

Item No. 01

Court No. 1

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

Appeal No. 05/2021  
(I.A. No. 43/2021)

M/s NTPC Limited

Appellant

Versus

Uttarakhand Pollution Control Board

Respondent

Date of hearing: 18.02.2021

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

Appellant: Mr. Pawan R. Upadhyay, Advocate

**ORDER**

1. This appeal has been preferred against order dated 07.12.2020 passed by the Uttarakhand Pollution Control Board under Section 33 A of the Water (Prevention and Control of Pollution) Act, 1974 (Water Act) requiring the appellant to pay compensation of Rs. 57,96,000/- on polluter pays principle for restoration of the environment. The appellant was found to have violated muck disposal sites maintenance norms, resulting in damage to the environment.

2. We have heard learned Counsel for the appellant at length and perused the impugned order and the memo of appeal.

3. Case of the appellant-Corporation is that it is operating Vishnugad Hydroelectric Project, District Chamoli, Uttarakhand. It has set up 5 muck disposal dumping sites in Tapovan – Vishnugad Hydroelectric Project, out of which 3 were completed 3-5 years back

sites while 2 are still active and operational. The State PCB found deficiencies in respect of the same and vide notice dated 29.06.2020 directed the appellant to take following measures:-

- “1. *Damaged toe protection and contour stone walls should be repaired and strengthened with proper engineering design.*
2. *Suitable fencing may be provided to control excess human and animal interference.*
3. *Unattended works of leveling, surface smoothing, and removal of unwanted material and spreading of available soil at Tapovan site should be completed.*
4. *Manure and fertilizer may be applied to improve the soil fertility.*
5. *Suitable species of grasses, shrubs and tree may be planted in degraded area.”*

4. Thereafter an inspection was conducted by the State PCB on 23.10.2020 and 24.10.2020 and non-compliances were noticed based on which the impugned order has been passed. Inter-alia it was found that **“the slope of muck dump is observed to be about 60° which is hazardously double the standards. Upstream side of the muck dump is subjected to the entry of water which has further added to trigger severe mass erosion. Under such unstable conditions, as expected, huge mass erosion has been seen in terms of very deep gully formation in downstream of this muck dump.”**

5. The impugned order also refers to proceedings before this Tribunal in O.A. No. 61/2019, *Gram Pradhan & Residents of Tapovan v. State of Uttarakhand*. Record of the said matter shows that on 02.01.2020, the Tribunal considered the report of the State PCB dated 07.12.2019 that muck disposal was causing damage to the river. It was observed:

- “4. *The photographs annexed to the report show clear possibility of the muck reaching the river system which needs to be prevented by way of adequate protective measures.*

5. **Let the NTPC and the TDCL take necessary steps in the matter forthwith once such steps are identified by an Expert Committee comprising Himalayan Forest Research Institute, Shimla, Central Soil and Water Conservation Research and Training Institute, Dehradun and the SPCB. The SPCB will be nodal agency for coordination and compliance. The Committee may give its report within one month.**

6. *Let a compliance report be furnished to this Tribunal by the SPCB by 31.03.2020 by e-mail at [judicial-ngt@gov.in](mailto:judicial-ngt@gov.in).*

6. Thereafter the matter was further considered on 18.06.2020 in the light of the following report filed by the State PCB:-

#### **“Field Observations**

*Expert committee along with officials from NTPC conducted field visit during March 7-8, 2020 to the muck disposal sites in Tapovan — Vishnugad Hydro-electric Power Project. The following observations were recorded:*

#### **A. Active Muck Disposal Sites**

*In Tapovan — Vishnugad Hydro-electric Power Project, two muck disposal sites (At Dhak and near TBM) are active. On site visit and discussion held with officials from NTPC, the expert committee has made the following important observations:*

- 1. Dhak muck disposal site is located with geographical coordinate of latitude 30° 30' 10.6"N, longitude 79° 36' 47.0" and altitude 2015m. This site is active but near completion (Photo 1a and 1b). Gabion toe wall has been constructed but found to be with improper foundation and backfilling. Downstream slope of dumped material is more than 45° which is prone to very severe erosion during high intensity rainfall event. Dump surface is mostly uneven and undulating with dominance of boulder, rock fragments and inert material. Comparatively a little amount of soil has been spread over a few patches of the muck dump. This site has not been fully utilized to its capacity as usable part of muck generated might have been used in construction.*
- 2. Muck disposal near TBM adit is located with geographical coordinate of latitude 30° 32' 25.2"N, longitude 79° 31' 29.9" and altitude 1713 m. This site is active and dumping of the muck material being generated in tunnelling is going on (Photo 2a and 2b). **The toe wall has been constructed but it was found as damaged in one side of the dumping zone. The slope of muck dump is observed to be about 60° which is hazardously double the standards. Upstream side of the muck dump is subjected to the entry of water which has further added to trigger severe mass erosion. Under such unstable conditions, as expected, huge mass erosion has been seen in terms***

**of very deep gully formation in downstream of this muck dump.** Since, deep excavations are inevitable in tunnelling, only grounded and fragmented rocks are being dumped and no soil is available to spread over this muck dump site. On older portion of this dump, native grass (*Chrysopogon*), shrub (*Epitorium*) and tree (*Alnus*) could be observed.

## **B. Completed Muck Disposal Sites**

Out of a total of five muck disposal sites identified in Tapovan — Vishnugad Hydro-electric Power Project, three sites were found to be completed. These sites are moderately stabilized and native grass and shrubs have appeared to provide vegetation cover. Toe protection and contour stone walls were constructed but some of them are damaged or over turned. In addition to the details of these sites provided in Table 1, site wise specific observations recorded during the field visit are provided below:

1. **Barrage Site at Tapovan:** This site is located with geographical coordinates of latitude 30° 29' 30.7"N, longitude 79° 37' 33.5" and altitude 1918m. In this site dumping of the material has been completed 4 years back (Photo 3a and 3b). The site is more or less stabilized but toe protection and contour stone barriers are damaged at some places. Some good soil was kept separately but not spread over the muck dump. Top surface is not smoothed and found uneven and undulating with boulders and other materials.
2. **Near BVC/Pressure Shaft:** This sites is located at **latitude 30° 32' 08.4"N**, longitude 79° 31' 27.8" and altitude 1704 m. In this site dumping of the material has been completed 3 years back. The site is more or less stabilized (Photo 4a and 4b).
3. **Power House Site at Animath:** This sites is located at latitude 30° 32' 00.1"N, longitude 79° 31' 10.01" and altitude 1422 m. Muck dumping has been completed 5 years back in this site. The site has been moderately stabilized but area is not protected from uncontrolled human and animal interference (Photo 5a and 5b).

## **Recommendations and Discussion**

Based on the field observations, the following recommendations are made in order to prevent muck reaching river system and minimize environmental damage:

### **A. Recommendation for Active Muck Dumps**

In Vishnugad — Tapovan Hydro-electric Power Project, two out of five muck dump sites are active while other three sites have been moderately stabilized. In active sites (Dhak and near TBM adit) **muck (grounded and fragmented rocks) is being**

**dumped and top soil is not available to spread it on the top of the muck dump on its completion.** The following measures are recommended to restore these muck dumps:

- *First of all toe/contour stone wall in each of the muck dump should be strengthened / constructed with proper engineering design. Another important aspect of the toe/contour stone wall is the ratio of its height and bottom width which should be maintained around 1:2/3. Third important aspect of toe/contour stone wall construction at muck dump site is the porous nature of the structure; therefore, gabion structures are preferred. Fourth — foundation of toe/contour stone wall should be kept in originally existing land condition.*
- *Downstream slope of the muck dump should be kept within the range of 200-300*
- *Up-stream side of the muck dump, water entry should be restricted by providing concrete diversion drain. Flat portion of muck dump may be merged with sloping surface which will not only help in easing out of downstream steep slope but also restrict the entry of water in muck dump.*
- *Stepwise consolidation is required to be provided from bottom to top.*
- *Boulders, lumps of inert materials and rock fragments should be removed from the surface. These materials can be used in strengthening or constructing the toe wall or contour stone barriers.*
- *Contour stone barrier may be provided at 3-4 m vertical interval but their foundation should be kept in originally existing land condition and not on loose muck dump.*
- *Sloping surface should be smoothed.*
- *A layer of top soil (about 5 cm thick), if available, to be spread over smoothed surface of muck dump. Good native soil will not only be having plant nutrients and organic matter but also be serving as seed bank for native vegetation.*
- *Fertility can be improved by application of manures, bio-fertilizers and fertilizers. This will promote quick vegetation establishment. These things should be applied in contour furrow (15-20 cm deep) open at about 1 m spacing. First mixture of fertilizers (DAP @ 100 kg/ha and MOP @ 50 kg/ha) be applied in the furrow then mixture of manure (FYM @ 20 t/ha) and bio-fertilizer (VAM @ 30 kg/ha) should be applied in the same furrow. After this furrow should be closed with pouring top soil collected from nearby area.*

- Now the dump is ready to apply geojute of desired specifications. Proper stitching of geo-jute strips and anchoring to surface through nailing are must to get the desired results.
- Geojute: Also called as 'soil saver' is a natural geotextile used as mulch. This is essentially a jute matting with an open mesh of 2 to 5 ins thick jute yarn having 10 mm apertures and is biodegradable. It has been successfully tried for stabilization of landslides, 'nine-spoils and sleep slopes, The technique of geojute application includes (a) spreading of geojute by overlapping and joining adjacent widths (b) driving wooden sticks to a depth of 0.5 to 1.0 m to secure mailing in place (c) planting rooted slips of local grasses and shrubs in openings between the geojute strands at close spacing.
- Slips of chrysopogon which is a native and hardy grass species or any other suitable grass can be planted at 30 cm spacing in the above mentioned furrow after application of geo-jute.
- Most suitable plant tree is alnus for such conditions. This tree is naturally growing in this project area. This tree is a non-leguminous nitrogen fixing plant which is the first tree colonizer of such situations that prevails at the muck dumps created in this project. This tree can be planted in the above mentioned furrow at spacing of 3x3 m.

### **List of Plants Species Suggested for Plantation**

#### **Grasses and Herbs**

*Chrysopogon fulvus* (Dhaloo), *Vetiveria zizanioides* (Khus or Khas), *Rumex hastatus* (Churki or Malori), *Artemisia parviflora* (Majtari), *Themeda tremula* (Kangaroo Grass) and other local grass species.

#### **Shrubs Species**

*Rosa moschata* (Ban Gulab), *Rubus ellipticus* (Rasberry or Hir), *Indigofera heterantha* (Kaithi), *Berberis lycium* (Kashmal), *Zanthoxylum alatum* (Timar). *Hypericum oblogifolium* (Choli Phulya), *Dabregeasia hypoleuca* (Siharu), *Coriaria nepalensis* (Masuri) etc.

#### **Trees Species**

*Alnus nitida* (Alder or Kosh), *Pyrus pashia* (Kainth), *Pinus wallichiana* (Kail), *Prunus cerasoides* (Pazza), *Robinia pseudoacacia* (Robinia or Pahari kikar), *Pinus roxburghii* (Chirpine) etc.

### **B. Recommendation for Completed Muck Dumps**

*Out of five muck disposal sites identified in Tapovan — Vishnugad Hydro-electric Power Project, three sites have been completed 3-5 years back. These sites are moderately stabilized and native grasses and shrubs have appeared to provide vegetation cover. Further these sites may be improved with the following measures:*

- Damaged toe protection and contour stone walls should be repaired and strengthened with proper engineering design.*
- Suitable fencing may be provided to control excess human and animal interference.*
- Unattended works of leveling, surface smoothing, removal of unwanted material and spreading of available soil at Tapovan site should be completed.*
- Manures and fertilizers may be applied to improve the soil fertility.*
- Suitable species of grasses, shrubs and trees, as listed above, may be planted in degraded area.”*

7. The Tribunal accordingly directed:-

*“1to3...xxx.....xxx.....xxx*

*4. In view of the above, **action suggested by the Committee needs to be taken by the NTPC and other concerned which may be overseen by the same Committee which may be coordinated by the State PCB. The State PCB may also assess and recover compensation for the damage to the environment in accordance with law.** Further compliance report be filed within three months from today by e-mail at [judicial-nqt@gov.in](mailto:judicial-nqt@gov.in) preferably in the form of searchable PDF/ OCR Support PDF and not in the form of Image PDF.”*

8. The State PCB, in the light of the above developments, held that the appellant had not complied with the directions of the State PCB which had resulted in damage to the environment. The State PCB assessed the compensation on ‘Polluter Pays’ principle of Rs. 57,96,000/.

9. The appellant has mentioned in the memo of appeal its action plan for compliance of environmental norms which includes repair of damaged wall, protection work with gabions in respect of the completed muck dumping sites and repair of the damaged toe protection wall. These

works are to be completed by 31.05.2021. The table in the memo of appeal in this respect is as follows:-

<b>Muck disposal Area</b>	<b>Measures for compliance</b>	<b>Action plan</b>
1. BARRAGE SITE AT TAPOVAN	Damaged toe protection and contour stone walls should be repaired and strengthened with proper engineering design.	In this site dumping of material has been completed 4 years back. Damaged wall will be repaired by 31.05.2021.
	Suitable Fencing may be provided to control excess human and animal interference.	
	Unattended works of leveling, surface smoothing, and removal of unwanted material and spreading of available soil at Tapovan site should be completed.	Will be done progressively along with other activity. Completion by 31.08.2021
	Manure and fertilizer may be applied to improve the soil fertility.	
Suitable species of grasses, shrubs and tree may be planted in degraded area.		
2. NEAR BVC PRESSURE SHAFT	Damaged toe protection and contour stone walls should be repaired and strengthened with proper engineering design.	In this site dumping of material has been completed 3 years back. Protection work with Gabions already completed. Further the damage/strengthening shall be completed by 31.05.2021.
	Suitable fencing may be provided to control excess human and animal interference.	
	Unattended works of leveling, surface smoothing, and removal of unwanted material and spreading of available soil at Tapovan site should be completed.	
	Manure and fertilizer may be applied to improve the soil fertility.	Will be done progressively along with other activity. Completion by 31.08.2021.
	Suitable species of grasses, shrubs and tree may be planted in degraded area.	
3. POWERHOUSE SITE AT ANIMATH	Damaged toe protection and contour stone walls should be repaired and strengthened with proper engineering design.	In this site dumping of material has been completed 3 years back. Protection work with Gabions already completed. Further the damage/strengthening shall be completed by 31.05.2021.
	Suitable fencing may be provided to control excess human and animal interference.	
	Unattended works of leveling, surface smoothing, and removal of unwanted material and spreading of available soil at Tapovan site should be completed.	Will be done progressively along with other activity. Completion by 31.08.2021
	Manure and fertilizer may be applied to improve the soil	



	<i>fertility.</i>	
	<i>Suitable species of grasses, shrubs and tree may be planted in degraded area.</i>	
<b>ACTIVE SITES</b>		
4. NEAR TBM ADIT	<i>Damaged toe protection and contour stone walls should be repaired and strengthened with proper engineering design.</i>	<i>The site is active and tunneling is going on. Damaged toe protection wall be repaired by 31.05.2021.</i>
	<i>Suitable fencing may be provided to control excess human and animal interference.</i>	
	<i>Unattended works of leveling, surface smoothing, and removal of unwanted material and spreading of available soil at Tapovan site should be completed.</i>	<i>Will be done progressively along with other activity.</i>
	<i>Manure and fertilizer may be applied to improve the soil fertility.</i>	
	<i>Suitable species of grasses, shrubs and tree may be planted in degraded area.</i>	

10. From the above, it is seen that even according to the appellant the remedial measures are yet to be completed. Credible reports, considered earlier, quoted above show that slope of the muck dumped was hazardously double the standards with potential for erosion. Erosion was already seen in terms of gully formation in down streams of the muck dumps. Thus, it is clear that the operative muck disposal sites were not being maintained as per MoEF laid down norms.<sup>1</sup>

11. In view of the above, there is no merit in the appeal as ‘Polluter Pays’ principle has been rightly invoked for damage to the environment.

12. Accordingly, the appeal is dismissed. The amount of compensation which may be recovered by the State PCB may be utilized for restoration of the environment in the District, as per action plan for the purpose, for

<sup>1</sup>

<http://environmentclearance.nic.in/writereaddata/Form-1A/HomeLinks/GuidanceManual.htm>

which directions have already been issued vide order passed by this Tribunal on 09.02.2021 in *O.A. No. 102/2019, Ashish Kumar Dixit v. State of Uttar Pradesh & Ors.*

In view of order in the main matter, I.A. No. 43/2021 also stands disposed of.

A copy of this order be forwarded to the State PCB by e-mail for compliance.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. Nagin Nanda, EM

February 18, 2021  
Appeal No. 05/2021  
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