization of the treated effluent to achieve zero discharge	Treated Effluent from ETP is effectively being used in Water sprinkling, Fire fighting and wahsing of HEMM and zero discharge is maintained. As per suggestion of OC, Study of maintenance and upgradation of Existing ETP by CMPDI is under process . Construction of Two no. of Bunds in Ballia Nallah to stop any discharge in Balia Nallah has been completed.	In-Process	December 2024	UPPCB
		Ensure that no treated/untreated effluent will be discharged into the Balia Nalla which finally meets the Rihand reservoir	Arrangements have been made to stop discharge of untreated water from mine into Ballia nallah except rainwater & surface water. Sumps have been provided to stop the discharge of water and cleaning of sumps done on yearly contract basis for controlling water seepage. Treated water from existing 30 MLD ETP is being reused for water sprinkling for dust suppression in mines to maximum extent possible for ensuring zero discharge. Study of maintenance and upgradation of Existing ETP by CMPDI is under process .Construction of Two no. of Bunds in Ballia Nallah to stop discharge in Balia Nallah has been completed.	In-Process	December 2024	UPPCB

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Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities	CCTV network has been provided for monitoring of production activities in the Project. CCTV network is utilized for monitoring of fugitive emissions. In case of appearance of fugitive emissions on CCTV, immediate action is taken.	Completed		UPPCB
		Strengthen the vigilance mechanism to identify the default transporters and take stringent action against them	Coal transportation through road despatch is allowed only if trucks are covered with tarpaulin. Vigilance Mechanism has been strengthen by posting of security guard round the clock at the exit check post and CCTV has also been installed at the exit check post to ensure the strict compliance.	In-Process	Regular activity	UPPCB
		Effective tire washing facility for transport vehicles	Work has been awarded for the construction of tyre washing facility at Dudhichua Project on 14.03.2024. 15 % Construction work has been completed and balance work is scheduled to be completed by 19.08.2024.	In-Process	August 2024 (Extended from May 2023)	UPPCB
		Treatment and disposal of MSW generated in the residential colony	Residential colony of Dudhichua lies in Singrauli Municipal limits of MP state. Door to Door collection of waste is being done and waste thus collected is segregated as Dry and Wet waste. Wet waste is converted to compost and Dry waste is handled by Singrauli Municipal Corporation.	Completed		Municipal Corporation
		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	1. There is only one abandoned mine in NCL namely Gorbi OC where three voids are available. Out of three voids, NCL has already offered one void to NTPC-VSTPS and one for UPRVUNL for fly-ash filling through MoU signed on 03.01.2019. Approx. 30 to 40 million tons of fly ash will be accommodated into this mine void. Thereafter remaining one void may also be made available for fly ash filling. 2. Correspondence has also been done to DGMS to get instructions and permission for disposal of fly ash. 3. Work Order to CIMFR for "Feasibility study in utilizing fly ash in the running Nigahi mine of NCL in view of the recent Fly Ash Notification dated 31st December, 2021 through CSIR CIMFR, Dhanbad"., given on 10.01.2023., which will include Field Trial, which may pave way for dumping of fly ash in mines of NCL 4. As per the minutes dated 18-8-22 of the first meeting of the committee constituted under the Chairmanship of Chairman CPCB for identification of the mine for backfilling of mine voids with ash or mixing of ash with OB dump, a team of experts of CMPDI, CIMFR and representatives of CIL and SCCL shall examine the findings of studies already carried out for disposal of ash in operational coal mines by mixing with OB dump and give suggestions to facilitate ash disposal in operational mines and any studies that needs to be carried out for this purpose. Action plan will be submitted on the basis of recommendations of above mentioned study. Final Study Report by CIMFR is expected to be submitted by December`2024.	In-Process	December 2024 (Extended from December 2023)	UPPCB/CPCB

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Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Imposition and payment of EC of Rs. 1,36,80,000/- for constantly discharging untreated effluent into the Balia Nalla.	Period (01.08.2020 to 31.10.2021) for which fine has been imposed includes monsoon and other seasons. Water cannot be held in the mines during rains including monsoon and non-monsoon seasons concerning safety of men and machinery. Moreover sudden make of water due to groundwater surge is beyond control. This imposition of EC is on account untreated effluent into Ballia nalla. However water is being pumped to ETP and after due treatment is utilised for dust suppression, fire fighting and washing of HEMMs. <i>Hon'ble Supreme Court in Civil Appeal no. 3856/2022 and Supreme Court has set aside the order.</i>	Completed		UPPCB/CPCB
11	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	<i>Water treated from ETP is being utilised for industrial use (Sprinkling washing of CHP, Dumper, Doser, Dust Suppression etc). Excess is being dissipated to a big sedimentation pond utilizes for water harvesting system.</i>	Completed	Completed (Timeline - May 2023)	UPPCB
		Entrapment of seepage in the drain at mine water collection sump	Seepage has been arrested in the drain at mine water collection sump.	Completed		UPPCB
		Strengthening of 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. Notice has been given to all transporters and also displayed at conspicuous places that non-compliance shall be strictly lead to banning from Kakri Project. Transporters are complying with guidelines strictly.	In-Process	Regular activity	UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	Measures has been taken to control fugitive emission. Monitoring of fugitive emissions inside the mines is being done through CMPDIL fortnightly, and the report of the same is being communicated to UPPCB quarterly. CCTV have been installed at strategic points in mine and monitoring is being done through them, however monitoring of fugitive emissions throughout the mines through CCTV is not possible.	In-Process		UPPCB
		Effective tyre washing facility for transport vehicles	Proposal of tyre washing facility at Kakri Project is under process.	In-Process	Sep 2024 (Extended from May 2023)	UPPCB
		Treatment and disposal of MSW generated in the residential colony	Work has been started.	Completed		Municipal Corporation
		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.	Will be complied as directed by NCL-HQ, Environment department after completion of scientific study.	In-Process	Mar 2024 (Extended from Dec 2023)	UPPCB/CPCB
		Open the site of CAAQMS from all the direction	Trees in the close vicinity of CAAQMS are trimmed periodically to minimize hindrance for horizontal movement of wind.	Completed		UPPCB/CPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Imposition and payment of EC of Rs. 27,60,000/- for discharging untreated/treated effluent into the Rihand Reservoir	With reference to above subject, an EC of ₹ 27,60,000/- has been imposed on Kakri Project NCL for 'Discharging of untreated/ treated water in the Rihand Reservoir'. Kakri Project put forward following points against the EC levied on the project for the above mentioned reason: - 1. In November 2021, at the time of the visit of NGT Oversight Committee, no treated or untreated water was being discharged by Kakri Project to Rihand Reservoir. Kakri Project would further reiterate the fact that except monsoon the treated water from ETP is being reused by the Project for washing and dust suppression; any surplus water from ETP is being sent to Siltation pond near mine barrier and other low lying areas near mine and does not reach Rihand Reservoir, the same has already been inspected by NGT Oversight Committee on their previous visits. 2. Further, neither detailed violation was communicated or any clarification sought from the Project by the NGT Oversight Committee/SPCB on the above mentioned transgression for which EC of ₹ 27,60,000/- has been fined. Hon'ble Supreme Court in Civil Appeal no. 3856/2022 and Supreme Court has set aside the order.	Completed		UPPCB/CPCB
12	M/s Northern Coalfields Limited (NCL) (NCL Khadia Project, Sonbhadra)	Continuous operations of the ETP	Continuous operation of ETP is being ensured.	Completed		UPPCB
		Ensure that no treated/untreated effluent will be discharged in to the environment	Additional provision for feeding raw water into ETP has been provided to ensure that untreated water reaches ETP for treatment. Currently no treated / untreated water is being discharged outside mine premises. Also, Two new Siltation ponds have been created to further arrest silt from surface run off flowing outside.	Completed		UPPCB
		Regular operation of the water spraying system for effective control of fugitive dust emissions	Multi approach water sprinkling is in place at Khadia Project:- • Water sprinkling on haul roads is being done through departmental and contractual water tankers. • Fixed water sprinklers have been installed near coal yard. • Regular sprinkling is being ensured in CHP at all transfer points for control of dust emissions. • Four Fixed Fog cannon has been installed near coal yards. • Two nos. of truck mounted fog cannon system (one departmental and one hired) are operational.	Completed		UPPCB
		Strengthening of 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.	In-Process	Regular activity	UPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Effective tyre washing facility for transport vehicles	For the purpose of installation of tyre washing facility, Khadia Project has floated tenders 03 times. In first 02 tenders, no bidder was technically qualified and the third bid, only a single bidder was qualified but had been banned by M/s GSRTC, Gujrat and hence, Khadia project had to cancel the tender. <i>The installation of tyre washing system is currently under tendering process.</i>	In-Process	December 2024 (Extended from December 2023)	UPPCB
		Proper treatment and disposal of MSW generated in the residential colony	MSW site has been completed and wastes are being disposed as per Solid Waste Management Rules, 2016.	Completed	Completed (Timeline - July 2023)	Municipal Corporation
		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	1. 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. Apart from this, an MoU has also been signed between NCL and Anpara Thermal Power Station for filling of fly ash in Pit-3 of abandoned mine of Gorbi. 2. Mine is working with HEMM and there is high traffic density in the mines including dump area. 3. Khadia Project is working on on high stripping ration of around 3.52 cum of coal per tonne of coal production. Mixing and dumping of fly ash in such huge volume of overburden is impractical and unsafe. In this regard, a study has been done for Khadia OCP mine through an Institute of National repute viz. IIT(BHU). As per results of the technical study: "It is technically not feasible to dump the 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." 4. Further field study at NCL in Nigahi mine related to Backfilling through Fly Ash and its stability analysis in running mine is being done through CSIR-CIMFR, Dhanbad. A fly ash mixed dump has been created Nigahi Area for study purpose, however, impact of monsoon is yet to assessed and final outcome of the study is likely to be given by CSIR-CIMFR after monsoon period. Action plan will be submitted on the basis of recommendations of above mentioned study.	In-Process	October 2024 (Extended from December 2023)	UPPCB/CPCB
		Ensure that the site of CAAQMS is open from all the direction	It is being ensured that CAAQMS is free from obstruction in its surroundings.	Completed		UPPCB
		Imposition and payment of EC of Rs. 27,60,000/- for discharging untreated/treated effluent into the Rihand Reservoir	The fine of Rs 27,60,000 was recommended in the order dated 18.01.2022 in the O.A. no of 164/2018. However the same order was considered in Hon'ble Supreme Court in Civil Appeal no. 3856/2022 and Supreme Court has set aside the order.	Completed	Completed	UPPCB/CPCB
13	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	At present 71 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.	Completed	-	UPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Strengthening of 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. Strict action are being taken against the uncovered trucks if found. The despatch of coal from Krishnashila project through road mode is very less. Further It is being ensured that trucks exiting Krishnashila Mine are fully covered with tarpaulin sheets only. Strict action is taken against the those who are not found using tarpaulin for covering of trucks. Construction of Tyre washing facility has been completed jointly for Bina & Krishnashila projects. Domestic roading sweeping machine is also being used for mecahnised sweeping of road.	In-Process	Regular activity	UPPCB
		Effective tyre washing facility for transport vehicles	Construction of Tyre washing facility has been completed jointly for Bina & Krishnashila projects.	Completed	Completed (Timeline - March 2023)	UPPCB
		Proper treatment and disposal of MSW generated in their residential colony	For the management of solid waste for Krishnashila B, C & D type quarters in Bina Colony, door to door collection, segregation and disposal of solid waste is already being done. A separate composting facility has been developed for disposal of organic solid waste.	Completed	Completed (Timeline - June 2023)	Municipal Corporation
		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 (Pit no. 1) of abandoned/closed Gorbi Mine to NTPC-Vindhyachal (VSTPP). MoU between NCL and NTPC-VSTPS has been done on 03.01.2019. Approx. 30 to 40 Million tons of fly ash will be accommodated in to this mine void. Another pit (pit no. 2) of abandoned/closed Gorbi Mine has been provided to NTPC-VSTPS & NTPC- SSTPS, against which MoU has been signed between NCL and NTPC-VSTPS on 06.06.2024. This pit can accomodate over 5 Million tons of fly ash. Similarly another pit (Pit No. 3) has been provided to UPRVUNL-ATPS as per MoU executed on 15.07.2023. This will accomodate over 16 Million tons of flyash. At present, Krishnashila mine is a working mine. Further mine operates at a high stripping ratio of 3 and above (ratio of volume of waste rock/OB to be removed per ton of coal). There are following constraints in fly ash filling in operating mines: 1. Krishnashila 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. Mine is working with HEMM and there is high traffic density in the mines including dump area. 3. The Krishnashila OCP has limited life and requires additional space to accommodate OB of more than 100 MCum as per PR/Mining Plan. 4. In this regard, a study has been done for NCL Bina mine through an Institute of National repute viz. IIT(BHU). As per results of the technical study: "It is technically not feasible to dump the fly ash in Mine dump due to geo mining conditions, high stripping ratio, and huge rate of OB removal and instability of dump during rainy season in present condition." The same conditions implies on Krishnashila OCP.	In-Process	October 2024 (Extended from December 2023)	UPPCB/CPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
14	M/s Grasim Industries Limited Chemical Division, Renukoot, Sonbhadra	Submission of the clarification regarding the discharge of chemically contaminated effluent into the drain	Non-Justifiable Allegation - 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. - 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.	Completed		UPPCB
		Ensure environment friendly disposal of all the brine sludge stored in open pit	Status: Fully Complied - Disposal of membrane cell plant brine sludge, was started since December'2019 to authorized TSDF at Kanpur, M/s Re-Sustainability Limited, [formerly known as Ramky Enviro Engineers Ltd] & M/s Bharath Oil & Waste Management Ltd. - The disposal process of legacy brine sludge has been completed as on date 31-07-2022. Intimation of this has been given by the Grasim-Renukoot Unit vide letter dated 01-08-2022 to the Regional Officer & Member Secretary, U.P.P.C.B. - The brine sludge generated on daily basis shall be stored in intermittent storage site, developed as per CPCB Guidelines and regularly disposed through TSDF-Kanpur, under contract agreement. - At present no legacy brine sludge is stored inside the plant premises.	Completed		UPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Completion of the remediation activities in the time bound manner of the area wherein the ash has been dumped	Status: Fully 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 GOO0691/Miyawaki/2021 dated 22.09.2021, Grasim Unit has completed Miyawaki Plantation at its Fly Ash Reclamation site. Successful reclamation has also been affirmed by the authorities. - 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. - 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. - Intimation through e-mail dated 14.11.2022 along with and Hard Copy, has been sent to MoEFC&CC, Hazardous Substances Management Division, New Delhi.	Completed		UPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		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 - 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 stabilized 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, 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,	In-Process		UPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
15	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	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.	Completed		UPPCB
16	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. Suggested to carry out regular maintenance of the slope due to erosion during monsoon season. 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.	Completed		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.	Completed		MPPCB
17	Mahan Energen Ltd. Singrauli, MP.	Submission of time-bound action plan for 100% fly ash utilization	Detailed Action plan already submitted to MPPCB , Fly Ash will be utilized in Cement Plant, Brick Plant and filling of low lying area	Completed		MPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
18	M/s Sasan Mega Power Ltd.	Ash cleaning work from Goiwahai drain within 1 month .	The site restoration job including cleaning of Goiwahai Drain is already completed and a letter informing about the compliance to the directives was submitted to MPPCB on 31st Oct, 2020 and NGT Committee on 28th Dec 2020. Further additional preventive measures were taken during the raising of our existing ash dyke like provision of earthen bunds to prevent any ash escape, proper compaction of ash and soil, immediate soil covering of area completed with ash hearting, construction of slope and toe drains to channelize the rain water, providing rock toe at the base and grass turfing at the slope to ensure no fly ash escape into the nallah. Further, the detailed report along with photographs and complete videography of Goiwahia, Thargatta and Garra drain has been submitted to MPPCB vide letter No. SPL/ EMG/ 2023-24/07 dated 10.05.2023 and e-mailed on 11.05.2023 and also updated to MPPCB time to time as directions received. <i>As advised by Oversight Committee during site visit dated 04.01.24, some muddy deposits were observed below culvert near SPL's recovery gate is removed immediately and communicated along with photographs .</i>	Completed	Completed	Concerned Irrigation Dept. and SPCB
		Take control measures to prevent fly ash discharge to Goiwahai drain and finally the Rihand River	Same as above.	Completed	Completed	Concerned Irrigation Dept. and SPCB
		Grievance redressal of affected people near Tola Badi village, Harrahawa village and other affected villages along the Goiwahai drain	All the earlier grievances are settled as per the recommendations of District administration and also additional compensation were paid. Further, grievance redressal mechanism is established to address the complaints and grievances of stake holders through coordination with district administration (Tehsildar/SDM) and village panchayat. Company's CSR team regularly visits the surrounding villages and genuine grievances, if any, are timely resolved.	Completed		MPPCB
		Obtain prior permission from MPPCB before any disposal of ash in the low lying areas	No disposal is being done in the low lying area. However, necessary permission from the SPCB shall be obtained in case the disposal is done in low lying area.	Completed		MPPCB
		Submission of time-bound action plan for 100% fly ash utilization	Action plan submitted	Completed		MPPCB
		Stability study of bunds created around the ash dykes/low lying areas periodically	Sasan Power Ltd. has appointed IIT-BHU to carry out ash dyke stability study. The detailed study has been conducted in July, 2020 and the report was submitted to your good office vide our letter dated 16.09.2020. In addition to this, the stability and strength of the ash dyke is being monitored annually by the IIT-BHU before the monsoon period. Pre Monsoon Inspection for stability and strength of the Ash Dyke for FY 22-23 and 23-24 were conducted in May, 2022 and June 2023 and the reports have already been submitted to MPPCB vide letters dated 12.07.2022 and 11.07.2023, respectively. For the year FY 2024-25 the study has already been conducted by IIT-BHU on 27th May 2024 and report is expected by 15th July 2024.	Completed	Completed	MPPCB

Fly Ash Management and Utilization Mission - Status of compliance of the action plan as per Hon'ble NGT's Judgement dated 18-01-2022						
Sl No.	Stakeholders	Action Plans	Status of compliance/progress	Summary of Compliance (Please select)	Timelines for Completion	Enforcement Agency/ Department
		Study by IIT-BHU regarding the impact on aquifers due to fly ash breach	The IIT-BHU has submitted the final report on "Hydrological Study in and around Sasan Power Limited" and copy of the said report is already submitted to MPPCB vide letter dated 22.04.2022.	Completed		MPPCB
		Conduct environmental damage assessment studies with CSIR-NEERI due to fly ash breach	NEERI was engaged for the said study on 21.04.2020. They visited the site from 22 – 26th Dec 2020. During the site visit NEERI carried out detailed site survey and collected the samples required for the study. As understood from NEERI, they have completed the analysis of total 89 samples which were taken during the first site visit (49 of water, 32 of soil, 05 of ash and 03 of crops/plants). They are in the process of collating and analyzing the results of the samples collected. All the above samples are analyzed for physicochemical properties and heavy metal characteristics. Another round of sampling was taken during last week of June 2021 and December, 2021 for consolidation and verification of the results obtained for samples collected during their previous site visit. We have received the draft report from NEERI and we are in process of review of the report, expected to be submitted by 30th Sep 2023. SPL has engaged institutes of repute namely NEERI, Nagpur and IIT – BHU. NEERI carried out monitoring, analysis and estimated the environmental damage compensation. Further IIT – BHU carried out the revalidation/ reevaluation of the assessment methodology and final calculations. The final report is under review and expected to be submitted by 15.02.2024. Environemtnal Damage Assessment Report is submitted at MPPCB vide letter No. GIL/EMG/2023-24/51 on 7th February, 2024	Completed	Completed on 07.02.2024	MPPCB

No.43012/13/2017-CPAM

Government of India

Ministry of Coal

Shastri Bhavan, New Delhi

Date : 22nd April, 2021

Office Memorandum

Subject:	List of UG mines and abandoned OC mines identified by CIL and SCCL for ash filling

The undersigned is directed to refer to the recommendations dated 01.03.2019 of Expert Committee constituted by NITI Aayog for best utilization of fly ash. One of the recommendations of the Expert Committee, pertaining to MoC was identification of mines for fly ash filling and periodic updation of the list by a Task Force constituted by Ministry of Power.

2. In compliance to Expert Committee recommendations and subsequent order dated 12.02.2020 of Hon'ble NGT, MoC vide its letter dated 08.04.2020 had communicated to MoEF&CC a list of mines (21 Nos.) identified by coal PSUs for fly ash/bottom ash filling.

3. Based on the inputs received from coal PSUs, the list of mines for fly ash/bottom ash filling has now been updated. The revised list comprises of 22 mines of CIL (Annexure-I) and 10 mines of SCCL (Annexure-II).

Encl: As above



(Manish Uniyal)

Under Secretary to the Govt. of India

To,

1. Shri A N Singh
Addl. Director (S)/Scientist 'E', HSM Division
Ministry of Environment, Forest and Climate Change
Indira Paryavaran Bhawan, New Delhi

2. Shri RK Das
Under Secretary to the Govt. of India.
Ministry of Power, New Delhi
Tel: 23715507, Ext: 212

Annexure-I

List of CIL mines identified for fly/bottom ash filling as on 31.03.2021							
Sl.No	CIL Subsidiary	Admin. Areas	Name of Mine	OC/UG	Volume (Approx) (Lakh Cu.m)	Nearby TPP's	Remarks
Ongoing mine for fly ash Dumping= 06 NOS							
1	MCL	Jaganath	South Balanda Q-II &III	OC	14.73	NTPC	MoU signed on 15.07.2004 and 14.57 lakh cu.m has been filled
2			Jaganath OC, Quarry IV	OC	17	Bhusan steel	Already filled with 0.558 lakh cu.m. Filling stopped from Feb, 2016 as the permission for transportation of ash has not obtained by Bhusan Steel.
3			Jaganath OC, Quarry VI & VII	OC	6.43 & 3.96 =10.39	NTPC	MoU for ash filling was executed on 30.07.2020 and 0.462 lakh cum has been filled.
4			South Balanda Q-I	OC	0.883	NBVL	Already filled with 0.624 lakh cu.m , Fly ash dumping is continuing .
5	SECL	Korba	Manikpur, western quarry	OC	210	NTPC & CSPGCL	1)MoU has been signed with NTPC for filling of fly ash 105 lakh cu.m As per agreement, 2.13 lakh cu.m fly ash has been filled 2)MoU has been signed with CSPGCL for 105 lakh cu.m and as per agreement 4.17 lakh cu-m fly ash has been filled
6			Surakadhar 3&4 pit	UG	1.50 & 1.80	NTPC	MoU has been signed with NTPC on 13.10.16 for 1.50 lakh cu-m and filling has been completed. Fresh MoU with NTPC signed on 31.08.2019 for filling of 1.80 lakh cu.m. As on date 0.855 lakh cu.m has been filled.
MoU signed = 04 NOS							
7	BCCL	WJA	Murulidih (Cluster-XIII)	OC	1.5	CTPP	MoU between BCCL & DVC for Back filling Fly-Ash from Chandrapura Thermal Power plant has been signed on 14th September 2020. Safety Clearance from DGMS and Clearance from MoEFCC for dumping fly ash within 500 m range from Damodar river is yet to be obtained by DVC.
8	NCL	Block-B	Gorbi	OC	14	NTPC	MoU has been signed with NTPC on 03.01.2019. NTPC is in the process for obtaining statutory clearances.

List of CIL mines identified for fly/bottom ash filling as on 31.03.2021

Ongoing mine for fly ash Dumping= 06 NOS

MoU signed = 04 NOS

Sl.No	CIL Subsidiary	Admin. Areas	Name of Mine	OC/UG	Volume (Approx) (Lakh Cu.m)	Nearby TPP's	Remarks
9	MCL	Jaganath	Jaganath OC, Quarry VIII	OC	17.8	NTPC	MoU for ash filling was executed on 18.09.2020.
10		Bhartpur	Bharatpur	OC	13.3	NALCO	Laying of pipeline by NALCO is under process for transportation of fly ash.
On process = 12 NOS							
11	WCL	Majri	Telwasa OC	OC	200	GMR power, Warora, SaiWardha Power, Warora	Abandoned Mine Plan (AMP) has been submitted to DGMS vide our letter no. WCL/ MA/ CTS/ SAM/ 2020/280 and 277 dated 30.09.2020, field inspection from DGMS officials awaited. A meeting with MAHAGENCO was held on 12.02.2021 at WCL HQ. In the meeting, the guidelines of CIL on Fly ash filling in mine void was explained in detail to MAHAGENCO. The safety and environmental issues in respect of operational mines was also informed.
12		Majri	Dhorwasa OC	OC	100		Abandoned Mine Plan (AMP) has been submitted to DGMS vide our letter dated 30.09.2020, DGMS visited the site on 21.11.2020.
13		Majri	NavinKunada OC	OC	250		Void is filled with water
14		Bhatgaon	Dugga	OC	170		NTPC, Korba
15	SECL	Bishrampur	Bishrampur	OC	17	NTPC, Korba	Bishrampur Quarry-1, partially backfilled. Part has been planted and remaining part is filled with water.
16		JamunaKotma	Jamuna OC	OC	10	NTPC,	TPPs have submitted their applications. Allotment will be done with consent of state pollution control Board.
17		Sohagpur	ShardaOC (OPQR patch & Trench T-1 patch)	OC	10.0 & 30.0	TPPS	ECL has approved dumping of Fly ash in Pusla OCP.
18	ECL	Mugma	Pusla	OC	12	MPL, Maithon	ECL has approved dumping of fly ash in Lachipur Colliery & voids in Nabakajora Colliery under Kajora Area. MoU is under process
19		Kajora	Lachipur	OC	3	DSTPS	Bottom ash could be filled in the mine void for stowing.
20		Kajora	Nabakajora	OC	3.8	(DVC)Durgapur	It is a running mine and expected reserve may exhaust by 2023. Available for ash filling from 2023-24
21	CCL	Kathara	Gowindpur	UG	0.85	DVC/STPS	
22		NK	Dakra	OC	214.5	Patratu	

List of SCCL Mines Identified for fly ash/Bottom ash filling as on 31.03.2021

OC mines (1)											
Sl. No.	Comp.	Area	Name of Mine	OC	District	Area (Ha)	Volume (Lakh Cu.m)	Nearby TPP	Distance (Km)	Transport	Remarks
1	SCCL	RG-1	Medapalli OCP	OC	Peddapalli Telangana	258.31	2154.3	NTPC	5.00	Road	Mine to be closed in 2022-23
List of UG mines (9 Nos.) - suitable for Bottom ash filling											
Sl. No.	Comp.	Admin Area	Name of Mine	UG	District	Volume of ash (Cu.m/Annum)		Nearby TPPs	Distance from TPPs	Transport Infra	Remarks, if any
						Utilization Potential	Actual utilization (2019-20)		Km (Approx)		
2	SCCL	RG-I	GDK-1 Inc.	UG	Peddapalli	220828	164079	STPP, NTPC	19.41, 26.10	Road	Bottom ash and Processed OB (POB) are utilised for stowing
3	SCCL	RG-I	GDK-2 Inc.	UG	Peddapalli	283687	275582	STPP, NTPC	21.24, 27.54	Road	
4	SCCL	RG-II	GDK-7Lep	UG	Peddapalli	219398	219398	STPP, NTPC	24.47,32.00	Road	-
5	SCCL	RG-II	Vakilpalli	UG	Peddapalli	18699	18699	STPP, NTPC	32.4, 39.0	Road	-
6	SCCL	SRP	RK-7 Inc.	UG	Mancherial	250948	86452	STPP	13.05	Road	Bottom ash, Processed OB (POB) & Sand are utilised for stowing.
7	SCCL	SRP	SRP-3 & 3A Inc.	UG	Mancherial	218879	60520	STPP	12.71	Road	
8	SCCL	SRP	IK-1A Inc.	UG	Mancherial	168467	81865	STPP	15.89	Road	
9	SCCL	MM	Kasipet	UG	Mancherial	146162	94621	STPP	40.62	Road	Bottom ash & sand are utilised for stowing.
10	SCCL	MM	RK 1A	UG	Mancherial	26240	15841	STPP	25.70	Road	
	Total/UG					1553308	1017058				

नरेश पाल गंगवार, आई.ए.एस.
Naresh Pal Gangwar, IAS



अपर सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
ADDITIONAL SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST
AND CLIMATE CHANGE

D.O. No. 09/01/2019- HSMD (Pt.)

Dated: 8th June, 2023

Respected Sir,

Kindly refer to the meeting of Fly ash Manangement and Utilization Mission held under Chairpersonship of Secretary, EF&CC on 01.05.2023. Ministry of Mines has been requested to identify more mines for backfilling of ash in mine voids to facilitate TPPs for achieving 100% ash utilization.

2. Ministry of Mines vide DO letter dated 12th May, 2023 (*copy enclosed*) has identified 195 mines (138 abandoned mines and 57 mines partly surrendered). Further, it was informed that Regional Controller of Mines will facilitate the process of identification and signing of MoUs with the help of concerned State Govt. in case of working mines.

3. A committee under the Chairman, CPCB has been constituted for identification of mines as per para B(5)(i) of Ash Utilisation Notification, 2021. Representative of IBM (Chief Controller of Mines) has been included as a member of the committee.

4. In view of the above, it is requested to review the identification of mines as updated by Regional Controller of Mines on regular basis and make the list of identified mines available on Mission's website for enabling TPPs to engage with such mines in backfilling activities.

Encl.: as stated

Regards,

Yours sincerely,


(Naresh Pal Gangwar)

Shri Tanmay Kumar
Chairman
Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar, Delhi-110032



नरेश पाल गंगवार, आईएएस
Naresh Pal Gangwar, IAS



अपर सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
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AND CLIMATE CHANGE

D.O. No. 09/01/2019-HSMD (Pt.)

Dated: 8th June, 2023

Respected Sir,

Ash Utilization Notification, 2021 published by the MoEF&CC for 100% utilization of ash by coal or lignite based thermal power plants.

2. The Notification mandates TPPs for achieving 100% utilisation as per the prescribed timelines. In addition, it also obligates operational and abandoned mines to utilise ash in backfilling of mine voids or mixing at least 25% of ash with external overburden dumps. A committee under Chairman, CPCB has also been constituted to identify the mines for this purpose.

3. Ministry of Mines had earlier shared 82 abandoned mines for facilitating backfilling of ash by TPPs. Vide DO letter dated 12th May, 2023 (copy enclosed), M/o Mines has, further, shared the list of 56 mining leases where mine closure plans have been implemented and were surrendered to the State Government. Further, 57 mining leases were partly surrendered to the State Governments. State-wise list of identified abandoned mines, fully and partly surrendered mining leases is enclosed herewith.

4. With regard to identification of voids in working leases/mines, it has been informed that Regional Controller of Mines will facilitate the process of identification and signing of MoU with the help of concerned State Govt.

5. In this regard, concerned State Governments have been requested to share the details of ownership, coordinates (Lat. and Long.) and availability of volume of mine voids and prescribe a simplified procedure for signing MoU between the mine owner and TPP.

6. In view of the above, it is requested to widely circulate the details of above mentioned mines to Thermal Power Plants to enable them to approach the concerned mine owners and State Governments to take up backfilling activities in identified mine voids.

Regards,

Yours sincerely,

(Naresh Pal Gangwar) 8/6/2023

Shri Alok Kumar, IAS
Secretary
Ministry of Power
Shram Shakti Bhawan, Rafi Marg, New Delhi-1.



D.O.No. M.V-8/1/2023-Mines-V

12th May, 2023

Respected Ma'am,

Kindly refer to your D.O. letter Nos. 11/3/2018-HSM dated 08.05.2023 and 23.03.2023 regarding Fly Ash Management and Utilisation Mission.

2. I have had the matter examined and would like to inform you that instructions have been issued to all working leases (non-coal, non-atomic and other than minor minerals) under Rule 58 of Mineral Conservation and Development Rules, 2017 for undertaking safety and feasibility studies for backfilling of ash in the mine voids which are exhausted and mixing of ash with the external dumps with 25% ash, in accordance with the MOEF&CC Notification S.O.5481 (E) dated 31 December, 2021, with due permission from DGMS and other agencies.

3. Apart from the list of 82 leases (**copy enclosed**) furnished earlier by this Ministry, an additional list containing 56 leases (**copy enclosed**) where final mine closure plan has been implemented and where the lease area has been surrendered to the State Government is enclosed herewith. Further, a list containing 57 leases (**copy enclosed**) where part surrender of the lease area has been done is also enclosed herewith.

4. It is informed that all the leases which have been surrendered / part surrendered the possession of the area is with the State Government or in very few cases with the private person as the case may be. Therefore, for utilization of such areas for backfilling of ash the concerned thermal power plant need to approach the respective State Governments for signing of MoU. Further, for the identification of the working leases for the purpose of backfilling, the concerned thermal power plant may contact the respective Regional Controller of Mines who will facilitate the identification of leases and signing of MoU, taking State Government on board.

Contd..2/-

:2:

5. Instructions have been issued to all Regional Controllers of Mines to map all the mine voids to identify those suitable for backfilling, where mineral is exhausted, in the working leases. The information will be provided by the Ministry in due course.

With warm regards,

Yours sincerely,



Encl: As above

(Vivek Bharadwaj)

Ms. Leena Nandan,
Secretary,
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh,
New Delhi - 110003

Annexure I

State-wise list of non-coal mines for ash disposal

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
1.	Andhra Pradesh	Borra	-	-
		Budarayavalasa	-	-
		Dasari Ramanaidu Valasa II	-	-
		Dasari Ramanaidu Valasa I	-	-
		Korlam I	-	-
		Kunchagumadam	-	-
		Moutoor	-	-
		Palakandyaaur	-	-
		Pedabantupalli	-	-
		Pullajipeta	-	-
		Regati V.U mine	-	-
		Sri Ramchandra	-	-
2.	Goa	Sacorda	-	-
3.	Gujarat	Aditya	Ramapara	-
		Dhadu	Vadnagar	-
		Kahalgaon	-	-
4.	Jharkhand	Manduapat	Gorgaon	Gaura
		Rajbar	Ghaghra	-
		Shanti No.2	Balaji	-
		Shanti U/G	-	-
		Shanti West	-	-
		Mohudi	-	-
		Mysore	-	-
		Nandidurg	-	-
	Karnataka	-	Karnatakagudda	Yadwad

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
5.		-	Habbigegudda	-
		-	Jambunatha	-
		-	Pathikonda	-
		-	Jaisingpur	-
		-	SV Chetty	-
		-	Mahadevapura	-
		-	Jaisingpur	-
		-	Jagalur	-
		-	Karekurchi	-
6.	Madhya Pradesh	Badretha	Pandarwani	-
		Bahadurpalli	Kanka	-
		Bamangawan	Reora	-
		Bhamraha	-	-
		Bharoli	-	-
		Bhatiatola	-	-
		Bodhanwara	-	-
		Chhenehara	-	-
		Dudiyani khera	-	-
		Jamnera	-	-
		Jhaulana (barapathar)	-	-
		Kalhera	-	-
		Karanjia	-	-
		Karanjia	-	-
		Karanjia	-	-
		Kari	-	-
		Khamtara	-	-
		Khodola	-	-
		Kishnapura	-	-
		Kusiara bhatha	-	-
		Lalpur	-	-

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
		Lamani	-	-
		Lamataghat	-	-
		Latagaon-b	-	-
		Malachaua	-	-
		Malachaua	-	-
		Morur	-	-
		Paniyar khera	-	-
		Phutkapahar	-	-
		Pondi	-	-
		Ramsalaya Khonda Khurd	-	-
		Sagral	-	-
		Singhanpuri	-	-
		Umaria	-	-
7.	Maharashtra	Nawargaon II	Red Iron Ore Mine	Velas Sakhri
		Pitichua	Pauni Chromite Mine	Uttamber
8.	Odisha	Bankiamunda	Tempadar	Patamunda
		Domuhani	Birili	Khondbondh
		Naupara II	Dahigaon	Panchapatmali
		Sargipalli	Unchabali iron & Mn	Anilapalli
		-	Gonua Iron & Mn	TRB
		-	Nuasahi Chromite mine	KJST
		-	Saruabil Sukrangi	GBC Quartz & Gemstone
		-	Boula Chromite mine	Menkamunda
		-	-	Patamunda
		-	-	Nagalsila
		-	-	Laupada
		-	-	Beheramunda
		-	-	Kamando & Kula

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
		-	-	Lanjiberna
		-	-	Panchapatmali
		-	-	Unchabali
		-	-	Kurmitar
		-	-	Daitari
		-	-	Nuasahi
		-	-	Badampahar
		-	-	Teherai
		-	-	Bamebari
		-	-	Nadidih
		-	-	Gorumahisani
		-	-	Dunguri
		-	-	Rantha
		-	-	Baniapank
9.	Rajasthan	Khautani-2	Badgoan	Devkhera
		Ranasar	Belkapahar	Narda
		-	Dhakankotra	Tadawas
		-	Kapuria 11/08	Mandai
		-	-	Kapuria 01/01
		-	-	Kodukota
		-	-	Rajmahal
		-	-	Kali Dungri
		-	-	Thankuron Ki Dhani
		-	-	Devkhera
		-	-	Preetampuri
		-	-	Kushalपुरा
		-	-	Jamalpur
		-	-	sajit
		-	-	sajit
		-	-	Gaonri

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
		-	-	Mandai
10.	Tamil Nadu	L.N.Patti	Reddimangudi	Chettichavadi
		Nagampalli	Olaipadi(W) Lst. mine	Pandalgudi
		Pungambadi	Vijayapathy Lst	-
		Pungambodi	Vijayapathy Lst.	-
		Sowdhapuram	Vadkkuvalliyoor Lst.	-
		Sungakarampatti	Talayuthu Lst. mine	-
		Vadugapatti	Reddipalayam	-
		Vellakoil	Veerachipalayam Lst mine	-
		Lakkammanaiekenpatti (0.61H)	Talayuthu Lst. mine	-
		Mewasa	Reddipalayam and Pudupalayam Lst. mine	-
		Pallakapalayam	Veerachipalayam Lst mine	-
		Sirukalanai	M/s.Shevaroy Bauxite mine (Semmaduvu Puliyur and Manjakuttai)	-
		-	Pudupalayam Lst.	-
		-	Edayathankudi Lst.	-
		-	Alathiyur Lst.	-
		-	Alathiyur Lst.	-
		-	Varagupadi Lst.	-
		-	Chinnapattakadu	-
		-	Perali	-
11.	Uttar Pradesh	Bawal Tanda	-	-
12.	Uttarakhand	Durmala	-	-
		Maldeota	-	-
		Malla	-	-
		-	-	Pamta

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
13.	Himachal Pradesh	-	-	Barwas
		-	-	Banour
		-	-	Dhanwasa
		-	-	Sangrah
		-	-	Kashlog
		-	-	Banour
14.	Chhattisgarh	-	Laindongri	-
		-	Daldali	-
15.	Meghalaya	-	Cheragaon Limestone mine	-
16.	Kerala	-	Sooranadu	-
		-	Karrapuram	-

LIST OF 82 ABANDONED MINE SITES

Sl No.	State	Name of Mine Site	Mineral	Earlier Lessee
1	Andhra Pradesh	Borra	Calcite	Perl Glass India Ltd.
2	Andhra Pradesh	Budarayavalasa	Lime kanker	M/s FACOR
3	Andhra Pradesh	Dasari Ramanaidu Valasa II	Lime kanker	M/s FACOR
4	Andhra Pradesh	Dasari Ramanaidu Valasa I	Lime kanker	M/s FACOR
5	Andhra Pradesh	Korlam I	Quartz	M/s FACOR
6	Andhra Pradesh	Kunchagumadam	Lime kanker	M/s FACOR
7	Andhra Pradesh	Moutoor	Feldspar	Sh.B.A.Khan
8	Andhra Pradesh	Palakandyaaur	Lime kanker	M/s FACOR
9	Andhra Pradesh	Pedabantupalli	Lime kanker	M/s FACOR
10	Andhra Pradesh	Pullajipeta	Quartz	M/s FACOR
11	Andhra Pradesh	Regati V.U mine	Lime kanker	M/s FACOR
12	Andhra Pradesh	Sri Ramchandra	Manganese	M/s FACOR
13	Goa	Sacorda	Iron ore	Shri V.D.Chowgule
14	Gujrat	Aditya	Chalk	Patel Min.Industries
15	Jharkhand	Dhadu	Fireclay	Shri M.P.Singhdeo
16	Jharkhand	Kahalgaon	Fireclay	Biharilal & Bros
17	Jharkhand	Manduapat	Bauxite	HINDAL Indus.Ltd.
18	Jharkhand	Rajbar	Fireclay	R.C.Mohapatra
19	Jharkhand	Shanti No.2	Mica	S.K.Jhanjhari
20	Jharkhand	Shanti U/G	Mica	S.K.Jhanjhari
21	Jharkhand	Shanti West	Mica	S.K.Jhanjhari
22	Jharkhand	Mohudi	Iron	M/s TISCO
23	Karnataka	Mysore	Gold	M/s BGML
24	Karnataka	Nandidurg	Gold	M/s BGML
25	Madhya Pradesh	Badretha	Limestone	Bhagwati Prasad Agrawal
26	Madhya Pradesh	Bahadurpalli	Quartz	Mahalaxmi Glass Corpn. Pvt.Ltd.

27	Madhya Pradesh	Bamangawan	Ochre	Vimla Agrawal
28	Madhya Pradesh	Bhamraha	White earth	Bagri Minerals & Chemicals Ltd.
29	Madhya Pradesh	Bharoli	Ochre	Ram Das Agrawal
30	Madhya Pradesh	Bhatlatola	Dolomite	M.P.State Mining Corpn.Ltd.
31	Madhya Pradesh	Bodhanwara	Fireclay	V.P.Gupta
32	Madhya Pradesh	Chhenehara	Ochre	Shiv Kumar Agrawal
33	Madhya Pradesh	Dudiyan khera	Barytes	Bundela Enterprises
34	Madhya Pradesh	Jamnera	Fireclay	Burn Standard Co.Ltd.
35	Madhya Pradesh	Jhaulana (barapathar)	Ochre	Shiv Kumar Agrawal
36	Madhya Pradesh	Kalhera	Limestone	Ram Kishore Pathak
37	Madhya Pradesh	Karanja	Ochre	Makel Minerals
38	Madhya Pradesh	Karanja	Ochre	Makel Minerals
39	Madhya Pradesh	Karanja	Ochre	Makel Minerals
40	Madhya Pradesh	Kari	Pyrophyllite	Putli Lal Tiwari
41	Madhya Pradesh	Khamtara	Fireclay	S.N.Sunderson & Co.
42	Madhya Pradesh	Khodola	Fireclay	Kedarnal Sawalram
43	Madhya Pradesh	Kishnapura	Pyrophyllite	Rajendra Kumar Tiwari
44	Madhya Pradesh	Kuslara bhatha	Ochre	Harrish Mineral Supply Co.
45	Madhya Pradesh	Lalpur	Dolomite	Capital Minerals
46	Madhya Pradesh	Lamanl	Ochre	Jailal Bharatlal
47	Madhya Pradesh	Lamataghat	Fireclay	Burn Standard Co.Ltd.
48	Madhya Pradesh	Lategaon-b	Limestone	Gopal Shran Singh
49	Madhya Pradesh	Malachaua	Ochre	Ramdas Rajkishore Agrawal
50	Madhya Pradesh	Malachaua	Ochre	Ramdas Rajkishore Agrawal
51	Madhya Pradesh	Morur	Ochre	Shiv Kumar Agrawal
52	Madhya Pradesh	Paniyar khera	Pyrophyllite	M.P.State Mining Corpn.Ltd.
53	Madhya Pradesh	Phutkapahar	Bauxite	M/s BALCO

54	Madhya Pradesh	Pondi	Limestone	Burn Standard Co.Ltd.
55	Madhya Pradesh	Ramsalaiya khonda	Limestone	Abhishak Cement
56	Madhya Pradesh	Sagral	Limestone	Anal Pal Singh
57	Madhya Pradesh	Singhanpuri(new)	Fireclay	Burn Standard Co.Ltd.
58	Madhya Pradesh	Umaria	Laterite	Birla Jute & Indu.Ltd. (Cement Div.)
59	Maharashtra	Nawargaon II	Kyanite	M/s MSMC Ltd.
60	Maharashtra	Pitichua	Chromite	M/s MSMC Ltd.
61	Orissa	Bankiamunda	Quartz	M/s IMFA Ltd.
62	Orissa	Domuhani	Manganese	AMTC P.Ltd..
63	Orissa	Naupara II	Quartzite	M/s IMFA Ltd
64	Orissa	Sargipalli	Pb-zn-cu	M/s HCL
65	Rajasthan	Khautani-2	Gypsum	M/s RSMM Ltd.
66	Rajasthan	Ranasar	Gypsum	M/s RSMM Ltd.
67	Tamilnadu	L.N.Patti	Qtrz/felds	Tamil Nadu Min.Ltd
68	Tamilnadu	Nagampalli	Qtrz/felds	Tamil Nadu Min.Ltd
69	Tamilnadu	Pungambadi	Qtrz/felds	Tamil Nadu Min.Ltd
70	Tamilnadu	Pungambodi	Qtrz/felds	Chettinad mb-Fh.Silica P.Ltd.
71	Tamilnadu	Sowdhapuram	Limestone	Tan India CementLtd
72	Tamilnadu	Sungakarampatti	Qtrz/felds	M/s Tamin
73	Tamilnadu	Vadugapatti	Qtrz/felds	Tamil Nadu Min.Ltd
74	Tamilnadu	Vellakoil	Qtrz/felds	Tamil Nadu Min.Ltd
75	Tamilnadu	Lakkammanaiekenpatti (0.61H)	Qtrz/felds	Tamil Nadu Min.Ltd
76	Tamilnadu	Mewasa	Qtrz/felds	Tamil Nadu Min.Ltd
77	Tamilnadu	Pallakapalayam	Qtrz/felds	Tamil Nadu Min.Ltd
78	Tamilnadu	Sirukalanai	Qtrz/felds	Tamil Nadu Min.Ltd
79	Uttar Pradesh	Bawal Tanda	Pyrophyllite	M/s J. K. Minerals
80	Uttarakhand	Durmala	Rock phosphate	M/s PPCL
81	Uttarakhand	Maldeota	Rock phosphate	M/s PPCL

82	Uttarakhand	Malla	Limestone	M/s ACC Ltd.

Updated information on Mines (Non-Coal) where Final Mine Closure Plan has been approved for Full surrender of area and FMCP

Sl. No.	Region	State	District	Name of the Mining Lease	Mineral	Name of the (previous) Leaseholder	Whether O/C or U/G	Major/Minor	Total Lease Area			Area for which FMCP is approved			Date of approval of FMCP	Date of issue of Certificate for successful implementation of FMCP	Remarks, if any
									Forest	Non	Total	Forest	Non	Total			
1	Rajpur	Chhattisgarh	Kanker	Laindighi Iron Ore Mine	Iron Ore	M/s Jayaswal Neco Industries Ltd.	O/C	Major	9.5	4.5	14.4	9.5	4.9	14.4	03.05.2019	07.04.2021	FMCP certificate issued
2	Rajpur	Chhattisgarh	Kabrdham	Daldoli Bauxite Mine	Bauxite	M/s CMDC Limited	O/C	Major	0	5.313	5.313	0	5.313	5.313	29.01.2020	28.04.2022	FMCP certificate issued
3	Goa	Maharashtra	Sindhudurg	Radi Iron Ore Mine (Block-I)	Iron Ore	M/s Gogle Minerals	O/C	Major	0	19.54	19.54	0	19.54	19.54	02.08.2012	13.06.2022	FMCP Certificate issued. Abandon mine pit has been converted into water reservoir and water is supplied to the local villagers after treatment
4	Nagpur	Maharashtra	Bhandara	Pauni Chromite Mine	Chromite	Shri B. K. Shukla	O/C	Major	0	16.22	16.22	0	16.22	16.22	24-07-2019	26-08-2020	FMCP Certificate issued. Reserves exhausted
5	Guwahati	Meghalaya	West Khasi Hills	Ghergaon Limestone Mine	Limestone	Anderson Minerals(P) Ltd.	O/C	Major	0	60	60	0	60	60	23.09.2018	03.05.2019	FMCP certificate issued
6	Ranchi	Jharkhand	Germwa	Gergaon Limestone	Limestone	M/s SAIL	O/C	Major	78.77	149.69	228.46	78.77	149.7	228.46	09-05-2019	27-11-2020	FMCP certificate issued
7	Ranchi	Jharkhand	Germwa	Chaghra Limestone	Limestone	M/s SAIL	O/C	Major	516.47	158.99	675.46	516.47	158	675.46	08-05-2019	27-11-2020	FMCP certificate issued
8	Ranchi	Jharkhand	West Singhbhum	Balaji	Iron Ore	Shri Anil Khinwal	O/C	Major	19.331	0	19.331	19.331	0	19.331	04-10-2021	25-08-2022	FMCP certificate issued
9	Bangalore	Kerala	Kollam	Sooranadu	Bauxite	A. Rahiyath	O/C	Major	0	0.3317	0.3317	0	0.332	0.3317	18-09-2015	29-12-2015	FMCP Certificate issued
10	Bangalore	Karnataka	Chitradurga	Karnatakagudda	Iron ore	M/s Mineral Enterprises Limited	O/C	Major	12.87	0	12.87	12.87	0	12.87	29-09-2015	02-12-2015	FMCP Certificate issued
11	Bangalore	Karnataka	Tumkur	Habbigudda	Iron ore	M/s Mineral Enterprises Limited	O/C	Major	0	128.06	128.06	0	128.1	128.06	23-02-2015	01-08-2018	FMCP Certificate issued
12	Bangalore	Karnataka	Bellary	Jambunatha	Iron ore	M/s G. G. & Brothers	O/C	Major	42.9	0	42.9	42.9	0	42.9	05-06-2018	11-09-2020	FMCP Certificate issued
13	Bangalore	Karnataka	Bellary	Pathikonda	Iron ore	M/s P. Venganna Setty & Brothers	O/C	Major	49.31	0	49.31	49.31	0	49.31	28-09-2018	24-09-2020	FMCP Certificate issued
14	Bangalore	Kerala	Alappay	Karapuram	Limeshell	M/s Karapuram White Limeshell Vyasaaya Co-operative Society Ltd.	O/C	Major	0	500	500	0	500	500	20-11-2018	Not issued	FMCP Approved. Under water deposit. Certificate not issued
15	Bangalore	Karnataka	Bellary	Jaisingpur	Iron ore	M/s Belaji Mines & Minerals Private limited	O/C	Major	24.27	0	24.27	24.27	0	24.27	26-10-2018	21-08-2020	FMCP Certificate issued
16	Bangalore	Karnataka	Bellary	S.V. Cheriy	Iron ore	S.V. Srinivasulu	O/C	Major	60.23	0	60.23	60.23	0	60.23	06-11-2018	17-06-2020	FMCP Certificate issued
17	Bangalore	Karnataka	Chitradurga	Mahadevapura	Manganese ore	M/s Alfa Minerals	O/C	Major	0	23.47	23.47	0	23.47	23.47	28-11-2018	18-02-2021	FMCP Certificate issued Fully reclaimed
18	Bangalore	Karnataka	Bellary	Jaisingpur	Iron ore	M/s Ashwathinarayana Singh & Co.	O/C	Major	56	0	56	56	0	56	15-11-2018	17-02-2021	FMCP Certificate issued
19	Bangalore	Karnataka	Bellary	H.P. Marjunath	Iron ore	HP Marjunath	O/C	Major	3.2	0	3.2	3.2	0	3.2	14-09-2019	05-10-2020	FMCP Certificate issued
20	Bangalore	Karnataka	Bellary	Venkatagiri	Iron ore	M/s Mineral Syndicate	O/C	Major	2.26	0	2.26	2.26	0	2.26	24-05-2019	11-09-2020	FMCP Certificate issued
21	Bangalore	Karnataka	Bellary	Jaisingpur	Iron ore	M/s Munger Enterprises	O/C	Major	36.26	0	36.26	36.26	0	36.26	03-07-2019	11-09-2020	FMCP Certificate issued
22	Bangalore	Karnataka	Davangere	Jagalur	Iron ore	M/s Mahabalesha Mining Industries	O/C	Major	0	29.946	29.946	0	29.95	29.946	30-09-2019	11-12-2020	FMCP Certificate issued
23	Bangalore	Karnataka	Tumkur	Karekurchi	Manganese ore and Clay	M/s Jayaram Minerals	O/C	Major	0	11.74	11.74	0	11.74	11.74	26-09-2021	25-04-2022	FMCP Certificate issued. Mineral exists.
24	Bhubaneswar	Odisha	Rayagada	Tempadar	Graphite	M/s TP Minerals	O/C	Major	0	46.5	46.5	0	46.5	46.5	16.12.2010	23/03/2012	FMCP Certificate issued. (0.058 ha afforestation on back filled area). No case is available for backfilling of mine void with Ash
25	Bhubaneswar	Odisha	Rayagada	Birli	Graphite	M/s TP Minerals	O/C	Major	0	17.717	17.717	0	17.72	17.717	16.12.2010	23/03/2012	FMCP Certificate issued. (0.66 ha afforestation on back filled area). No case is available for backfilling of mine void with Ash
26	Bhubaneswar	Odisha	Baragarh	Dahagan	Graphite	M/s T. P. Minerals Industries	O/C	Major	0	14.941	14.941	0	14.94	14.941	04-10-2012	24.07.2013	FMCP Certificate issued. (0.64 ha converted to water reservoir). No case is available for backfilling of mine void with Ash
27	Bhubaneswar	Odisha	Keonjhar	Unchabell Iron & Mn Mine	Iron Ore & Manganese Ore	Shri Prabodh Mohanty	O/C	Major	0	8.133	8.133	0	8.133	8.133	16.11.2016	27.12.2019	FMCP Certificate issued. Afforestation carried. No case is available for backfilling of mine void with Ash
28	Bhubaneswar	Odisha	Sundargarh	Gonua Iron & Mn Mine	Iron Ore & Manganese Ore	Shri Prabodh Mohanty	O/C	Major	9.947	3.849	13.796	9.947	3.849	13.796	20.11.2018	30.06.2022	FMCP Certificate issued. No case is available for backfilling of mine void with Ash
29	Bhubaneswar	Odisha	Keonjhar	Nuasahi Chromite Mine	Chromite	M/s (MFA Ltd.	U/G	Major	0.339	40.129	40.468	0.339	40.13	40.468	01.07.2020	19.03.2021	FMCP Certificate issued. Under Ground Mines and Closed due to Expiry of lease. No case is available for backfilling of mine void with Ash
30	Bhubaneswar	Odisha	Jajpur	Sarubel Sukrangi Chromite Mines	Chromite	M/s OMC Ltd.	O/C	Major	17.881	5.362	23.243	17.881	5.362	23.243	24.08.2020	14.10.2022	FMCP Certificate issued. Virgin area no degraded land. No case is available for backfilling of mine
31	Bhubaneswar	Odisha	Keonjhar	Bouia Chromite Mine	Chromite	M/s OMC Ltd.	O/C	Major	207.36	0	207.36	207.36	0	207.36	22.04.2021	09.09.2021	FMCP Certificate issued. Virgin area no degraded land. No case is available for backfilling of mine

32	Ajmer	Rajasthan	Udaipur	Badoan	Rock-phosphate	M/s RSMML	O/C	Major	0	215.8	215.8	0	215.6	215.6	08-04-2011	31-01-2018	FMCP Certificate issued.
33	Ajmer	Rajasthan	Sirohi	Bekapahar	Wollastonite	M/s WOLKEM IND. LTD.	O/C	Major	28.375	0	28.375	28.375	0	28.375	06-01-2017	20-02-2018	FMCP Certificate issued.
34	Ajmer	Rajasthan	Udaipur	Dhakankotra	Rock-phosphate	M/s RSMML	O/C	Major	0	159.77	159.77	0	159.8	159.77	07-01-2019	19-02-2020	FMCP Certificate issued.
35	Ajmer	Rajasthan	Jaisa mer	Kapuna 11/08	Siliceous Earth	M/s Seema Minerals	O/C	Major	0	4.41	4.41	0	4.41	4.41	08-08-2020	27-05-2021	FMCP Certificate issued.
36	Chennai	Tamilnadu	Tiruchy	Reddimgudi Lst Mine	Limestone	S. Saravanan M/s.Dhandapani Cements Pvt. Ltd.	O/C	Major	0	2.185	2.185	0	2.185	2.185	05.09.2011	30.03.2012	FMCP Certificate issued.
37	Chennai	Tamilnadu	Perambalur	Olaiyadi(W) Mine	Limestone	S. Saravanan M/s.Dhandapani Cements Pvt. Ltd.	O/C	Major	0	Patta land - 1.33	1.33	0	Patta land - 1.33	1.33	06.09.2011	23.12.2014	FMCP Certificate issued.
38	Chennai	Tamilnadu	Tirunelveli	Vijayapathy Mine	Limestone	M/s.India Cements Ltd.	O/C	Major	0	Govt. Land	25.75	0	Govt. Land	25.75	24.09.2013	22.09.2014	FMCP Certificate issued.
39	Chennai	Tamilnadu	Tirunelveli	Vijayapathy Mine	Limestone	M/s.India Cements Ltd.	O/C	Major	0	Govt. Land - 24.315, Patta land	29.9	0	Govt. Land - 24.315, Patta land	29.9	22.09.2013	22.09.2014	FMCP Certificate issued.
40	Chennai	Tamilnadu	Tirunelveli	Vadakkuvallyoor Lst. Mine	Limestone	M/s.India Cements Ltd.	O/C	Major	0	Poramboke	35.495	0	Poramboke	35.495	13.11.2013	11.08.2014	FMCP Certificate issued.
41	Chennai	Tamilnadu	Tirunelveli	Talayuthu Lst. Mine	Limestone	M/s.India Cements Ltd.	O/C	Major	0	Poramboke	2.58	0	Poramboke	2.58	17.02.2014	09.09.2014	FMCP Certificate issued.
42	Chennai	Tamilnadu	Ariyalur	Reddipalayam & Pudupalayam Lst. Mine	Limestone	M/s. UltraTech Cement Ltd. (Grasim Industries Ltd.)	O/C	Major	0	Patta land	3.915	0	Patta land	3.915	25.07.2014	10.09.2014	FMCP Certificate issued.
43	Chennai	Tamilnadu	Salem	Veerachipalayam Ist. Mine	Limestone	M/s.Mahalakshmi Mines & Pulverisara	O/C	Major	0	Patta land	4.615	0	Patta land	4.615	20.10.2014	13.07.2017	FMCP Certificate issued.
44	Chennai	Tamilnadu	Salem	M/s. Shivaroy Boudo Mine (Saminaduvu, Pullyur & Menakutal)	Bauxite	M/s.Vedanta (M/s. Sesa Stenite Ltd.)	O/C	Major	0	Poramboke Land	190.53	0	Poramboke Land	190.53	17.06.2016	16.10.2019	FMCP Certificate issued.
45	Chennai	Tamilnadu	Ariyalur	Pudupalayam Lst. Mine	Limestone	M/s.Ramco Cements Ltd. (previous - M/s Madras Cements Ltd.)	O/C	Major	0	Patta land	4.83	0	Patta land	4.83	--	10.06.2016	FMCP Certificate issued. FMCP approval date not given
46	Chennai	Tamilnadu	Ariyalur	Edayatharkudi Lst. Mine	Limestone	M/s. Ultra Tech (Previous - M/s. Grasim Industries Ltd.)	O/C	Major	0	Patta land - 10.41, Poramboke	10.545	0	Patta land - 10.41, Poramboke	10.545	07.06.2018	17.12.2018	FMCP Certificate issued.
47	Chennai	Tamilnadu	Ariyalur	Alathiyur Lst. Mine	Limestone	M/s.Ramco Cements Ltd. (previous - M/s Madras Cements Ltd.)	O/C	Major	0	Patta land	13.88	0	Patta land	13.88	10.05.2018	26.03.2019	FMCP Certificate issued.
48	Chennai	Tamilnadu	Ariyalur	Alathiyur Lst. Mine	Limestone	M/s.Ramco Cements Ltd. (previous - M/s Madras Cements Ltd.)	O/C	Major	0	Patta land - 53.375, Poramboke	57.12	0	Patta land - 53.375, Poramboke	57.12	10.05.2018	26.03.2019	FMCP Certificate issued.
49	Chennai	Tamilnadu	Perambalur	Veragupadi Lst. Mine	Limestone	M/s Vijay Cements Ltd.	O/C	Major	0	Poramboke	0.965	0	Poramboke	0.965	01.03.2019	30.03.2021	FMCP Certificate issued.
50	Chennai	Tamilnadu	Ariyalur	Chinnappattakadu Ist. Mine	Limestone	M/s.Dhandapani Cements Ltd.	O/C	Major	0	Patta land	4.94	0	Patta land	4.94	20.08.2020	17.03.2021	FMCP Certificate issued.
51	Chennai	Tamilnadu	Perambalur	Perali(S) Lst. Mine	Limestone	S. Sathammal	O/C	Major	0	Patta land	1.92	0	Patta land	1.92	20.08.2020	17.03.2021	FMCP Certificate issued.
52	Gandhinagar **	Gujarat	Junagadh	Ramapara	Limestone	Ambuja Cements Ltd.	O/C	Major	0	131.66	131.66	0	131.7	131.66	07-03-2006		Record Taken from Control Chart received from Eastwile Udaipur Regional Office. Date not Mentioned in Control Chart for issue of Certificate for successful implementation of proposals of
53	Gandhinagar **	Gujarat	Junagadh	Vadnagar	Limestone	Ambuja Cements Ltd.	O/C	Major	0	90.044	90.044	0	90.04	90.044	16-03-2009	11-11-2009	Record Taken from Control Chart received from Eastwile Udaipur Regional Office
54	Jabalpur	Madhya Pradesh	Balaghat	Pandanwani	Manganese	M/s D P Rai	O/C	Major	0	4.232	4.232	0	4.232	4.232	28.02.2020	29/09/2020	FMCP Certificate issued.
55	Jabalpur	Madhya Pradesh	Neemach	Kanka	Limestone	M/s Ultratech Cement limited	O/C	Major	0	34.232	34.232	0	34.23	34.232	03.06.2019	24/03/2022	FMCP Certificate issued.
56	Jabalpur	Madhya Pradesh	Saina	Raura	Limestone	Smt. Manju Singh	O/C	Major	0	23.9	23.9	0	23.9	23.9	22.06.2020	29/07/2021	FMCP Certificate issued.

Note:-
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Eastwile Udaipur Region

FMCP approved for full area and FMCP certificate issued for successful implementation of FMCP proposal

Updated Information on Mines (Non-Coal) where Final Mine Closure Plan has been approved for Part surrender of area and FMCP Certificate

Sl. No.	Region	State	District	Name of the Mining Lease	Mineral	Name of the (previous) Leaseholder	Whether O/C or U/G	Major/Minor	Total Lease Area			Area for which FMCP is approved			Date of approval of FMCP	Date of Certificate successful implementation of proposals of FMCP	Remarks, if any
									Forest	Non Forest	Total	Forest	Non	Total			
1	Goa	Maharashtra	Ratnagiri	Velas Sakin Bauxite	Bauxite	Smt. Sushilaba S.	O/C	Major	0	171.3	171.3	0	80.2	90.2	16.09.2009	18.10.2011	FMCP certificate issued (Part Area)
2	Goa	Maharashtra	Ratnagiri	Uttamgar Bauxite	Bauxite	M/s. Ashapura Miners	O/C	Major	0	107.74	107.74	0	61.9	61.9	17.11.2009	27.11.2013	FMCP certificate issued (Part Area)
3	Ranchi	Jharkhand	Palamu	Gaura	Graphite	Shri Shishir Kumar Poddar	O/C	Major	0	6.608	6.608	0	1.947	1.947	18-02-2013	22-03-2013	FMCP certificate issued (Part Area)
4	Goa	Karnataka	Balgauri	Yadwad Limestone Mine (M.L. No. 1828)	Limestone	M/s. Ratna Cement (Yadwad) Ltd.	O/C	Major	0	877.11	877.11	0	203.46	303.46	13.01.2010	08.04.2010	FMCP certificate issued (Part Area)
5	Bhubaneswar	Odisha	Sundergarh	Patamunda	Iron & Manganese	M/s Sun Alloys Ltd.	O/C	Major	612.351	164.955	807.306	31.629	0	31.629	30.08.2008	23.03.2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
6	Bhubaneswar	Odisha	Keonjhar	Rhondabendi	Iron	Tata Steel	O/C	Major	836.757	141.243	978	315.433	0	315.433	03-09-2009	25.03.2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
7	Bhubaneswar	Odisha	Koraput	Panchapatmal	Bauxite	NALCO	O/C	Major	547.615	698.08	1244	715.733	0	715.733	24/05/2010	17/10/2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
8	Bhubaneswar	Odisha	Bolangir	Anilapali Graphite	Graphite	A. Mishra	O/C	Major	0	14.937	14.937	10.044	0	10.044	06-10-2010	03-04-2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
9	Bhubaneswar	Odisha	Sundergarh	TRB Iron	Iron ore	Jinori	O/C	Major	286.713	1.139	287.848	90.061	0	90.061	29.07.2010	17/02/2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
10	Bhubaneswar	Odisha	Sundergarh	KJ ST	Iron/Bauxite	S.N. Mohanty	O/C	Major	330.04	3.023	333.063	144.54	0	144.54	12.01.2011	01.11.2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
11	Bhubaneswar	Odisha	Sonepur	GBC Quartz & Gemstone	Qtz & Gemstone	M/s Manikswari Minerals	O/C	Minor	51.78	0	51.78	46.888	0	46.888	01-04-2011	28/01/2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
12	Bhubaneswar	Odisha	Barangam	Menkanunda	Graphite	Sh. P.C. Agarwal	O/C	Major	10.91	34.342	45.252	10.024	0	19.024	07-11-2011	17/10/2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
13	Bhubaneswar	Odisha	Sundergarh	Patamunda	Manganese	M/s Sun Alloys & Minerals Ltd.	O/C	Major	0.38	80.817	81.197	0.036	0	0.036	28/10/2011	12.11.2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
14	Bhubaneswar	Odisha	Mayurbhanj	Nagalisila	Iron ore	Sh. G.C. Choudhary	O/C	Major	8.745	37.186	45.931	0.568	0	0.568	28/10/2011	02-09-2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
15	Bhubaneswar	Odisha	Keonjhar	Laupada	Iron ore	Narayani Sons (P) Ltd.	O/C	Major	38.817	104.519	143.336	60.8	0	60.8	12-05-2011	25/04/2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
16	Bhubaneswar	Odisha	Bolangir	Beharamunda	Graphite	Sh. Pramod Kumar Agarwal	O/C	Major	0	48.705	48.705	0	27.284	27.284	19/12/2011	02-07-2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
17	Bhubaneswar	Odisha	Sundergarh	Kamando & Kula	Manganese Ore	Sh. U. C. Mishra	O/C	Major	47.81	12.89	60.7	16.04	0	16.04	01-02-2012	20/04/2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
18	Bhubaneswar	Odisha	Sundergarh	Lanjiberna	Limestone & Dolomite	M/s OCL India Ltd.	O/C	Major	62.403	631.147	693.55	20.493	0	20.493	02-08-2012	23/03/2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
19	Bhubaneswar	Odisha	Koraput	Panchapatmal	Bauxite	M/s NALCO Ltd.	O/C	Major	2967.347	515.934	3483.28	2087.92	0	2087.92	05-05-2012	23/08/2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
20	Bhubaneswar	Odisha	Keonjhar	Unchabali	Iron & Manganese	Sh. Prabodh Mohanty	O/C	Major	0	8.133	8.133	0	1.497	1.497	04-11-2012	20/04/2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
21	Bhubaneswar	Odisha	Sundergarh	Kumitar	Iron Ore & Manganese Ore	M/s OMC Ltd.	O/C	Major	1206.138	0.332	1212.47	561.47	0	561.47	20/07/2012	08.09.2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
22	Bhubaneswar	Odisha	Keonjhar	Daitari Iron ore Mines	Iron ore	M/s OMC Ltd.	O/C	Major	1618.937	193.053	1812.99	794.685	0	794.685	0/0/2013	26/06/2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
23	Bhubaneswar	Odisha	Keonjhar	Nuasahi Chromite	Chromite	M/s IMFA	O/C	Major	0.338	40.129	40.468	0.339	0	0.339	08-02-2013	04.11.2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
24	Bhubaneswar	Odisha	Mayurbhanj	Bedampohar	Iron ore	Ltd. Traders	O/C	Major	443.94	0	443.94	314.33	0	314.33	24.01.2014	05-02-2014	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
25	Bhubaneswar	Odisha	Sundergarh	Tehara Iron & Mn Mine	Iron Ore & Manganese Ore	M/s BICO Ltd.	O/C	Major	87.714	28.856	116.572	20.888	0	20.888	16.01.2015	26.04.2019	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
26	Bhubaneswar	Odisha	Keonjhar	Barnabani Mn Mine	Manganese Ore	M/s Tata Steel Ltd.	O/C	Major	688.55	464	1150.55	688.55	0	688.55	20.01.2015	31/05/2016	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
27	Bhubaneswar	Odisha	Sundergarh	Nadish Iron & Mn Mine	Iron Ore & Manganese Ore	M/s Feegrade & Co (P) Ltd.	O/C	Major	89.87	31.535	121.405	5.443	0	5.443	17.04.2015	26.04.2019	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
28	Bhubaneswar	Odisha	Mayurbhanj	Gorumahisani Iron Ore Mine	Iron	M/s Ghanashyam Mishra & Sons	O/C	Major	1203.8	231.5	1435.3	1085.8	0	1085.8	09.11.2015	21/04/2016	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
29	Bhubaneswar	Odisha	Bargarh	Dungun Lst Mine	Limestone	ACC Ltd.	O/C	Major	78.309	428.906	507.215	19.5	0	19.5	04.05.2016	19/09/2016	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
30	Bhubaneswar	Odisha	Sundergarh	Raniba Iron Ore Mine	Iron Ore	M/s OMC Ltd.	O/C	Major	408.873	0	408.873	139.992	0	139.992	25.10.2018	19.12.2018	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
31	Bhubaneswar	Odisha	KEONJHAR	Banapora Chromite Mine	Chromite	M/s OMC Ltd.	O/C	Major	295.38	1287.45	1582.83	0	612.605	612.605	02.08.2021	04.10.2021	FMCP Certificate issued (Part Area). Mine not yet started. No case is available for backfilling of mine void with Ash.
32	Ajmer	Rajasthan	Tonk	Davkhara	Garnet	M.K. Lal	O/C	Major	0	82.2	82.2	0	43.6	43.6	11-05-2009	05-05-2009	FMCP Certificate issued (Part Area).
33	Ajmer	Rajasthan	Sikar	Nanda	Iron Ore	M/s Prateek Minerals	O/C	Major	0	44.93	44.93	0	19.42	19.42	12-07-2008	20-12-2009	FMCP Certificate issued (Part Area).
34	Ajmer	Rajasthan	Jhunjhunu	Tadawas	Iron Ore	M/s Shree Balaji Minerals	O/C	Major	0	34.81	34.81	0	30.02	30.02	24-05-2007	22-08-2008	FMCP Certificate issued (Part Area).

35	Ajmer	Rajasthan	Bhikwara	Mandal	Garnet	Rama Sharma	O/C	Major	0	5	5	0	0.625	0.625	25-07-2007	21-01-2010	FMCP Certificate issued (Part Area)
36	Ajmer	Rajasthan	Jaisalmer	Kapuria Q/OI	Siliceous Earth	M/s Soema Minerals	O/C	Major	0	350	350	0	301.2	301.3	28-11-2007	28-11-2009	FMCP Certificate issued (Part Area)
37	Ajmer	Rajasthan	Bhikwara	Kodukota	Garnet	M/s AKD Gems Garnet	O/C	Major	0	5	5	0	0.73	0.73	20-02-2008	22-06-2008	FMCP Certificate issued (Part Area)
38	Ajmer	Rajasthan	Tonk	Rajmahal	Garnet	M/s Ansal Brothers Garnet	O/C	Major	0	83.4085	83.4085	0	78.05	78.65	24-09-2008	21-10-2008	FMCP Certificate issued (Part Area)
39	Ajmer	Rajasthan	Ajmer	Kali Dunda	Magnetite	M/s Pansan Minerals	O/C	Major	0	254.25	254.25	0	124.76	124.76	18-12-2008	26-03-2009	FMCP Certificate issued (Part Area)
40	Ajmer	Rajasthan	Jalpur	Thankuren Ki Dhani	Iron Ore	M/s PSI Ltd	O/C	Major	52.7945	0	52.7945	48.0945	0	48.0945	26-12-2008	13-02-2009	FMCP Certificate issued (Part Area)
41	Ajmer	Rajasthan	Tonk	Devichers	Garnet	M/s Hakim Mohammad	O/C	Major	0	5	5	0	0.2	0.2	12-10-2009	07-01-2010	FMCP Certificate issued (Part Area)
42	Ajmer	Rajasthan	Sikar	Protdimpuri	Iron Ore	Net Ram Goyal	O/C	Major	0	5	5	0	0.05	0.05	26-03-2010	30-06-2010	FMCP Certificate issued (Part Area)
43	Ajmer	Rajasthan	Tonk	Kushelpura	Garnet	Naimuddin	O/C	Major	0	5	5	0	0.5	0.5	26-03-2010	06-05-2010	FMCP Certificate issued (Part Area)
44	Ajmer	Rajasthan	Sikar	Jamalpur	Iron Ore	M/s Prateek Minerals	O/C	Major	0	5	5	0	0.04	0.04	07-07-2010	09-08-2010	FMCP Certificate issued (Part Area)
45	Ajmer	Rajasthan	Jaisalmer	sait	Siliceous Earth	Rebual	O/C	Major	0	5	5	0	0.1	0.1	30-08-2011	22-08-2012	FMCP Certificate issued (Part Area)
46	Ajmer	Rajasthan	Jaisalmer	sait	Siliceous Earth	Chhatrapal	O/C	Major	0	5	5	0	0.1	0.1	30-08-2011	22-08-2012	FMCP Certificate issued (Part Area)
47	Ajmer	Rajasthan	Tonk	Gachni	Garnet	Chiranjil Banjara	O/C	Major	0	5	5	0	0.2	0.2	03-01-2012	10-02-2012	FMCP Certificate issued (Part Area)
48	Ajmer	Rajasthan	Jaisalmer	Mandal	Siliceous Earth	Sundar Devi	O/C	Major	0	5	5	0	1	1	01-06-2012	22-08-2012	FMCP Certificate issued (Part Area)
49	Chennai	Tamilnadu	Salom	Cherichavadi	Magnetite	Dalmia Bharat Sugar & Industries Ltd.	O/C	Major	0	Hill	531.08	0	Hill	52.516	05-11-2005	30-03-2011	FMCP Certificate issued (Part Area)
				Magnetite Mine over 32.516 hect.	Dunite					Poramboke land			Poramboke land				
50	Chennai	Tamilnadu	Virudhunagar	Pandalgudi Ist. Mine (Vysithapuram)	Limestone	M/s Ramco Cements Ltd	O/C	Major	0	Patta land	189.45	0	Patta land	2.5	12-01-2021	27-05-2022	FMCP Certificate issued (Part Area)
51	Dehradun	Himachal Pradesh	Sirmour	Pamta Limestone Mine	Limestone	A. Dean & Co.	O/C	Major	4.89	18.3	23.2	18.3	Nil	18.3	13-11-2007	14-07-2014	FMCP Certificate issued (Part Area)
52	Dehradun	Himachal Pradesh	Sirmour	Banwas Mine	Limestone	M/s R.P. Anand & Sons	O/C	Major	Nil	14.48	14.48	Nil	9.89	9.89	09-06-2011	19-01-2012	FMCP Certificate issued (Part Area)
53	Dehradun	Himachal Pradesh	Sirmour	Banour Mine	Limestone	S.C. Chawla	O/C	Major	Nil	28.26	28.26	Nil	23.51	23.51	10-08-2011	04-01-2012	FMCP Certificate issued (Part Area)
54	Dehradun	Himachal Pradesh	Sirmour	Dhanwasa Banour Limestone Mine	Limestone	M.C. Goyal & Sons	O/C	Major	Nil	20.1	20.1	Nil	15.142	15.142	30-07-2013	14-09-2012	FMCP Certificate issued (Part Area)
55	Dehradun	Himachal Pradesh	Sirmour	Sangrahi Limestone Mine	Limestone	V.K. Waia	O/C	Major	Nil	9.051	9.051	Nil	1.061	1.061	05-07-2012	22-08-2012	FMCP Certificate issued (Part Area)
56	Dehradun	Himachal Pradesh	Solan	Kashlog Mine	Limestone	M/s Ambuja Cements Ltd.	O/C	Major	138.7	346.62	485.52	15.52	Nil	15.52	19-11-2013	18-01-2014	FMCP Certificate issued (Part Area)
57	Dehradun	Himachal Pradesh	Sirmour	Banour Limestone Mine	Limestone	Rakesh Chaudhary	O/C	Major	Nil	4.98	4.98	Nil	0.23	0.23	18-01-2014	20-02-2014	FMCP Certificate issued (Part Area)

Information regarding Pits in Working Mines for Fly Ash

SN	Region	District	Mine_Code	Name of Mine	Name of Lessee	Name of Mineral	Lease Area Total (ha)	(Opencast/Underground, Opencast & Underground both)	Pit-Id	Area covered under Existing Pit-Id (sqm.)	Depth of Pit (m)	Estimated Volume covered under Pit-Id (cu m)	Area covered under Pit ID where mineral is exhausted (sqm.)	Depth of exhausted pit (m)	Estimated Volume of the exhausted pit (cu m)	Location of Pit (Latitude)	Location of Pit (Longitude)	Remarks for suitability of the exhausted Pit for backfilling with fly ash
1	Ajmer	Bundi	38RAJ08002	Lakheri(01/92)	ACC LTD	Limestone	1516.88	Opencast	P3Upper	75800	20	642720	10250	20	205000	From 25°40'46.17"N to 25°41'0.75"N	From 76°10'55.00"E to	PIT AVIALBLE FOR ASH FILLING. Matured for backfilling.
2	Ajmer	Chittorgarh	38RAJ09006	Aditya(24/92)	Ultratech Cement Ltd.	Limestone	760.692	Opencast	Pit1	955501.6	54	38697815.2	Nil	Nil	Nil	2736938.14	459703.25	THE PITS WILL BE AVILABLE FOR ASH FILLING FROM FY 2024-25 ONWARDS.
3	Ajmer	Chittorgarh	38RAJ09006	Aditya(24/92)	Ultratech Cement Ltd.	Limestone	760.692	Opencast	Pit3	964732	50	36177450.75	Nil	Nil	Nil	2733962.86	460310.17	THE PITS WILL BE AVILABLE FOR ASH FILLING FROM FY 2024-25 ONWARDS.
4	Jabalpur	Rewa	38MPR33029	Bankuiyan Limestone Mine	Jaiprakash Associates Ltd	Limestone	407.005	Opencast	1	610000	15	9150000	610000	15	9150000	519787 E	2721194 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
5	Jabalpur	Rewa	38MPR33030	Bankuiyan Limestone Mine	Jaiprakash Associates Ltd	Limestone	72.321	Opencast	1	150000	15	2250000	150000	15	2250000	520368 E	2721295 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
6	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	1	33852	20	677040	33852	20	677040	518200 E	2718800 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
7	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	2	40211	16	643376	40211	16	643376	518518 E	2718667 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
8	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	3	50010	18	900180	50010	18	900180	518319 E	2718902 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
9	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	4	83142	18	1496556	83142	18	1496556	517685 E	2719089 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
10	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	5	70531	14	987434	70531	14	987434	517498 E	2718853 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
11	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	6	79079	11	869869	79079	11	869869	516665 E	2719061 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
12	Jabalpur	Rewa	38MPR33003	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	460.31	Opencast	1	137147	20	2742940	137147	20	2742940	5180000 E	2718000 N	Suitable for backfilling with fly ash. Fully matured for backfilling.

नरेश पाल गंगवार, आई.ए.एस.
Naresh Pal Gangwar, IAS



अपर सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
ADDITIONAL SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST
AND CLIMATE CHANGE

D.O. No. 09/01/2019- HSMD (Pt.)

Dated: 8th June, 2023

Respected Sir,

Kindly refer to the meeting of Fly ash Manangement and Utilization Mission held under Chairpersonship of Secretary, EF&CC on 01.05.2023. Ministry of Mines has been requested to identify more mines for backfilling of ash in mine voids to facilitate TPPs for achieving 100% ash utilization.

2. Ministry of Mines vide DO letter dated 12th May, 2023 (*copy enclosed*) has identified 195 mines (138 abandoned mines and 57 mines partly surrendered). Further, it was informed that Regional Controller of Mines will facilitate the process of identification and signing of MoUs with the help of concerned State Govt. in case of working mines.

3. A committee under the Chairman, CPCB has been constituted for identification of mines as per para B(5)(i) of Ash Utilisation Notification, 2021. Representative of IBM (Chief Controller of Mines) has been included as a member of the committee.

4. In view of the above, it is requested to review the identification of mines as updated by Regional Controller of Mines on regular basis and make the list of identified mines available on Mission's website for enabling TPPs to engage with such mines in backfilling activities.

Encl.: as stated

Regards,

Yours sincerely,


(Naresh Pal Gangwar)

Shri Tanmay Kumar
Chairman
Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar, Delhi-110032



नरेश पाल गंगवार, आई.ए.एस.
Naresh Pal Gangwar, IAS



अपर सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
ADDITIONAL SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST
AND CLIMATE CHANGE

D.O. No. 09/01/2019-HSMD (Pt.)

Dated: 8th June, 2023

Respected Sir,

Ash Utilization Notification, 2021 published by the MoEF&CC for 100% utilization of ash by coal or lignite based thermal power plants.

2. The Notification mandates TPPs for achieving 100% utilisation as per the prescribed timelines. In addition, it also obligates operational and abandoned mines to utilise ash in backfilling of mine voids or mixing at least 25% of ash with external overburden dumps. A committee under Chairman, CPCB has also been constituted to identify the mines for this purpose.

3. Ministry of Mines had earlier shared 82 abandoned mines for facilitating backfilling of ash by TPPs. Vide DO letter dated 12th May, 2023 (copy enclosed), M/o Mines has, further, shared the list of 56 mining leases where mine closure plans have been implemented and were surrendered to the State Government. Further, 57 mining leases were partly surrendered to the State Governments. State-wise list of identified abandoned mines, fully and partly surrendered mining leases is enclosed herewith.

4. With regard to identification of voids in working leases/mines, it has been informed that Regional Controller of Mines will facilitate the process of identification and signing of MoU with the help of concerned State Govt.

5. In this regard, concerned State Governments have been requested to share the details of ownership, coordinates (Lat. and Long.) and availability of volume of mine voids and prescribe a simplified procedure for signing MoU between the mine owner and TPP.

6. In view of the above, it is requested to widely circulate the details of above mentioned mines to Thermal Power Plants to enable them to approach the concerned mine owners and State Governments to take up backfilling activities in identified mine voids.

Regards,

Yours sincerely,

(Naresh Pal Gangwar) 8/6/2023

Shri Alok Kumar, IAS
Secretary
Ministry of Power
Shram Shakti Bhawan, Rafi Marg, New Delhi-1.



D.O.No. M.V-8/1/2023-Mines-V

12th May, 2023

Respected Ma'am,

Kindly refer to your D.O. letter Nos. 11/3/2018-HSM dated 08.05.2023 and 23.03.2023 regarding Fly Ash Management and Utilisation Mission.

2. I have had the matter examined and would like to inform you that instructions have been issued to all working leases (non-coal, non-atomic and other than minor minerals) under Rule 58 of Mineral Conservation and Development Rules, 2017 for undertaking safety and feasibility studies for backfilling of ash in the mine voids which are exhausted and mixing of ash with the external dumps with 25% ash, in accordance with the MOEF&CC Notification S.O.5481 (E) dated 31 December, 2021, with due permission from DGMS and other agencies.

3. Apart from the list of 82 leases (**copy enclosed**) furnished earlier by this Ministry, an additional list containing 56 leases (**copy enclosed**) where final mine closure plan has been implemented and where the lease area has been surrendered to the State Government is enclosed herewith. Further, a list containing 57 leases (**copy enclosed**) where part surrender of the lease area has been done is also enclosed herewith.

4. It is informed that all the leases which have been surrendered / part surrendered the possession of the area is with the State Government or in very few cases with the private person as the case may be. Therefore, for utilization of such areas for backfilling of ash the concerned thermal power plant need to approach the respective State Governments for signing of MoU. Further, for the identification of the working leases for the purpose of backfilling, the concerned thermal power plant may contact the respective Regional Controller of Mines who will facilitate the identification of leases and signing of MoU, taking State Government on board.

Contd..2/-

:2:

5. Instructions have been issued to all Regional Controllers of Mines to map all the mine voids to identify those suitable for backfilling, where mineral is exhausted, in the working leases. The information will be provided by the Ministry in due course.

With warm regards,

Yours sincerely,



Encl: As above

(Vivek Bharadwaj)

Ms. Leena Nandan,

Secretary,

Ministry of Environment, Forest and Climate Change,

Indira Paryavaran Bhawan, Jor Bagh,

New Delhi - 110003

Annexure I

State-wise list of non-coal mines for ash disposal

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
1.	Andhra Pradesh	Borra	-	-
		Budarayavalasa	-	-
		Dasari Ramanaidu Valasa II	-	-
		Dasari Ramanaidu Valasa I	-	-
		Korlam I	-	-
		Kunchagumadam	-	-
		Moutoor	-	-
		Palakandyaaur	-	-
		Pedabantupalli	-	-
		Pullajipeta	-	-
		Regati V.U mine	-	-
		Sri Ramchandra	-	-
2.	Goa	Sacorda	-	-
3.	Gujarat	Aditya	Ramapara	-
		Dhadu	Vadnagar	-
		Kahalgaon	-	-
4.	Jharkhand	Manduapat	Gorgaon	Gaura
		Rajbar	Ghaghra	-
		Shanti No.2	Balaji	-
		Shanti U/G	-	-
		Shanti West	-	-
		Mohudi	-	-
		Mysore	-	-
		Nandidurg	-	-
	Karnataka	-	Karnatakagudda	Yadwad

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
5.		-	Habbigegudda	-
		-	Jambunatha	-
		-	Pathikonda	-
		-	Jaisingpur	-
		-	SV Chetty	-
		-	Mahadevapura	-
		-	Jaisingpur	-
		-	Jagalur	-
		-	Karekurchi	-
6.	Madhya Pradesh	Badretha	Pandarwani	-
		Bahadurpalli	Kanka	-
		Bamangawan	Reora	-
		Bhamraha	-	-
		Bharoli	-	-
		Bhatiatola	-	-
		Bodhanwara	-	-
		Chhenehara	-	-
		Dudiyan khera	-	-
		Jamnera	-	-
		Jhaulana (barapathar)	-	-
		Kalhera	-	-
		Karanjia	-	-
		Karanjia	-	-
		Karanjia	-	-
		Kari	-	-
		Khamtara	-	-
		Khodola	-	-
		Kishnapura	-	-
		Kusiara bhatha	-	-
		Lalpur	-	-

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
		Lamani	-	-
		Lamataghat	-	-
		Latagaon-b	-	-
		Malachaua	-	-
		Malachaua	-	-
		Morur	-	-
		Paniyar khera	-	-
		Phutkapahar	-	-
		Pondi	-	-
		Ramsalaya Khonda Khurd	-	-
		Sagral	-	-
		Singhanpuri	-	-
		Umaria	-	-
7.	Maharashtra	Nawargaon II	Red Iron Ore Mine	Velas Sakhri
		Pitichua	Pauni Chromite Mine	Uttamber
8.	Odisha	Bankiamunda	Tempadar	Patamunda
		Domuhani	Birili	Khondbondh
		Naupara II	Dahigaon	Panchapatmali
		Sargipalli	Unchabali iron & Mn	Anilapalli
		-	Gonua Iron & Mn	TRB
		-	Nuasahi Chromite mine	KJST
		-	Saruabil Sukrangi	GBC Quartz & Gemstone
		-	Boula Chromite mine	Menkamunda
		-	-	Patamunda
		-	-	Nagalsila
		-	-	Laupada
		-	-	Beheramunda
		-	-	Kamando & Kula

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
		-	-	Lanjiberna
		-	-	Panchapatmali
		-	-	Unchabali
		-	-	Kurmitar
		-	-	Daitari
		-	-	Nuasahi
		-	-	Badampahar
		-	-	Teherai
		-	-	Bamebari
		-	-	Nadidih
		-	-	Gorumahisani
		-	-	Dunguri
		-	-	Rantha
		-	-	Baniapank
9.	Rajasthan	Khautani-2	Badgoan	Devkhera
		Ranasar	Belkapahar	Narda
		-	Dhakankotra	Tadawas
		-	Kapuria 11/08	Mandai
		-	-	Kapuria 01/01
		-	-	Kodukota
		-	-	Rajmahal
		-	-	Kali Dungri
		-	-	Thankuron Ki Dhani
		-	-	Devkhera
		-	-	Preetampuri
		-	-	Kushalpur
		-	-	Jamalpur
		-	-	sajit
		-	-	sajit
		-	-	Gaonri

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
		-	-	Mandai
10.	Tamil Nadu	L.N.Patti	Reddimangudi	Chettichavadi
		Nagampalli	Olaipadi(W) Lst. mine	Pandalgudi
		Pungambadi	Vijayapathy Lst	-
		Pungambodi	Vijayapathy Lst.	-
		Sowdhapuram	Vadkkuvalliyoor Lst.	-
		Sungakarampatti	Talayuthu Lst. mine	-
		Vadugapatti	Reddipalayam	-
		Vellakoil	Veerachipalayam Lst mine	-
		Lakkammanaiekenpatti (0.61H)	Talayuthu Lst. mine	-
		Mewasa	Reddipalayam and Pudupalayam Lst. mine	-
		Pallakapalayam	Veerachipalayam Lst mine	-
		Sirukalanai	M/s.Shevaroy Bauxite mine (Semmaduvu Puliyur and Manjakuttai)	-
		-	Pudupalayam Lst.	-
		-	Edayathankudi Lst.	-
		-	Alathiyur Lst.	-
		-	Alathiyur Lst.	-
		-	Varagupadi Lst.	-
		-	Chinnapattakadu	-
		-	Perali	-
11.	Uttar Pradesh	Bawal Tanda	-	-
12.	Uttarakhand	Durmala	-	-
		Maldeota	-	-
		Malla	-	-
		-	-	Pamta

S. No.	State	Identified abandoned mines (82 nos.)	Mining leases approved for full surrender of areas (56 nos.)	Mining leases approved for part surrender of areas (57 nos.)
13.	Himachal Pradesh	-	-	Barwas
		-	-	Banour
		-	-	Dhanwasa
		-	-	Sangrah
		-	-	Kashlog
		-	-	Banour
14.	Chhattisgarh	-	Laindongri	-
		-	Daldali	-
15.	Meghalaya	-	Cheragaon Limestone mine	-
16.	Kerala	-	Sooranadu	-
		-	Karrapuram	-

LIST OF 82 ABANDONED MINE SITES

Sl No.	State	Name of Mine Site	Mineral	Earlier Lessee
1	Andhra Pradesh	Borra	Calcite	Perl Glass India Ltd.
2	Andhra Pradesh	Budarayavalasa	Lime kanker	M/s FACOR
3	Andhra Pradesh	Dasari Ramanaidu Valasa II	Lime kanker	M/s FACOR
4	Andhra Pradesh	Dasari Ramanaidu Valasa I	Lime kanker	M/s FACOR
5	Andhra Pradesh	Korlam I	Quartz	M/s FACOR
6	Andhra Pradesh	Kunchagumadam	Lime kanker	M/s FACOR
7	Andhra Pradesh	Moutoor	Feldspar	Sh.B.A.Khan
8	Andhra Pradesh	Palakandyaaur	Lime kanker	M/s FACOR
9	Andhra Pradesh	Pedabantupalli	Lime kanker	M/s FACOR
10	Andhra Pradesh	Pullajipeta	Quartz	M/s FACOR
11	Andhra Pradesh	Regati V.U mine	Lime kanker	M/s FACOR
12	Andhra Pradesh	Sri Ramchandra	Manganese	M/s FACOR
13	Goa	Sacorda	Iron ore	Shri V.D.Chowgule
14	Gujrat	Aditya	Chalk	Patel Min.Industries
15	Jharkhand	Dhadu	Fireclay	Shri M.P.Singhdeo
16	Jharkhand	Kahalgaon	Fireclay	Biharilal & Bros
17	Jharkhand	Manduapat	Bauxite	HINDAL Indus.Ltd.
18	Jharkhand	Rajbar	Fireclay	R.C.Mohapatra
19	Jharkhand	Shanti No.2	Mica	S.K.Jhanjhari
20	Jharkhand	Shanti U/G	Mica	S.K.Jhanjhari
21	Jharkhand	Shanti West	Mica	S.K.Jhanjhari
22	Jharkhand	Mohudi	Iron	M/s TISCO
23	Karnataka	Mysore	Gold	M/s BGML
24	Karnataka	Nandidurg	Gold	M/s BGML
25	Madhya Pradesh	Badretha	Limestone	Bhagwati Prasad Agrawal
26	Madhya Pradesh	Bahadurpalli	Quartz	Mahalaxmi Glass Corpn. Pvt.Ltd.

27	Madhya Pradesh	Bamangawan	Ochre	Vimla Agrawal
28	Madhya Pradesh	Bhamraha	White earth	Bagri Minerals & Chemicals Ltd.
29	Madhya Pradesh	Bharoli	Ochre	Ram Das Agrawal
30	Madhya Pradesh	Bhatlatola	Dolomite	M.P.State Mining Corpn.Ltd.
31	Madhya Pradesh	Bodhanwara	Fireclay	V.P.Gupta
32	Madhya Pradesh	Chhenehara	Ochre	Shiv Kumar Agrawal
33	Madhya Pradesh	Dudiyar khera	Barytes	Bundela Enterprises
34	Madhya Pradesh	Jamnera	Fireclay	Burn Standard Co.Ltd.
35	Madhya Pradesh	Jhaulana (barapathar)	Ochre	Shiv Kumar Agrawal
36	Madhya Pradesh	Kalhera	Limestone	Ram Kishore Pathak
37	Madhya Pradesh	Karanjia	Ochre	Makel Minerals
38	Madhya Pradesh	Karanjia	Ochre	Makel Minerals
39	Madhya Pradesh	Karanjia	Ochre	Makel Minerals
40	Madhya Pradesh	Kari	Pyrophyllite	Putti Lal Tiwari
41	Madhya Pradesh	Khamtara	Fireclay	S.N.Sunderson & Co.
42	Madhya Pradesh	Khodola	Fireclay	Kedarnath Sawalram
43	Madhya Pradesh	Kishnapura	Pyrophyllite	Rajendra Kumar Tiwari
44	Madhya Pradesh	Kuslara bhatha	Ochre	Harrish Mineral Supply Co.
45	Madhya Pradesh	Lalpur	Dolomite	Capital Minerals
46	Madhya Pradesh	Lamanl	Ochre	Jailal Bharatlal
47	Madhya Pradesh	Lamataghat	Fireclay	Burn Standard Co.Ltd.
48	Madhya Pradesh	Lategaon-b	Limestone	Gopal Shran Singh
49	Madhya Pradesh	Malachaua	Ochre	Ramdas Rajkishore Agrawal
50	Madhya Pradesh	Malachaua	Ochre	Ramdas Rajkishore Agrawal
51	Madhya Pradesh	Morur	Ochre	Shiv Kumar Agrawal
52	Madhya Pradesh	Paniyar khera	Pyrophyllite	M.P.State Mining Corpn.Ltd.
53	Madhya Pradesh	Phutkapahar	Bauxite	M/s BALCO

54	Madhya Pradesh	Pondi	Limestone	Burn Standard Co.Ltd.
55	Madhya Pradesh	Ramsalaiya khonda	Limestone	Abhishak Cement
56	Madhya Pradesh	Sagral	Limestone	Anal Pal Singh
57	Madhya Pradesh	Singhanpuri(new)	Fireclay	Burn Standard Co.Ltd.
58	Madhya Pradesh	Umaria	Laterite	Birla Jute & Indu.Ltd. (Cement Div.)
59	Maharashtra	Nawargaon II	Kyanite	M/s MSMC Ltd.
60	Maharashtra	Pitichua	Chromite	M/s MSMC Ltd.
61	Orissa	Bankiamunda	Quartz	M/s IMFA Ltd.
62	Orissa	Domuhani	Manganese	AMTC P.Ltd..
63	Orissa	Naupara II	Quartzite	M/s IMFA Ltd
64	Orissa	Sargipalli	Pb-zn-cu	M/s HCL
65	Rajasthan	Khautani-2	Gypsum	M/s RSMM Ltd.
66	Rajasthan	Ranasar	Gypsum	M/s RSMM Ltd.
67	Tamilnadu	L.N.Patti	Qtrz/felds	Tamil Nadu Min.Ltd
68	Tamilnadu	Nagampalli	Qtrz/felds	Tamil Nadu Min.Ltd
69	Tamilnadu	Pungambadi	Qtrz/felds	Tamil Nadu Min.Ltd
70	Tamilnadu	Pungambodi	Qtrz/felds	Chettinad mb-Fh.Silica P.Ltd.
71	Tamilnadu	Sowdhapuram	Limestone	Tan India CementLtd
72	Tamilnadu	Sungakarampatti	Qtrz/felds	M/s Tamin
73	Tamilnadu	Vadugapatti	Qtrz/felds	Tamil Nadu Min.Ltd
74	Tamilnadu	Vellakoil	Qtrz/felds	Tamil Nadu Min.Ltd
75	Tamilnadu	Lakkammanaiekenpatti (0.61H)	Qtrz/felds	Tamil Nadu Min.Ltd
76	Tamilnadu	Mewasa	Qtrz/felds	Tamil Nadu Min.Ltd
77	Tamilnadu	Pallakapalayam	Qtrz/felds	Tamil Nadu Min.Ltd
78	Tamilnadu	Sirukalanai	Qtrz/felds	Tamil Nadu Min.Ltd
79	Uttar Pradesh	Bawal Tanda	Pyrophyllite	M/s J. K. Minerals
80	Uttarakhand	Durmala	Rock phosphate	M/s PPCL
81	Uttarakhand	Maldeota	Rock phosphate	M/s PPCL

82	Uttarakhand	Malla	Limestone	M/s ACC Ltd.

Updated information on Mines (Non-Coal) where Final Mine Closure Plan has been approved for Full surrender of area and FMCP

Sl. No.	Region	State	District	Name of the Mining Lease	Mineral	Name of the (previous) Leaseholder	Whether O/C or U/G	Major/Minor	Total Lease Area			Area for which FMCP is approved			Date of approval of FMCP	Date of issue of Certificate for successful implementation of proposals of FMCP	Remarks, if any
									Forest	Non	Total	Forest	Non	Total			
1	Raipur	Chhattisgarh	Kanker	Laindighi Iron Ore Mine	Iron Ore	M/s Jayaswal Neco Industries Ltd.	O/C	Major	9.5	4.5	14.4	9.5	4.5	14.4	03.05.2019	07.04.2021	FMCP certificate issued
2	Raipur	Chhattisgarh	Kabrdham	Daldoli Bauxite Mine	Bauxite	M/s CMDC Limited	O/C	Major	0	5.313	5.313	0	5.313	5.313	29.01.2020	28.04.2022	FMCP certificate issued
3	Goa	Maharashtra	Sindhudurg	Radi Iron Ore Mine (Block-I)	Iron Ore	M/s Gogle Minerals	O/C	Major	0	19.54	19.54	0	19.54	19.54	02.08.2012	13.06.2022	FMCP Certificate issued. Abandon mine pit has been converted into water reservoir and water is supplied to the local villagers after treatment
4	Nagpur	Maharashtra	Bhandara	Pauni Chromite Mine	Chromite	Shri B. K. Shukla	O/C	Major	0	16.22	16.22	0	16.22	16.22	24-07-2019	26-08-2020	FMCP Certificate issued. Reserves exhausted
5	Guwahati	Meghalaya	West Khasi Hills	Ghergaon Limestone Mine	Limestone	Anderson Minerals(P) Ltd.	O/C	Major	0	60	60	0	60	60	23.09.2018	03.05.2019	FMCP certificate issued
6	Ranchi	Jharkhand	Germwa	Gergaon Limestone	Limestone	M/s SAIL	O/C	Major	78.77	149.69	228.46	78.77	149.7	228.46	09-05-2019	27-11-2020	FMCP certificate issued
7	Ranchi	Jharkhand	Germwa	Chaghra Limestone	Limestone	M/s SAIL	O/C	Major	516.47	158.99	675.46	516.47	158	675.46	08-05-2019	27-11-2020	FMCP certificate issued
8	Ranchi	Jharkhand	West Singhbhum	Balaji	Iron Ore	Shri Anil Khinwal	O/C	Major	19.331	0	19.331	19.331	0	19.331	04-10-2021	25-08-2022	FMCP certificate issued
9	Bangalore	Kerala	Kollam	Sooranadu	Bauxite	A. Rahiyath	O/C	Major	0	0.3317	0.3317	0	0.332	0.3317	18-09-2015	29-12-2015	FMCP Certificate issued
10	Bangalore	Karnataka	Chitradurga	Karnatakagudda	Iron ore	M/s Mineral Enterprises Limited	O/C	Major	12.87	0	12.87	12.87	0	12.87	29-09-2015	02-12-2015	FMCP Certificate issued
11	Bangalore	Karnataka	Tumkur	Habbigegudda	Iron ore	M/s Mineral Enterprises Limited	O/C	Major	0	128.06	128.06	0	128.1	128.06	23-02-2015	01-08-2018	FMCP Certificate issued
12	Bangalore	Karnataka	Bellary	Jambunatha	Iron ore	M/s G. G. & Brothers	O/C	Major	42.9	0	42.9	42.9	0	42.9	05-06-2018	11-09-2020	FMCP Certificate issued
13	Bangalore	Karnataka	Bellary	Pathikonda	Iron ore	M/s P. Venganna Setty & Brothers	O/C	Major	49.31	0	49.31	49.31	0	49.31	28-09-2018	24-09-2020	FMCP Certificate issued
14	Bangalore	Kerala	Alappay	Karapuram	Limeshell	M/s Karapuram White Limeshell Vyasaaya Co-operative Society Ltd.	O/C	Major	0	500	500	0	500	500	20-11-2018	Not issued	FMCP Approved. Under water deposit. Certificate not issued
15	Bangalore	Karnataka	Bellary	Jaisingpur	Iron ore	M/s Belaji Mines & Minerals Private limited	O/C	Major	24.27	0	24.27	24.27	0	24.27	26-10-2018	21-08-2020	FMCP Certificate issued
16	Bangalore	Karnataka	Bellary	S.V. Cheriy	Iron ore	S.V. Srinivasulu	O/C	Major	60.23	0	60.23	60.23	0	60.23	06-11-2018	17-06-2020	FMCP Certificate issued
17	Bangalore	Karnataka	Chitradurga	Mahadevapura	Manganese ore	M/s Alfa Minerals	O/C	Major	0	23.47	23.47	0	23.47	23.47	28-11-2018	18-02-2021	FMCP Certificate issued Fully reclaimed
18	Bangalore	Karnataka	Bellary	Jaisingpur	Iron ore	M/s Ashwathinarayana Singh & Co.	O/C	Major	56	0	56	56	0	56	15-11-2018	17-02-2021	FMCP Certificate issued
19	Bangalore	Karnataka	Bellary	H.P. Marjunath	Iron ore	HP Marjunath	O/C	Major	3.2	0	3.2	3.2	0	3.2	14-09-2019	05-10-2020	FMCP Certificate issued
20	Bangalore	Karnataka	Bellary	Venkatagiri	Iron ore	M/s Mineral Syndicate	O/C	Major	2.26	0	2.26	2.26	0	2.26	24-05-2019	11-09-2020	FMCP Certificate issued
21	Bangalore	Karnataka	Bellary	Jaisingpur	Iron ore	M/s Munger Enterprises	O/C	Major	36.26	0	36.26	36.26	0	36.26	03-07-2019	11-09-2020	FMCP Certificate issued
22	Bangalore	Karnataka	Davangere	Jagalur	Iron ore	M/s Mahabalesha Mining Industries	O/C	Major	0	29.946	29.946	0	29.95	29.946	30-09-2019	11-12-2020	FMCP Certificate issued
23	Bangalore	Karnataka	Tumkur	Karekurthi	Manganese ore and Clay	M/s Jayaram Minerals	O/C	Major	0	11.74	11.74	0	11.74	11.74	26-09-2021	25-04-2022	FMCP Certificate issued. Mineral exists.
24	Bhubaneswar	Odisha	Rayagada	Tempadar	Graphite	M/s TP Minerals	O/C	Major	0	46.5	46.5	0	46.5	46.5	16.12.2010	23/03/2012	FMCP Certificate issued. (0.058 ha afforestation on back filled area). No case is available for backfilling of mine void with Ash
25	Bhubaneswar	Odisha	Rayagada	Birli	Graphite	M/s TP Minerals	O/C	Major	0	17.717	17.717	0	17.72	17.717	16.12.2010	23/03/2012	FMCP Certificate issued. (0.66 ha afforestation on back filled area). No case is available for backfilling of mine void with Ash
26	Bhubaneswar	Odisha	Baragarh	Dahagan	Graphite	M/s T. P. Minerals Industries	O/C	Major	0	14.941	14.941	0	14.94	14.941	04-10-2012	24.07.2013	FMCP Certificate issued. (0.64 ha converted to water reservoir). No case is available for backfilling of mine void with Ash
27	Bhubaneswar	Odisha	Keonjhar	Unchabelli Iron & Mn Mine	Iron Ore & Manganese Ore	Shri Prabodh Mohanty	O/C	Major	0	8.133	8.133	0	8.133	8.133	16.11.2016	27.12.2019	FMCP Certificate issued. Afforestation carried. No case is available for backfilling of mine void with Ash
28	Bhubaneswar	Odisha	Sundargarh	Gonua Iron & Mn Mine	Iron Ore & Manganese Ore	Shri Prabodh Mohanty	O/C	Major	9.947	3.849	13.796	9.947	3.849	13.796	20.11.2018	30.06.2022	FMCP Certificate issued. No case is available for backfilling of mine void with Ash
29	Bhubaneswar	Odisha	Keonjhar	Nuasahi Chromite Mine	Chromite	M/s (MFA Ltd.	U/G	Major	0.339	40.129	40.468	0.339	40.13	40.468	01.07.2020	19.03.2021	FMCP Certificate issued. Under Ground Mines and Closed due to Expiry of lease. No case is available for backfilling of mine void with Ash
30	Bhubaneswar	Odisha	Jajpur	Sarubel Sukrangi Chromite Mines	Chromite	M/s OMC Ltd.	O/C	Major	17.881	5.362	23.243	17.881	5.362	23.243	24.08.2020	14.10.2022	FMCP Certificate issued. Virgin area no degraded land. No case is available for backfilling of mine
31	Bhubaneswar	Odisha	Keonjhar	Bouia Chromite Mine	Chromite	M/s OMC Ltd.	O/C	Major	207.36	0	207.36	207.36	0	207.36	22.04.2021	09.09.2021	FMCP Certificate issued. Virgin area no degraded land. No case is available for backfilling of mine

32	Ajmer	Rajasthan	Udaipur	Badoan	Rock-phosphate	M/s RSMML	O/C	Major	0	215.8	215.8	0	215.6	215.6	08-04-2011	31-01-2018	FMCP Certificate issued.
33	Ajmer	Rajasthan	Sirohi	Bekapahar	Wolastonite	M/s WOLKEM IND. LTD.	O/C	Major	28.375	0	28.375	28.375	0	28.375	06-01-2017	20-02-2018	FMCP Certificate issued.
34	Ajmer	Rajasthan	Udaipur	Dhakankotra	Rock-phosphate	M/s RSMML	O/C	Major	0	159.77	159.77	0	159.8	159.77	07-01-2019	19-02-2020	FMCP Certificate issued.
35	Ajmer	Rajasthan	Jaisa mer	Kapuna 11/08	Siliceous Earth	M/s Seema Minerals	O/C	Major	0	4.41	4.41	0	4.41	4.41	08-08-2020	27-05-2021	FMCP Certificate issued.
36	Chennai	Tamilnadu	Tiruchy	Reddimangudi Lst. Mine	Limestone	S. Saravanan M/s.Dhandapani Cements Pvt. Ltd.	O/C	Major	0	2.185	2.185	0	2.185	2.185	05.09.2011	30.03.2012	FMCP Certificate issued.
37	Chennai	Tamilnadu	Perambalur	Olaiyadi(W) Mine	Limestone	S. Saravanan M/s.Dhandapani Cements Pvt. Ltd.	O/C	Major	0	Patta land - 1.33	1.33	0	Patta land - 1.33	1.33	06.09.2011	23.12.2014	FMCP Certificate issued.
38	Chennai	Tamilnadu	Tirunelveli	Vijayapathy Mine	Lst.	M/s.India Cements Ltd.	O/C	Major	0	Govt. Land	25.75	0	Govt. Land	25.75	24.09.2013	22.09.2014	FMCP Certificate issued.
39	Chennai	Tamilnadu	Tirunelveli	Vijayapathy Mine	Lst.	M/s.India Cements Ltd.	O/C	Major	0	Govt. Land - 24.315, Patta land	29.9	0	Govt. Land - 24.315, Patta land	29.9	22.09.2013	22.09.2014	FMCP Certificate issued.
40	Chennai	Tamilnadu	Tirunelveli	Vadkuvallypoor Lst. Mine	Limestone	M/s.India Cements Ltd.	O/C	Major	0	Poramboke	35.495	0	Poramboke	35.495	13.11.2013	11.08.2014	FMCP Certificate issued.
41	Chennai	Tamilnadu	Tirunelveli	Talayuthu Lst. Mine	Limestone	M/s.India Cements Ltd.	O/C	Major	0	Poramboke	2.58	0	Poramboke	2.58	17.02.2014	09.09.2014	FMCP Certificate issued.
42	Chennai	Tamilnadu	Ariyalur	Reddipalayam & Pudupalayam Lst. Mine	Limestone	M/s. UltraTech Cement Ltd. (Grasim Industries Ltd.)	O/C	Major	0	Patta land	3.916	0	Patta land	3.916	25.07.2014	10.09.2014	FMCP Certificate issued.
43	Chennai	Tamilnadu	Salem	Veerachipalayam Ist. Mine	Limestone	M/s.Mahalakshmi Mines & Pulverisara	O/C	Major	0	Patta land	4.615	0	Patta land	4.615	20.10.2014	13.07.2017	FMCP Certificate issued.
44	Chennai	Tamilnadu	Salem	M/s. Shivaroy Boudto Mine (Saminaduvu, Pullyur & Menakutal)	Bauxite	M/s.Vedanta (M/s. Sesa Stenite Ltd.)	O/C	Major	0	Poramboke Land	190.53	0	Poramboke Land	190.53	17.06.2016	16.10.2019	FMCP Certificate issued.
45	Chennai	Tamilnadu	Ariyalur	Pudupalayam Lst. Mine	Limestone	M/s.Ramco Cements Ltd. (previous - M/s Madras Cements Ltd.)	O/C	Major	0	Patta land	4.83	0	Patta land	4.83	--	10.06.2016	FMCP Certificate issued. FMCP approval date not given
46	Chennai	Tamilnadu	Ariyalur	Edayathankudi Lst. Mine	Limestone	M/s.Ultra Tech (Previous-M/s.Grasim Industries Ltd.)	O/C	Major	0	Patta land - 10.41, Poramboke	10.545	0	Patta land - 10.41, Poramboke	10.545	07.06.2018	17.12.2018	FMCP Certificate issued.
47	Chennai	Tamilnadu	Ariyalur	Alathiyur Lst. Mine	Limestone	M/s.Ramco Cements Ltd. (previous - M/s Madras Cements Ltd.)	O/C	Major	0	Patta land	13.88	0	Patta land	13.88	10.05.2018	26.03.2019	FMCP Certificate issued.
48	Chennai	Tamilnadu	Ariyalur	Alathiyur Lst. Mine	Limestone	M/s.Ramco Cements Ltd. (previous - M/s Madras Cements Ltd.)	O/C	Major	0	Patta land - 53.375, Poramboke	57.12	0	Patta land - 53.375, Poramboke	57.12	10.05.2018	26.03.2019	FMCP Certificate issued.
49	Chennai	Tamilnadu	Perambalur	Veragupadi Lst. Mine	Limestone	M/s Vijay Cements Ltd.	O/C	Major	0	Poramboke	0.965	0	Poramboke	0.965	01.03.2019	30.03.2021	FMCP Certificate issued.
50	Chennai	Tamilnadu	Ariyalur	Chinnapattakadu Ist. Mine	Limestone	M/s.Dhandapani Cements Ltd.	O/C	Major	0	Patta land	4.94	0	Patta land	4.94	20.08.2020	17.03.2021	FMCP Certificate issued.
51	Chennai	Tamilnadu	Perambalur	Perali(S) Lst. Mine	Limestone	S. Sathammal	O/C	Major	0	Patta land	1.92	0	Patta land	1.92	20.08.2020	17.03.2021	FMCP Certificate issued.
52	Gandhinagar **	Gujarat	Junagadh	Ramapara	Limestone	Ambuja Cements Ltd.	O/C	Major	0	131.66	131.66	0	131.7	131.66	07-03-2006		Record Taken from Control Chart received from Eastwile Udaipur Regional Office. Date not Mentioned in Control Chart for issue of Certificate for successful implementation of proposals of
53	Gandhinagar **	Gujarat	Junagadh	Vadnagar	Limestone	Ambuja Cements Ltd.	O/C	Major	0	90.044	90.044	0	90.04	90.044	16-03-2009	11-11-2009	Record Taken from Control Chart received from Eastwile Udaipur Regional Office
54	Jabalpur	Madhya Pradesh	Balaghat	Pandanwani	Manganese	M/s D P Rai	O/C	Major	0	4.232	4.232	0	4.232	4.232	28.02-2020	29/09/2020	FMCP Certificate issued.
55	Jabalpur	Madhya Pradesh	Neemach	Kanka	Limestone	M/s Ultratech Cement limited	O/C	Major	0	34.232	34.232	0	34.23	34.232	03.06.2019	24/03/2022	FMCP Certificate issued.
56	Jabalpur	Madhya Pradesh	Saina	Raura	Limestone	Smt. Manju Singh	O/C	Major	0	23.9	23.9	0	23.9	23.9	22.06.2020	29/07/2021	FMCP Certificate issued.

Note:-
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Eastwile Udaipur Region

FMCP approved for full area and FMCP certificate issued for successful implementation of FMCP proposal

Updated Information on Mines (Non-Coal) where Final Mine Closure Plan has been approved for Part surrender of area and FMCP Certificate

Sl. No.	Region	State	District	Name of the Mining Lease	Mineral	Name of the (previous) Leaseholder	Whether O/C or U/S	Major/Minor	Total Lease Area			Area for which FMCP is approved			Date of approval of FMCP	Date of Certificate successful implementation of proposals of FMCP	Remarks, if any
									Forest	Non Forest	Total	Forest	Non	Total			
1	Goa	Maharashtra	Ratnagiri	Velas Sakin Bauxite	Bauxite	Smt. Sushilaba S.	O/C	Major	0	171.3	171.3	0	80.2	90.2	16.09.2009	18.10.2011	FMCP certificate issued (Part Area)
2	Goa	Maharashtra	Ratnagiri	Uttamner Bauxite	Bauxite	M/s. Ashapura Miners	O/C	Major	0	107.74	107.74	0	61.9	61.9	17.11.2009	27.11.2013	FMCP certificate issued (Part Area)
3	Ranchi	Jharkhand	Palamu	Gaura	Graphite	Shri Shishir Kumar Poddar	O/C	Major	0	6.608	6.608	0	1.947	1.947	18-02-2013	22-03-2013	FMCP certificate issued (Part Area)
4	Goa	Karnataka	Balgauri	Yadwad Limestone Mine (M.L.No.1828)	Limestone	M/s. Ratna Cement (Yadwad) Ltd.	O/C	Major	0	877.11	877.11	0	203.46	303.46	13.01.2010	08.04.2010	FMCP certificate issued (Part Area)
5	Bhubaneswar	Odisha	Sundergarh	Patamunda	Iron & Manganese	M/s Sun Alloys Ltd.	O/C	Major	612.351	164.955	807.306	31.629	0	31.629	30.08.2008	23.03.2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
6	Bhubaneswar	Odisha	Keonjhar	Rhondabendi	Iron	Tata Steel	O/C	Major	836.757	141.243	978	315.433	0	315.433	03-09-2009	25.03.2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
7	Bhubaneswar	Odisha	Koraput	Panchapatnai	Bauxite	NALCO	O/C	Major	547.615	698.08	1244	715.733	0	715.733	24/05/2010	17/10/2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
8	Bhubaneswar	Odisha	Bolangir	Anilapali Graphite	Graphite	A Mishra	O/C	Major	0	14.937	14.937	10.044	0	10.044	06-10-2010	03-04-2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
9	Bhubaneswar	Odisha	Sundergarh	TRB Iron	Iron ore	Jinori	O/C	Major	286.713	1.139	287.848	90.061	0	90.061	29.07.2010	17/02/2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
10	Bhubaneswar	Odisha	Sundergarh	KJ ST	Iron/Bauxite	S.N Mohanty	O/C	Major	330.04	3.023	333.063	144.54	0	144.54	12.01.2011	01.11.2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
11	Bhubaneswar	Odisha	Sonepur	GBC Quartz & Gemstone	Qtz & Gemstone	M/s Manikswari Minerals	O/C	Minor	51.78	0	51.78	46.888	0	46.888	01-04-2011	28/01/2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
12	Bhubaneswar	Odisha	Baragani	Menkanunda	Graphite	Sh. P.C. Agarwal	O/C	Major	10.91	34.342	45.252	19.024	0	19.024	07-11-2011	17/10/2011	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
13	Bhubaneswar	Odisha	Sundergarh	Patamunda	Manganese	M/s Sun Alloys & Minerals Ltd.	O/C	Major	0.38	80.817	81.197	0.036	0	0.036	28/10/2011	12.11.2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
14	Bhubaneswar	Odisha	Mayurbhanj	Nagalisila	Iron ore	Sh. G.C. Choudhary	O/C	Major	8.745	37.186	45.931	0.568	0	0.568	28/10/2011	02-09-2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
15	Bhubaneswar	Odisha	Keonjhar	Laupada	Iron ore	Narayani Sons (P) Ltd.	O/C	Major	38.817	104.519	143.336	60.8	0	60.8	12-05-2011	25/04/2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
16	Bhubaneswar	Odisha	Bolangir	Beharamunda	Graphite	Sh. Pramod Kumar Agarwal	O/C	Major	0	48.765	48.765	0	27.284	27.284	19/12/2011	02-07-2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
17	Bhubaneswar	Odisha	Sundergarh	Kamando & Kula	Manganese Ore	Sh. U. C. Mishra	O/C	Major	47.81	12.89	60.7	16.04	0	16.04	01-02-2012	20/04/2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
18	Bhubaneswar	Odisha	Sundergarh	Lanjibania	Limestone & Dolomite	M/s OCL India Ltd.	O/C	Major	62.403	631.147	693.55	20.493	0	20.493	02-08-2012	23/03/2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
19	Bhubaneswar	Odisha	Koraput	Panchapatnai	Bauxite	M/s NALCO Ltd.	O/C	Major	2967.347	515.934	3483.28	2087.92	0	2087.92	05-05-2012	23/08/2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
20	Bhubaneswar	Odisha	Keonjhar	Unchabali	Iron & Manganese	Sh. Prabodh Mohanty	O/C	Major	0	8.133	8.133	0	1.497	1.497	04-11-2012	20/04/2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
21	Bhubaneswar	Odisha	Sundergarh	Kumitar	Iron Ore & Manganese Ore	M/s OMC Ltd.	O/C	Major	1206.138	0.332	1212.47	561.47	0	561.47	20/07/2012	08.09.2012	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
22	Bhubaneswar	Odisha	Keonjhar	Daitari Iron ore Mines	Iron ore	M/s OMC Ltd.	O/C	Major	1618.937	193.053	1812.99	794.685	0	794.685	0/0/2013	26/06/2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
23	Bhubaneswar	Odisha	Keonjhar	Nuasahi Chromite	Chromite	M/s IMFA	O/C	Major	0.338	40.129	40.468	0.339	0	0.339	08-02-2013	04.11.2013	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
24	Bhubaneswar	Odisha	Mayurbhanj	Bedampohar	Iron ore	Ltd Traders	O/C	Major	443.94	0	443.94	314.33	0	314.33	24.01.2014	05-02-2014	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
25	Bhubaneswar	Odisha	Sundergarh	Tehra Iron & Mn Mine	Iron Ore & Manganese Ore	M/s BICO Ltd.	O/C	Major	87.714	28.856	116.572	20.888	0	20.888	16.01.2015	26.04.2019	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
26	Bhubaneswar	Odisha	Keonjhar	Barnabani Mn Mine	Manganese Ore	M/s Tata Steel Ltd.	O/C	Major	688.55	464	1150.55	688.55	0	688.55	20.01.2015	31/05/2016	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
27	Bhubaneswar	Odisha	Sundergarh	Nadish Iron & Mn Mines	Iron Ore & Manganese Ore	M/s Feegrade & Co (P) Ltd.	O/C	Major	89.87	31.535	121.405	5.443	0	5.443	17.04.2015	26.04.2019	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
28	Bhubaneswar	Odisha	Mayurbhanj	Gorumahisani Iron Ore Mine	Iron	M/s Ghanashyam Mishra & Sons	O/C	Major	1203.8	231.5	1435.3	1085.8	0	1085.8	09.11.2015	21/04/2016	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
29	Bhubaneswar	Odisha	Bargarh	Dungun Lst Mine	Limestone	ACC Ltd.	O/C	Major	78.809	428.906	507.215	19.5	0	19.5	04.05.2016	19/09/2016	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
30	Bhubaneswar	Odisha	Sundergarh	Raniba Iron Ore Mine	Iron Ore	M/s OMC Ltd.	O/C	Major	408.873	0	408.873	139.992	0	139.992	25.10.2018	19.12.2018	FMCP Certificate issued (Part Area). No case is available for backfilling of mine void with Ash.
31	Bhubaneswar	Odisha	KEONJHAR	Banapora Chromite Mine	Chromite	M/s OMC Ltd.	O/C	Major	295.38	1287.45	1582.83	0	612.605	612.605	02.08.2021	04.10.2021	FMCP Certificate issued (Part Area). Mine not yet started. No case is available for backfilling of mine void with Ash.
32	Ajmer	Rajasthan	Tonk	Davkhara	Garnet	M K Lal	O/C	Major	0	82.2	82.2	0	43.6	43.6	11-05-2009	05-05-2009	FMCP Certificate issued (Part Area).
33	Ajmer	Rajasthan	Sikar	Nanda	Iron Ore	M/s Prateek Minerals	O/C	Major	0	44.93	44.93	0	19.42	19.42	12-07-2008	20-12-2009	FMCP Certificate issued (Part Area).
34	Ajmer	Rajasthan	Jhunjhunu	Tadawas	Iron Ore	M/s Shree Balaji Minerals	O/C	Major	0	34.81	34.81	0	30.02	30.02	24-05-2007	22-08-2008	FMCP Certificate issued (Part Area).

35	Ajmer	Rajasthan	Bhikwara	Mandal	Garnet	Rama Sharma	O/C	Major	0	5	5	0	0.625	0.625	25-07-2007	21-01-2010	FMCP Certificate issued (Part Area)
36	Ajmer	Rajasthan	Jaisalmer	Kapuria Q/1/D1	Siliceous Earth	M/s Soema Minerals	O/C	Major	0	350	350	0	301.3	301.3	28-11-2007	28-11-2009	FMCP Certificate issued (Part Area)
37	Ajmer	Rajasthan	Bhikwara	Kodukota	Garnet	M/s AKD Gems Garnet	O/C	Major	0	5	5	0	0.73	0.73	20-02-2008	22-06-2008	FMCP Certificate issued (Part Area)
38	Ajmer	Rajasthan	Tonk	Rajmahal	Garnet	M/s Ansal Brothers Garnet	O/C	Major	0	83.4085	83.4085	0	73.65	73.65	24-09-2008	21-10-2008	FMCP Certificate issued (Part Area)
39	Ajmer	Rajasthan	Ajmer	Kali Dunda	Magnetite	M/s Pansan Minerals	O/C	Major	0	254.25	254.25	0	124.76	124.76	18-12-2008	26-03-2009	FMCP Certificate issued (Part Area)
40	Ajmer	Rajasthan	Jalpur	Thakurani Ki Dhani	Iron Ore	M/s PSI Ltd	O/C	Major	52.7945	0	52.7945	48.0945	0	48.0945	26-12-2008	13-02-2009	FMCP Certificate issued (Part Area)
41	Ajmer	Rajasthan	Tonk	Devichers	Garnet	M/s Hakim Mohammad	O/C	Major	0	5	5	0	0.2	0.2	12-10-2009	07-01-2010	FMCP Certificate issued (Part Area)
42	Ajmer	Rajasthan	Sikar	Prokimpuri	Iron Ore	Net Ram Goyal	O/C	Major	0	5	5	0	0.05	0.05	26-03-2010	30-06-2010	FMCP Certificate issued (Part Area)
43	Ajmer	Rajasthan	Tonk	Kushelpura	Garnet	Naimuddin	O/C	Major	0	5	5	0	0.5	0.5	26-03-2010	06-05-2010	FMCP Certificate issued (Part Area)
44	Ajmer	Rajasthan	Sikar	Jamalpur	Iron Ore	M/s Prateek Minerals	O/C	Major	0	5	5	0	0.04	0.04	07-07-2010	09-08-2010	FMCP Certificate issued (Part Area)
45	Ajmer	Rajasthan	Jaisalmer	sait	Siliceous Earth	Rebual	O/C	Major	0	5	5	0	0.1	0.1	30-08-2011	22-08-2012	FMCP Certificate issued (Part Area)
46	Ajmer	Rajasthan	Jaisalmer	sait	Siliceous Earth	Chhatrapal	O/C	Major	0	5	5	0	0.1	0.1	30-08-2011	22-08-2012	FMCP Certificate issued (Part Area)
47	Ajmer	Rajasthan	Tonk	Gachni	Garnet	Chiranjil Banjara	O/C	Major	0	5	5	0	0.2	0.2	03-01-2012	10-02-2012	FMCP Certificate issued (Part Area)
48	Ajmer	Rajasthan	Jaisalmer	Mandal	Siliceous Earth	Sundar Devi	O/C	Major	0	5	5	0	1	1	01-06-2012	22-08-2012	FMCP Certificate issued (Part Area)
49	Chennai	Tamilnadu	Salom	Cherichavadi Magnetite Mine over 32.516 hect.	Magnetite Dunite	S. Dalmis - Bharat Sugar & Industries Ltd.	O/C	Major	0	Hill Porambo ke land	531.08	0	Hill Porambo nke land	52.516	05-11-2005	30-03-2011	FMCP Certificate issued (Part Area)
50	Chennai	Tamilnadu	Virudhunagar	Pandalgudi Ist. Mine (Vs. Suthapuram)	Limestone	M/s Ramco Cements Ltd. Previous M/s Madras	O/C	Major	0	Patta land	189.45	0	Patta land	2.5	12-01-2021	27-05-2022	FMCP Certificate issued (Part Area)
51	Dehradun	Himachal Pradesh	Sirmour	Pamta Limestone Mine	Limestone	A. Dean & Co.	O/C	Major	4.89	18.3	23.2	18.3	Nil	18.3	13-11-2007	14-07-2014	FMCP Certificate issued (Part Area)
52	Dehradun	Himachal Pradesh	Sirmour	Banwas Limestone Mine	Limestone	M/s R.P. Anand & Sons	O/C	Major	Nil	14.48	14.48	Nil	9.89	9.89	09-06-2011	19-01-2012	FMCP Certificate issued (Part Area)
53	Dehradun	Himachal Pradesh	Sirmour	Banour Limestone Mine	Limestone	S.C. Chawla	O/C	Major	Nil	28.26	28.26	Nil	23.51	23.51	10-08-2011	04-01-2012	FMCP Certificate issued (Part Area)
54	Dehradun	Himachal Pradesh	Sirmour	Dhanwasa Monal Banour Limestone Mine	Limestone	M.C. Goyal & Sons	O/C	Major	Nil	20.1	20.1	Nil	15.142	15.142	30-07-2013	14-09-2012	FMCP Certificate issued (Part Area)
55	Dehradun	Himachal Pradesh	Sirmour	Sangrahi Limestone Mine	Limestone	V.K. Waia	O/C	Major	Nil	9.051	9.051	Nil	1.061	1.061	05-07-2012	22-08-2012	FMCP Certificate issued (Part Area)
56	Dehradun	Himachal Pradesh	Solan	Kashlog Limestone Mine	Limestone	M/s Ambuja Cements Ltd.	O/C	Major	138.7	346.62	485.52	15.52	Nil	15.52	19-11-2013	18-01-2014	FMCP Certificate issued (Part Area)
57	Dehradun	Himachal Pradesh	Sirmour	Banour Limestone Mine	Limestone	Rakesh Chaudhary	O/C	Major	Nil	4.98	4.98	Nil	0.23	0.23	18-01-2014	20-02-2014	FMCP Certificate issued (Part Area)

Information regarding Pits in Working Mines for Fly Ash

SN	Region	District	Mine_Code	Name of Mine	Name of Lessee	Name of Mineral	Lease Area Total (ha)	(Opencast/Underground, Opencast & Underground both)	Pit-Id	Area covered under Existing Pit-Id (sqm.)	Depth of Pit (m)	Estimated Volume covered under Pit-Id (cu m)	Area covered under Pit ID where mineral is exhausted (sqm.)	Depth of exhausted pit (m)	Estimated Volume of the exhausted pit (cu m)	Location of Pit (Latitude)	Location of Pit (Longitude)	Remarks for suitability of the exhausted Pit for backfilling with fly ash
1	Ajmer	Bundi	38RAJ08002	Lakheri(01/92)	ACC LTD	Limestone	1516.88	Opencast	P3Upper	75800	20	642720	10250	20	205000	From 25°40'46.17"N to 25°41'0.75"N	From 76°10'55.00"E to	PIT AVIALBLE FOR ASH FILLING. Matured for backfilling.
2	Ajmer	Chittorgarh	38RAJ09006	Aditya(24/92)	Ultratech Cement Ltd.	Limestone	760.692	Opencast	Pit1	955501.6	54	38697815.2	Nil	Nil	Nil	2736938.14	459703.25	THE PITS WILL BE AVILABLE FOR ASH FILLING FROM FY 2024-25 ONWARDS.
3	Ajmer	Chittorgarh	38RAJ09006	Aditya(24/92)	Ultratech Cement Ltd.	Limestone	760.692	Opencast	Pit3	964732	50	36177450.75	Nil	Nil	Nil	2733962.86	460310.17	THE PITS WILL BE AVILABLE FOR ASH FILLING FROM FY 2024-25 ONWARDS.
4	Jabalpur	Rewa	38MPR33029	Bankuiyan Limestone Mine	Jaiprakash Associates Ltd	Limestone	407.005	Opencast	1	610000	15	9150000	610000	15	9150000	519787 E	2721194 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
5	Jabalpur	Rewa	38MPR33030	Bankuiyan Limestone Mine	Jaiprakash Associates Ltd	Limestone	72.321	Opencast	1	150000	15	2250000	150000	15	2250000	520368 E	2721295 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
6	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	1	33852	20	677040	33852	20	677040	518200 E	2718800 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
7	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	2	40211	16	643376	40211	16	643376	518518 E	2718667 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
8	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	3	50010	18	900180	50010	18	900180	518319 E	2718902 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
9	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	4	83142	18	1496556	83142	18	1496556	517685 E	2719089 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
10	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	5	70531	14	987434	70531	14	987434	517498 E	2718853 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
11	Jabalpur	Rewa	38MPR33035	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	171.362 Ha	Opencast	6	79079	11	869869	79079	11	869869	516665 E	2719061 N	Suitable for backfilling with fly ash. Fully matured for backfilling.
12	Jabalpur	Rewa	38MPR33003	Naubasta Limestone Mine	Jaiprakash Associates Ltd	Limestone	460.31	Opencast	1	137147	20	2742940	137147	20	2742940	5180000 E	2718000 N	Suitable for backfilling with fly ash. Fully matured for backfilling.

No. 24028/14/2018-H
Government of India
Ministry of Road Transport & Highways
S&R(P&B) Section

Transport Bhavan, No.1, Parliament Street, New Delhi-110001

Dated: August 27, 2018

To

1. The Chairman, National Highways Authority of India, G-5 & 6, Sector-10, Dwarka, New Delhi-110 075.
2. The Managing Director, NHIDCL, PTI Building, New Delhi-110001
3. All CE-ROs of the Ministry

Subject: Use of fly ash in road/ flyover embankments construction.

The use of fly-ash in road construction is permitted as per the Standards & Specifications evolved by the Indian Road Congress/ Ministry. The physical and chemical properties of fly ash and the design methodology to be adopted for embankment construction has been specified in IRC:SP:58:2001 "Guidelines for use of fly-ash in road construction". Section 305 i.e. "Embankment Construction" of MoRT&H Specifications for Road and Bridge works lays down the specifications for use of fly-ash in embankment construction.

2. There is a huge generation of fly ash in the country and substantial portion of it remains unutilized which is an environmental concern, creating health hazards apart from occupation of large areas of precious land for its storage/disposal. Disposal and utilization of ash generated at the thermal power plants has become a pressing and urgent task. Bulk utilization of the fly-ash is possible in the field of civil engineering applications, especially construction of road embankments.

3. Ministry of Environment Forests and Climate Change (MoEF&CC) has issued various notifications for fly ash utilization. The principal notification was issued on 14-9-1999, which was subsequently amended vide notifications dated 27-8-2003, 3-11-2009 and 25-1-2016. As per the notification of MoEF&CC, it is mandatory to use fly-ash in the construction of road or flyover embankments within a radius of 300 km of a thermal power plant. Further, the relevant content of the notification dated 25-1-2016 of MoEF&CC regarding road/ flyover embankment construction are as under:-

Para 10: The cost of transportation of ash for road construction projects or for manufacturing of ash based products or use as soil conditioner in agriculture activity within a radius of hundred kilometers from a coal or lignite based thermal power plant shall be borne by such coal or lignite based thermal power plant and the cost of transportation beyond the radius of hundred kilometers and up to three hundred kilometers shall be shared equally between the user and the coal or lignite based thermal power plant.

Para 14: The coal or lignite based thermal power plants shall within a radius of three hundred kilometers bear the entire cost of transportation of ash to the site of road construction projects under Pradhan Mantri Gramin Sadak Yojana and asset creation programmes of the Government involving construction of



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buildings, road, dams and embankments.

4. The issue of lesser off-take of fly-ash in road construction activities of the Ministry of Road Transport & Highways and its executing agencies (NHAI, State PWDs, NHIDCL) has been reviewed at the level of the Ministry. It was pointed out that the Thermal Power Plants have been found to be reluctant to bear the Transportation Costs in accordance with the latest Notification issued by the MoEF&CC on the subject. Accordingly, Secretary, MoRTH took up the matter with the Secretary, Ministry of Power and the CMD/ NTPC. The CMD, NTPC clarified that they had already issued instructions in this behalf to the officers-in-charge of all the NTPC Plants. The availability of fly ash at various stations of National Thermal Power Corporation (NTPC) is available at NTPC official web site www.ntpc.co.in under the Tab "Ash Availability". The names of responsible persons along with telephone number/ mobile number/ E-mail address to communicate for issues of Pond ash is mentioned herein. The same is also available in the App "ASHTRACK" launched by the Ministry of Power.

5. A list of Thermal Power Stations and the available quantity of fly ash as on 30-6-2018, as received from the Ministry of Urban Development is enclosed at **Annexure-A**.

6. The notification dated 25-1-2016 of the MoEF&CC further stipulates that an MoU or any other agreement for using fly ash is to be made between the Thermal Power Station and construction agency/ Contractor. A sample MoU finalized between the NTPC and officials of NHAI is enclosed as **Annexure-B**.

7. It is, therefore, requested to assess the quantity of fly ash that can be utilized in each on-going project within a radius of 300 km from the thermal power plant. The details of the assessed quantities of fly ash may be provided in the following proforma to the Ministry urgently:

A. On-going Projects (bid before 25-1-2016)

Sr. No.	Name of the nearby thermal power plant	Available quantity in plant in Tonne	Name of Project/ NH No.	Length of the Project	Quantity of fly ash that can be utilized in Tonne	Average lead of the project from plant
1.	2.	3.	4.	5.	6.	7.

B. On-going Projects (bid after 25-1-2016)

Sr. No.	Name of the nearby thermal power plant	Available quantity in plant in Tonne	Name of Project/ NH No.	Length of the Project	Quantity of fly ash that can be utilized in Tonne	Average lead of the project from plant
1.	2.	3.	4.	5.	6.	7.

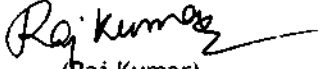


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8. It is requested to provide the details in the proforma prescribed under para 7 above within 10 days to the Ministry. It may be mentioned that a meeting shall be held by the Secretary (RT&H) on this issue in the first week of September, 2018.

Yours faithfully,


(Raj Kumar)

Assistant Executive Engineer (S&R) (P&B)
For Director General (Road Development) & SS

Copy to:

1. All ADGs in the Ministry of Road Transport & Highways
2. All CEs in the Ministry of Road Transport & Highways

Ash Availability

Stock of each type of ash available at NTPC Stations as on 30.06.2018

Sr. No.	Name of Coal based thermal power Station	State	Month	Year	Fly ash availability in Metric Ton	Stock of Bottom Ash in Metric Ton	Stock of Ash in ash Pond in Million Metric Ton	contact person & Designation	Contact No.	Download
1.	Singrauli	Uttar Pradesh	June	2018	600	-	70.20	Debasis Sen, CGM	05446 - 232441	
2.	Korba	Chhattisgarh	June	2018	700	-	48.52	Niraj Kumar Sinha, ED	07759-237234	
3.	Ramagundam	Telangana	June	2018	4969	0	70.84	Ravindra, CGM	08728 - 272125	
4.	Farakka	West Bengal	June	2018	2700	-	39.92	Kunal Gupta, CGM	03485-224241	
5.	Vindhyachal	Madhya Pradesh	June	2018	4000	-	64.86	A.K Tiwari, CGM	07805 - 247710	
6.	Rihand	Uttar Pradesh	June	2018	3000	-	32.88	Ashes Kumar Mukherjee, CGM	05446 - 242001	
7.	Kahalgaoon	Bihar	June	2018	3700	737000	65.93	K Sreedhar, CGM	06429 - 226333	
8.	Dadri	Uttar Pradesh	June	2018	18500	-	0.12	A.K Das, CGM	0120 - 2671300	
9.	Talcher Kaniha	Orissa	June	2018	1770	-	74.45	Ram Kuber, ED	06760 - 243252	
10.	Feroze Gandhi, Unchahar	Uttar Pradesh	June	2018	2000	-	8.58	R.K Sinha, CGM	05311 - 278010	
11.	Talcher Thermal	Orissa	June	2018	200	-	2.48	Mithlesh Singh, HOP	06760 - 249101	
12.	Simhadri	Andhra Pradesh	June	2018	5100	0	2.49	A Maiti, CGM	08924 - 243001	
13.	Tanda	Uttar Pradesh	June	2018	1450	-	6.14	K.S Rajiv , ED	05273 - 281198	

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14.	Badarpur	Delhi	June	2018	3500	857	-	0.16	Chandan Chakraborty, CGM	011 - 26949523
15.	Sipat	Chhattisgarh	June	2018	5200	-	-	30.88	A K Samanta, CGM	07752 - 246501
16.	Mauda	Maharashtra	June	2018	4000	784157	-	0.83	Rajkumar, CGM	07115 - 281170
17.	Barh	Bihar	June	2018	875	-	-	5.04	Asit Kumar Mukherjee, CGM	06132- 240001
18.	Bongaigaon	Assam	June	2018	-	-	-	0.58	Dipankar Bose, CGM	03661 - 282754
19.	Solapur	Maharashtra	June	2018	500	-	-	0.74	Nav Kumar Sinha, CGM	0217 - 2252578
20.	Kudgi	Karnataka	June	2018	1250	-	-	0.48	Sanjiv Kishore, ED	08426 - 280371

Remarks : ** Available on ash mound

Procedure for supply of ash from NTPC Thermal power plants [Click here...](#)

Draft MOU

**MEMORANDUM OF UNDERSTANDING FOR BEARING TRANSPORTATION COST OF
POND ASH/BOTTOM ASH MOUND ASH FROM NTPC'S ----- (NAME OF THERMAL
POWRE PLANT) TO ROAD PROJECT----- (NAME OF ROAD) OF----- NHAI**

The Memorandum of Understanding (MOU in short) is made on ----- day of ----- (name of month)----- (year) by and between NTPC limited, a wholly owned Government of India Enterprise, incorporated under the company Act, 1956 and having its Registered Office at NTPC Bhawan, Core -7, Scope Complex, 7 Institutional area, Lodhi road, New Delhi- 110003 and having one of its coal based thermal power station namely ----- (name of power plant with full address) herein referred to "NTPC" (which expression shall unless repugnant to the context or meaning there of "NTPC" includes its successors and assigns) on first part.

And

National Highway Authority of India (NHAI) having its registered office at ----- (full address of registered office) referred as "-----"(short name) (which expression shall unless repugnant to the context or meaning of includes its successors and assigns) on second part.

WHEREAS ----- (short name of power plant) has amongst other, a thermal power station at ----- (name of place where power plant situated) known as NTPC-----.

AND WHEREAS in the operation of said----- (name of power plant) ----- tonne of ash per day is generated and ----- (name of power plant) intends to bear cost for loading, transportation and unloading pond ash/ bottom ash mound ash for use in construction of road embankment at ----- (location of site) for its utilization in compliance of MoEF&CC gazette notification dated 03-1-2009 and its amendment 25-01-2016.

AND WHEREAS ----- (name of power plant) had approached ----- NHAI for use of pond ash/bottom ash/ mound ash in construction of road embankment of the ----- road project as per the stipulation of said gazette notification and compliance of the same.

AND WHEREAS ----- NHAI has agreed to utilize pond ash/ bottom ash/ mound ash in said road construction projects as per the design/ specification approved by the government agency or their consultant or as per the guidelines or specifications issued by the Indian Road Congress (IRC) as contained in IRC specification No. SP: 58 of 2001 as amended from time to time.

AND WHEREAS----- (name of power plant) has agreed to permit for excavation and loading of pond/ash/bottom ash/ mound ash from identified Ash Pond/ mound ash of ----- (name of ash pond and location) to transport ash to road construction site as per the requirement given by the construction agencies of NHAI, ---- to take up the road project work in line with specification / drawings.

NOW THE MEMORANDUM OF UNDERSTANDING WITNESS AS FOLLOWS:

That in consideration of mutual agreement and with intent to achieve above objective of

NTPC ----- and ----- NHAI mutually agreed as under:

1. NTPC shall allow excavation, loading and transportation of pond ash/ bottom ash/ mound ash in the covered trucks, dumpers as per the approved guidelines of CPCB to the construction site of road project (name of road site) to authorized transporter/ contractor of NHAI/ road construction department of Government/ Union Territory in compliance of MoEF&CC gazette notification on ash utilization dated 03-11-2009 and 25-01-2016.
2. NTPC shall issue pond ash/bottom ash/ mound ash on "as is where is basis and free of cost" to authorized transporter/contractor of NHAI for road construction projects.
3. The ----- NHAI shall inform to NTPC ----- for their (i) total requirement of pond ash/ bottom ash/bottom ash/ mound ash for the project (ii) schedule of construction plan along with location and (iii) monthly requirement of pond ash / bottom ash / mound ash at that site so that necessary arrangement will be made by NTPC----- at Ash pond/ mound for issue of ash.
4. The authorized representative of ----- NHAI shall certify the quantity of ash received from NTPC----- (name of station). In order to have better communication and management, number of trucks of ash received at construction site will be informed to NTPC ----- on daily basis. However, quantity will be reconciled with final measurement of the embankment/ fill site where ash has been used. For this, Project Director, NHAI ----- will coordinate this activity and take care of day to day issues and share with NTPC -----.
5. The Rate for transportation of Fly Ash will be as per the prevailing schedule of rates of the respective state and where such rates are not available, the same will be decided mutually by NHAI and NTPC.

6. The role of NTPC shall be limited to bear the cost of excavation, loading, transportation and unloading of pond ash/ bottom ash/ mound ash in line with MoEF&CC gazette notification dated 25-01-2016. The excavation, loading, transportation in an environment friendly manner to construction site, spreading, compaction etc. shall be the responsibility of authorized agency or contractor of NHAI.
7. "As per MoEF & CC gazette notification dated 03-11-2009 use of fly ash in road embankment construction within 100 km of any thermal power plant was mandatory. Accordingly, provision for use of ash was incorporated in DPR / tender document / award of work. In line with provision of latest gazette notification dated 25th January, 2016, NTPC shall bear the cost of transportation of ash within a radius of 100 km from thermal power plant and share equally with NHAI beyond the radius of 100 km and up to 300 km*. NHAI shall take necessary care in the contract awarded after 3rd Nov 2009 and before 25th January 2016 wherein provision for mandatory use of ash within 100 km of power plant already made and contractor has duly considered, no double benefit is passed on to the contractor due to bearing of transportation cost of ash by NTPC-----.
- With regard to the contract awarded by NHAI, the concessionaire / contractor will transport the fly ash from respective NTPC thermal power at their own resources. NHAI will submit the bill / invoice for reimbursement of transportation cost of fly ash based on the quantity of fly ash lifted and used in road embankment work and the rate agreed as per point no. 5 NTPC --- will reimburse the transportation cost of fly ash to NHAI after due verification within 6 weeks' time".
- * The decision on bearing the cost of Transportation will have to be implemented based on the clarification to be received from MOEF &CC.

8. "In order to ensure compliance of environment / safety norms while excavating, loading transportation, unloading and placing of ash, suitable provisions will be made in the contract of authorized agency / contractor by NHAI for making him solely responsible for compliance".
9. NTPC ----- shall not be responsible for any violation of quality/ construction norms set by NHAI for embankment construction by the ----- (name of agency) due to use of pond ash/ bottom ash/ mound ash. ----- NHAI shall ensure that Govt. rules & regulation, local bye-laws, environment norms/ stipulations etc. for construction of road project are adhered to.
10. To ensure that pond ash/ bottom ash/ mound ash issued from by NTPC --- thermal power plant has been utilized for road embankment construction by the contractor of NHAI shall link the payment of ----- (name of contractor) for the construction work of ----- (name of road project for which pond ash/ bottom ash/ mound ash is supplied) with the certification of ash supply by NTPC-----.
11. NTPC- shall not be responsible for any defects in the quality, construction/failure of road project, if any, due to use of ash and not liable to pay any compensation whatever reason may be.
12. NTPC - shall not be responsible for any accident or injury to person engaged or otherwise affected in the process of construction of road embankment due to use of ash.

- 13. NTPC shall not be responsible for ash dumped on construction site and not utilized by the contractor on default and NHAI shall take all precautions to prevent loss or damages or to minimize loss damages or to minimize loss or damage to the extent possible and shall be liable to make good any loss or damages incurred due to negligence on their part or work under MOU.

14. Dispute Resolution

In case of any dispute, confusion or difference between the NTPC ----- and NHAI hereto, the Head of the NHAI/ road construction department of Government/ Union Territory and the NTPC HQ shall confer together and arrive at a mutually agreeable solution amicably, which shall henceforth be binding upon both the parties.

15. Arbitration

In the event the dispute or difference or claim, as the case may be, is not resolved, as evidenced by the signing of the written terms of settlement by the Parties, within thirty (30) days of reference for amicable settlement and/or settlement with assistance of Expert, as the case may be, the same shall be finally settled by binding arbitration under the Arbitration and Conciliation Act, 1996 as amended from time to time. As the claims, if any, shall arise only for petty reasons and petty values not more than a few Lakh Rupees, the case may be referred for a local consolation at Regional Office level or a sole Arbitrator at Regional Office level.

16. Place of Arbitration

The place of arbitration shall be at the HQ of local Regional Office, NHAI. But by agreement of the Parties, the arbitration hearings, if required, can be held elsewhere from time to time.

17. Validity

This MOU shall come into force for all purpose and intent from the date of its signing and shall remain valid and operative for ----- months which may be extended or curtailed on mutual consent depending on the requirement.

18. Governing Law and Jurisdiction

This MOU shall be governed by Indian laws and the Courts of Delhi shall have exclusive jurisdiction in all matters under these Presents.

19. Severability

In the event that any clause or provision of this MOU or any part thereof shall be declared invalid, void, or unenforceable by any court having jurisdiction, such invalidity shall not affect the validity or enforceability of the remaining portions of this MOU unless the result would be manifestly inequitable or unconscionable.

20. Amendments & Scope of modification

The MOU terms can be reviewed on mutual agreement in writing between NTPC - and --
-- NHAI whenever required owing to new conditions.

21. Force Majeure

That notwithstanding anything contained herein the obligation of NTPC and NHAI under this agreement shall remain suspended and neither of them shall be entitled to claim any compensation from each other for any loss or damage caused by such suspension, whether total or partial during the force majeure events such as but not limited to flood, earthquake, strike, war, terrorist attack etc. It shall be obligatory on the part of all the two parties to communicate in writing to each other of the happening of force majeure events and its cessation within 10 (ten) days of its happening or on date of cessation as the case may be. All the parties shall mutually discuss and decide the future course of action on the happening of force majeure events if it continues for more than 30 days. (Force Majeure is hereby defined as any cause which is beyond the control of the NTPC - AND - NHAI as the case may be which they could not foresee or with a reasonable amount of diligence could not foresee and which substantially affect the performance of agreement such as (a). Natural Phenomena including but not limited to floods, draughts, earthquakes and epidemics and (b), Acts of any government, domestic or foreign including but not limited to war declared or undeclared, priorities, quarantines and embargoes.

22. Notices

Any notice that may be required under this agreement shall be given in writing by any of the party either by personal delivery against acknowledgement or Registered Ads, Mail or Facsimile and shall be deemed to have been duly served upon receipt thereon. The addresses for the notices or correspondence shall be as under:

NHAI

NTPC Station

In witness whereof the parties through their authorized representative put their respective signatures of the Memorandum of Understanding on the day, month and year first above written.

(Authorised Signatory of NTPC)

(Authorised Signatory of NHAI)

Witness

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