

DIAMER BASHA DAM PROJECT

Location

Diamer Basha Dam (DBD) Project is proposed to be located on river Indus about 315 km (195 miles) upstream of Tarbela Dam Project and about 40 km (24 miles) downstream of Chillas Town, which is the headquarter of Diamer District of Northern Areas.

Brief Description of Project Studies

The techno-economic evaluation / feasibility studies of DBDP have been carried out over the last 26 years. Notable among these are the following three (3):-

Feasibility Report MONENCO - 1984

In 1984, a report titled "Basha Storage and Power Project – Feasibility" was prepared by Montreal Engineering Company (MONENCO) of Canada. They proposed a 200 meter high zoned earth / rock fill dam with central core and concrete cut off to bed rock, underground power house on the left bank of the river Indus, installed generation capacity 3360 MW with annual energy generation about 14000 Gwh corresponding to Full Supply Level (FSL) of 1160 masl having storage capacity of 5.7 MAF.

Feasibility Report NEAC - 2004

In June 2002, Wapda assigned the task of preparing a detailed project feasibility report to a joint venture NEAC, comprising of renowned international & national engineering firms with M/s. NESPAK as a leading firm.

In August, NEAC submitted "Basha Diamer Dam Project – Feasibility Report". They recommended a Roller Compacted Concrete (RCC) gravity dam of 282 meter height above bed rock, two (2) underground power houses of 4500 MW total installed capacity, 2250 MW each, on right and left banks. Average annual energy generation was estimated around 18,300 Gwh out of which about 16,800 Gwh was at Basha and additional 1450 Gwh at Tarbela. Live storage capacity at FSL of 1170 masl was 7.3 MAF.

Design Report in DBC - 2008

Diamer Basha Consultants (DBC), a joint venture of international & national consulting firms, M/s. Lahmeyer International Germany as lead firm was engaged by Wapda in July 2005 for *Review of Feasibility Report, Engineering design and Tender Drawings / Documents already done by M/s. NEAC*. DBC have completed detailed engineering design of the project by June-30, 2008. Main features are given below:-

MAIN FEATURES

- **Location** 40 km downstream of Chillas
- **Main Dam**
 - Maximum Height 272 m
 - Type Roller Compacted Concrete (RCC)
- **Diversion System** 2 No. Diversion tunnels
1 No. Diversion channel
Upstream and Downstream Cofferdams
- **Main Spillway**
 - No. of gates 14
 - Size of gate 11.5 x 16.24 m
- **Reservoir Level** 1160 m
 - Gross capacity 8.1 MAF (10.0 BCM)
 - Live capacity 6.4 MAF (7.9 BCM)
 - Min. operation level El.1060 m
- **Outlets**
 - Low level 2
 - Sluicing 5
- **Power House(s)** 2
 - Total installed capacity 4500 MW
 - Location and type Two, one each under the right and left abutment
 - No. of units 12 each of 375 MW
 - Average generation 19028 Gwh/year
(Basha = 18097 Gwh)
(Tarbela = 1111 Gwh)
- **Estimated Base Cost** US\$ 8.5 billion
- **EIRR** 18.1%
- **Benefit/Cost Ratio** 2.49
 - 10% Discount Factor

Objectives of the Project

- Significantly enhance water storage capability of the Indus River System by adding about 7.9 BCM (6.4 MAF) of live storage.
- Contribution of over 19028 GWH of energy per annum to the National Grid from its installed capacity of 4,500 MW and additional generation at Tarbela.

- Increasing useful life of the downstream of Tarbela reservoir by trapping large amount of sediment.
- Alleviation of flood damage of the Indus River.

Pre-requisite Activities

Following are the pre-requisite activities:-

- Construction of a new bridge at Thakot, on river Indus, as the existing bridge can not sustain the anticipated transportation load during construction of DBDP.
- 323 km of Karakorum Highway (KKH) from Havalian to Dam site is to be up-graded by NHA for transportation of heavy machinery & equipment.
- 100 km of KKH will be submerged due to impounding of reservoir, this portion is to be re-located on higher elevation.
- Land acquisition.

Environment Impact Assessment

- | | |
|-------------------------------|-------------------------------|
| ➤ No. of villages affected | 31 |
| ➤ No. of houses affected | 3100 |
| ➤ Population affected | 28,560 |
| ➤ Agricultural land submerged | 2660 acres |
| ➤ Area under reservoir | 151 km ² |
| ➤ Length of KKH submerged | 100 km |
| ➤ Prehistoric Rock Carvings | 33000 |
| ➤ Infrastructure | Electricity Lines, Roads etc. |

Project Implementation

Implementation of the dam appurtenant structures shall be through international competitive bidding comprising of the following five lots:-

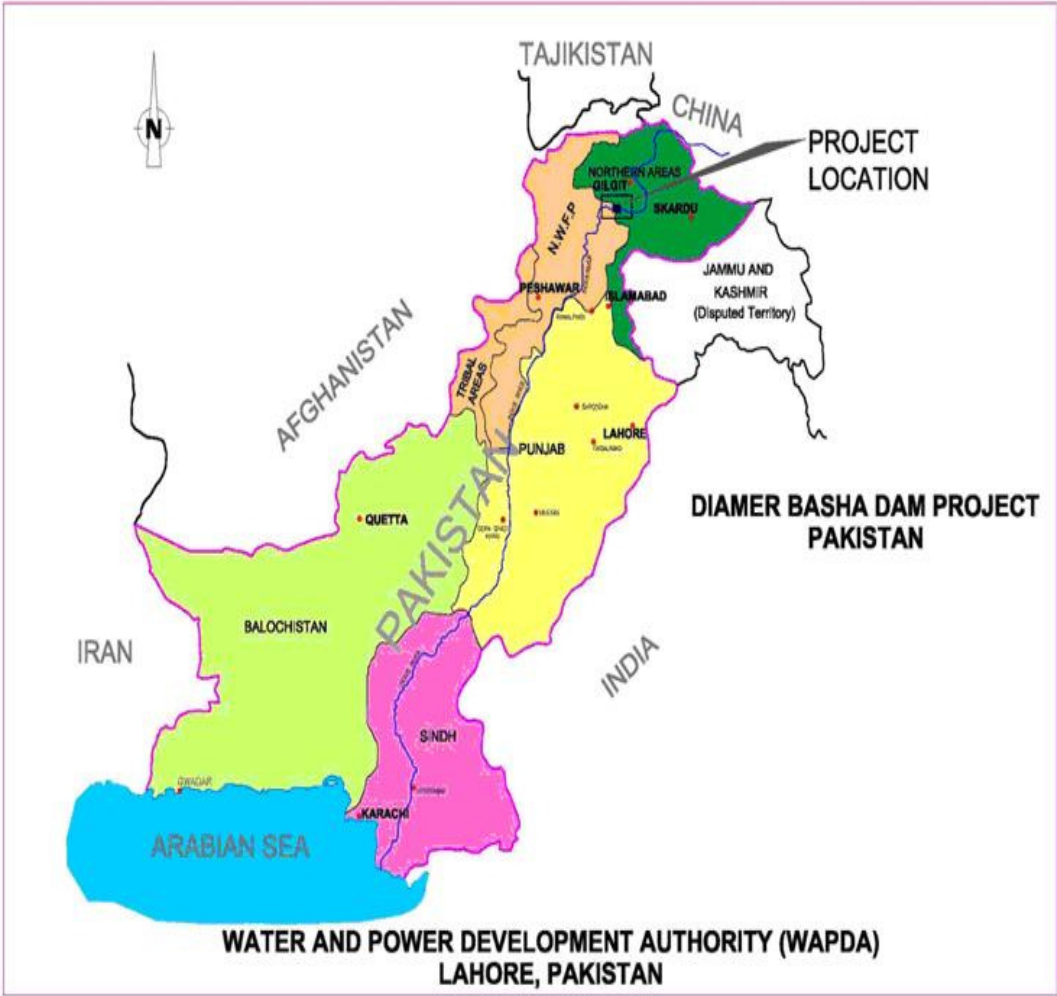
Lot No.	Description
LOT-1	Concrete Dam and Related Structures including Diversion Tunnels and Permanent Access Bridge.
LOT-2	Underground Works and Related Structures (Left and Right Banks)
LOT-3	Hydro-Mechanical Equipment and Hydraulic Steel Structures
LOT-4	Power Plant Generation Equipment (Left and Right Bank)
LOT-5	Electrical High Voltage Equipment and Power Plant Electrical Equipment (Left and Right Bank).

Present Status as on 14.12.2009

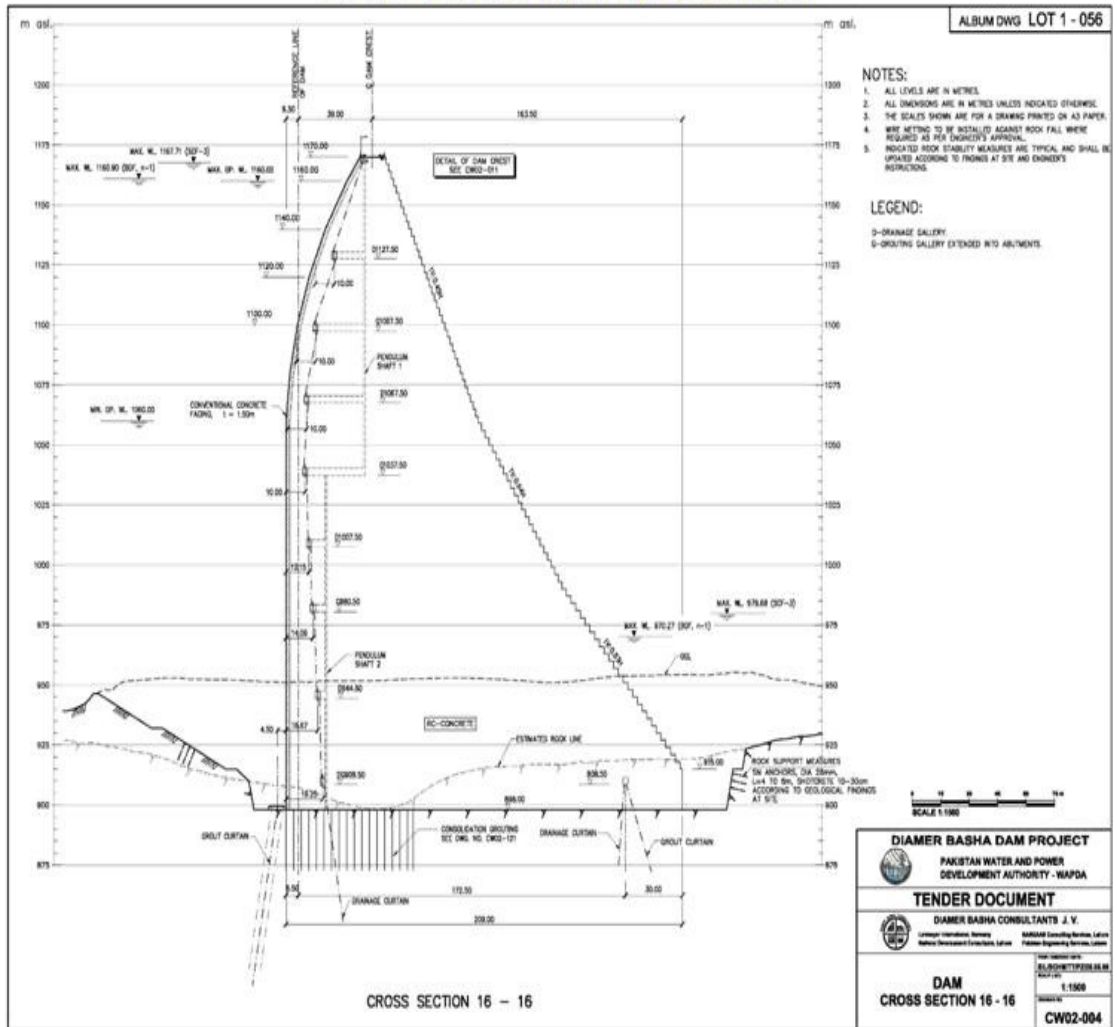
- Detailed Engineering Design DBDP was completed in June-2008.
- PC-I for Land Acquisition and Resettlement approved by ECNEC on 6.11.2008. GOP has allocated Rs.3 billion in ADP & Rs.5 billion WAPDA PSDP in 2009-2010.
- During March-April-May, 2009 ADB Reconnaissance Mission Reviewed the Project. The Bank Aide Memoir has been received & approved by WAPDA and GOP. Visit of ADB Facts Finding Mission is awaited.
- Expression of Interest (EOI) documents based on World Bank format issued earlier to the consulting firms have been cancelled. Modified EOI based on ADB guidelines shall be re-advertised, after approval of ADB.
- Pre-qualification of documents (PQD) for Lot-1, Lot-2, Lot-3 have been reframed as per Asian Development Bank (ADB) guidelines. Notice for prequalification shall be re-advertised after approval of these documents from ADB.
- Bidding documents for Lot-1 to 5 are being up-dated with the concurrence of Central Contract Cell (CCC), WAPDA.
- Main PC-I for DBDP approved by Executive Committee of National Economic Council (ECNEC) on August-20, 2009 for Rs.894,257.00 million. GOP has allocated Rs.15 billion in 2009-10 against WAPDA PSDP.
- ECNEC on 20.08.2009 also approved the PC-I for KKH By-pass, Shatial – Thore Nullah relocated KKH for Rs. 3.844 billion.
- Over-coring tests (Stress Tensor Tube Tests) are being executed by two Pakistani contractors with technical collaboration of M/s. LNEC, Portugal in Adit No.4 & 5 of Diامر Basha Dam Project.
- Construction of office building at Chillas is under way.
- Rs. 92.000 million have been released to DCO Kohistan NWFP for acquisition of land for Contractor's Camp.
- A presentation on Diامر Basha Dam Project issues to Prime Minister of Pakistan on 15.12.2009.

“Updated as on 30 November 2009”

REGIONAL & LOCATION MAP OF DIAMER BASHA DAM



DAM DESIGN CONFIGURATION



PROJECT LAYOUT

