National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad
Ph: +92-51-9206500, Fax: +92-51-2600026
Web: www.nepra.org.pk, E-mail: registrar@nepra.org.pk

No. NEPRA/R/DL/LAG-349/ 7544-49 May 19, 2017

Chief Executive Officer,
Pakhtunkhwa Energy Development Organization (PEDO),
221-PEDO House, Plot # 38, Sector B/2, Phase-V,
Hayatabad, Peshawar

Attention: Mr. Muhammad Irfan, Project Manager, Daral Khwar HPP, PEDO, Swat

Subject: **Grant of Generation Licence No. GL(Hydel)/13/2017**
Licence Application No. LAG-349
Pakhtunkhwa Energy Development Organization (PEDO)

Reference: PEDO's application vide letter dated June 14, 2016 (received on 16-06-2016).

Enclosed please find herewith Determination of the Authority in the matter of Application of "Pakhtunkhwa Energy Development Organization (PEDO)" for the Grant of Generation Licence along with Generation Licence No. GL(Hydel)/13/2017 annexed to this determination granted by the National Electric Power Regulatory Authority (NEPRA) to Pakhtunkhwa Energy Development Organization (PEDO) for its 36.60 MW Daral Khwar Hydro Power Plant located at Daral Khwar near Bahrain, District Swat, in the province of Khyber Pakhtunkhwa pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

2. Please quote above mentioned Generation Licence No. for future correspondence.

Enclosure: Generation Licence No. GL(Hydel)/13/2017

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

19.05.17

(Syed Safeer Hussain)

Copy to:

1. Chief Executive Officer, Peshawar Electric Supply Company Limited, PESCO House, Shami Road Peshawar.
2. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
3. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore.
4. Director General, Environment Protection Department, Government of KPK, 3rd Floor, Old Courts Building, Khyber Road, Peshawar.
5. Secretary, Energy and Power Department, Government of Khyber Pakhtunkhwa, 1st Floor, A-Block, Abdul-Wali Khan Multiplex, Civil Secretariat, Peshawar

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Application of Pakhtunkhwa Energy Development Organization for the Grant of Generation Licence

May 15, 2017
Case No. LAG-349

(A). Background

(i). The province of Khyber Pakhtunkhwa is blessed with huge hydropower potential. In order to harness hydropower potential in the province, the Government of Khyber Pakhtunkhwa has set up Pakhtunkhwa Energy Development Organization (PEDO).

(ii). PEDO has identified around 6000 MW hydropower potential at various sites all over the province. The identified/selected sites are at different stages of implementation. One of such sites is at Daral Khwar near Bahrain, district Swat, in the province of Khyber Pakhtunkhwa.

(B). Filing of Application

(i). In accordance with Section-15 of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("the NEPRA Act"), PEDO submitted an application on June 16, 2016 requesting for the grant of generation licence for its proposed 36.60 MW Daral Khwar Hydro Power Project (DKHPP).

(i). The Registrar examined the application to confirm its compliance with the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 ("the Licensing Regulations"). The Registrar found the same compliant with the Licensing Regulations and submitted the matter before the Authority for admission of the application or otherwise. The Authority considered the matter and found the form and content of the application in substantial compliance with Regulation-3 of the Licensing Regulations. Accordingly, the Authority admitted the application on August 06, 2016 for

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority approved the advertisement containing the prospectus and a notice to the general public about the admission of the application of PEDO, inviting to submit their comments in the matter as stipulated in Regulation-8 of the Licensing Regulations. The Authority also approved the list of the relevant stakeholders for providing their comments or otherwise to assist it in the matter. Accordingly, the advertisement was published in one (01) Urdu (the daily Express) and one (01) English (the News) newspapers on August 09, 2016 respectively.

(ii). Apart from the above, separate letters were also sent to Government Ministries, their attached departments, representative organizations and individual experts etc. on August 09, 2016. The said stakeholders were invited for submitting their views/comments for the assistance of the Authority.

(C). Comments of Stakeholders

(i). In response to the above, the Authority received comments from three (03) stakeholders. These included Water and Power Development Authority (WAPDA), Board of Investment (BoI) and Indus River System Authority (IRSA). The comments of the said stakeholders are summarized below:-

(a). WAPDA submitted that it is not aware of the detailed studies carried out for DKHPP. The notice published in the press did not provide any information about annual energy and plant factor of the proposed project. It is also not clear whether cost of the project is based on feasibility study or on finalized bid price. WAPDA submitted that considering that the project is located on a tributary of River of Swat, it has no objection if project cost and energy cost remains within permissible limit as defined by the Authority for the high head hydro projects;

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(b). BoI supported the grant of generation licence subject to the condition that the project has a consumer friendly and competitive tariff and it has completed all the required codal and other formalities as per the relevant rules & regulations; and

(c). IRSA in its comments desired a presentation/briefing on feasibility study of the project.

(ii). The Authority examined comments of the stakeholders and in view of the observations of WAPDA and IRSA decided to seek the perspective of PEDO. Regarding observations of WAPDA as explained at Para-C(i)(a) above, PEDO submitted that firm cost of the project has been approved by Executive Committee of National Economic Council (ECNEC)/Central Development Working Party as specified in PC-I of the project. Further, PEDO submitted that the work on project is in final stage and is expected to be completed in 2017, within the approved cost.

(iii). On the observation of IRSA as stated at Para-C(i)(c) above, PEDO gave a detailed presentation on the different aspects of the project and after being satisfied with the same, IRSA issued a No Objection Certificate (NOC) for the project.

(iv). The Authority considered the above submissions of PEDO and found the same plausible. In view thereof, the Authority decided to process the application of PEDO for the grant of generation licence as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules, 2000 ("the Generation Rules").

(D). Evaluation of the Case

(i). The Authority has examined the submissions of PEDO provided in its application for the grant of generation licence, feasibility study of the project, grid interconnection study and the applicable rules & regulations.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(ii). The Authority has observed that PEDO is under the administrative control of Irrigation and Power Department of Khyber Pakhtunkhwa and is an autonomous organization governed by its Board of Directors. PEDO has successfully completed six (06) small and medium sized hydel power projects. These include (a). 81.00 MW Malakand-III; (b). 18.00 MW Pehur; (c). 1.80 MW Shishi; (d). 4.20 MW Reshun; (e). 2.40 MW Machai and (f). 17.00 MW Ranolia Projects. Currently, PEDO is working on a number of hydropower projects which are at different stages of implementation. These hydropower potential sites are mainly located in the Northern districts of Khyber Pakhtunkhwa i.e. Chitral, Dir, Swat, Mansehra and Kohistan. The Authority has also observed that the major source of funding for financing these projects had been the Hydel Development Fund and the Annual Development Program of Govt. of Khyber Pakhtunkhwa. In view of the above, the Authority is satisfied that PEDO has the required financial and technical capability to implement hydel power projects.

(iii). The Authority has observed that current application of PEDO pertains to DKHPP being set up at Daral Khwar (a right tributary of River Swat), near Bahrain, district Swat, in the province of Khyber Pakhtunkhwa. The total installed capacity of DKHPP is 36.60 MW consisting of three (03) Pelton vertical type turbines (2 x 15.3 MW + 1 x 6 MW). The said capacity of the project has been optimized keeping in view the design discharge of 15 m^3/s. DKHPP is a run of river with mean annual energy of 149.7 GWh at plant factor of 48%. The project is in advanced stage and is expected to be completed by June 30, 2017.

(iv). The Authority has observed that PEDO carried out the required interconnection and system stability study for dispersal of electric power from the proposed generation facility/Hydel Power Plant. According to the said study, the dispersal of electric power will be made at 132 KV voltage level. The dispersal/interconnection arrangement will be consisting of a 132 KV Double Circuit (D/C) transmission line (measuring about 9.5 Kilometer on ACSR Rail Conductor) connecting the generation facility/Hydel Power Plant to 132/11 KV Madyan Grid Station of Peshawar Electric Supply Company Limited (PESCO). It is pertinent to mention that PESCO has already approved the said

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

dispersal/interconnection arrangement of the generation facility/Hydel Power Plant.

(v). The Authority is encouraged that the proposed project of PEDO will be utilizing water which is Renewable Energy (RE) source. However, the Authority has observed that the construction and operation of the proposed generation facility/Hydel Power Plant may cause some environmental concerns including soil pollution, water pollution and noise pollution. In this regard, the Authority has observed that PEDO carried out the required Initial Environment Examination Study and obtained NOC from Environmental Protection Agency, Government of Khyber Pakhtunkhwa.

(vi). In terms of Rule-3 of the Generation Rules, the Authority may grant a generation licence to any person to engage in the generation business. The said rule stipulates various conditions pertaining to the grant of generation licence as explained in Rule-3(2), Rule-3(3), Rule-3(5) and Rule-3(6) of the Generation Rules. In this particular case, the Authority has observed that conditions of Rule-3(2) and Rule-3(3) stands satisfied as PEDO has provided details of location, technology, size, net capacity/energy yield, interconnection arrangements, technical limits, technical functional specifications and other details specific to the generation facilities. The Rule-3(5) of the Generation Rules stipulates that the Authority may refuse to issue a generation licence where the site, technology, design, fuel, tariff or other relevant matters pertaining to the generation facility/Hydel Power Plant proposed in an application for a generation licence are either not suitable on environmental grounds or do not satisfy the least cost option criteria. In this regard, the Rule-3 of the Generation Rules also stipulates the conditions pertaining to least cost option criteria which include (a). sustainable development or optimum utilization of the renewable or non-renewable energy resources proposed for generation of electric power; (b). the availability of indigenous fuel and other resources; (c). the comparative costs of the construction, operation and maintenance of the proposed generation facility/Hydel Power Plant against the preferences indicated by the Authority; (d). the costs and rights-of-way considerations related to the provision of transmission and interconnection facilities; (e). the constraints on the transmission system likely to result from the proposed

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR

generation facility/Hydel Power Plant and the costs of the transmission system expansion required to remove such constraints; (f). the short-term and the long-term forecasts for additional capacity requirements; (g). the tariff resulting or likely to result from the construction or operation of the proposed generation facility/Hydel Power Plant; and (h). the optimum utilization of various sites in the context of both the short-term and the long-term requirements of the electric power industry as a whole.

(vii). In consideration of the above, the Authority clarifies that the project will be utilizing clean and cheap resource (i.e. water) for power generation. The interconnection study has not identified any constraints on the transmission system likely to result from the proposed generation facility/Hydel Power Plant and PESCO has also approved the interconnection study. The detailed economic analysis has been done in the feasibility study which confirms that the project fulfils the requirement of least cost option criteria as stipulated in Rule-3(5) of the Generation Rules. Further, the revised PC-I of the project having total cost of Rs. 8492.96 million has also been approved by ECNEC.

(viii). In view of the clarification and justifications given above, the Authority is of the considered view that the project of PEDO fulfills the eligibility criteria for grant of generation licence as stipulated in the NEPRA Act, rules and regulations and other applicable documents.

(E). Grant of Generation Licence

(i). The sustainable and affordable energy/electricity is a key prerequisite for socio-economic development of any country. In fact, the economic growth of any country is directly linked with the availability of safe, secure, reliable and cheaper supply of energy/electricity. The costs of producing energy vary between different energy sources and technologies. A competitive energy mix will keep overall costs as low as possible given the available resources.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(ii). The existing energy mix of the country is heavily skewed towards thermal power plants, mainly operating on imported fossil fuel. In this regard, the Authority is of considered opinion that use of imported fossil fuel for power generation is not only an environmental concern but also creates pressure on the precious foreign exchange reserves of the country. Therefore, the Authority considers that in order to achieve sustainable development, it is imperative that all indigenous RE resources including Hydel, Wind, Solar and other RE resources are given priority for power generation and their development is encouraged.

(iii). The Authority considers that the proposed project of PEDO is consistent with the provisions of Energy Security Action Plan 2005 which not only emphasizes the use of indigenous resources for power generation but also considers that RE resources are given priority in this regard. In consideration of the said, the Authority considers that the project will help in diversifying the energy portfolio of the country. Further, it will not only enhance the energy security of the country by reducing the dependence on imported fuel but it will also help in reducing carbon emissions by generating clean electricity, thus improving the environment.

(iv). The term of a generation licence under Rule-5(1) of the Generation Rules is to be commensurate with the maximum expected useful life of the units comprised in a generating facility. According to the information provided, the DKHPP will achieve Commercial Operation Date (COD) on July 01, 2017 and will have a useful life of more than thirty (30) years from its COD. The applicant/PEDO has requested that the term of the proposed generation licence may be fixed to thirty (30) years, in consistent with the term of the proposed Energy Purchase Agreement (EPA) to be signed with the Power Purchaser. The Authority considers that information provided by PEDO about the useful life of DKHPP and the subsequent request to fix the term of the generation licence as rational. Therefore, the Authority fixes the term of the generation licence to thirty (30) years from its COD.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(v). Regarding the tariff, the Authority hereby clarifies that under Section-7(3)(a) of the NEPRA Act, determining tariff, rate and charges etc. is its sole prerogative. PEDO has confirmed that it will be submitting a tariff petition under the relevant rules for determination of tariff of its generation facility/Hydel Power Plant for supplying to the Power Purchaser. In consideration of the said, the Authority directs PEDO to charge the Power Purchaser only such tariff which has been determined, approved or specified by the Authority. In this regard, a specific article (i.e. Article-6) has been included in the generation licence. The Authority directs PEDO to adhere to the Article-6 of the generation licence in letter and spirit without any exception.

(vi). As explained at Para-D(v) above, PEDO has already obtained NOC from Environment Protection Agency, Govt. of Khyber Pakhtunkhwa. About compliance with the environmental standards, the Authority directs PEDO to ensure that its project comply with the environmental standards during the term of the generation licence. In view of the said, the Authority has included a separate article (i.e. Article-10) in the generation licence along with other terms and conditions. Further, the Authority directs PEDO to adhere to the Article-10 of the generation licence in letter and spirit without any exception.

(vii). The Authority observes that the proposed generation facility/Hydel Power Plant of PEDO will be using RE resource for generation of electric power. Therefore, the project may qualify for the carbon credits under the Kyoto Protocol. Under the said protocol, projects coming into operation up to the year 2020 can qualify for the carbon credits. PEDO has informed that the project will achieve COD by July 01, 2017 which is within the deadline of the Koyoto Protocol. In view thereof, an article (i.e. Article-14) for carbon credits and its sharing with the power purchaser has been included in the generation licence. In view of the said, the Authority directs PEDO to initiate the process in this regard at the earliest so that proceeds for the carbon credits are materialized. PEDO shall be required to share the proceeds of the carbon credits with the Power Purchaser as stipulated in Article-14 of the generation licence.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(viii). In view of the above, the Authority hereby approves the grant of generation licence to PEDO for its DKHPP on the terms and conditions set out in the generation licence annexed to this determination. The grant of generation licence will be subject to the provisions contained in the NEPRA Act, relevant rules, regulations framed thereunder and other applicable documents.

Authority:

Maj. (R) Haroon Rashid
(Member)

Syed Masood-ul-Hassan Naqvi
(Member)

Himayat Ullah Khan
(Member)

Saifullah Chattha
(Member/Vice Chairman)

Tariq Saddozai
(Chairman)

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

19.05.17

National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE
No. GL (Hydel)/13/2017

In exercise of the Powers conferred upon under Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority hereby grants a Generation Licence to:

Pakhtunkhwa Energy Development Organization (PEDO)
[formerly Pakhtunkhwa Hydel Development Organization (PHYDO)]

Established under the PEDO Act of 2014 of Government of Khyber Pakhtunkhwa (KPK)

for its Daral Khwar Hydro Power Plant located at Daral Khwar near Bahrain, District Swat, in the Province of KPK

(Installed Capacity: 36.60 MW Gross)

to engage in generation business subject to and in accordance with the Articles of this Licence.

Given under my hand on 19th day of **May Two Thousand & Seventeen**, and expires on **30th** day of **June, Two Thousand & Forty Seven**.

19.05.17

Registrar

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Article-1
Definitions

1.1 In this licence

(a). "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 as amended or replaced from time to time;

(b). "Applicable Documents" mean the Act, the rules and regulations framed by the Authority under the Act, any documents or instruments issued or determinations made by the Authority under any of the foregoing or pursuant to the exercise of its powers under the Act, the Grid Code, the applicable Distribution Code, if any, or the documents or instruments made by the Licensee pursuant to its generation licence, in each case of a binding nature applicable to the Licensee or, where applicable, to its affiliates and to which the Licensee or any of its affiliates may be subject;

(c). "Applicable Law" means the Act, relevant rules and regulations made there under and all the Applicable Documents;

(d). "Authority" means the National Electric Power Regulatory Authority constituted under Section-3 of the Act;

(e). "Bus Bar" means a system of conductors in the generation facility/Hydel Power Plant of the Licensee on which the electric power of all the generators is collected for supplying to the Power Purchaser;

(f). "Carbon Credits" mean the amount of carbon dioxide (CO_2) and other greenhouse gases not produced as a result of generation of electric power by the generation facility/Hydel Power Plant of the Licensee and

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR

other environmental air quality credits and related emissions reduction credits or benefits (economic or otherwise) related to the generation of electric power by the generation facility/Hydel Power Plant, which are available or can be obtained in relation to the generation facility/Hydel Power Plant after the COD;

(g). "Commercial Operations Date (COD)" means the day immediately following the date on which the generation facility/Hydel Power Plant of the Licensee is Commissioned;

(h). "Commissioned" means the successful completion of commissioning of the generation facility/Hydel Power Plant for continuous operation and dispatch to the Power Purchaser;

(i). "Commissioning Tests" means the tests to be carried out pursuant to provisions of EPA;

(j). "CPPA-G" means Central Power Purchasing Agency (Guarantee) Limited or any other entity created for the like purpose;

(k). "Distribution Code" means the distribution code prepared by concerned XW-DISCO and approved by the Authority, as it may be revised from time to time with necessary approval of the Authority;

(l). "Energy Purchase Agreement (EPA)" means the energy purchase Agreement, entered or to be entered into by and between the power purchaser and the Licensee, for the purchase and sale of electric energy generated by the generation facility/Hydel Power Plant, as may be amended by the parties thereto from time to time;

(m). "Grid Code" means the grid code prepared by NTDC and approved by the Authority, as it may be revised from time to time by NTDC with the

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

approval by the Authority;

(n). "Generation Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000 as amended or replaced from time to time;

(o). "Hydel Power Plant" means a generation facility using water flows of canal or rivers for generation of electric power;

(p). "IEC" means "the International Electro-technical Commission and its successors or permitted assigns;

(q). "IEEE" means the Institute of Electrical and Electronics Engineers and its successors or permitted assigns;

(r). "Licensee" means **Pakhtunkhwa Energy Development Organization (PEDO)** and its successors or permitted assigns;

(s). "Licensing Regulations" mean the National Electric Power Regulatory Authority Licensing (Application & Modification Procedure) Regulations, 1999 as amended or replaced from time to time;

(t). "Net Delivered Energy" means the net electric energy expressed in kWh generated by the generation facility/Hydel Power Plant of the Licensee at its outgoing Bus Bar and delivered to the Power Purchaser;

(u). "NTDC" means National Transmission and Despatch Company Limited and its successors or permitted assigns;

(v). "PESCO" means Peshawar Electric Supply Company Limited and its successors or permitted assigns;

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(w). "Policy" means the Policy for Development of Renewable Energy for Power Generation, 2006 of Government of Pakistan as amended from time to time;

(x). "Power Purchaser" means CPPA-G which will be purchasing electric power from the Licensee either on behalf of all XW-DISCOs or any single XW-DISCO, pursuant to the EPA for procurement of electric power;

(y). "SCADA System" means the supervisory control and data acquisition system for gathering of data in real time from remote locations to control equipment and conditions;

(z). "XW DISCO" means "an Ex-WAPDA distribution company engaged in the distribution of electric power".

1.2 Words and expressions used but not defined herein bear the meaning given thereto in the Act or Rules and Regulations issued under the Act.

Article-2
Applicability of Law

This licence is issued subject to the provisions of the Applicable Law, as amended from time to time.

Article-3
Generation Facilities

3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the generation facility/Hydel Power Plant of the Licensee are set out in Schedule-I of this licence.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

3.2 The net capacity/Net Delivered Energy of the generation facility/Hydel Power Plant of the Licensee is set out in Schedule-II hereto. The Licensee shall provide the final arrangement, technical and financial specifications and other specific details pertaining to its generation facility/Hydel Power Plant before its COD.

Article-4
Term of Licence

4.1 This licence shall become effective from the date of its issuance and will have a term of thirty (30) years from the COD of the generation facility/Hydel Power Plant of the Licensee.

4.2 Unless suspended or revoked earlier, the Licensee may apply for renewal of this licence ninety (90) days prior to the expiry of the above term, as stipulated in the Licensing Regulations.

Article-5
Licence fee

The Licensee shall pay to the Authority the licence fee as stipulated in the National Electric Power Regulatory Authority (Fees) Rules, 2002 as amended or replaced from time to time.

Article-6
Tariff

The Licensee shall charge only such tariff which has been determined, approved or specified by the Authority.

Article-7
Competitive Trading Arrangement

7.1 The Licensee shall participate in such manner as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that any such participation shall be subject to any contract

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

entered into between the Licensee and another party with the approval of the Authority.

7.2 Any variation or modification in the above-mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of the parties thereto and such terms and conditions as may be approved by the Authority.

Article-8
Maintenance of Records

For the purpose of sub-rule (1) of Rule-19 of the Generation Rules, copies of records and data shall be retained in standard and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

Article-9
Compliance with Performance Standards

The Licensee shall comply with the relevant provisions of the National Electric Power Regulatory Authority Performance Standards (Generation) Rules, 2009 as amended from time to time.

Article-10
Compliance with Environmental & Safety Standards

10.1 The generation facility/Hydel Power Plant of the Licensee shall comply with the environmental and safety standards as may be prescribed by the relevant competent authority from time to time.

10.2 The Licensee shall provide a certificate on a bi-annual basis, confirming that the operation of its generation facility/Hydel Power Plant is in conformity with required environmental standards as prescribed by the relevant competent authority.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Article-11
Power off take Point and Voltage

The Licensee shall deliver the electric power to the Power Purchaser at the outgoing bus bar of its generation facility/Hydel Power Plant. The Licensee shall be responsible for the up-gradation (step up) of generation voltage up to the required dispersal voltage level.

Article-12
Performance Data

12.1 The Licensee shall install SCADA System or compatible communication system at its generation facility/Hydel Power Plant as well as at the side of the Power Purchaser.

12.2 The Licensee shall transmit the data for the flow of water and electric power output data of its generation facility/Hydel Power Plant to the control room of the Power Purchaser.

Article-13
Provision of Information

In accordance with provisions of Section-44 of the Act, the Licensee shall be obligated to provide the required information in any form as desired by the Authority without any exception.

Article-14
Emissions Trading/Carbon Credits

The Licensee shall process and obtain expeditiously the Carbon Credits admissible to the generation facility/Hydel Power Plant. The Licensee shall share the said proceeds with the Power Purchaser as per the Policy.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Article-15
Design & Manufacturing Standards

The generation facility/Hydel Power Plant of the Licensee shall be designed, manufactured and tested according to the latest IEC or IEEE or any other equivalent standard. All the plant and equipment of the generation facility/Hydel Power Plant shall be unused and brand new.

Article-16
Power Curve

The Power Purchaser shall verify the power curve of the generation facility/Hydel Power Plant of the Licensee, as part of the Commissioning Tests according to the latest IEC or IEEE or any other equivalent standard and shall be used to measure its performance.

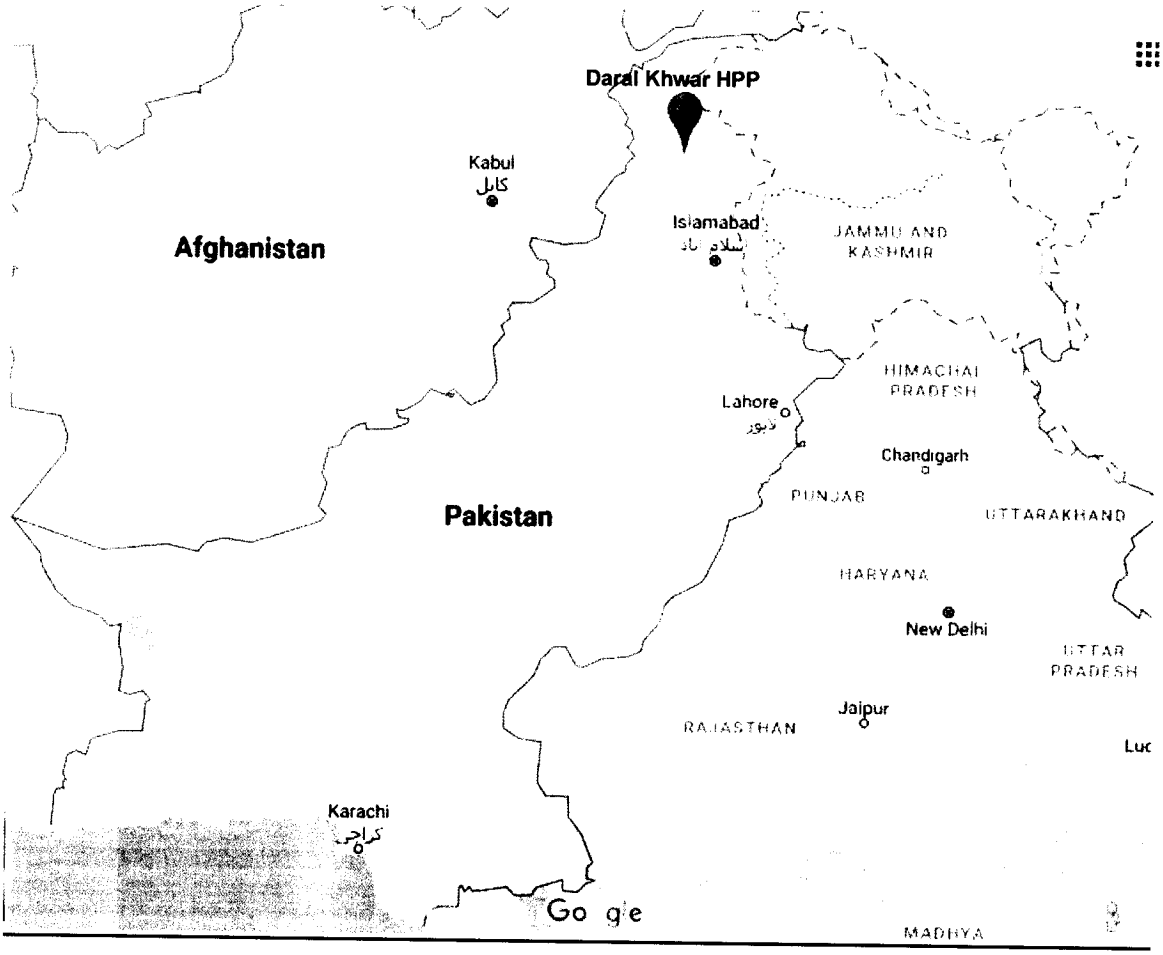
NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

SCHEDULE-I

The Location, Size (i.e. Capacity in MW), Type of Technology, Interconnection Arrangements, Technical Limits, Technical/Functional Specifications and other details specific to the Generation Facilities of the Licensee are described in this Schedule.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

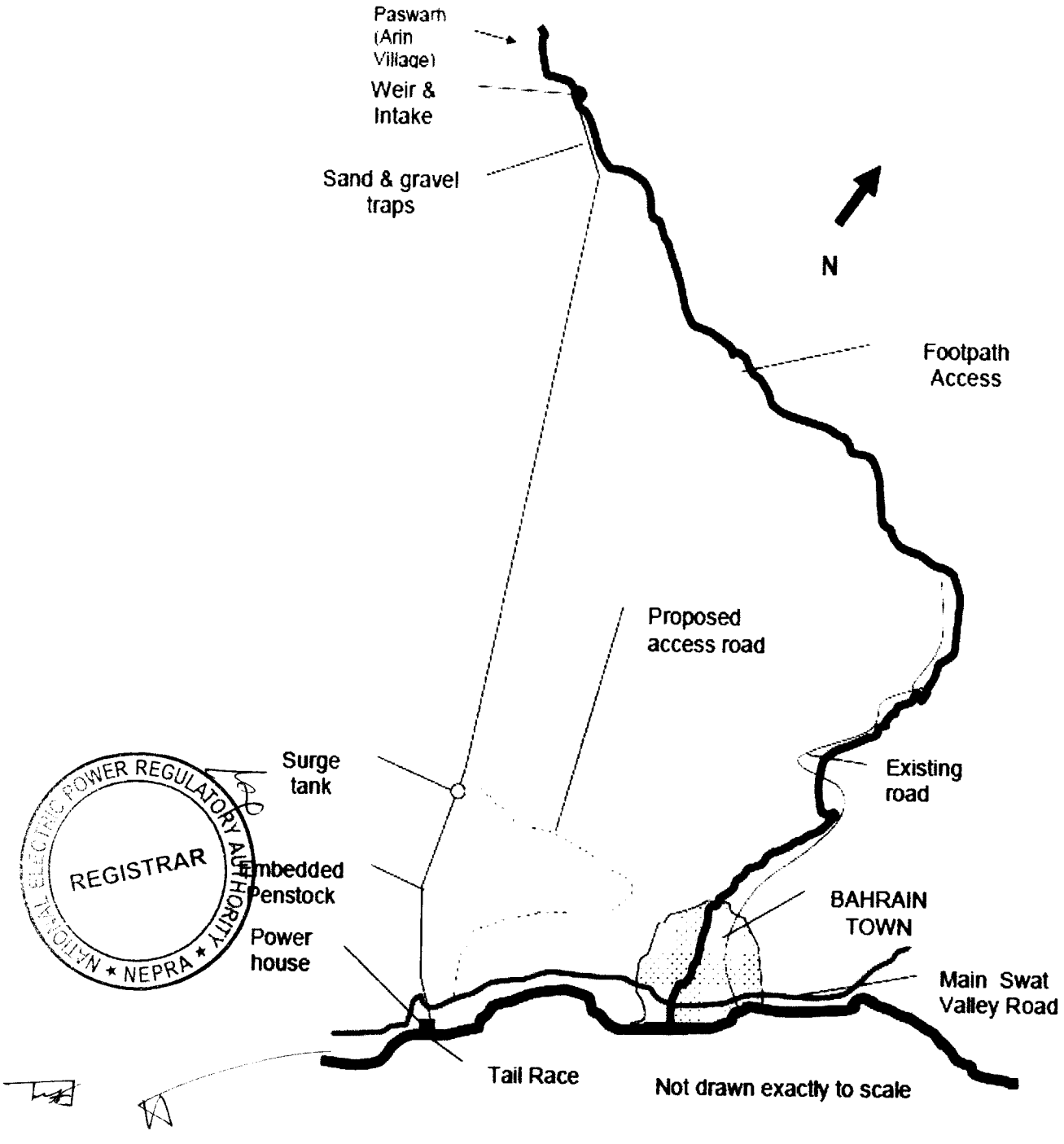
Location of the Generation Facility/Hydro Power Plant of PEDO



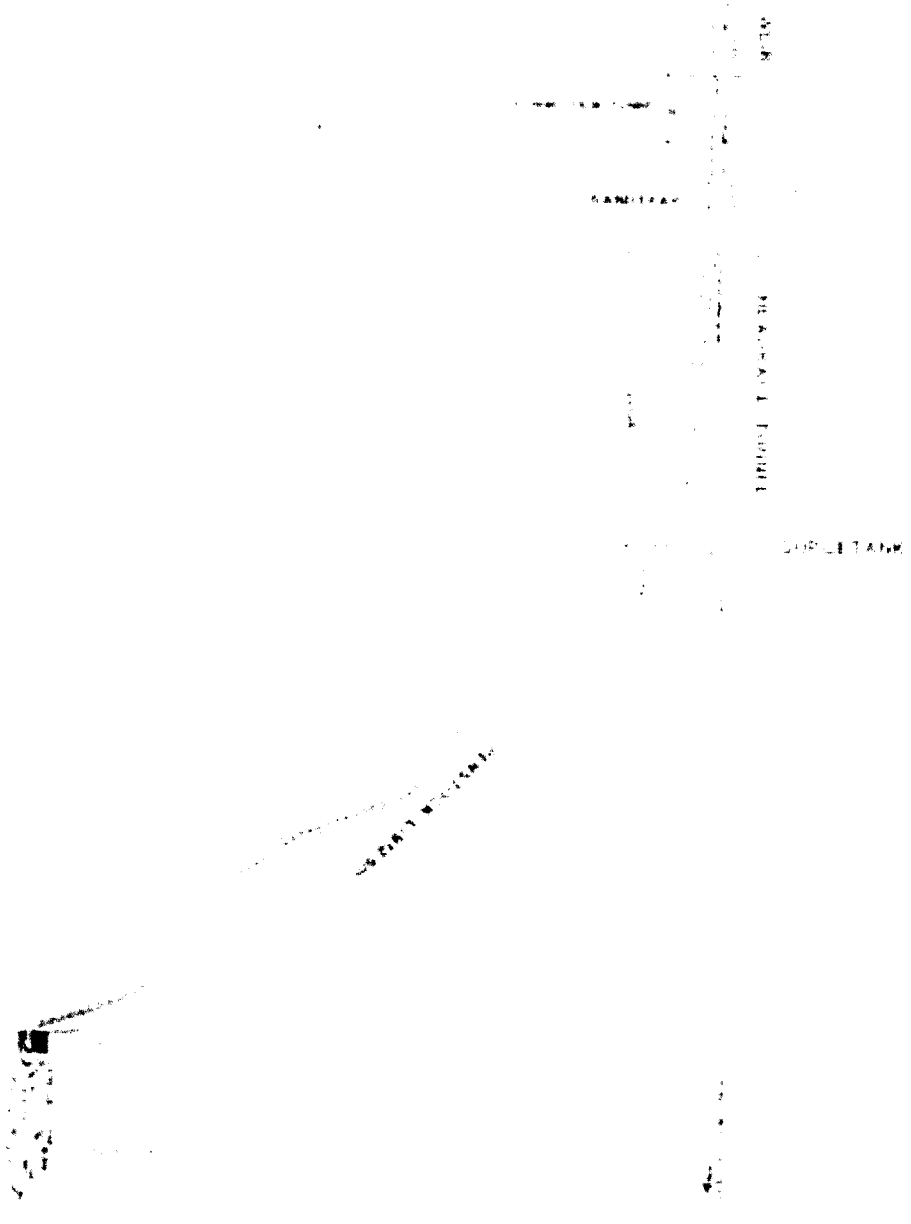
NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Location of Generation Facility/Hydro Power Plant of PEDO

Map 1 Daral Khwar

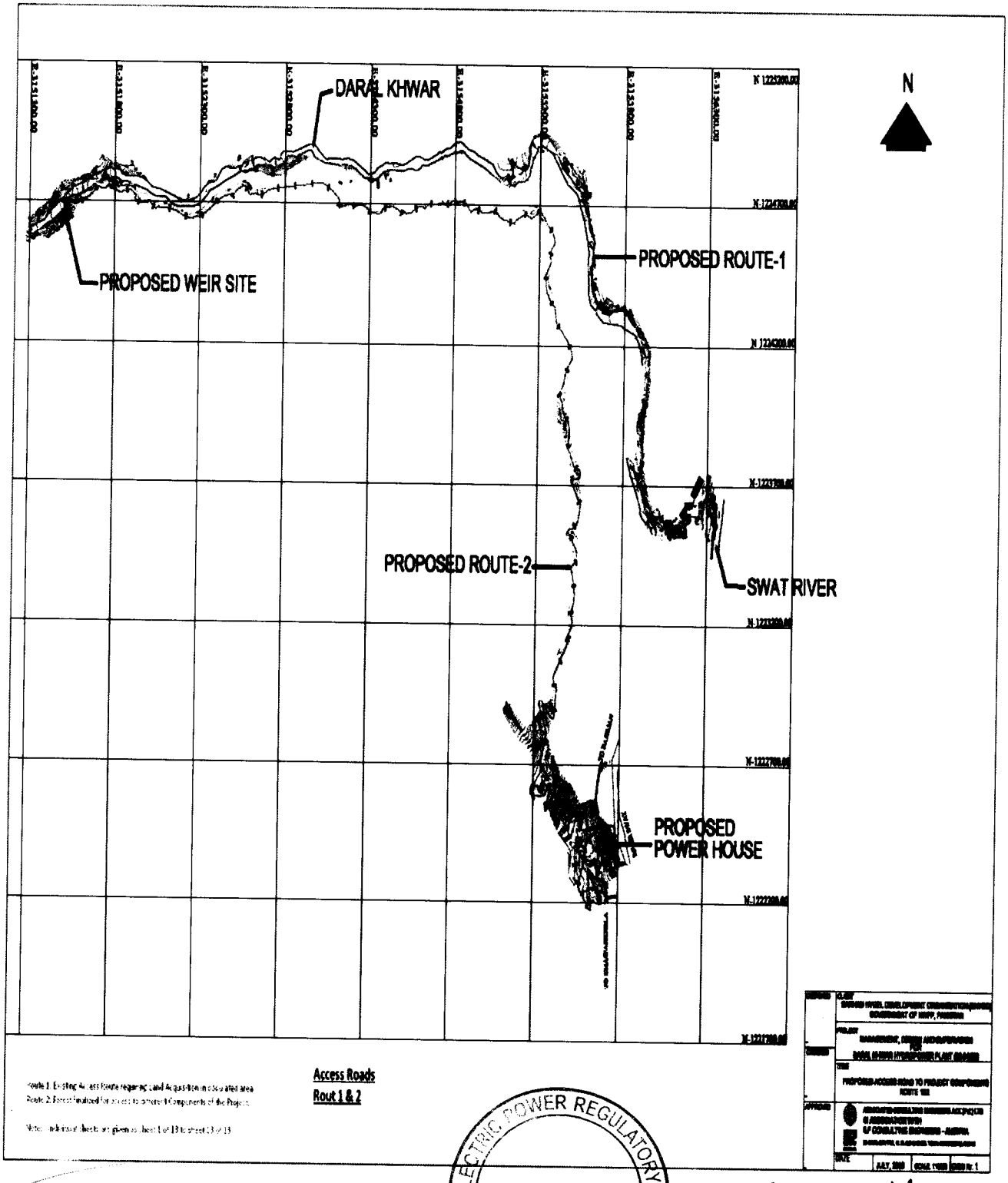


Layout of the Generation Facility/Hydro Power Plant of PEDO

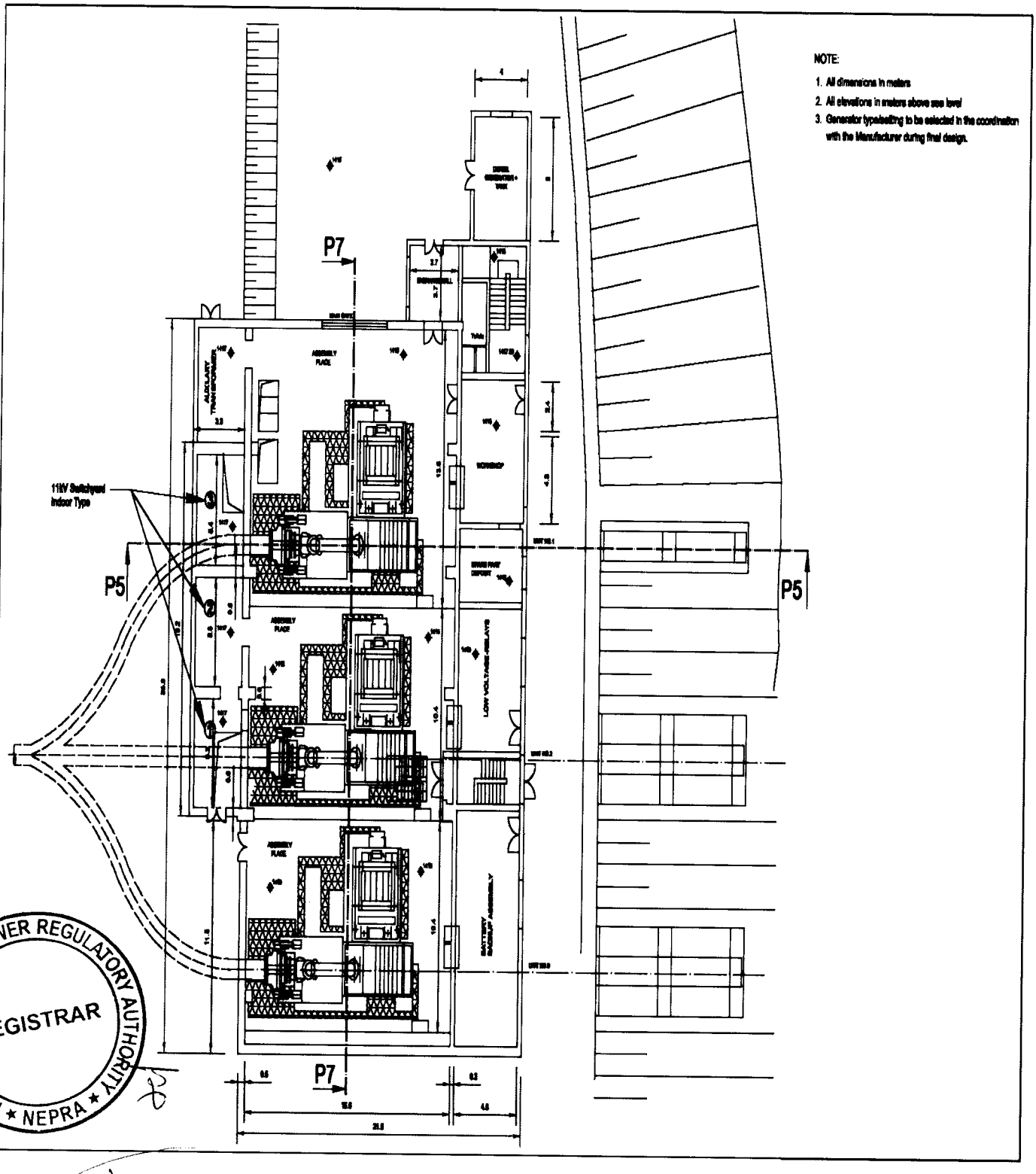


NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Layout
Of the Generation Facility/Hydro Power Plant of PEDO

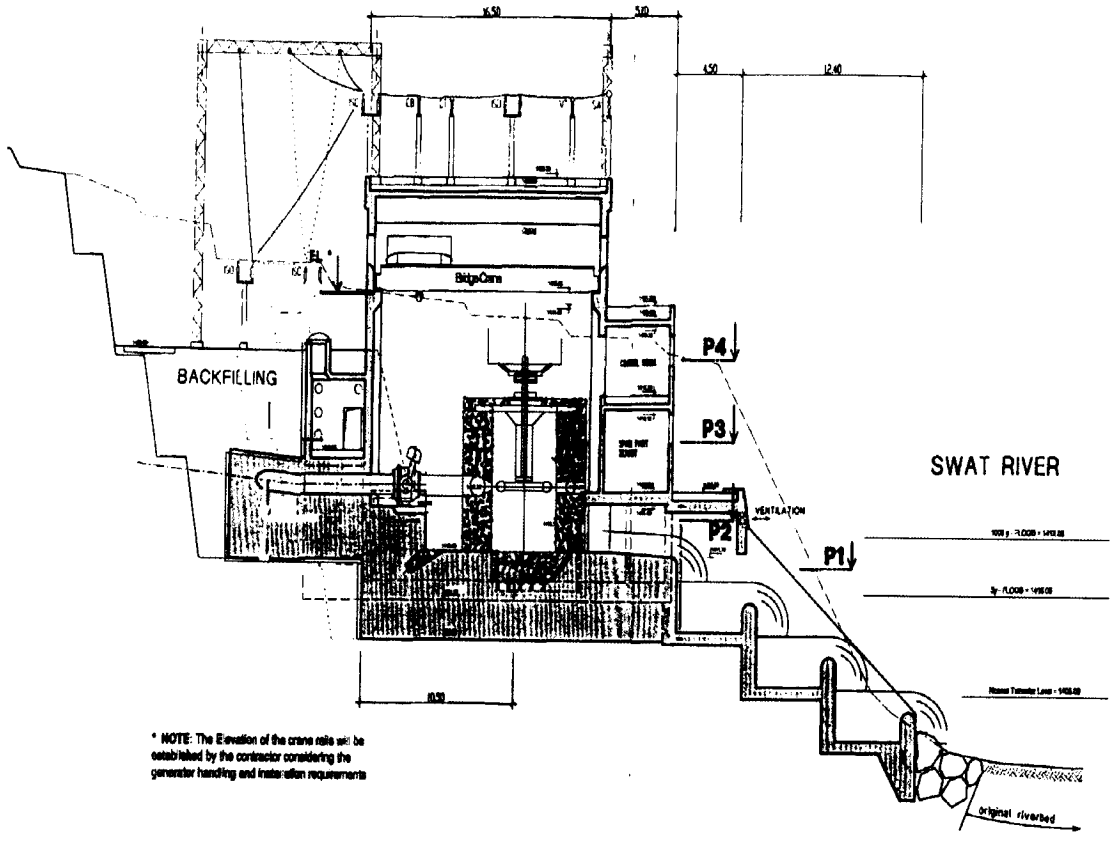


Power House Layout of the Generation Facility/Hydro Power Plant of PEDO



Turbine Setting of the Generation Facility/Hydro Power Plant of PEDO

SECTION OF PELTON TURBINE IN VERTICAL SETTING



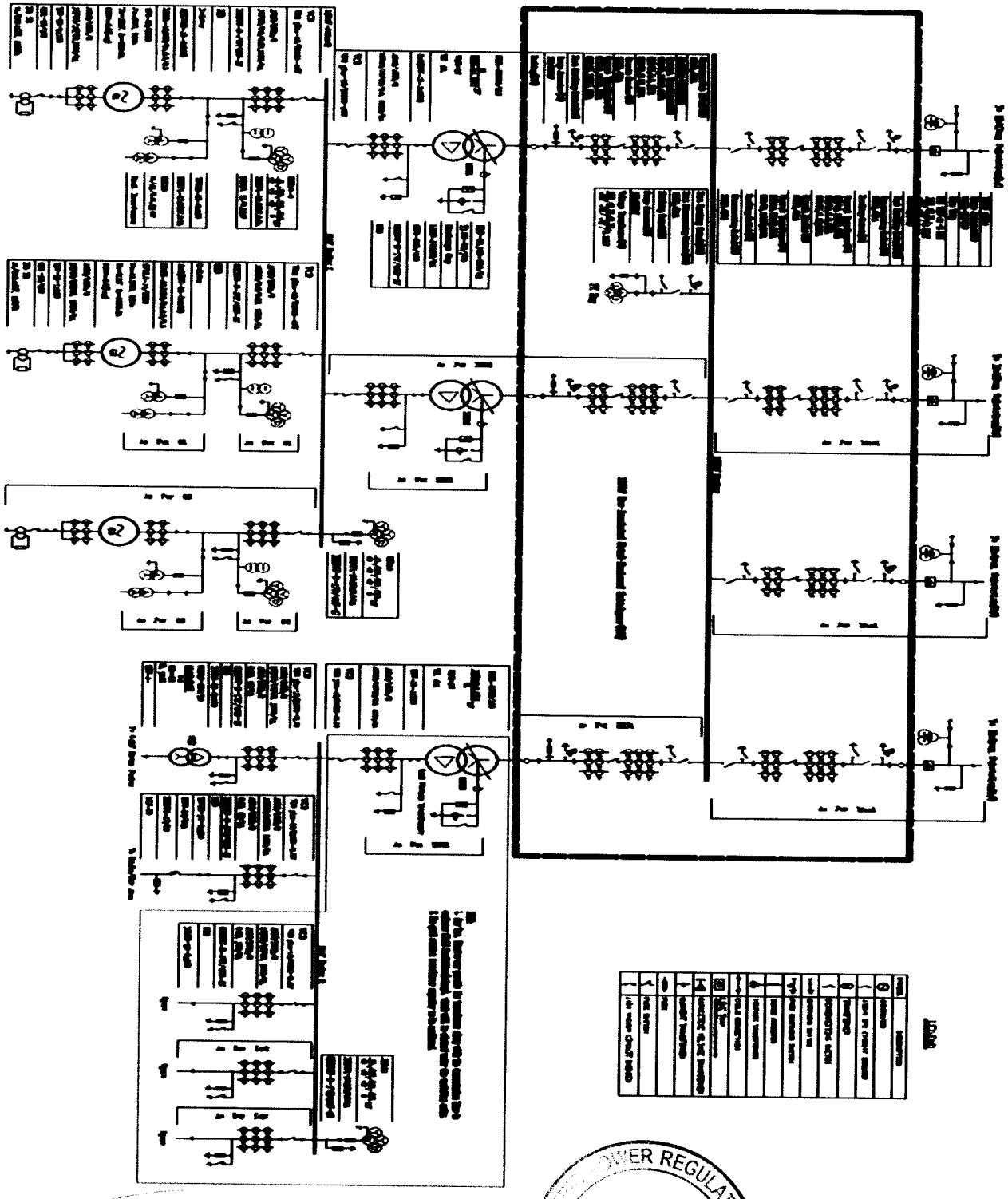
* NOTE: The Elevation of the crane rails will be established by the contractor considering the generator handling and installation requirements

NOTE:
1. All dimensions in meters
2. All elevations in meters above sea level
3. Generator type/rating to be selected in the coordination with the Manufacturer during final design.

0 1 2 5 10 25 m

Scale

Single Line Diagram (Electrical) of the Generation Facility/Hydro Power Plant of PEDO



Interconnection Arrangement/Transmission Facilities for Dispersal of Power from Generation Facility/ Hydro Power Plant of PEDO

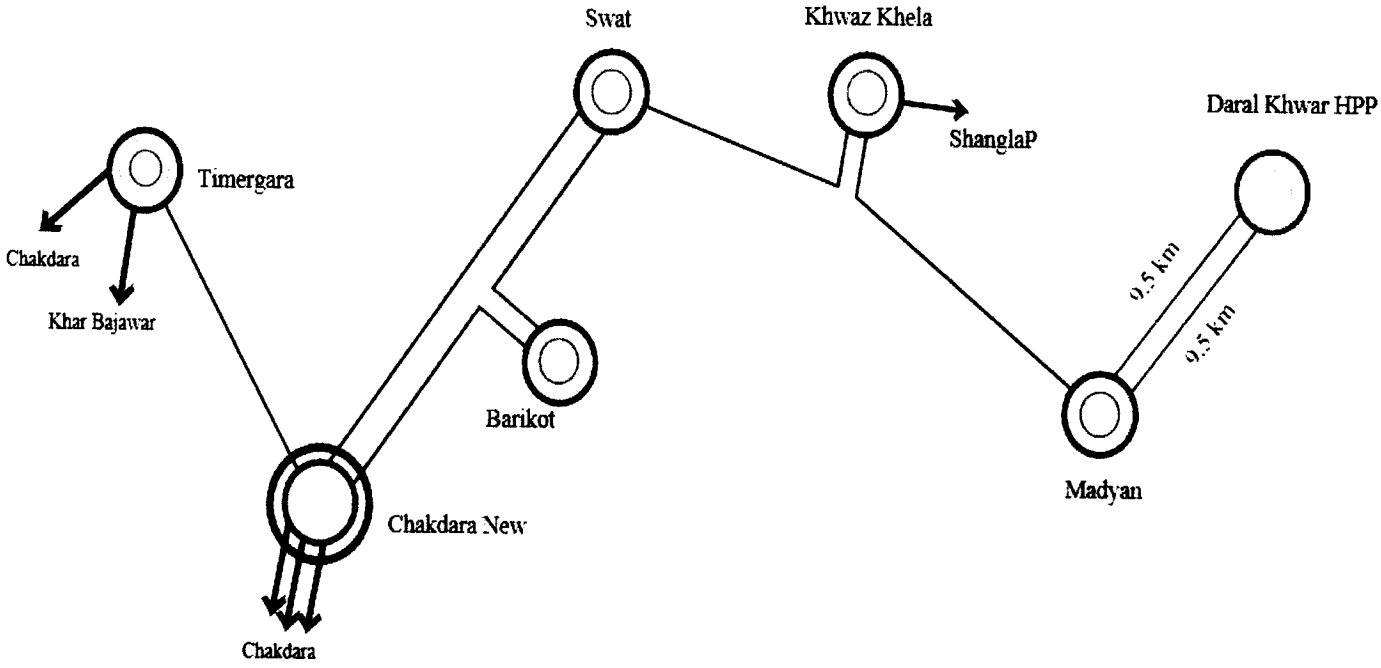
The power generated by the Daral Khwar Hydro Power Plant (DKHPP) of PEDO will be dispersed to the load center of Peshawar Electric Supply Company Limited (PESCO).

(2). The proposed interconnection arrangement/transmission facilities for dispersal of will consist of a 132 KV Double Circuit (D/C) 132 KV transmission line (measuring approximately 9.5 km length on ACSR Rail conductor) connecting the generation facility of DKHPP with 132/11 KV Madyan grid substation of PESCO.

(3). Any change in the final Interconnection and Transmission Arrangement(s), for the dispersal of power other than the above, as agreed by the Licensee and PESCO shall be communicated to the Authority in due course of time.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Schematic Diagram for Interconnection/Transmission Arrangement for Dispersal of Power from Hydro Power Plant of PEDO



Legend

132 kV ——————

66 kV

11 kV

11 kV Proposed

132 kV Proposed

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Details of Generation Facility/Hydro Power Plant of PEDO

(A). General Information

(i).	Name of the Licensee/ Company	Pakhtunkhwa Energy Development Organization (PEDO)
(ii).	Registered/Business Office of the Licensee/ Company	PEDO House, 38-B2, Phase-V, Hayatabad, Peshawar
(iii).	Location of the Generation Facility	Daral Khwar near Bahrain, District Swat, in the Province of Khyber Pakhtunkhwa
(iv).	Type of Generation Facility	Hydropower Plant

(B). Configuration etc.

(i).	Size/Installed Capacity (Gross) of the Generation Facility	36.60 MW
(ii).	Type of Storage etc.	Run of River Hydropower Plant
(iii).	Water Source	Right Tributary of River Swat
(iv).	Type of Technology	Three (03) Vertical Pelton Turbines
(v).	Number of Units & Size (MW)	2 x 15.3 MW + 1 x 6 MW

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(vi).	Turbine Make & Model*	Turbine type–CJ601-L-160/4x16.8 vertical pelton turbine for bigger units of capacity 15.3 MW-02 Nos. Turbine type–CJ601-L-138/2x15 vertical pelton turbine for smaller unit of capacity 6.00 MW-01 No. Make – (CTWT Chinese)
(vii).	COD of the Generation Facility	July 01, 2017
(viii).	Expected Life of the Generation Facility from COD	Thirty (30) Years

(C). Main Design Features

(i).	Design Discharge Q	15 m/s^3
(ii).	Gross Head	318.00 meters
(iii).	Head Loss	For 15.3 MW circuit: 10.28 meters For 6.0 MW circuit:12.86 meters
(iv).	Maximum Head	294 meters
(v).	Minimum Head	275.15 meters

(D). Weir Structure

(i).	Weir Type	Fixed Sill
(ii).	Height above riverbed	5.15 meters

* Hydro turbines are designed and manufactured to meet the specific requirements of each site and are not available off the shelf as per standard models.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(iii).	Depth below riverbed	6.5 meters approx.
(iv).	Width of 4 overflow sections	8 meters
(v).	Length of weir structure	39.8 meters
(vi).	Design Flood (100y-flood)	640 m^3/s

(E). Intake Structure

(i).	Intake Type	Lateral
(ii).	Lateral Intake	2 Sections
(iii).	Coarse trash rack	2 Sections
(iv).	Width of 4 sections	2.6 meters each

(F). Connecting Tunnel

(i).	Structure	Open Box Culvert
(ii).	Height	5 meters
(iii).	Width	4 meters
(iv).	Cross-Sectional Area	17.13 m^2

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(v).	Length without Gravel Spill	28 meters approx.

(G). Gravel Spill

(i).	Height	6 meters
(ii).	Width	4 meters
(iii).	Cross-Sectional Area	19.25 m^2
(iv).	Length	30 meters

(H). Sand Trap

(i).	No. of Chambers	02
(ii).	Effective height of each chamber	6.25 meters
(iii).	Total Width	13.40 meters
(iv).	Effective Length	40.00 meters
(v).	Total Length	99.40 meters approx.

(I). Headrace Canal

(i).	Internal Height	3.4 meters

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(ii).	Internal Width	2.5 meters
(iii).	Cross-Sectional Area	8.5 m^2
(iv).	Total Length	41 meters

(J). Headrace Tunnel

(i).	Storage Volume	26,000 m^3
(ii).	Cross-Sectional Area	8.34 m^2
(iii).	Total Length	3,071 meters

(K). Surge Tank (Shaft Type)

(i).	Internal Diameter	5 meters
(ii).	Cross-Sectional Area	19.6 m^2
(iii).	Height	48 meters

(L). Penstock Tunnel

(i).	Height	3.05 meters
(ii).	Width	4.4 meters

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(iii).	Length	50 meters

(M). Valve Chamber

(i).	Width	13.00 Meters
(ii).	Length	11.00 Meters
(iii).	Height (Above ground)	8.00 Meters
(iv).	Depth (Below ground)	6.00 Meters
(v).	Emergency Valve dia.	2 Meters
(vi).	Maintenance Valve dia.	2 Meters

(N). Embedded Penstock

(i).	Diameter	2 meters
(ii).	Total Length	910 meters

(O). Tailrace

(i).	Cascade type no. of Units	03
(ii)	Width	1.4 meters

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(iii).	Height	8 meters approx.
(iv).	Length	15.90 meters

(P). Plant Characteristics

(i).	Generation Voltage	11 KV
(ii).	Frequency	50 Hz
(iii).	Power Factor	0.8
(iv).	Automatic Generation Control	Yes
(v).	Ramping Rate	2~3 minutes for bigger circuit of 15.3 MW 1.5~2 minutes for smaller circuit of 6.00 MW
(vi).	Time required to Synchronize to Grid and loading the Complex to full load.	3 minutes

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

SCHEDULE-II

The Total Installed Gross Capacity (MW), De-Rated Capacity at Reference Site Conditions (MW), Auxiliary Consumption (MW) and the Net Capacity at Reference Site Conditions (MW) of the Generation Facility of Licensee are given in this Schedule

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

SCHEDULE-II

(1).	Total Installed Gross Capacity of the Generation Facility (2 x 15.3 MW & 1 x 6 MW Pelton Turbines)	36.60 MW
(2).	De-Rated Capacity of the Generation Facility at Reference Site Conditions	36.60 MW
(3).	Total Auxiliary Consumption of the Generation Facility	0.366 MW
(4).	Net Capacity of the Generation Facility at Reference Site Conditions	36.234 MW
(5).	Mean Annual Energy of the Generation Facility	149.7 GWh

Note

All the above figures are indicative as provided by the Licensee. The Net Capacity/Energy available to Power Purchaser for dispatch will be determined through procedure(s) contained in the Energy Purchase Agreement or any other Applicable Document(s).

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA