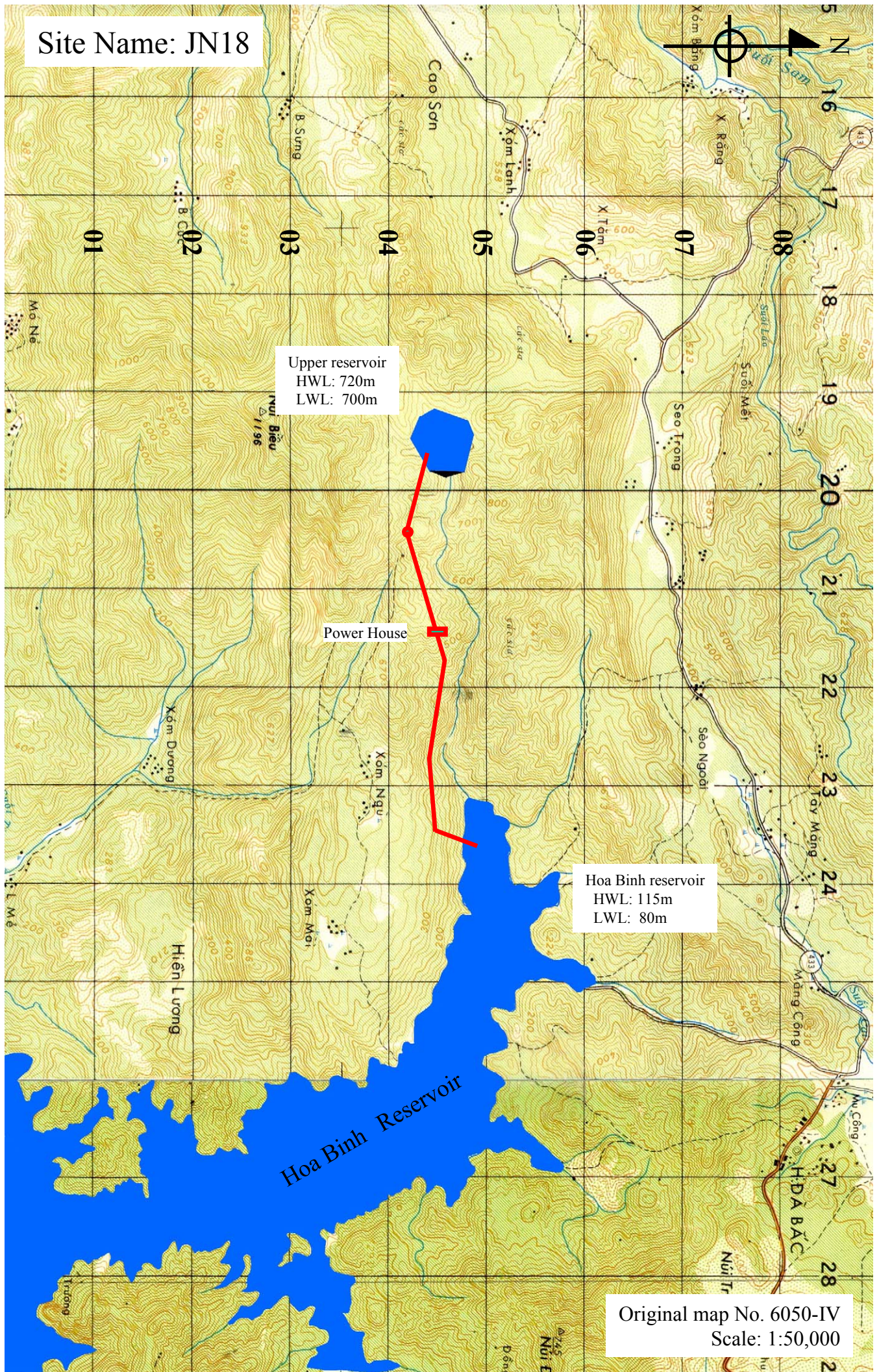


## The features of promising potential sites for PSPP

Site Name		<b>JN 18</b>
Location (Name of River)		Upper dam/reservoir : Hoa Binh Province / Da Bac District / Hien Luong Commune (Lo Lang River) Lower dam/reservoir : Hoa Binh Province / Da Bac District / Hien Luong Commune (Existing Hoa Binh Dam/Reservoir)
Project Parameter	Installed Capacity P(MW) Design Discharge Qd(m <sup>3</sup> /s) Effective Head He(m) Peak Duration Time T(hrs)	1,000 210 600 7
Topography and Geology	(Overall geological condition)	-The surveyed area located in the southeastern most of the folded NW-SE system ranges. -Mainly metamorphic rocks and sedimentary rocks such as Cambrian schist as metamorphic rocks (C2-O?bk), Ordovician-Silurian sedimentary rocks as limestone (O3-Ssv) and Silurian-Devonian sedimentary rock as limestone (S2-D1bh) occur in this area. -These beds strike generally NE-SW and dips irregular. The bedding was associated with the folding system.
	(Upper dam/reservoir)	- An approach road which is un-paved is three meters wide and only one traffic lane from Ban Men to Nuoi Nau. And it is necessary to construct a new approach road about 6km from Noui Nau to the site. -For approach road to the upper reservoir, two alternatives are considerable. One is direct approach with constructing new road from Cao Son Commune, which length is about 5km. The other route is to enhance existing road to Xom Ngu village, which width is 5m and length is 12km), and to extend to the reservoir along the footpath, which length is about 3km. -According to the preliminary study, Dam and pondage type are available for the upper reservoir. ①Dam type: The water flow of the stream is to be underground flow from about 300m upstream of the planned dam site. And the stream is disappeared at the dam site, where is a large calcareous cave. The stream flow may come back to the stream at about 2km downstream of the cave. Therefore construction of dam is not available. ②Pondage type: Planed area is available. Slope is gentle with its angle is about 20-30 degree. Since the area is covered by several meters thick of laterite, further survey to clarify its distribution and thickness. Most of the outcrops, which is lime stone, are soft by weathering. The stream flow is about 0.1m <sup>3</sup> /s.
	(Waterway • Power Station)	- Since the base rock of the proposed site is composed of limestone, there will be some risk of encountering sudden sump waters. -Steel lining will be considered for headrace because elevation of waterway may be higher than underground water level. -Entrance of approach tunnel to the underground powerhouse and tailrace tunnel will be planned near the upstream end of the Hoa Binh reservoir, length of the tunnels are rather longer than other sites.
	(Lower dam/reservoir)	- Since it is quite difficult to keep the water level of the Hao Binh reservoir lower during the construct the outlet , large cofferdam, which length is about 600m, is necessary.
Natural and Social Environment	Natural Park / Protected Area	The project site and its surrounding areas are not in any existing or proposed protected area.

	Prosperous fauna / flora	There are relatively intact forests around the proposed upper reservoir. Large mammals have been extinct by hunting pressure. It is assumed that no important flora exists.
	Minority	There is a village of Da ethnic group close to the site, and it is expected that they will receive negative impacts. However, scales of the impacts are unknown. The forest that will be lost by the proposed upper reservoir is the commons of the Dao people and the forest is irreplaceable.
	Resettlement / Compensatory assets	There is a possibility that resettlement and compensation occur because of project activities such as expansion of an access road.
	Historical / Cultural Heritage	There is no historical / cultural site in and around the project site.
	Road / Traffic condition	There is a good road to Da Bac from Hanoi via Hoa Binh. It is necessary to upgrade the existing road or construct a new one to the site, and in order to select a route of it, the local ethnic minorities who may receive negative impacts should be consulted.
Others' Special Note		Distance from Hoa Binh 500kv substation is about 10 km.
Estimated Economic Value		790 mln US\$ (B/C=1.05)

Site Name: JN18



Hoa Binh reservoir  
HWL: 115m  
LWL: 80m

Upper reservoir  
HWL: 720m  
LWL: 700m

Original map No. 6050-IV  
Scale: 1:50,000