

EXECUTIVE SUMMARY

1.0 INTRODUCTION

As a result of changes in overall scenario in the country, the Government of Himachal Pradesh invited private participation in development of projects which had been identified and investigated by Himachal Pradesh State Electricity Board (HPSEB) and authorized M/s HIMACHAL SORANG POWER PRIVATE LIMITED, for investigation and implementation of the Sorang Hydroelectric Project..

The Sorang Hydroelectric Project (HEP) with its planned installed capacity of 100 MW is being conceived as a run-of-the-river scheme on Sorang Khad, a tributary of Sutlej river in Kinnaur district of Himachal Pradesh.

The M/s HSPP Limited, Hyderabad, approached The International Testing Centre, Panchkula for carrying out Environmental Impact Assessment (EIA) study for the proposed project. Accordingly, International Testing Centre initiated the studies in accordance with latest Environment Impact Assessment (EIA) notification of the Ministry of Environment and Forest (MOEF) – Government of India.

2.0 PROJECT DESCRIPTION

2.1 LOCATION

The area is located in between North latitude 31°-35'-40" to 31°-34'-42" and longitude 77°-52'-38" to 78°-51-'28" covered in the Survey of India Toposheet No. 53E/14/3, 53E/14/6 The project is about 170 km from Shimla on National Highway 22.

2.2 DESCRIPTION

The Sorang HEP comprises of the following:

Brief details of the project:

Weir

A drop type diversion weir at an elevation of + 1943.50 m shall be provided.

Desilting Arrangement

Minimum size of sediment particle to be culminated as per design of turbines is taken as 200 micron. For this, an underground desilting chamber, 144m x 12 m wide, shall be provided based on detailed technical design considerations at normal operating level of +1937.00 m.

Head Race Tunnel (HRT)

The total length of HRT is proposed as 1.540 Km. The dia of tunnel will be 3.40 m, D-Shaped with a longitudinal slope of $\approx 1:78$ shall be adopted.

Surge Shaft

A 6.5m-diameter circular simple type surge shaft with a height of 48 m is proposed.

Penstock

2.7-meter dia circular steel lined penstock having total length of 970 m shall be provided mainly underground as per topography encountered in alignment.

Power House

An underground powerhouse 11.50m wide & 56m long has been proposed Pelton wheel type turbine vertical mounted with synchronous generator shall be provided.

Tail Race Tunnel

4.5 m, D-shaped structure shall be provided with total length of 95 meter and longitudinal slope of 1 in 1000.

Transmission

The power generated at Sorang project is proposed to be fed into HPSEB 220/66 KW sub station at Kotla near Jeori with total transmission length of 18 Km The transmission line is to be further extended by another 100 km to Kunihar sub station..

Cost

The completion cost of the project including escalation & interest during construction is Rs. 562.00 crores comprising of Rs. 182.00 crores on civil works and Rs. 200.00 crores on generation plant works etc.

Benefits

The Sorang HEP with installation of 100 MW will provide much needed peaking capacity in to HPSEB 220/66 KW substations at Kotla near Jeori and Kunihar in Distt. Solan

Construction Schedule

The project is programme to be completed in a period of 54 months from the day of the commencement of work.

3.0 BASE LINE STATUS OF PROJECT SITE

Base line studies were undertaken to generate baseline data within a 10 km radius around the proposed dam during the period of 16th December, 2004 to 17th January, 2005 for the preparation of the Environmental Impact Assessment Report. Environmental attributes namely air, noise, water, land, biological and socio-economic environment have been identified and the study conducted generally conforms to the requirements of the EIA Notification, 1994 (as amended on 4.5.94). Baseline status is comprehensively covered in [Chapter 3](#).

4.0 IDENTIFICATION, PREDICTION OF IMPACTS

The section summarises the pollution potential of the proposed construction of Sorang HEP, its possible impact on the surrounding environment during construction and operational phases.

4.1 AIR ENVIRONMENT

Dust levels may slightly increase during construction, However, the impact on ambient air quality will not be significant, since the dust generated is confined to the proposed project area and as it will be taken care of by adopting suitable control measures as described in EMP.

4.2 NOISE ENVIRONMENT

Tunnel drilling machines, blasting and vehicular traffic are the primary sources of sound generation on the site that would be in operation on a continuous or shift basis. Diesel generator sets and diesel driven pumps may be operated as and when required

during emergency. The noise impact is temporary in nature & will be controlled as detailed out in [Chapter-6](#)

4.3 WATER ENVIRONMENT

During the construction of tunnel and power house installation, surface water (river/khad water) may get polluted due to the generation of large quantities of suspended particulate matter at the time or transportation of muck and wastewater (sewage) coming from temporary arrangements like office, labour camp sheds, etc.,. These impacts are temporary in nature and have no permanent effect on surface water. However mitigation measures are detailed out under Chapter -6 in order to contain these impacts within permissible limits.

4.4 SOCIO-ECONOMIC ENVIRONMENT

The following positive impacts are anticipated on the socio-economic environment during the project construction and operation phases.

- Expatriate constructors who would probably come from other parts of the country would undertake construction activities.
- A number of marginal activities and jobs would be available to the locals in the project which will improve the job opportunities during construction phase.
- Education will receive a shot in the arm. The advantage of education to secure jobs will quickly percolate through all sections of the population and will induce people to get their children educated.
- The availability of electricity to the rural areas will reduce the dependence of the locals on alternative energy sources namely forest.

- With increased availability of electricity, small-scale and cottage industries are likely to come up in the area.
- In many parts of the country, water resources projects have provided an impetus to the tourism in the area. The proposed project site is well connected by road. Efforts shall be made to develop eco-tourism, which could earn additional revenue.

4.5 SOLID WASTE (Muck)

The total quantity of muck generated during the construction of various components of the project is about 248535 cum. from civil works and it will be disposed off at selected dumping sites by HSPPL project implementing authorities as per detail plan presented under Chapter-7.

4.6 COST TOWARDS ENVIRONMENT AND ECOLOGY

Apart from the different development activities, Himachal Sorang Power Private Limited has planned to take up activities pertaining to different environmental attributes. The estimated cost is worked out in the following table:

Sr. no.	Particulars	Qty	Unit	Rate (Rs.)	Amount in lakhs
1.	Creation Green belt around Diversion Weir	LS	-	-	5.00
2.	Landscaping of Colonies, Quarries and other works	LS	-	-	5.00
3.	Fisheries Development & Migration facilities	LS	-	-	15.00
4.	Compensation towards damages Relief & Rehabilitation	LS	-	-	5.00
5.	Fuel and Energy Provision, LPG, Kerosene etc.	LS	-	-	25.00

6.	Protection and Maintenance of D.A.	LS	-	-	487.00
7.	Pollution Control Board Consent to Operate	LS	-	-	25.00
8.	Reclamation of D.A.	LS	-	-	15.00
9.	Environment Monitoring	LS	-	-	35.00
10.	Compensatory Afforestation	LS	-	-	25.00
11.	Present Environment value of land	LS	-	-	87.00
12.	Price of Trees	LS	-	-	5.00
13.	Afforestation	LS	-	-	25.00
14.	Enrichment Plantation	LS	-	-	10.00
15.	Pasture Development	LS	-	-	7.00
16.	Development of Alpine forest	LS	-	-	5.00
17.	Stabilization of Slopes	LS	-	-	10.00
18.	Check Dams and Creation of Ponds	LS	-	-	10.00
19.	Development of Medicinal Plants	LS	-	-	8.00
20.	Health Delivery System and Medical Facilities	LS	-	-	50.00
21.	Rural Development in affected Panchayats	LS	-	-	50.00
22.	Education	LS	-	-	30.00
23.	Local Area Development Authority Administration (LADA)	LS	-	-	10.00
24.	Village roads/ Paths	LS	-	-	40.00
25.	Other Development Works	LS	-	-	10.00
26.	Disaster Management	LS	-	-	10.00
27.	Total				1009.00

5.0 ENVIRONMENTAL MANAGEMENT PLAN

Based on the detailed evaluation of the likely impacts on various environmental parameters, an environmental management plan is prepared. The mitigative measures for minimization of adverse impacts along with stage wise land reclamation strategy, afforestation (green belt development/plantation) programme and their implementation have been incorporated in the chapter on environmental management plan.

Post-project Monitoring and analysis shall be carried out as per the procedures given in [Chapter 6](#). The frequency, methodology of sampling and testing for various pollutants specified by CPCB/HPSEP&PCB will be followed.

In addition following additional measures shall be adopted:

- i.) Ambient air quality, water quality and noise levels are being monitored for summer and winter seasons as part of detailed EIA study.
- ii.) Complete videography of water sources if any, falling under the alignment of tunnels underground powerhouse etc. shall be made to assess base line data of quantity of surface/ underground water sources in presence of members of local panchayats, officers of I & PH Department, State Revenue & Forest Department. The CD's of the observations shall thereafter be placed in the office of the local Administration, Revenue authorities, I & PH office and in the nearest regional office of the HP Environment Protection and Pollution Control Board. Similarly video-graphy for buildings, houses if any shall also be conducted.
- iii.) Blasting shall be done after observing all safety measures as per notified safety code but even then provision for compensation for damage & sinking of land due to blasting exists under sub-head R& R.