FORM - A

Form for seeking prior approval under Section 2 of the proposals by the State Government and other authorities Forest (Conservation) Act, 1980

PART – I

1. Project Details:

(i). Short narrative of the proposal and project/scheme for which the forest land is required

LOCATION AND ACCESS TO PROJECT SITE

Rahi Kyoung Hydro Electric Project with an installed capacity of 25 MW is located in North Sikkim District of Sikkim and is proposed on river Rahi Chu, a tributary of Tolung Chu. The project site is located at about 197 km from Siliguri by road via Singtam & Mangan. Singtam is 100 km from Siliguri (on Siliguri-Gangtok NH-31A) & Singtam to Mangan is about 55 Km. The Diversion site is located at about 42 km from Mangan via Tung Bridge (on River Teesta) & Saffu village. The Diversion site is about 7 km from Saffu village on the Saffu-Sangkalan road presently under construction by BRO. Access road of about 8 Km will be required to be constructed from the Saffu-Sangkalan road to reach the Diversion site.

HYDROLOGY

The Rahi Chu, is a tributary of Tolung Chu, which in turn is a major tributary of the Teesta. The catchment area up to the diversion site is about 50 Km^2 and lies between Longitude 88º32'25"E to 88º30'55"E and Latitude 27º32'58"N to 27º31'55"N.

No site specific G&D data of Rahi Chu is available. Stream flow records (10-daily) of the Tolung Chu at the Sankalang gauge site (Catchment Area = 777 Km^2) are available for the period May 1990 – Apr 2004). The flow series for the Panan Hydro-Electric Project was generated by applying a reduction factor of 0.89 on the observed stream flow series at Sankalang (1991-91 to 2003-04) with an annual runoff of 4140 mm, thus arriving at 3684 mm.

Assuming that the stream flow is proportional to the catchment area, stream flow (10-daily) for the Rahi Kyoung diversion site (about 53 Km^2) have been developed. It is considered prudent to adopt the 10-daily stream flow data for the power planning studies of the Rahi Kyoung Hydro-Electric Project on the basis of annual flows. The Years 2002-2003 and 1992-93 have been identified as the 50% and 90% dependable years, respectively.

POWER POTENTIAL STUDY

The following data and assumptions are used in the calculations:

1. Full Reservoir Level: Full reservoir level for the project has been fixed at 1259 m.
2. Minimum Drawdown Level: Minimum drawdown level for the barrage has been fixed at 1255.0 m.
3. Tail water Level: Normal tail water level (all units running) = 820 m

4. Head Losses: A head loss of 10m is considered for power potential assessment.
5. Design Head: Rated head of 428.7 m is considered for the study
6. Overall plant efficiency: Overall plant efficiency of 89.20 % for pelton turbine is considered
7. Riparian Flow: In the present study, a minimum flow of 15 % of minimum lean discharge is considered as riparian flow throughout the year.

For fixing the installed capacity of the project, incremental energy study was done and following was inferred from the studies carried out above that:

i. On the basis of incremental energy benefits i.e. the energy that could be generated in the 90% dependable year with full installed capacity at 95 % machine availability of the generating station, the installed capacity of the Rahi Kyoung Hydro Electric Project could be 25 MW.

The installed capacity at Rahi Kyoung HE Project is, therefore, proposed to be 25 MW. and the corresponding design discharge is 6.33cumec. This will generate of 103.55 MU annually.

PROJECT PLANNING

Based on the latest Eco Sensitive Zone (ESZ), the layout of the project is done giving due considerations to the Etopographical & geological features, optimization of valley for power benefits, and the presence of Khangchendzonga National Park etc. All structures of the project are planned in manner so as to avoid encroachment of the ESZ of Khangchendzonga National Park. The major structures planned for this project are described below:

i. A diversion weir across Rahi Chu
ii. Intake structure on the right bank of Rahi Chu.
iii. A connecting tunnel from intake to an underground desanding basin to remove suspended particles of size below 0.2mm.
iv. A surge Shaf
v. Pressure Shaft/Penstock conveying water to 3 numbers of pelton wheel turbines installed in a surface type power house on the right bank of Rahi Chu.

The completed cost of construction assessed based on the construction schedule of 3 years is estimated at Rs.218.15 Crs. The tariff of the project with 70:30 as Debt : Equity ratio and considering interest rate @ 12% p.a. and 12 years repayment period, the 1st year tariff and the levellised tariff work out to R.5.17/Unit and Rs.4.72/Unit respectively.

The total land requirement for various project activities is 13.7258 Ha out of which 4.7685 Ha is forest land and 8.9573 Ha is Non forest land.

(ii). Map showing the required forest land, boundary of adjoining forest on a 1:50,000 scale map

- Map showing required forest land in 1:50,000 scale on Survey of India Topo sheet no 78 A/10/3 is enclosed as **Annexure-I. (**Geo-referred Map)
- Map showing required forest land in 1:10,000 scale based on field survey is enclosed as **Annexure-II.**

- Toposheet showing boundary of forest land for Rahi Kyoung HEP is enclosed as **Annexure-III.**

(iii). Cost of the Project

The present estimated cost of the project is Rs. 218.15 Crore as per Oct 2015 price level.

(iv). Justification for locating the Project in Forest Area

By very nature of hydroelectric project, it can be only on the river with certain drop. The present location on river being forest land, requires the diversion of forest land. Apart from these requirements the project also envisages the requirement of the land for roads, working area, and dumping sites etc which is kept at Minimum level. The optimized layout of project has minimal impact on the environment and requires unavoidable minimum Forestland. Some of the project components are planned as underground, however, only the unavoidable minimum forestland and site specific components have been involved.

(v). Cost benefit analysis

Not Applicable (Since the area of the proposed forest land for diversion is less than 5 Ha).

However, the cost estimate has been prepared at October 2015 price level to arrive at the capital cost of the civil works including infrastructure facilities, electrical/ mechanical works and hydro-mechanical works. The estimated completion cost works out to Rs. 218.15 Cr, including Civil works and Electro-Mechanical works, which are exclusive of the cost of interest during construction.

The installed capacity at Rahi Kyoung HE Project is, therefore, proposed to be 25 MW and the corresponding design discharge is 6.33cumec. This will generate of 127.85 MU. The 1st year tariff and the levellised tariff work out to R.5.17/Unit and Rs.4.72/Unit respectively. Besides mitigating peaking demand, the project will provide pollution free power for years at cheaper rates considering the escalation in coal prices / petroleum prices.

(vi). Employment likely to be generated

The Implementation of project will be helpful to generate employment opportunities for local people. The peak unskilled persons and technical staff strength likely to be employed during construction phase is about 200 no. Approximate break-up of the manpower is as below.

- Skilled/Technical Staff 50
- Construction staff 150

During the construction of the approach roads, drainage, retaining walls etc. temporary employment will be generated for skilled and unskilled manpower. The locals of the project area will be able to directly associate with the construction works by way of petty contract works as well as supply of provisions and construction materials. After the completion of the construction period almost 15 to 25 numbers of people will be directly or indirectly employed for the routine upkeep and maintenance of the roads. More than 20 people are

likely to be employed permanently by the project authorities in various categories for Operation and maintenance of the Rahi Kyoung HEP.

The local people will be employed during various phases of construction as well as operation and maintenance phase of the project, after completion of execution of the project. The construction activities are expected to lead to generation of various activities, e.g. up gradation of permanent structure like community centre, schools, dispensary, access roads to few villages, up gradation of education facility, opening of PCO etc. The economic opportunities include preference to PAPs in the project and its township during operation phase in following area: i.e. employment with contracting agencies, allotment of shops/ kiosks, award of petty contracts, vehicle hiring , PCO/ Internet kiosks, newspaper vending, vendor permits, courier service etc. which will have a positive cascading effect on development on the region and generation of additional employment.

In addition, the 12% free power to state, and 1% of free power for Local Area Development will improve the economics of the state, adding more employment opportunities and economic growth.

2. Purpose-wise break up of total land required for Rahi Kyoung HEP in Ha

The total land requirement for the Rahi Kyoung HEP is **13.7258 Ha**, out of which **4.7685 Ha** is forest land and **8.9573 Ha** is Non forest land.

SL. No	COMPONENT	PURPOSE	AREA REQ (HA)		
			PRIVATE LAND	FOREST LAND	TOTAL LAND
1	POWER HOUSE AREA	MAT /CAT	-	0.424	
		MUCK DUMPING YARD -1	-	0.286	
		WORK FACILITIES	0.09	-	
		ADIT II	0.048	-	
		MUCK DUMPING YARD -2 /COLONY	0.338	-	
		MUCK DUMPING YARD -3	0.108	-	
		PENSTOCK/VPS JUNCTION	-	0.25	
		EXPLOSIVE MAGAZINE AREA	0.0248	-	
		SWITCH YARD	0.9	-	
		TOTAL	**1.5088**	**0.96**	**2.4688**
2	FOREBAY AREA	FOREBAY AREA	0.09	0.008	
		WORK FACILITIES	0.022	-	
		MUCK DUMPING AREA	0.1727	-	
		LABOUR COLONY AREA	0.018	-	
		TOTAL	**0.3027**	**0.008**	**0.3107**
3	SURFACE PENSTOCK	**TOTAL**	**0.04**	**0.144**	**0.184**
4	ADIT 1 AREA	ADIT PORTAL		0.04	
		WORK FACILITIES	0.04	0.3625	
		LABOUR COLONY AREA	0.15	-	
		CONTRACTOR FACILITY	0.25	-	
		MUCK DUMPING AREA	0.5008	-	
		STAFF QUARTERS	0.12	-	
		TOTAL	**1.0608**	**0.4025**	**1.4633**

5	WEIR SITE AREA	TRENCH WEIR/SUBMERGENCE AREA	-	0.32	
		WORKING FACILITIES	-	0.26	
		LABOUR COLONY	0.218	-	
		DUMPING YARD	-	0.40	
		BACHING PLANT/CRUSHER PLANT	-	0.09	
		PORTABLE MAGAZINE HOUSE	0.01	-	
		STAFF QUARTERS	0.1656	-	
		TOTAL	**0.3936**	**1.0700**	**1.4636**
6	ACCESS ROADS		**5.6514**	**0.9950**	**6.6464**
7	UNDER GROUND WORKS	Adits, HRT, PS, MAT, TRT, PH Caven, CT etc		**1.189**	
	TOTAL		**8.9573**	**4.7685**	**13.7258**

3. Details of displacement of people due to the Project, if any:

There is no displacement /Oustees in the project.

i. Number of families
No displacement of people is involved in the project.

ii. Number of Scheduled caste/Scheduled Tribe
Not applicable in view of above as no displacement of peoples.

iii. Rehabilitation plan (to be enclosed)
Letter of ToR approval from Ministry of Environment, Forests and Climate Change is attached as **Annexure-IV**. EIA/EMP studies are under preparation, same shall be submitted after finalization. However, the cost of the R&R would be finalized during course of obtaining the approvals from various authorities as part of Environmental Clearance, and same would be revised as per final approval by competent authorities.

4. Whether clearance under Environmental (Protection) Act, 1986 required?

Yes.

As per the ministry of environment, forests and climate change notification dated 25.06.2014, New Delhi, Any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 5 km from the boundary of:
(i) Protected Areas notified under the Wild Life (Protection) Act, 1972, (53 of 1972);
(ii) Critically Polluted areas as notified by the Central Pollution Control Board constituted under the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) from time to time;
(iii) Eco-sensitive areas as notified under sub-section (2) of section 3 of the Environment (Protection) Act, 1986.

5. Undertaking to bear the cost of raising and maintenance of compensatory Afforestation and/or penal compensatory Afforestation and/or penal compensatory Afforestation as well as cost for protection and regeneration of Safety Zone, etc., as per the scheme prepared by the State Government (undertaking to be enclosed)

The required undertaking are enclosed as **Annexure-V**

6. Details of Certificates/documents enclosed as required under the instructions

Yes, Enclosed

List of Annexure enclosed

ANNEXURE	DETAILS
Annexure-I	Map showing required forest land in 1:50,000 scale on Survey of India Topo sheet no 78 A/10/3. (Geo-referred Map).
Annexure-II	Map showing required forest land in 1:10,000 scale based on field survey
Annexure-III	Toposheet showing boundary of forest land for Rahi Kyoung
Annexure-IV	Letter of ToR approval from Ministry of Environment, Forests and Climate Change.
Annexure-V	Under taking to bear the cost of rising and maintenance of Compensatory Afforestation, NPV and Cost of trees etc.
Annexure-VI	NOC-Village
Annexure-VII	Authorization letter.
Annexure-VIII	Agreement b/w Govt. of Sikkim & PP
Annexure-IX	Google image of the land required for the project
Annexure-X	Feasibility Report (FR).

Date: 13.01.2016

Signature:

Place: Gangtok

Name: **KARMA CHOTER LEPCHA**
Authorized Signatory
Sikkim Engineering Pvt. Ltd

State serial No. of Proposal:_____
(To be filled up by the Nodal Officer with date of receipt)