



**Revised muck management plan for Muck
Management Plan for Proposed Addl. Forest Land
Measuring (7-3722 Ha.)**

Approved By:-

AK
Divisional Forest Officer,
Kinnaur Forest Division
At Reckong Peo, Distt. Kinnaur,
Himachal Pradesh -172107

SK
Surender Kumar
Director (Civil), HPPCL
Himfed Building, BCS,
New Shimla-171009

Submitted By:-

SK
Dy. General Manager (E&RR)
Shongtong Karchham HEP,
HPPCL, Reckong Peo Kinnaur.
Himachal Pradesh -172107

KM
General Manager
Shongtong Karchham HEP,
HPPCL, Reckong Peo
Kinnaur (Hr)

Muck Management Plan

Brief Introduction: Himachal Pradesh Power Corporation Limited being a HP State Govt. Undertaking executing the Shongtong Karchham Hydro Electric in Distt. Kinnaur HP. Ministry of Environment and Forest & climate change (MoEF&CC) has granted Environment Clearance (EC) and forest clearance for construction of Shongtong Karchham HEP, in the year 19 May 2011 and 14 November 2012 respectively. After following the due procedure Expert Appraisal Committee of MoEF&CC after recommending the EIA and EMP (muck management plan being a part of EMP) granted final EC.

Now due to enhancement in the exiting capacity of HEP 402 to 450 MW due to change in the river course during flood and also usage of already diverted dumping site used by BRO and restriction impose by the Army Authorities for construction activities within the boundary of 1200 yards. Project proponent has to propose additional land measuring 7-3722 ha. Additional forest land for diversion. Out of 7-3722 ha. 5-22-4 ha. of land is proposed for dumping of muck at free locations near Tangling, Usarang & Rang up mohal of Kalpa District. The detail of the propose dumping site along with the Khasara No. and area is as under: -

Sr. No.	Location of dumping site	Khasara No.	Area (in ha.)
1	Near Tangling, DS-A	2/2	2-38-13
2	Near Tangling, DS-B	2/1	1-10-05
3	Rang, DS-C	561/1, 568, 569	1-44-70
4	Usaring, DS-D	3/2	0-29-60
5		Total	5-22-48

In the proposed site for dumping.e DS-A, &B situated at Tangling area measuring 3-48-18there is no trees stnding on the location , and in DS -C situated at Rang Area measuring 1-44-70ha only 15 numbers of trees are standing that too maximum of broad leafed trees out of 15Number trees 10 no. are of Kunish and 1 is of Khidik and only 4 numbers trees are of Neoza(pinus Geradiana) apart from this only 32 no of sapling are there , out of which 20 nos are of Kunish, 9 are of Ash,5 Nos are of Alanthus and Only 2 number of Neoza saplings

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Conservator of Forests
Forest Division at Kalpa

Director, HP Power Corporation Limited,
Himad Building SOG,
New Shimla-171009 (H.P.)

District Engineer (HEP)
Kinnaur District

District Engineer (HEP)
Kinnaur District

District Engineer (HEP)
Kinnaur District

Trees standing on proposed diverted Land:

Sr. No.	Location of dumping site	Khasara No.	Area (in ha.)	Trees standing (Numbers)	Remarks
1	Near Tangling, DS-A	2/2	2-38-13	Nil	Note: - In Khasara. Number 561/1,568,569(DS-C) there are 20 (Khunish), (Alunthus)- 5, (Ash.) -9 (Newza)- 2,splings are there.
2	Near Tangling, DS-B	2/1	1-10-05	Nil	
3	Rang, DS-C	561/1, 568, 569	1-44-70	15	
4	Usaring, DS-D	3/2	0-29-60	Nil	
5		Total	5-22-48	15	

The capacity of propose dumping sites with 40% swelling factor are as under: -

Sr. No.	Location of dumping site	Khasara No.	Area (in ha.)	Capacity of dumping site with 40% SF (in cum)	Capacity of DS after 12% compaction
1	Near Tangling, DS-A	2/2	2-38-13	18,500	20,720
2	Near Tangling, DS-B	2/1	1-10-05		
3	Rang, DS-C	561/1, 568, 569	1-44-70	1,47,194	1,64,857
4	Usaring, DS-D	3/2	0-29-60	45,271	50,703.5
	Total		5-22-47	2,10,965	2,36,280

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Deputy Conservator of Forests,
Kinnair Forest Division at R.P. HP.

General Manager
Kinnair Forest Division
R.P. HP, R.P. HP
Dist. Kinnair (HP)

Dr. General Manager (ESM)
Kinnair Forest Division
R.P. HP, R.P. HP
Dist. Kinnair (HP)

Muck disposal : Considering a swelling factor of 40% quantity of muck generated from various component will be dump to these proposed dumping sites about 2,10,965.0 cum of muck and about 11,981.4 cum of muck will be utilize for construction of protection measures i.e. wire create and filling of wire create and its cladding. The detail of muck disposal site along with the expenditure to be occurred for the protection measures are tabulated below: -

MUCK MANAGEMENT PLAN

Suitable retaining walls shall be constructed to develop terraces so as to support the muck on vertical slope and for optimum space utilization. Loose muck would be compacted layer wise. The muck disposal area will be developed in a series of terraces of boulder crate wall and masonry wall to protect the area/muck from flood water during monsoons. In-between the terraces, catch water drain will be provided.

The terraces of the muck disposal area will be ultimately covered with fertile soil and suitable plants will be planted adopting suitable bio-technological measures. The basic aim and objectives of the muck management plan are to:

- Protect these areas from soil erosion
- Develop these areas by afforestation
- Develop them into parks, gardens etc.
- Utilize the maximum quantity of muck for development of infrastructure of the project
- Develop these areas in harmony with the landscape of the project area.

Various activities proposed as a part of the management plan are given as below:

- Land acquisition for muck dumping sites
- Civil works (construction of retaining walls, boulder crate walls etc.)
- Dumping of muck
- Levelling of the area, terracing and implementation of various engineering control measures e.g., boulder, crate wall, masonry wall, catch water drain.
- Spreading of soil
- Application of fertilizers to facilitate vegetation growth over disposal sites.

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Deputy Conservator of Forests,
Karnataka Forest Divisional Office HP.

General Manager (E&R)
Shree Siddaganga NRE, Bangalore
HPPCL, Hoskote, Bangalore (H. P.) 172107
Dist. Kinnar (HP)

Director (Civil),
Power Corporation Limited,
4 Building EGS,
Mumbai 400 001

For stabilization of muck dumping areas following measures of engineering and biological measures have been proposed

Engineering Measures

- Wire crate wall
- Boulder crate wall
- R.C.C
- Catch water Drain

Financial expenditure to be occurred for the protection of these dumping sites.

Sr. No	Description of items	Qty.	Rate	Unit	Amount
1. Tangling DS-A&B					
1	Wire crate of G.I. wire filled with boulders .	2343.75	2080	M3	48,75,000.0
2	Providing & laying cement concrete work 1:2:4 and cutting complete cladding work	288	4076.8		1,17,4118.4
2. Rang DS-C					
1	Wire crate of G.I. wire filled with boulders .	5664.06	2080	M3	1,17,81,250.0
2	Providing & laying cement concrete work 1:2:4 and cutting complete cladding work	722.50	4076.8		29,45,488.0
3. DS-D, Usarang					
1	Wire crate of G.I. wire filled with boulders .	2683.59	2080	M3	55,81,873.44

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Power Corporation Limited,
Infed Building ECS,
New Shimla-171009 (H.P.)

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Kinnaur Forest Division at Retao HP.

General Manager
Shanglong Karcham HEP,
HPPCL, Shanglong Pao
Dist. Kinnaur (HP)

By General Manager (E&R)
Shanglong Karcham HEP,
HPPCL, Shanglong Pao
Dist. Kinnaur (H. P.) 172107

2	Providing & laying cement concrete work 1:2:4 and cutting complete cladding work	280.80	4076.8		11,44,765.44
	Total (1+2+3)				2,75,02,495.28

Reclamation Plan

The muck generated and dump in these designated dumping sites will be properly protected by constructing wire create filled with boulders. After completing the dumping of muck these dumping sites will be properly reclaimed in consultation with the HP forest department.

Biological Measures

- Plantation of suitable tree species and soil binding species
- Plantation of ornamental plants
- Barbed wire fencing

Muck generally lacks nutrients and therefore, are difficult to re-vegetate. However, if no attempts to vegetate the slopes are made, the muck could slide lower down during rain and may eventually wash off the check dams also. Since, top soils are not available in large quantities in Himalayas, it may not be possible to apply a thin layer of soil over the muck. Bio-fertilizer technique developed by National Environmental Engineering Research Institute (NEERI) can be adopted in the proposed project. NHPC has successfully used this technique in Uri hydroelectric project. Similar approach can be utilized in the proposed project as well. In this process, the unused excavated material is piled and stacked with proper slopes at the designated muck disposal sites. The slopes are broken up by creating benches across them. This is done to provide stability to the slopes and also to provide ample space for planting of trees that would further help in holding and consolidating biotechnological approach. The traditional methods of afforestation of these areas would be supplemented with the use of fungus, i.e. Vesicular Arbuscular Mycorrhizae (VAM) and nitrogen fixing bacteria that form partnership with plant roots. These grow on plant roots and provide water and nutrition especially phosphorus to plants


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 HP Power Corporation Limited,
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 New Shimla-171009 (H.P.)

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 Deputy General Manager of Forests,
 Kinnaur Forest Division at R.D. HP.


 General Manager (E&R)
 Kinnaur Hydro Electric Project,
 Himachal Pradesh, India.
 HP-PCL, R.D. Kinnaur, Dist. Kinnaur (H. P.) 171107
 Udaipur Kinnaur (HP)

The afforestation with suitable plant species shall be done. About 1000-1200 trees/ha shall be planted. Major species recommended for plantation are listed in Table below

Botanical Name	Local Name
Trees	
<i>Populus ciliate</i>	Popular
<i>Pinus roxburghii</i>	Chir
<i>Cedrus deodara</i>	Deodar
<i>Salix acutifolia</i>	Bhains
Shrubs	
<i>Artemisia nilgarica</i>	Kunja
<i>Berberis aristata</i>	Kingor
<i>Berberis lyceum</i>	Kingor
<i>Rosa Moschata</i>	Ban gulab

Kmm
 General Manager
 Deputy General Manager (E3R)
 Deputy General Manager (E3R)
 Deputy General Manager (E3R)
 Deputy General Manager (E3R)
 Deputy General Manager (E3R)

Director (G.M.),
HP Power Corporation Limited,
Himad Building BCS,
New Shimla-171019 (H.P.)

Reclamation plan approved by the concern forest division is as under:-

Full Title of the Project:

Diversion of 7-3722 ha. of forest land in favour of Himachal Pradesh Power Corporation Ltd.
Proposal No. FP/HP/HYD/40611/2019.

Date of Proposal:

13 Nov. 2019

RECLAMATION PLAN FOR MUCK DUMPING

Dumping site situated at up Muhul Rang, Yusaring & Tangling area measuring 05-22-48 ha. Tehsil Kalpa, Range Kalpa, Forest Division Kinnaur, District Kinnaur having capacity of 210965 cum will be used for dumping of excavated muck from the project. After leveling dumping site will be rehabilitated by planting plants like, Poplar, Alinthus, Moru, and shrubs i.e Kungia, Kingor, Ban Gulab and other suitable site specific Local species. The reclamation plan for the dumping yard is as under :-

Particulars of works	Area in ha. for raising of 1100 tall plants per ha. with 4 stand RC fence post	Norms of ha. wage rate of Rs. 375/- per day (including 25%)	Add 25% increase due to increase in wage rate from 375/- to 400/- on the norms depicted in col. 3	Years of execution of works	Add 10% escalation in subsequent years	Tentative rates	Total amount (Rs.)	Area planted 5.2248 ha. (16500 tall plant planted)
Initial cost for plantation	(For 05-22-48 ha.) 5742 tall plants	138700 (2023-24)	152570	2024-25	13870	152570	152570	797147.73
Detail of Maintenance of plantation for Ten Years								
1 st year	5-2248 ha.	14200	15620	2024-25	1420	15620	15620	81611.4
2 nd year	5.2248 ha.	9600	10560	2025-26	960	7986	10560	55173.9
3 rd year	5.2248ha.	4900	5390	2026-27	490	5390	5390	52248
4 th year	5.2248 ha.	4900	5390	2027-28	2213	5838	29190	52248
5 th year	5.2248 ha.	4900	5390	2028-29	2797	6422	32110	52248
6 th year	5.2248 ha.	4900	5390	2029-30	2372	4872	24360	52248
7 th year	5.2248ha.	4900	5390	2030-31	2859	5359	26795	52248
8 th year	5.2248ha.	4900	5390	2031-32	3395	5895	29475	52248
9 th year	5.2248 ha.	4900	5390	2032-33	3984	6484	32420	52248

Director (C.I.M.),
HP Power Corporation Limited,
Himad Building BCS,
New Shimla-171009 (H.P.)

Deputy Commissioner of Forests,
Kinnaur Forest Division at N.H. Kalpa, H.P.,

(Signature)

KMP

10 th year	5 ha.	4900	5390	2033-34	4633	7133	35665	52,248.00
							Total	5,54,769.00
Total a+b								13,35,917.0
Add contingencies charges @ 5%								67,596.00
Departmental Charges @ 17.5%								2,33,785.00
G. Total								16,37,297.50

Muck Dumping Certificate: It is certified that the tree standing on the proposed land will be felled as per the norms of HP Forest Department under the supervision of HP State Forest Development Corporation Ltd. It is also certified that the said area will be developed by user agency. Hence the proposal is being recommended & Approved.

Director (Civil),
HP Power Corporation Limited,
Himad Building BCS,
New Shimla-171009 (H.P.)

Deputy Conservator of Forests,
Karnah Forest Division at (H.P.)

By (Consent) (Signature) (Date)
Deputy Conservator of Forests,
Karnah Forest Division at (H.P.),
District, Shimla (H.P.) 171009

Consent
Date
Signature
Name
Designation
Office
Address

S. No.	Particular	Area (ha)	Unit Rate (Rs/ha)	Amount (Rs.)
1.	Cost of afforestation including Cost of material	5.2248	152570	7,97,148.00
2.	1 st year Maintenance	5.2248	15620	81611.4
3.	2 nd year Maintenance	5.2248	10560	55173.9
4.	3 rd year Maintenance	5.2248	5390	52248
5.	4 th year Maintenance	5.2248	29190	52248
6.	5 th year Maintenance	5.2248	32110	52248
7.	6 th year Maintenance	5.2248	24360	52248
8.	7 th year Maintenance	5.2248	26795	52248
9.	8 th year Maintenance	5.2248	29475	52248
10.	9 th year Maintenance	5.2248	32420	52248
11.	10 th year Maintenance	5.2248	35665	52248.00
			Total	554769.00
	Total(A+B)			1335917.00
	Contingencies (5% of Total Cost)			67596.00
	Departmental Charges @ 17.5%			2,33,785.00
	Grand Total			16,37,297.50

BUDGET

The total expenditure required for stabilization of these three muck disposal sites has been estimated to be of the order of Rs 24.60 Crore. The details are given in below:

TABLE
Break-up of cost for stabilization of muck disposal sites

S. No.	Items	Cost (Rs. Lakhs)
1.	Construction of check dams wire crates along Dumping sites @Rs. 2080/ m ³	2,22.83
2.	PCC cladding @ Rs. 4076.5m ³ for 1292 m ³	52.64

Director (Civil),
HP Power Corporation Limited,
Himfid Building BCS,
New Shimla-171009 (H.P.)

Secretary, Ministry of Forests,
Forest Division, Shimla

UP

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By: General Manager (E&R)
H.P. Power Corporation Ltd.,
District Engineer (H. P.) 172107

3.	Preparation of muck disposal site @ Rs 5.0 Lakhs /ha for 5.2248ha	26.124
4.	Provision of 15 cm soil layer over an area 5.2249 ha @ Rs. 4 lakhs/ha	20.90
5.	Development of vegetation (Reclamation)	16.38
	Total	2459.46

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 Deputy Conservator of Forests,
 Kinnaur Forest Division at Rulpo HP.

Dy. General Manager (E&RR)
 Shergarh-Marchant HEP,
 HPPCL, Redborg Pao,
 Distt. Kinnaur (H. P.) 172107

Director (Civil),
 HP Power Corporation Limited,
 Himfed Building BCS,
 New Shimla-171005 (H.P.)

General Manager
 Shergarh-Marchant HEP
 HPPCL, Redborg Pao
 Distt. Kinnaur (H.P.)



Himachal Pradesh Power Corporation Limited

(A State Government Undertaking)

Office of the General Manager

Shongtong-Karchham Hydro Electric Project

Reckong-Peo, Distt. Kinnaur (H.P.)-172107, Phone: - 01786-223310



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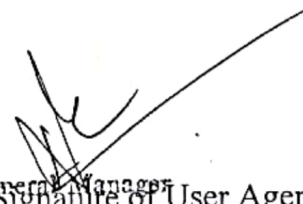
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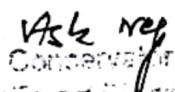
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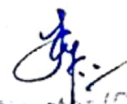
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Date:

Place:


(Name & Signature of User Agency)
Dy. General Manager
Shongtong-Karchham HEP,
HPPCL, Reckong Peo,
Distt. Kinnaur (H. P.) 172107


Deputy Conservator of Forests,
Kinnaur Forest Division, Reckong-Peo HP.


Director (Civil),
HPPCL, Reckong Peo,
Himachal Pradesh Power Corporation Limited,
Himachal Building BCS,
New Shimla-171009 (H.P.)


General Manager
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HP Power Corporation Limited,
Himachal Pradesh,
New Delhi-110009 (H.P.)

Deputy Conservator of Forests,
Kinnaur Forest Division at Noida-201301.

General Manager
Shanglong Karolam HEP,
HPCL, Shanglong Poo
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At Reckong Peo, Distt. Kinnaur,
Himachal Pradesh -172107

Km
General Manager
Shongtong Karchham HEP,
HPPCL, Reckong Peo
Distt. Kinnaur (H.P.)

✓
DY. General Manager (E & RR)
Shongtong Karchham HEP,
HPPCL, Reckong Peo Kinnaur.
Himachal Pradesh -172107

Director (Civil),
HP Power Corporation Limited,
Himachal Pradesh BCO,
New Shimla-171009 (H.P.)



Himachal Pradesh Power Corporation Limited

(A State Government Undertaking)

Office of the General Manager

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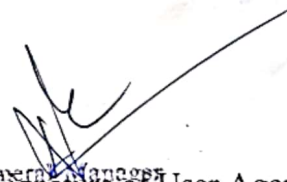
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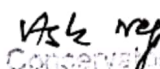
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Date:

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(Name & Signature of User Agency)
Dy. General Manager
Shongtong-Karchham HEP,
HPPCL, Reckong Peo,
Distt. Kinnaur (H. P.) 172107


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