Initial Environmental Examination

Document stage: Draft
Project Number: 47282-007
August 2019

Afghanistan: Energy Supply Improvement Investment Program Tranche 6

Uzbekistan-Afghanistan 500kV Power System Interconnection Project

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

ADB	– Asian Development Bank
AERA	– Afghanistan Energy Regulatory Authority
ANDS	– Afghanistan National Development Strategy
AP	– Affected Persons
CBD	– Convention on Biological Diversity
CC	– Construction Contractor
CEO	– Chief Executive Officer
CITES	– Convention on International Trade in Endangered Species
COI	– Corridor of Influence
CSC	– Construction Supervision Consultant (SMEC International Pyt Ltd.)
DABS	– Da Afghanistan Breshna Sherkat (National Power Utility)
EA	– Executing Agency
EHS	– Environment, Health, and Safety
EHS-MS	– Environment, Health and Safety Management System
EIA	– Environmental Impact Assessment
EL	– Environmental Law
EMF	– Electric and Magnetic Fields
EMP	– Environmental Management Plan
GoA	– Government of Afghanistan
GIRoA	– Government of the Islamic Republic of Afghanistan
GRC	– Grievance Redress Committee
GRM	– Grievance Redress Mechanism
ICIMOD	– International Centre for Integrated Mountain Development
ICLES	– International Conference on Law, Environment and Society
IEE	– Initial Environmental Examination
IFC	– International Finance Corporation
IUCN	– International Union for Conservation of Nature
IUFRO	–International Union of Forest Research Organizations
LARP	– Land Acquisition and Resettlement Plan
MACCA	– Mines Action coordination Center for Afghanistan
MDG	– Millennium Development Goal
MEW	– Ministry of Energy and Water
MFF	– Multi-Tranche Financing Facility
MIC	– Ministry of Industry and Commerce
MoE	– Ministry of Economy
MoPH	– Ministry of Public Health
MoMP	– Ministry of Mines and Petroleum
MRRD	– Ministry of Rural Rehabilitation and Development
MWh	– Megawatt-hour
NEPA	– National Environmental Protection Agency
NEPS	– Northern Electric Power System
NEQS	– National Environment Quality Standards
PA	– Protected Area
PCR	– Physical Cultural Resources
PH	–Potential of Hydrogen
PMO	– Program Management Office
PMU	– Program Management Unit
PMPIC	– Program Management and Project Implementation Consultants
ROW	– Right of Way
SMEC	– Snowy Mountains Engineering Corporation

SPS – Safeguard Policy Statement
SSEMP – Site Specific Environmental Management Plan
TOR – Terms of Reference
UN – United Nations
UNCCD – United Nations Convention to Combat Desertification
UNEP – United Nations Environment Program
UNESCO – United Nations Educational, Scientific and Cultural Organization
UNCED – United Nations Conference on Environment and Development
USD – United States Dollar
UXO – Unexploded Ordinance
WB – World Bank
WHC – World Heritage Convention
WWF – World Wide Fund for Nature

1. EXECUTIVE SUMMARY

1.1 Introduction

1. The present IEE covers the construction of a new 500kV single circuit transmission line from Uzbekistan-Afghanistan border river crossing (i.e. Amu-Darya River) near Kharayraton bridge to Khwaja Alwan substation (Pul-e-Khumri) and the expansion of a one line-bay at Alwan substation.

2. The expansion of Surkhan substation in Uzbekistan and the 45 km transmission line connection Surkan substation to the Uzbekistan-Afghanistan border is considered an associated facility to this project.

3. This project is expected to increase the power transmission capacity on the Particular route which conveys power from imports and domestic power plants in the north to the load centers at the southern end of the transmission line.

4. On the basis of the existing environmental situation in the Investigation area, the technical planning and the Environmental Assessment Review Framework (EARF), DABS determined the potential environmental impacts of the proposed project during design, construction, operation and decommissioning. Alternative routings and options, as well as appropriate mitigation and monitoring measures were considered to reduce possible adverse impacts.

5. For preparing the IEE study, DABS set up a multi-disciplinary team composed of one Senior Environmental Expert, one Senior Environmental Officer and one Environmental Officer. The Land Acquisition and Resettlement Plan (LARP) prepared by a National Social Safeguards Expert was also taken into consideration for the present IEE. A Due Diligence Report (DDR), which includes a Corrective Action Plan (CAP) has also been prepared for the associated facility of the project.

6. The national team, together with male field surveyors and technical surveyors conducted intensive field work in the project areas between the 30 July to 10 August 2019.

7. Socioeconomic surveys of the affected households were conducted as part of the LARP preparation. The environmental team preparing the IEE surveyed the physical and biological conditions of the areas.

1.2 Institutional and Legislative Framework

8. The Executing Agency (EA) will be DABS, the National Power Utility. Other Central Government institutions potentially linked to the Project and the implementation of the EMP include the Ministry of Energy and Water (MEW); the National Environmental Protection Agency (NEPA); the Department of Meteorology; etc.

9. Other stakeholders are the Province administration of Balkh, Samangan and Baghlan Provinces; and Civil Society Organizations. The JSC National Electric Networks of Uzbekistan (NENU) is also one of the project's stakeholders, being the EA for the project's associated facility. NENU's scope covers the expansion of Surkhan substation (in Uzbekistan) and 45 km transmission line connecting Surkhan substation to the Uzbekistan-Afghanistan border.

10. National acts, laws, regulations, guidelines and policies relevant to the project are, among others: Environmental Act, 2007; Mineral Law, 2010; Water Law, 2009; Draft Forest Law, 2009; Interim Environmental Impact Assessment Regulations, draft 2.3.

11. Afghanistan has in addition ratified a number of international agreements and conventions relating to the protection of the environment and biodiversity.

12. This IEE was carried out in accordance with applicable international Guidelines. The legal framework of the Islamic Republic of Afghanistan does in the essence correspond with the International regulations and safeguards. Gaps however do exist in enforcement of the regulations. There is still a considerable lack of institutional capacities for implementation, monitoring and evaluation.

1.3 Description of the Project

13. The proposed tranche includes a new 500kV single circuit transmission line from Uzbekistan-Afghanistan border river crossing (Amu-Darya river) near Khayraton bridge to Khwaja Alwan substation (Pul-e-Khumri) and the expansion of a one line-bay at Alwan substation. The expansion of Surkhan substation (in Uzbekistan) and the 45 km transmission line connecting Surkhan substation to the Uzbekistan-Afghanistan border is considered as an associated facility to this project.

14. The 500 KV single-circuit line runs at approximately 85.5 km long from Amu-Darya River to Samangan border, crosses Samangan to Baghlan province for about 113.5 km, and continues for approximately 2 km long from Baghlan. The terrain is relatively flat, with the transmission line running through a semi-desert and river, and neither access nor other construction difficulties are expected.

15. The RoW is taken 60 m wide for the 500 kV transition line. The expansion of Surkhan substation (in Uzbekistan) and 45 km transmission line connecting Surkhan substation to the Uzbekistan-Afghanistan border is considered as an associated facility to this project. The work covers development, financing, design, engineering, procurement, transportation to site, construction, erection, installation, completion, testing and commissioning, operation and maintenance for 3 years of the 500kV single circuit transmission line of 45 km from Surkhan substation to Khwaja Alwan substation and all associated facilities, ancillary equipment and systems.

1.4 Baseline Description

16. The preparation of this IEE covers the 500 kV single-circuit line from the Uzbekistan-Afghanistan border river crossing near Khayraton bridge to Khwaja Alwan substation (Pul-e-Khumri) and the expansion of the one line-bay at Alwan substation, with the total line length of approximately 201 km.

17. The expansion of Surkhan substation (in Uzbekistan) and 45 km transmission line connecting Surkhan substation to the Uzbekistan-Afghanistan border is considered as an associated facility to this project. Thus, the IEE will not cover the proposed works associated with this facility. A DDR and a CAP have been prepared separately for the associated facility of the project.

Project (part 1): between Amu-River and Balkh Province

18. This section of the transmission line crosses the provinces of Jawzjan and Balkh. The main physical and biological characteristics of the project area in this section are:

- There are important oil and natural gas reserves, as well as sulphur, sand and gravel deposits.
- The Investigation area is presently not a touristic area.
- The Investigation area is characterized by a continental dry climate.
- The Safid and the Balkh rivers, as well as small rivers and creeks are crossed by the line.
- No water storage facility is present in the Investigation area.
- The groundwater table is assumed to be found at minimum 15 m depth.
- The area is marked by alternate grassland savanna and sandy desert
- Woodlands are not crossed by the line corridor
- There are some plantations, trees, bushes and grassland, as well as fruit trees.
- The Investigation area is not rich regarding fauna.
- No protected areas are crossed by the transmission line corridor or are located near to it.

19. In relation to the human environment, the project area for the project (part 1) can be generally classified as follows:

- Along the line corridor, the majority of the population lives as a joint/extended family system. The size of most of the extended households located along the line corridor is between 10 to 30 persons.

- The overall literacy rate in Balkh Province is 44%.
- The Investigation area has no industrial or major commercial activities.

- Partly the household income is also supplemented through the sale of livestock (especially goat/ sheep).

- According to the field survey, 30% of the population living along the line corridor has access to health facilities.

- Safe drinking water is not available to the population in the Investigation area. According to the field survey, the main ethnic groups/ tribes living along the line route are Uzbeks (53%).

- About one half of the population is female. In the tribal area, the women have a limited role in decision-making process at household level.

- Agricultural cultivation or farm forestry is found at isolated areas. A big portion of land in the line corridor is unused, barren and un-vegetated .

- More than 60% of the population residing along the line corridor has access to electricity.
- Access to roads is to the extent of 30%.

Project (part 2): between Balkh Province and Dashte-Alwan

20. This transmission line component crosses the provinces of Balkh, Samangan and Baghlan. Punctually Balkh, Naebabad and Dasht e Alwan which are separate locality of these provinces are crossed by the line corridor.

21. The main physical and biological characteristics of the project area in this section are:

- Sandy soil and dune, somewhat loam. The area is a dry desert, without any water sources.
- There are no valuable protected or touristic areas.
- This area is characterized by arid and semi-arid continental climate. Since many years this area is exposed to periodic drought.
- Two major rivers – Shulgar river and Polemamocry river are crossed by the line corridor.
- Drinking water is scarce, found approximately 60 m below ground. The underground water close to the surface of the earth is salty.
- Generally ground cover is less than 15% and wild trees are absent.
- Because of the past 40 decades of war, drought and continuously irregular hunting, the number of animal species has severely declined.
- Only a relative small part of the land area along the line corridor is suitable for arable farming for horticulture including both irrigated and rain fed farming. Only here and there some small gardens are observed.

22. In relation to the human environment, the project area for the Project (part 2) can be generally classified as follows:

- Samangan Province has a total population of 395000.
- Balkh Province has a total population of 930000.
- The majority of the population is farmers, businessmen, laborers, and unemployed persons.
- Almost 50% of the population has access to schools and health clinics.
- Some of the villagers along the line route live far away from maternity hospitals, therefore the risk of child and mother mortality is very high.
- Access to safe drinking water from wells is limited
- Close to the line route in the Hayratan desert, there are new Hayratan Custom and Railway.

1.5 Environmental and Social Impacts and Mitigation

23. In summary, the results of the investigation demonstrate that the Project will have mostly low impacts on the environment if the Environmental Management Plan (EMP) proposed in the IEE Report is implemented. The following aspects decisively contribute to this assessment:

- The landscape of the investigation area is mostly flat so that tower and access road construction do not pose a risk regarding soil erosion and sand deflation.
- The groundwater in the Investigation area is located relatively deep.
- The Project is situated in a (semi-)desert and woodlands are not crossed by the transmission line.
- The transmission lines are not located in or near a protected area or an area that is of outstanding importance for flora, fauna and biodiversity.

24. The following medium negative impacts will be highlighted:

During the design phase:

- Impacts of the line routing on biological, human and physical features of the area.

During the construction phase:

- Surface water pollution and riverbed destruction due to river crossings;
- Impacts on workers and community health and safety, e.g. regarding work accidents, noise emissions, sanitary conditions, risks of electrocution, and presence of landmines;
- Impacts on historical and cultural sites;
- Damages to crops and trees during land survey, construction of access roads, construction of towers and conductor stringing;
- Land acquisition for towers;
- Relocation of houses/ households from the new ROW including impacts on women and other vulnerable people.

During the operation phase:

- Impacts on workers and community health and safety regarding natural disasters and risk of electrocution

25. Positive impacts are expected to be generated from the project, namely:

- An increased stability of the electricity supply;
- An increased efficiency/ reduction of transmission losses in electricity network;
- Generation of local employment.

26. A careful final design will be able to balance the impacts, avoiding resettlement as the highest priority, without increasing environmental impacts i.e. by long access roads or crossing protected areas and without affecting cultural heritage sites. Also quite often, design options are able to reduce environmental as well as social impacts at the same time.

27. The EMP and the LARP have to be part of the tender documents and construction contracts. A review of the final design by independent social and environmental experts is recommended.

1.6 Analysis of Alternatives

Line routing alternatives:

28. Beginning with first rough power line route options and based on recent high-resolution satellite scenes the line route has been optimized step by step and section for section in order to avoid settlements and single houses and to reduce the impacts on the environment e.g. by following already existing power line corridors, existing roads or by circumventing sensitive locations.

1.7 Public Consultation and Information Disclosure

29. During the field survey, various meetings were held with regional and local stakeholders. The meetings focused on the collection of information with regard to the socio-economic conditions in the wider areas of the planned line corridor. At the same time, information on the project was provided to those stakeholders who, until that point, had not been informed.

30. During the focus group discussions (FGD), the main issues were:

- The quality of the electricity supply;
- The high costs per kWh when using generators;
- The low level of coverage in the rural areas;
- The possibility that the future supply will not be fair;
- Fear that compensation payments would not be made at all or that the compensation money would not cover losses adequately;
- Pointing of vulnerable households living in their communities.

31. Nobody expressed concern as to possible damage and losses through the construction of the HVTL.

32. The implementation of the land acquisition and resettlement process requires an improved gender approach.

1.8 Grievance Redress Mechanism

33. According to the ADB safeguards, great care is taken in the project to prevent grievances. The situation in the conflict-marked Afghanistan requires special attention in order to avoid any additional development of conflicts.

34. Furthermore, Grievance Redress Mechanism is formulated for timely resolution and monitoring of external and internal grievances of workers, community and residents of the project area.

35. Prevention of grievances will mainly be effected through careful land acquisition design and implementation, by ensuring full DP participation and consultation and by establishing extensive communication and coordination between the community, the PMO and their consultants and coordinators and the local governments. In order to include women, the team for the implementation of the land acquisition and resettlement (and compensation) process will be gender-sensitive and culturally-adapted.

36. This notwithstanding, complaints are sometimes unavoidable if, for example, a different understanding of the value of losses and consequently of compensation payment arises. Therefore, a grievance redress mechanism is being adopted for the project to allow the DP the opportunity to appeal against any contested decision, practice or activity arising from the valuation of losses and the compensation/rehabilitation process. Efforts to make DPs fully aware of their rights and of the procedures for addressing complaints will continue during the updating of the LARP and at the time of compensation.

1.9 Environmental and Management Plan

37. The IEE and the LARP define measures to mitigate or prevent the negative impacts from the project. In this Chapter, an Environmental and Management Plan (EMP) is presented for the design phase, construction phase and the operation and decommissioning phases covering the description of the measures, their location, the time frame and the responsible for their implementation. Mitigation and monitoring measures are included.

1.10 Implementation Arrangements and Capacity Building

38. Internal environmental monitoring will be conducted by DABS-PMO, DABS Environment Department. Monitoring of EMP implementation will be performed by an EHS Consultant hired within the contract of the Project Implementation Consultant during the construction phase. Monitoring results will be included in the Project's quarterly progress reports, semiannual environmental reports during the construction phase and annual reports after commissioning. The detailed monitoring program will be subject to review and approval by ADB.

39. In addition, construction site audits will be performed by an international EHS External Auditor to ensure that all requirements as stipulated in the EMP of the Project are fulfilled. Such an EHS Construction Site Monitoring will be performed three times a year with special focus on the period of performing the detailed land survey.

40. Environmental monitoring during the operation phase will be performed by DABS and NEPA. The PMO will no longer exist after construction. Monitoring results will be included in annual environmental reports during the construction phase and in annual reports after commissioning. The detailed monitoring program will be subject to review and approval by ADB.

1.11 Overall Findings and Recommendations

41. In summary, the results of the investigation demonstrate that the project will have mostly low impacts on the environment if the proposed EMP is implemented and all proposed mitigation measures are accomplished. Some medium impacts remain regarding the land acquisition and land use, involuntary resettlement and vulnerable people during construction (see separate LARP document), as well as visual impacts and natural disasters during operation.

42. Careful line routing during the final design will help to minimize social and environmental impacts.

43. The overall construction will be supervised by an independent international expert.

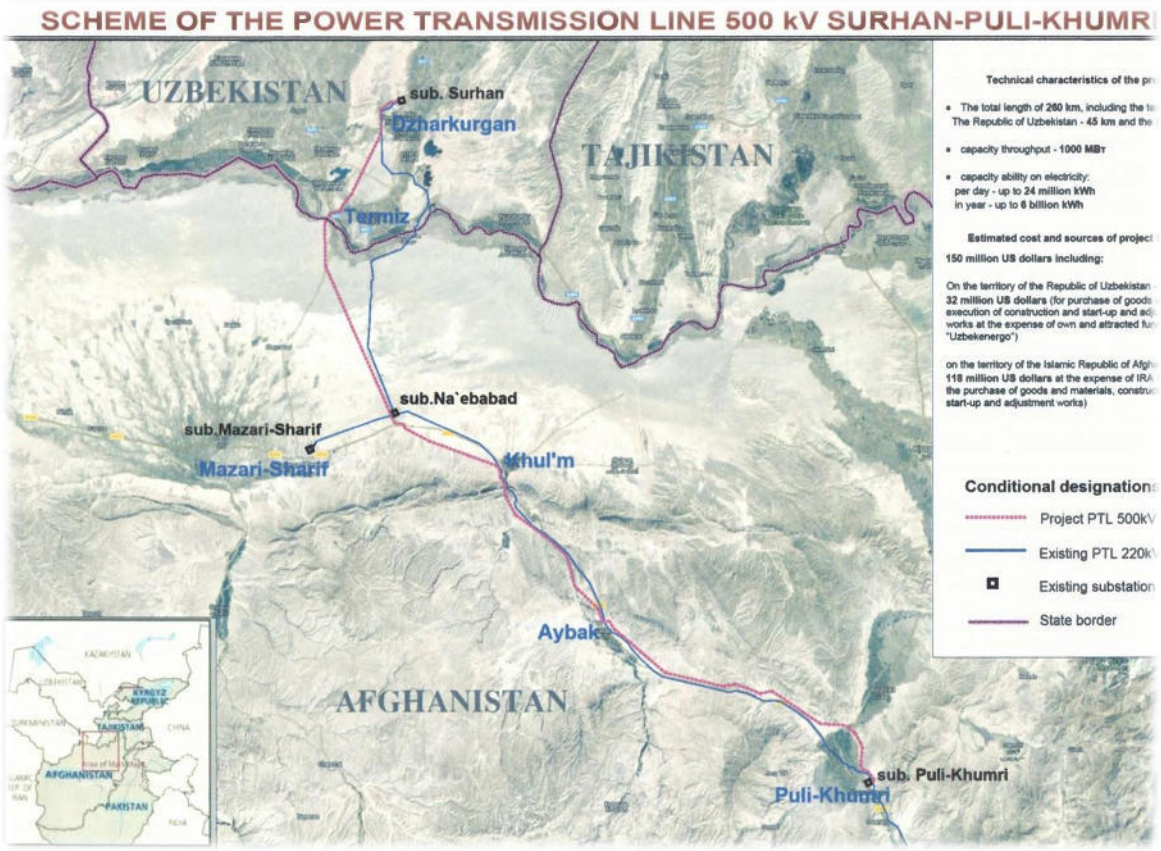
44. ADB will review the borrower's/client's social and environmental assessments and plans to ensure that safeguard measures are in place to avoid, wherever possible, and minimize, mitigate, and compensate for adverse social and environmental impacts in compliance with ADB's safeguard policy principles.

45. The EMP and the LARP have to be part of the tender documents and construction contracts. A review of the final design by independent social and environmental experts is recommended. Detailed baseline studies (physical, biological, socioeconomic and cultural/archeological) and public consultation will be carried out in the detailed design stage to update the current IEE study.

1.12 Conclusions

46. If all proposed mitigation measures are implemented, the transmission lines can be constructed with a minimum of adverse effects on the natural and human environment.

Figure 1.1 -AFG: Energy Supply Improvement Investment Program – Power Transmission Line 500KV Surkhan-Puli-Khumri



2. INTRODUCTION

47. Afghanistan is facing chronic power shortage. In 2018, around 45% of population has accessed to grid power, with average electricity consumption of 227 kWh per capita, among the lowest 5% in per capita energy consumption globally. By 20th March 2019, the unconstrained peak demand was estimated to be 1541 megawatt (MW) while the available power supply capacity of generation in Afghanistan and imports, was 898 MW. As such, a demand of 643 MW was not met. In 2018, of its total power supply of 5,850 gigawatt-hours (GWh), around 86% (5,005 GWh) was imported from Iran (20.9%), Tajikistan (30.5%), Turkmenistan (13.4%), and Uzbekistan (35.1%). Only 14% (845 GWh) was generated through indigenous hydropower, thermal and solar sources

48. Afghanistan's power network is split into 4 regional power systems comprising 10 power islands, which increases costs and reduces reliability, impedes efficient load dispatch, and results in a higher probability of blackouts. Due to the lack of transmission and distribution infrastructure, nearly 3,000 MW in latent demand cannot be met. Among the 4 regional power systems, North East Power System (NEPS) takes 75% national demand and supply, connecting 17 load centers (Kabul, Mazar-e-Shariff, Jalalabad, etc) with Uzbekistan and Tajikistan through 220kV, 110kV and 35kV lines.

49. The proposed project includes construction of 500KV of Over Head Transmission Line (OHTL) from Uzbekistan-Afghanistanborder river crossing (Amu-Darya river) near Khayraton bridge to Khodja Alwan substation (Afghanistan). The total length of OHTL is about 201 km (Balkh – 85.5 km, Samanghan -113.5 km., Baghlan 2 km). The OHTL will pass through Balkh, Samangan and Baghlan provinces of Afghanistan.

50. The expansion of Surkhan substation (in Uzbekistan) and 45 km transmission line connecting Surkhan substation to the Uzbekistan-Afghanistan border is considered as an associated facility to this project.

51. The construction activities will include route alignment and route survey, soil investigation, demining, detail survey, preparation of plan and profile, foundation preparation, earthing, tower erection, stringing of conductor, earth wire connection etc. The project will also include setting up of temporary construction camps to house the workers; excavation and operation of borrow pits; construction of temporary access road etc.

2.1 Project Background

52. Afghanistan had very low access to the electricity about a decade back. The Ministry of Energy and Water (MEW) estimated that about 30% of Afghans have access to electricity from grid-based power, micro-hydro, or solar panel stations1. Traditional fuels meet more than 85 percent of country's energy need, and more than 80 percent of the population lives in rural areas that depend on these traditional sources. Use of fuel wood, crop residue and kerosene has led to serious deforestation, adverse impacts on watersheds, air quality and human health. On the other hand, in an emerging economy like Afghanistan, access to electricity is the main responsible factor to ensure a sustainable growth. It is a crucial agent to reap the benefits of the present day technological advancements in the fields of information technology, space technology, communications, agricultural development, industrial development, etc. Therefore, to improve the electricity supply situation for the future development of the country and to overcome the said problems, the Government of Afghanistan has planned to undertake new power infrastructure development projects.

53. Asian Development Bank (ADB) is financing the transmission and distribution network projects in Afghanistan through Energy Sector Development Investment Program (ESDIP), a Multi-tranche Financial Facility (MFF) that has been divided into a number of tranches or groups of subprojects. As a result of these efforts, the supply situation is improving day-by-day and according to a recent World Bank estimate, about 89.5% of the population has access to the electricity in 2015 2.

54. Based on the DABS request for synchronized operation of the current 220kV TL dated 8th and 9th July 2017, UZBEKENERGO – the national power company of Uzbekistan proposed to make a new transmission line HV 500kV, from SURKHAN Uzbekistan to Pul-e-KHOMRI. Thus, the construction of the 500 kV Surkhan-Puli-Khumri HV transmission line is planned by mutual agreement of the governments of the two countries in the period 2018-2020.

Benefits:

- Improvement and further development of good-neighborly relations with Republic of Uzbekistan.
- Development of the economy and the improvement of the welfare of the people in Afghanistan.
- Increasing of electricity import from Uzbekistan.
- Ensuring uninterrupted power supply from Uzbekistan to Afghanistan (up to 24 million kWh per day).
- Creation of technical conditions for the connecting of energy system of Islamic republic of Afghanistan to the energy system of Uzbekistan and Central Asia (CAPS).

2.2 Scope and Objectives of the IEE

55. The scope of this IEE covers the construction of 500KV of Over Head Transmission Line (OHTL) from Uzbekistan-Afghanistan border river crossing (Amu-Darya river) near Khayraton bridge to Khodja Alwan substation (Afghanistan).

56. Within the scope of this IEE, DABS identify the potential environmental impacts of the propose project. On the basis of the existing environmental situation in the Investigation area and the technical planning, determined the potential environmental impacts of the proposed project during design, construction and operation. Alternative routings and options, as well as identify appropriate mitigation and monitoring measures were considered to minimize any anticipated adverse impacts of the proposed project, at least to a level meeting national and good international industry practice (GIIP) criteria for evaluation of environmental impacts.

57. The objectives of this IEE are the assessment of the potential environmental and social impacts of the design, construction, and operation of the planned project. On the basis of the existing environmental baseline of the project area, the potential environmental impacts determined and appropriate mitigation measures are proposed for the proposed project. Alternate routings and options are analyzed, and appropriate mitigation and monitoring measures were considered to minimize any anticipated adverse impacts.

58. During the initial phase of the project inspection, the main focus has given to find a line routing that is feasible from technical points of view and achieve the following expectation:

- environmental friendly route followed for the proposed project

- Technically feasible route and avoid crossing other high voltage lines in the area to the possible extent
- To a high extent possible avoid the need of resettlement actions
- Avoid ecologically sensitive Areas, cultural and historical places.
- Consideration of accessibility and security on the line route for the project
- Appropriate mitigation measures are suggested and their implementation should be closely monitored during implementation of project.

59. An Environmental Due Diligence Report (DDR) along with a Corrective Action Plan (CAP) has been prepared for associated facility. The details of these have also been made part of the IEE study.

2.3 Methodology

60. For development of the IEE study, DABS set up a multi-disciplinary team composed of one International Environmental and Ecological Expert and one National Environmental Expert. The work made by two International Social Experts and one National Social Safeguards Expert (in the context of the LARP (Land Acquisition and Resettlement Plan) for this project) was also taken into consideration for the present IEE.

61. The national team, together with male field surveyors and technical surveyors conducted field work in the project between the 31st July and the 10th of august. Socio-economic surveys of the affected households were conducted as part of the LARP preparation. The environmental team preparing the IEE surveyed the physical and biological conditions of the areas.

62. The field surveys were conducted particularly transmission line between Naebabad substation and Dasht-el-Alwan (pul e khumri substation). DABS made this decision based on the fact that previous studies have been undertaken for the areas or nearby area where the remaining components of the project will be built. In preparing the final IEE, it will be ensured that any assumptions made due to absence of field data are clearly set-out, and that conclusions regarding impact significance are based on the precautionary principle. The EMP will include and undertake environmental monitoring to complete the gaps in baseline data during detailed design and before construction work begin. In summary, the information was obtained as indicated in Table 2-1.

Table 2-1: Basis for the IEE and LARP reports

Parts	Subsections	Existing environmental/social studies	Basis for the IEE and LARP
Part 1	Between Sheberghan and Mazar-e-Sharif	IEE for the PREVIOUS MFF 0026-AFG, October 2012 Draft LARP for Afghanistan, September 2012 plus Attachment B (Socio-Economic Set-Up of the Project Areas, Social Impact and Gender Analysis) LARP for the Turkmenistan: TA-7853 REG: Afghanistan and Turkmenistan: Regional Power Interconnection, September 2012	The existing studies
Part 2	Between Mazar-e-Sharif and Na'ebabad	Existing PTL 220 kV	Field surveys
	Between Na'ebabad and Dasht el Awan	MFF MAZAR TO DASHT EL ALWAN	Field surveys

63. It is in addition to say that all new line sections run parallel to existing transmission lines, except for the strip between Mazar-e-Sharif and Na'ebabad. This means that the baseline description of the existing studies for the remaining line is valid for the planned project. However, additional baseline data was collected where relevant data was not available for the proposed planned project.

64. Regarding the environment, a corridor of 500 m was investigated on both sides based on the potential environmental impacts of the planned transmission line during the field survey. Socio-economic baseline surveys were carried out for sample populations settled along the corridor of influence (COI). Additionally, an evaluation of possible ecological and social impacts was performed by interpretation of satellite maps and other available maps and data for the Investigation area.

65. Due to the fact that there is no official international consensus on an agreed approach for assessing the significance of impacts on the environment, DABS uses an own evaluation procedure. The focus of the used evaluation procedure is to decide whether the Project is likely to cause significant adverse environmental effects resulting from the design, construction, and operation and decommissioning. The evaluation scale applied is as follows:

Extent of impact:

| || || |	=	High
| || |	=	Medium
| |	=	Low
| |*	=	no impact
| || |*	=	locally positive
| || || |*	=	Regionally
***	=	Positive

66. For the judgment, international standards like standards from the World Bank, World Health Organization (WHO) etc. are used and supported by Afghan standards. Afghanistan does not have any transmission lines grid codes or environmental standards and relies upon standards pursued by donor organizations.

67. ADB SPS (2009) has been followed for the development of this IEE study, which has introduced by ADB to promote the sustainability of the project outcomes by protecting the environment and people from projects' potential adverse impacts.

68. Furthermore, below activities have been carried out for the development of this IEE:

- Desk review of data, maps, reports, etc. related with project affected area.
- Checklist development for project related data collection.
- Afghanistan government environmental laws and legal frameworks review.
- Site visits for data collection and interviews.
- Stakeholder's engagement/consultation (DABS officials, government, and local communities).

69. The following team was assigned for the development of this IEE:

- One Senior Environmental Expert
- One Senior Environmental Officer and
- One Environmental Officer
- National Social Safe-guards Expert (LARP expert) and
- Surveyors for LARP.

70. Noise Level Measurement, Ambient Air quality, Vibration and Water Quality surveys are normally mandatory as part of IEE study to establish baseline condition of the project area. However, due to security constraints, these surveys/test analyses were not conducted for development of IEE study. Therefore, these surveys or analyses are recommended to conduct before start of the construction work of the project.

3. INSTITUTIONAL AND LEGISLATIVE FRAMEWORK

71. The past five years have seen several important achievements in the field of environmental governance. The National Environmental Protection Agency (NEPA) was established in 2005 as Afghanistan's environmental policy-making institution, tasked with regulation, coordination, monitoring and enforcement. With technical assistance from the United Nations Environment Program, Afghanistan's first Environment Law was drafted further to a consultative process and signed by the President in late 2005. It was then reviewed and amended by the (then newly-established) National Assembly, and the final version was promulgated in early 2007 (Official Gazette No. 912, 25 January 2007). In addition, with support from the international community, several projects targeting various aspects of capacity building and environmental assessment, clean-up and restoration have been implemented, and important international environmental conventions and cross border cooperation agreements signed.

72. In 2008 the Afghanistan National Development Strategy (ANDS) was adopted, which among priority issues and sectors lists environmental management and conservation, will be an essential step forward. Within ANDS, NEPA is expected to play an important role in environmental protection. However its mandate extends further: under the Environment Law it is responsible for fulfilling 18 key functions related to the environment and natural resources. In the years to come NEPA will consequently be one of the central institutions dealing with management of Afghanistan's environment for the benefit of all Afghan people, alongside other sectoral ministries such as the Ministry for Agriculture, Irrigation and Livestock (MAIL), the Ministry of Energy and Water (MEW), and the Afghanistan National Disaster Management Authority (ANDMA).

73. The new Environment Law of Afghanistan is based on 13 fundamental principles. It consists of nine chapters and 78 articles addressing all the main environmental concerns. For example, chapter 4 addresses the regulatory provisions for pollution control and waste management; chapter 6 focuses on biodiversity, conservation and management of natural resources. Overall, the law defines the functions and powers of NEPA and reflects the role of the agency as the apex body for the formulation, implementation, regulation and monitoring of Afghanistan's environmental policies and also as the coordinator for international environmental cooperation. To promote further integration and coordination of environmental matters with other government agencies, the Environment Law has established Afghanistan's Committee for Environmental Coordination and the National Environmental Advisory Council.

74. Afghanistan's environmental policies are steadily improving. The National Capacity Needs Self-Assessment for Global Environmental Management (NCSA) and National Adaptation Program of Action for Climate Change (NAPA) projects, completed in February 2008, provide an excellent overview of Afghanistan's progress towards implementing UNFCCC (Climate Change Convention), UNCBD (Biodiversity Convention), and UNCDD (Desertification Convention), and its overall position in the international environmental arena. The National Environmental Strategy of Afghanistan, developed by NEPA in 2007 as part of the ANDS process, clearly demonstrates the cross-sectoral perspective of environmental management.

75. It also proposes specific activities and considerations to meet national targets for the Millennium Development Goals (MDGs). Assessment of ozone-depleting substances has helped to define the weight of Afghanistan in the global impact on Earth's ozone layer. Very

comprehensive work has been carried out to assess Afghanistan's biodiversity, ecological hotspots and conservation potential, while developing recommendations for strengthening the network of protected areas and supporting community-based natural resource management.

76. The new approach to environmental policy is designed to address the cross-sectoral character of the use of natural resources, as well as the underlying causes of environmental degradation.

3.1 Institutional Framework and National Requirements

3.1.1 Institutional framework

77. The EA send the revised IEE to National Environmental Protection Agency (NEPA) of Afghanistan for its review and concurrence before physical works could be initiated by contractor. They may require and advise certain additional measures in the environmental management plan. A non-objection from NEPA is required before contractor can begin the works. NEPA does not prepare its own EIA or other documentation for any project prepared and funded by donors.

Da Afghanistan Breshna Sherkat (DABS):

78. DABS is an independent and autonomous company established under "The Corporations and Limited Liabilities Law of the Islamic Republic of Afghanistan (IROA)". DABS is a limited liability company with all its equity shares owned by the Government of Afghanistan (GoA). The company was incorporated on 4th May 2008 (15 Saur 1387) and replaces Da Afghanistan Breshna Moassassa (DABM) as the national power utility. DABS will operate and manage electric power generation, import, transmission, and distribution throughout Afghanistan on a commercial basis. DABS is the Implementing Agency (IA) of the Project.

Ministry of Energy and Water (MEW):

79. In supporting the socio-economic growth of Afghanistan, the MEW is responsible for preparing and managing national policies of the energy sector with the exception of those management or implementation policies that are assigned to the yet-to-be established Afghanistan Energy Regulatory Authority (AERA) by the Electricity Law. The guiding and development direction of the planned energy sector of Afghanistan is subject to the policies under this law.

National Environmental Protection Agency (NEPA):

80. NEPA's goal is "to protect the environmental integrity of Afghanistan and support sustainable development of its natural resources through the provision of effective environmental policies, regulatory frameworks and management services that are also in line with the Afghanistan Millennium Development Goals (MDGs)".

Afghanistan National Standard Authority (ANSA)

81. ANSA was established in 2004 based on Presidential Decree 952 under the Ministry of Commerce and Industries that was the cornerstone for the establishment of a standards body. Through 2007, the operations of this body were limited due to a lack of human resources, budget, work plan, and strategy. The government then placed greater attention in

this area. The Council of Ministers approved ANSA as an Independent entity in August 2007 - the first step towards a fully functioning standards body in the country. Recognizing the needs of modern business and cross-border trade - vital for the Afghan private sector - the Parliament of Afghanistan also ratified this decision in February 2008. ANSA now works toward the following objectives:

- Serve Afghan stakeholders (government, industry and consumers etc.) in the fields of standardization, conformity assessment, accreditation and metrology
- Improve commercial interactions, build the technical infrastructure and capacity, develop human resources, and establish closer ties amongst relevant institutions
- Encourage the private sector to participate in standardization, conformity assessment, accreditation, and metrology activities to contribute to commercial interactions within Afghanistan
- Enhance implementation of international standards as well as regional and national standards and their application in business and industry
- Improve awareness of the role to promote the benefits of standardization and conformity assessment, accreditation and metrology amongst government, the private sector and the public

82. ANSA is responsible for the development of national standards. ANSA operates in 13 fields including the environment. However, up to now, the agency has developed limited numbers of standards, particularly in the environmental field. Therefore, it is recommended to adopt International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability with coordination of ANSA.

Other Central Government institutions potentially linked to the Project and the implementation of the EMP include the following:

- Ministry of Rural Rehabilitation and Development;
- Ministry of Agriculture, Irrigation and Livestock;
- Ministry of Energy and Water;
- Ministry of Information and Culture;
- Ministry of Mines and Industry;
- Ministry of Frontiers and Tribal Affairs;
- Afghanistan National Disaster Management Authority;
- Central Statistics Office;
- Department of Meteorology.

Civil Society Organizations:

83. Save the Environment Afghanistan (SEA) is Afghanistan‘s only major grassroots and Afghan-managed conservation organization. SEA (then SAVE) was active in environmental issues during the civil war when there was no active government involvement in environmental issues. SEA‘s mission is protection of the environment, sustainable resource utilization, conservation of biodiversity and integrated development of natural resources. SEA is member

of IUCN, IUFRO (The Global Network for Forest Science Cooperation) and APAFRI (Asia Pacific Association of Forestry Research Institutions) and works closely with the International Crane Foundation, the World Wide Fund for Nature (WWF), the International Centre for Integrated Mountain Development (ICIMOD), the International Snow Leopard Trust and other environmental organizations (MAIL, 2009).

3.1.2 National requirements

84. The lists all national acts/ laws relevant to the Project are given in Table 3-1.

Table 3-1: National acts/laws of Afghanistan

Act/ Law	Year	Key areas
Environmental Act	2007	This act has been promulgated to give effect to Article 15 of the Constitution of Afghanistan and provide for the management of issues relating to rehabilitation of the environment and the conservation and sustainable use of natural resources, living organisms and non-living organisms.
Minerals Law	2010	The Minerals Law of 2010 governs the ownership, control, prospecting, exploration, exploitation, extraction, marketing, sale, and export of minerals in the territory of Afghanistan. The law provides that all deposits of minerals on or under Afghanistan or in its water courses are the exclusive property of the state. A surface land interest does not include right to minerals. The Ministry of Mines is authorized to grant mineral rights in accordance with the provisions of the law (GIRoA, 2010; Kuo, 2007) (source USAID, 2010).
Water Law	2009	Afghanistan's new Water Law became effective in April 2009 and is one component of the country's strategy to integrate its water systems and institutions. The Water Law adopted a river basin approach under which natural river basin boundaries (versus administrative boundaries) govern all aspects of natural resources management and planning (Wegerich 2009; GIRoA, 2007b). Customary law tends to govern the use of water on private land and in private systems, the resolution of conflicts over water, and water resource conservation. Customary law generally governs allocation of water through the kaerez system, which is constructed and maintained on a community basis (McMurray and Tarlock, 2005) (source USAID, 2010).
Law on Managing Land Affairs	2008	The 2008 Law on Managing Land Affairs sets out definitions for various land types and classifications, requirements for land deeds, and principles governing allocations of state land, land leasing, land expropriation, settlement of land rights, and restoration of lands.
Draft Rangeland Management Law	Draft 2009	The Rangeland Law is currently under development. Its purpose is to create a framework for community custodianship and management of rangeland resources to provide for sustainable use and management of the rangeland resources, to maximize productivity of rangeland resources and to maintain ecological functions and evolutionary processes of Afghan rangelands, conserve soil and water resources, maintain biological diversity, and combat desertification.

Act/ Law	Year	Key areas
Draft Forest Law	Draft 2009	The Draft Forest Law reflects the principles of community based natural resource management enshrined in the Cabinet-endorsed National Strategy for Forests and Rangeland. The draft is currently with the Ministry of Justice for processing.

85. Relevant regulations, guidelines and policies are described in Table 3-2.

Table 3-2: NEPA's National regulations, guidelines and policies

Regulation/ Guideline/ Policy	Date	Key areas
Interim Environmental Impact Assessment Regulations	Draft 2.3	These regulations govern the process of environmental impact assessment in Afghanistan on an interim basis pending the establishment of the EIA Board of Expert in terms of Article 20 of the Environmental Law and issuing of final regulations. These regulations provide the detailed process of EIA and list the projects into category A and B based on potential impacts.
Administrative Guidelines for the Preparation of Environmental Impact Assessments	Draft 2 March 2007	These guidelines are in draft form and have been prepared by NEPA in coordination with UNEP. The purpose of guidelines are to provide guidance to proponents while undertaking a development project that may have a potential impact on the environment. The guidelines also provide guidance on how public should be consulted and defines the roles and responsibilities of various stakeholders in the process.
Environmental Impact Assessment Policy – "An Integrated Approach to Environmental Impact Assessment in Afghanistan"	November 2007	NEPA with the assistance from UNEP has developed the EIA Policy of Afghanistan. The policy stipulates energy sector guidelines to the project proponents to integrate EIA in the process of development and the procedures to address environmental consequences and involve necessary institutions in the process of project implementation.

Framework for EIA (Environmental Act)

86. The Government's regulation on environmental impact assessment is based on the Environmental Act of Islamic Republic of Afghanistan (Gazette No. 912) dated 23 Jadi, 1384 (25 January, 2007). The National Environmental Protection Agency (NEPA), as an independent institutional entity, is responsible for coordinating and monitoring conservation and rehabilitation of the environment, and for implementing this act.

87. Article 16 and 17 of Chapter 3 of the Environmental Act describes the process of preparing a preliminary assessment, an environmental impact statement and a comprehensive mitigation plan to be conducted by the proponent of each project. Article 21 mentions public consultation is required for all the projects.

88. Article 18 describes the approval procedure of environmental impact assessment. The NEPA will appoint an EIA Board of Experts to review, assess and consider applications and documents submitted by the proponent. Acting on the advice of the EIA Board of Experts, NEPA will either grant or refuse to a grant permit in respect of the project. A permit granted will lapse in the event that the proponent fails to implement the project within three years of the date of which the permit was granted.

89. Article 19 describes the appeal procedure. Any person may, within thirty (30) days of the granting or refusal of a permit, appeal the decision to the Director-General of the NEPA. The Director-General will review the appeal application and thereafter make an appropriate decision. Should the appellant wish to appeal the Director-General's final decision, the matter will be referred to the relevant court.

Land Code

90. The legal framework governing land rights is a collection of laws including formal (constitutional and civil law), religious and customary law. However, the government is making progress toward creating a cohesive framework. The 2004 Constitution of Afghanistan provides that property will be safe from violation, no one will be forbidden from owning and acquiring property except by law, and private property can only be confiscated by legal order.

91. In 2007, the Cabinet of Ministers approved a new Land Policy that allows for the formalization of land rights in informal settlements, and addresses bottlenecks in land rights administration as well as the overlap in different institutions' authority over questions of land rights (USAID, year unknown).

92. The 2008 Law on Managing Land Affairs sets out definitions for various land types and classifications, requirements for land deeds, and principles governing allocations of state land, land leasing, land expropriation, settlement of land rights, and restoration of lands. The law recognizes Shari'a, and defers to applicable principles of Shari'a in some areas (GIRoA2008b). Issues that are not covered by the Law on Managing Land Affairs are governed by the country's Civil Code, which in large measure reflects the Hanafi school of

Islamic law (Shari'a).

93. Customary law dominates in Afghanistan, and the Civil Code recognizes the application of customary law with regard to land rights. The Ministry of Justice estimates that, due to lack of trust and confidence in formal judicial institutions, 90% of Afghans rely solely on customary law.

National Environment Strategic Documents

94. Afghanistan's national environmental strategies are contained within the fabric of four interlocking national-level planning documents:

- the Millennium Development Goals: Vision 2020;
- the Afghanistan Compact;
- the Afghanistan National Development Strategy (ANDS 2008-2013) and

- the National Environment Strategy.

3.2 International Agreements

95. Afghanistan has ratified a number of international agreements and conventions relating to the protection of the environment and biodiversity.

96. The Ramsar Convention on Wetlands, signed in Ramsar, Iran in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Afghanistan is currently not a Contracting Party to the Ramsar Convention.

97. The World Heritage Convention (WHC) is an international agreement that was adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1972. It is based on the premise that certain places on earth are of outstanding universal value and should therefore form part of the common heritage of mankind. The Convention seeks to identify and safeguard the world's most outstanding natural and cultural heritage. Afghanistan became a Party to the Convention in March 1979.

98. The objective of the Convention to Combat Desertification (UNCCD, Paris, 1994) is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/ or desertification. Afghanistan signed the UNCCD in 1995 and the Convention entered into force in December 1996.

99. The United Nations Framework Convention on Climate Change (UNFCCC) sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. Afghanistan signed the UNFCCC in June 1992. The Transitional Authority ratified the Convention in September 2002 and the Convention entered into force in December 2002. The Kyoto Protocol is an extension to the Convention adopted in 1997 that outlines legally binding commitments to emission cuts. Afghanistan has yet to accede to the Kyoto Protocol.

100. The Convention on International Trade in Endangered Species (CITES) is an international agreement between governments which came into force in 1975. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Afghanistan acceded to CITES on 30 October 1986 but has not been actively implementing the Convention.

101. Afghanistan signed the Convention on Biological diversity (CBD) in 1992 and ratified it in 2002. Afghanistan submitted the Fourth National Report to the CBD Secretariat in 2009.

102. Afghanistan is not a Party to the Cartagena Protocol on Biosafety, a supplementary agreement to the CBD. Afghanistan does not currently consider biosafety to be a significant issue relative to others challenges facing the country (MAIL, 2009).

3.3 International Requirements

3.3.1 ADB safeguards

103. ADB's Environment Operational Directions 2013–2020 identifies 4 environment operational directions to promote the transition to green growth, and address the causes and

consequences of climate change. ADB's Safeguard Policy Statement (2009) is a consolidated policy framework setting out policy objectives, principles and requirements for 3 safeguard areas: environmental, involuntary resettlement, and indigenous people.

104. The ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, financial intermediation loans, and private sector investment operations. Environmental assessment is a process rather than a one-time report, and includes necessary environmental analyses and environmental management planning that take place throughout the project cycle.

105. This IEE was carried out in accordance with the following relevant ADB Guidelines:

- Safeguard Policy Statement (SPS), June 2009, effective since January 2010;

106. According to ADB SPS (2009), the Project is classified as category "B" and therefore an IEE is required. ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. A project is classified as one of the four environmental categories (A, B, C, or FI) based on the most environmentally sensitive component. As such, projects are screened for their expected environmental impacts and are assigned to one of the following categories:

- Category A: This category project is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.
- Category B: A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of Category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases, mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.
- Category C: Projects unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are still reviewed.
- Category FI: A proposed project involves the investment of ADB funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system, unless all of the financial intermediary's business activities have minimal or no environmental impacts or risks.

3.3.2 Other relevant international guidelines

- IFC Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution, April 2007;

- ICNIRP Guidelines for Limiting Exposure to time-varying Electric, Magnetic, and Electromagnetic Fields (UP TO 300 GHz) (International Commission on Non-Ionizing Radiation Protection);

- CIGRE 1998: High Voltage Overhead Lines – Environmental Concerns, Procedures, Impacts & Mitigation.

- General EHS Guidelines (covering construction work) as well as the transmission sector guidelines

Gap analysis

107. The legal framework of the Islamic Republic of Afghanistan does in the essence correspond with the international regulations and safeguards. Gaps however do exist in enforcement of the regulations. There is still a considerable lack of institutional capacities for implementation, monitoring and evaluation.

108. There is a lack of specific Social and Environmental (S&E) qualification of staff and a specific S&E department does not exist within the implementing institution (DABS), partly the existing structures are overloaded with work and staff is not sufficiently remunerated. To some extent, the number of highly qualified staff is not sufficient to cope with the amount of work to guarantee an effective enforcement of the regulations.

109. The lack of access to legal support and lack of trust in the institutions, especially for weaker sections of the society may create further gaps concerning implementation of compensation and resettlement.

110. Additional training would be a necessary component to improve implementation and monitoring performance. Compliance with international safeguards could be increased with independent monitoring by internationally experienced auditors/ consultants.

111. Afghanistan national standards for air quality, noise level, water quality. are in place. Moreover, International standards (such as WHO / IFC) have also been referred to in the IEE study. Hence, the stringent values as provided in the national and International standards have been used in the IEE study.

112. Putting environmental and social compliance under the responsibility of the construction contractor should be clearly defined in contractor's Terms of Reference (ToR) and credible monitoring measures should be implemented.

4. DESCRIPTION OF THE PROJECT

4.1 Technical Description

113. The project consists of 500 kV Single Circuit Transmission line to be built from Uzbekistan – Afghanistan Border to Sub-Station Dashte-Alwan (Puli-khumri). Total length of the TL is about 201 Km and it passes through Mazar Sharif, Samangan and Baghlan Provinces of Afghanistan.

114. The Associated facility includes expansion of Surkhan substation and 45 km transmission line connecting Surkhan substation to the Uzbekistan-Afghanistan border.

BASIC TECHNICAL CHARACTERISTIC:

115. The total length of OHTL line: 246 km

116. On the territory of Uzbekistan - 45 km & on the territory of Afghanistan - 201 km

117. Capacity throughput - 1 000 MW

118. Electricity transmission capacity: per day - up to 24 million kWh & per year - up to 6.0 billion kWh

119. Project construction period is estimated about 2 year.

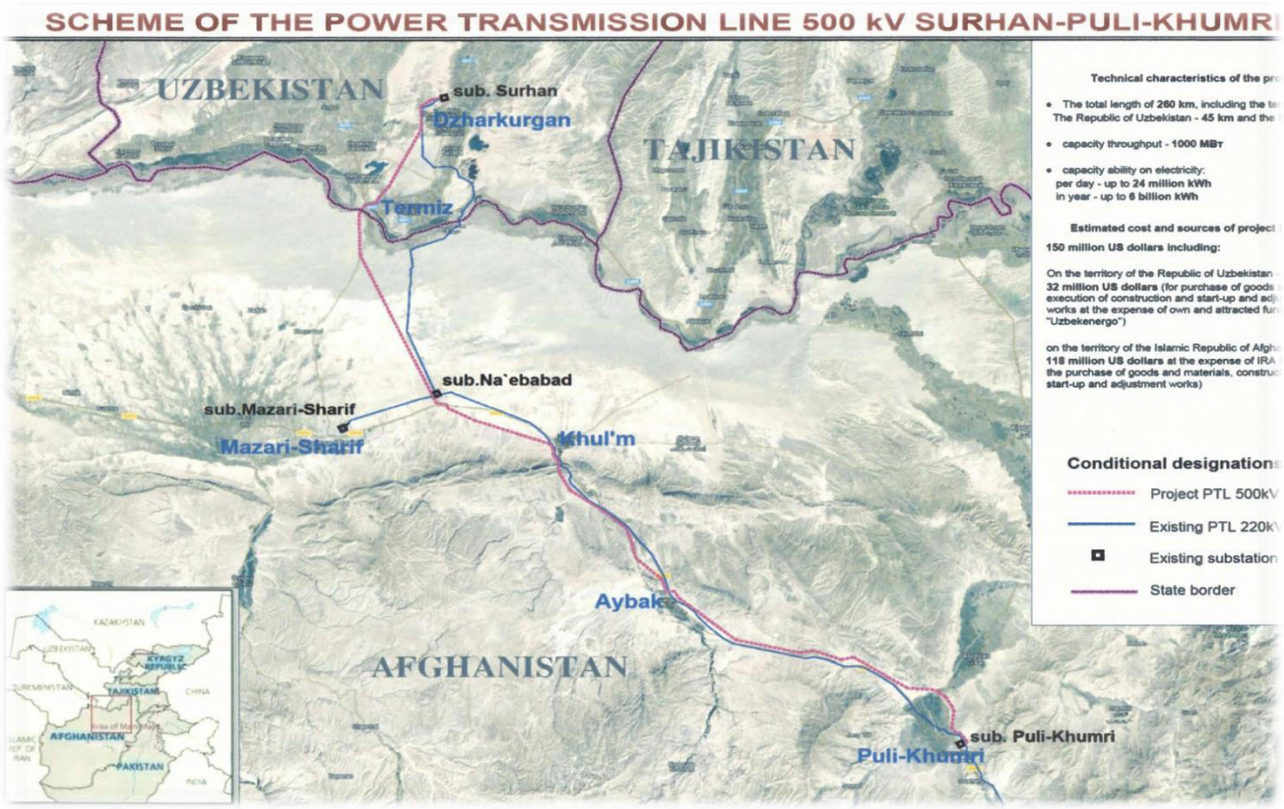


Figure 4-1: Scheme of 500KV OHL Sub-Surkhan-Khoja alwan Puli-Khumri

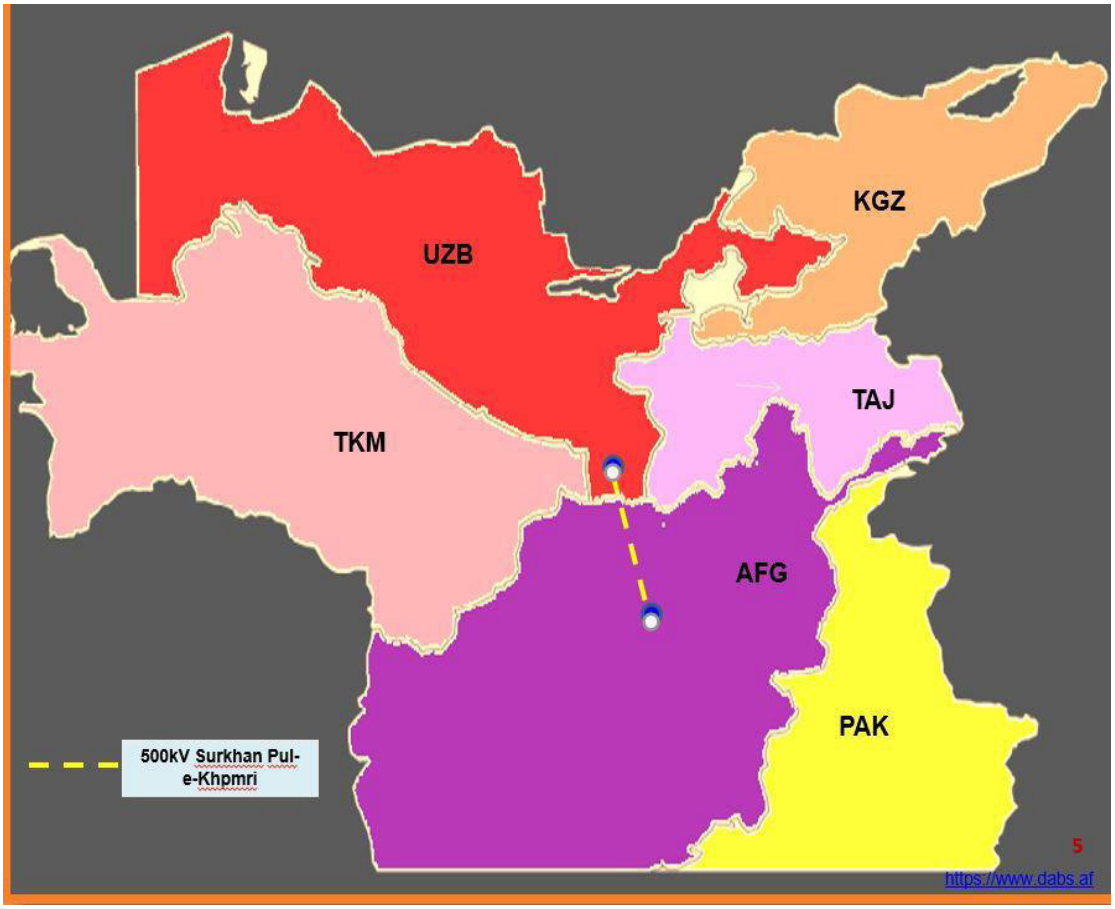


Figure 4-2: Final Route of 500KV OHL Sub-Surkhan-Khoja alwan Puli-Khumri

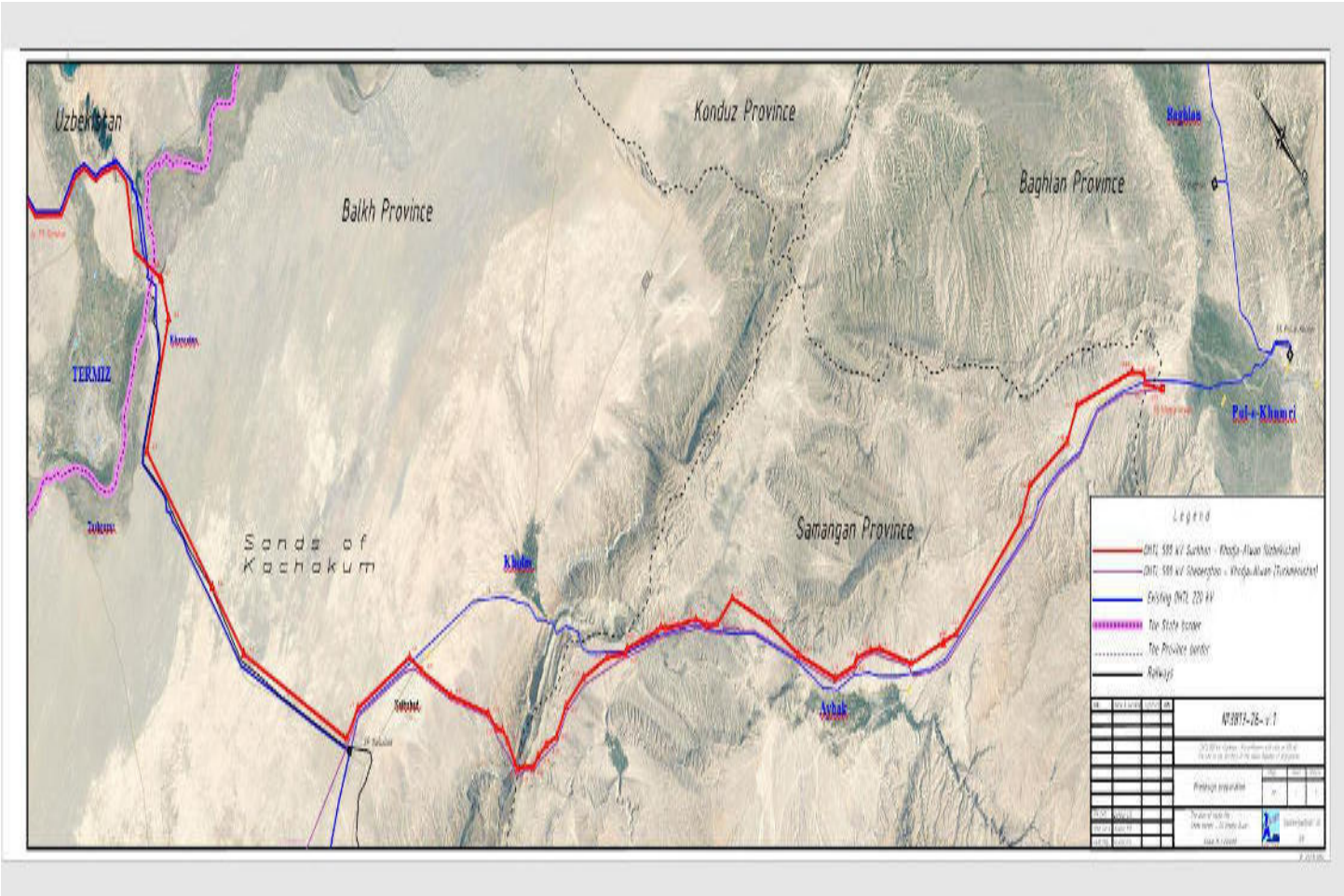
4.2 Investigation Area

120. The 500 kV single-circuit line from the close vicinity of the Surhan substation to the Dasht-e-Alwan converter station, for the most part, be located close to existing lines and pass through predominantly flat terrain. The line length in Afghanistan area about 201 km. Some difficulty is expected long passing through the mountain chain south-west of Khulm, and in the section bypassing the city of Mazar-e-Sharif on the north side.

121. As a principle, in order to minimize impact on land acquisition and usage, the new 500 kV line is aligned as close as possible to the existing 220 kV lines between Sheberghan and Mazar-e-Sharif, and further south from vicinity of village of Sayyad all the way to Dasht-e-Alwan.

122. The accessibility to future work areas is maintained by relative proximity to the main road. The anticipated minimum required corridor width for the new lines is assessed to be 60 m for 500 kV. Outside this strip, but still inside the RoW all vegetation above 3 m height needs to be cleared.

Figure 4-3: Final Route of 500KV OHL Amudaria-Khoja alwan



Transmission Lines Detail

123. The detail of transmission lines i.e. direct lines, angles and crossings on the route of OHTL 500kV is given in Annex A-1

5. DUE DILIGENCE ASSESSMENT OF ASSOCIATED FACILITY

5.1 Introduction

124. The Uzbekistan-Afghanistan Power Interconnection Project project proposed for ADB's financing comprises: i) the 500kV single circuit transmission line from mid of border river crossing (Amu-Darya river) near Khayraton bridge between Uzbekistan and Afghanistan to 500 kV Khodja-Alwan (Puli-Khumri(substation in Afganistan, with lenngh of 201 km; and ii) expansion of line bay including associated equipment at the Khodja-Alwan substation. Associated facility includes expansion of the 500kv Surkhan substation in Uzbekistan and construction of 127 towers for new high voltage transmission line (length 45 km) connecting Surkhan substation to the Uzbekistan-Afghanistan border.

125. The contract scope will include design, procurement, build, testing &commissioning, and operation & maintenance (O&M) of the 500kV single circuit transmission line from the border to 500 kV Khodja-Alwan substation, and connecting one-line bay at the Khodja-Alwan substation.

126. On 5 December 2017, Government of Uzbekistan and Government of Afghanistan agreed to jointly develop the project. Accordingly, on 27 December 2017, Joint Stock Company (JSC) Uzbekenergo of the Republic of Uzbekistan and DABS signed the plan of practical measures on Road Map for the implementation of the project. In accordance with the Roadmap, UE Uzelectroset of JSC Uzbekenergo and DABS established a permanent joint working group for development of the project. The joint working group requested design institute JSC Sredazenenergosetprotekt (SAESP) to conduct preliminary study. On 4 April 2018, DABS signed the contract agreement with SAESP for the development of feasibility study and design documents of the project Afghanistan segment. Subsequently, SAESP submitted the feasibility study report to DABS in October 2018. According to the agreement/roadmap, construction of the project in Afghanistan will be direct contracted to Uzbekenergo by DABS.

127. On 18 June 2018, Government of Uzbekistan and Government of Afghanistan signed Memorandum of Understanding on Ensuring Security in Implementation of Infrastructure Projects, which includes the Project and Mazar-e-Sharif-Herat Railway Project.

128. On 29-31 January 2019, UE Uzelectroset of JSC Uzbekenergo, SAESP, and DABS held meetings on the feasibility study and agreed to reduce the project cost of Afghanistan segment from $148.8 million to $109.9 million which includes $3.6 million of SAESP's contract for feasibility study and detailed design. DABS recommended further cost reduction to conclude the contract agreement with UE Uzelectroset on construction of the line and to purchase all transmission line materials from Uzbekistan and meet the international standards.

129. On 19-20 June 2019, Minster of Energy of Uzbekistan, JSC National Electric Networks of Uzbekistan (NENU), Ministry of Energy and Water (MEW) of Afghanistan, and DABS organized meetings on PPSA and project implementation mode and cost at ADB's HQ in Manila. The key features of PPSA and project roadmap were agreed. It was agreed to directly contract NENU as Design Build Operate (DBO) contractor for implementation of the project.

130. On 1 July 2019, Uzbekistani government delegations led by the Prime Minister met with Afghanistan government counterparts led by Chief Executive in Balkh and proposed to contribute $45 million for the transmission line portion inside Afghanistan, with several conditions.

131. NENU and DABS further negotiated on 16-17 July 2019 in Tashkent agreeing on the head of terms (HoTs), including:

i) NENU's scope of work covers development, financing, design, engineering, procurement, transportation to site, construction, erection, installation, completion, testing and commissioning, operation and maintenance for 3 years of the 500kV single circuit transmission line from Surkhan substation to Khwaja Alwan substation and all associated facilities, ancillary equipment and systems;
ii) the PPSA will cover the project (single circuit 500 kV transmission line), existing 10kV and two single circuit 220 kV interconnections for 10 years on "take or pay" principle with power trade of 4- 6 billion kWh annually subject to system configuration and technical capacity of transmission network within Afghanistan;
iii) a third party consulting firm funded by ADB grant will supervise project implementation;
iv) all import customs duties and any other corporate, income, withholding and other taxes and fees are subject to the applicable laws and regulations of Afghanistan;
v) Government of Afghanistan shall allocate land plots and rights of way for project construction;
vi) Government of Afghanistan shall provide requisite security during the entire construction and operation phase. NENU will, if required, make its own security arrangement for the project site and its occupants;
vii) Government of Afghanistan shall grant to NENU all licenses, consents, permits, visas, work permits, approvals and other governmental authorizations necessary for implementation of the project;
viii) the insurance arrangement will be similar to other ADB funded projects; and
ix) the terms and conditions of contract signed between DABS and SAESP dated 4 April 2018 will be integral part of DBO contract.

132. Construction in Uzbekistan part of the project has started in May 2019 and in June 2019 all works in Uzbekistan within mentioned project were suspended.

133. Per ADB SPS (2009), these activities are considered as associated facilities which are not funded as part of the project (funding were provided separately by the Uzbekistan side (own and attracted means), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project.

134. As part of environmental assessment, due diligence of these facilities have been conducted and corrective action Plan were developed.

135. Present due diligence assessment was conducted based on desk review of available materials, site visits and consultation with specialists and stakeholders from the project area.

136. Construction works in Uzbekistan are funded by JSC National Electric Networks of Uzbekistan.

137. General designer is JSC "Sredazenergosetproekt" and General contractor on the territory of the Republic of Uzbekistan is JSC "Electrokishlokkurilish". The construction company JSC "Electrokishlokkurilish" was established in 1962 and has extensive experience in construction of transmission lines.

5.1.1 Current status of works

138. In Uzbekistan implementation of the project has started in May 2018 in accordance with the decisions of the President of the Republic of Uzbekistan on approval of international treaties dated February 14, 2018 No. PP-3531 and the protocol of the workshop on the implementation of agreements and agreements reached between the Republic of Uzbekistan and the Islamic Republic of Afghanistan dated November 7, 2017 No. 157 (06-06- nineteen).

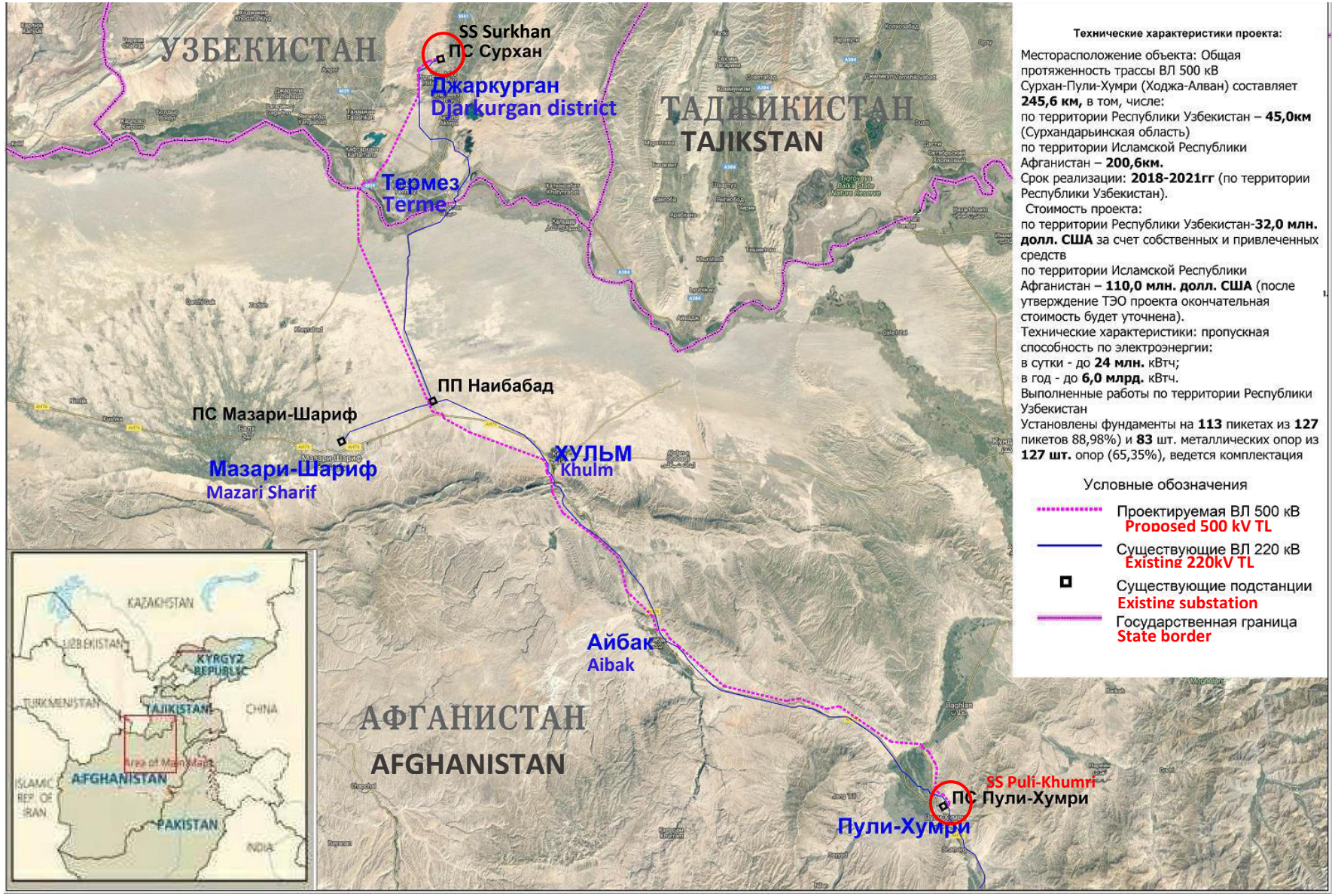
139. Out of 127 transmission line towers, 83 have already been installed and for the rest 30 only foundations have been constructed. No construction works have been initiated for the remaining 14 towers. Out of 113 foundations, 25 were installed in Djarkurgan, 45 in Angor and 43 in Termez districts.

140. Construction works of the transmission line stopped in June 2019 and for at least a year because the Project in Afghanistan has not started yet.

141. Construction works on expansion of the Surkhan substation has not started yet.

142. The scheme of the proposed project in Uzbekistan and Afghanistan is presented in Figure- 1 below.

Figure 5-1. Scheme of 500 kV TL route Surkhan - Puli-Khumri



5.1.2 Status of fulfillment of national environmental impacts assessments processes and preparation of reports (EIA).

143. According to the legislation of the national legislation, pursuant to Section 10 of the Regulation on State ecological expertise (SEE), the developer must conduct the EIA assessment process ('OVOS' is the national acronym) in a staged approach, providing the Glavgosecoexpertiza/ Gosecoexpertisa with OVOS documents for review at three distinct stages of the Project. Section 11 of the Regulation on SEE outlines the information that should be within the documentation at each of these stages. The three OVOS stages and their required deliverables are summarised as follows:

- **Stage I:** The 'Concept Statement on Environmental Impact' ('PZVOS' is the national Acronym, the same as OVOS), to be conducted at the planning stage of the proposed project prior to development funds being allocated.
- Stage II: The 'Statement on Environmental Impact' ('ZVOS' is the national acronym, the same as OVOS), to be completed where it was identified by the Glavgosecoexpertiza/ Gosecoexpertise at Stage I that additional investigations or analyses were necessary. The Statement must be submitted to the Glavgosecoexpertiza/Gosecoexpertise before approval of the project's feasibility study, and therefore before construction.
- **Stage III:** The 'Statement on Environmental Consequences' ('ZEP' is the national acronym) represents the final stage in the SEE process and is to be conducted before the project is commissioned. The report details the modifications to the project design that have been made from the Glavgosecoexpertiza/Gosecoexpertise review at the first two stages of the EIA process, the comments received through the public consultation, the environmental norms applicable to the project and environmental monitoring requirements associated with the project and principal conclusions.

144. SEE approval (Glavgosecoexpertiza/Gosecoexpertise opinion) is a mandatory document for project financing by Uzbekistan (Section 18) at Stages I and II and for project commissioning at Stage III of the national EIA procedure. An overview of the national EIA process is provided in Figure 1.

145. All economic activities subject to SEE are classified into one of four categories:

- Categories I and II — "high and medium risks of environmental impact" (SEE is conducted by the national SNPC within 30 days, all EIA materials are required);
- Category III — "low risk of impact" (SER is conducted by regional branches of SNPC within 20 days, all EIA materials are required); and
- Category IV – "low impact" (SEE is conducted by regional branches of SNPC within ten days, only a draft EIA is required).

146. According of the List of activities of the Regulation on the State Environmental Expertise in the Republic of Uzbekistan (No.491 of 31.12.2001, as amended on 05.06.2009) this expansion of SS and construction of 45 km 500 kV transmission TL of international value belongs to the national Category I ("high and medium risks of environmental impact") of economic activities.

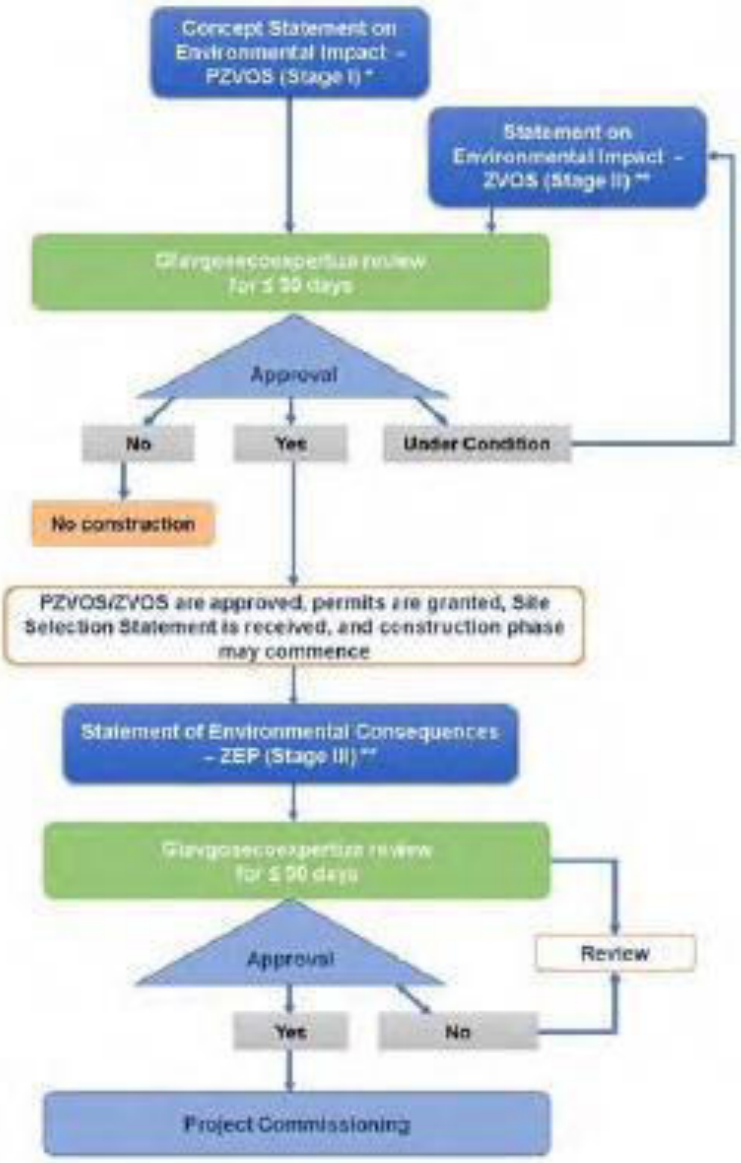


Figure 1: Uzbek EIA procedure [1]

* - Apply for Project Categories I to IV
** - Apply for Project Categories I to III

[1] (Source: Regulation on the State Environmental Expertise in the Republic of Uzbekistan No.491 of 31.12.2001, as amended on 05.06.2009)

5.1.3 Implementation of national environmental requirements

147. Although the construction began in 2018 the national environmental assessment for this project was not finalized yet, no Environmental Appraisal from SEE (State Nature Committee (Goskompriroda) with requirements for implementation before commencement of civil works, during construction and before operation was received so far. This means that no EIA study has been approved at the national level by the SEE by the time of this due diligence survey. The project activities were coordinated with specialists of Regional and local environmental bodies (Surkhandarya environmental protection committee and districts departments in Djarkurgan, and Angor districts). Before start of construction meetings with population in Djarkurgan and Angor districts were conducted by design company and representatives of NENU in the region in order to inform people on construction details.

148. Location of construction camps (one near the Surkhan SS and two mobile camps along the TL route) were agreed with local authorities and environmental departments of the districts. However no any records or reports for the implementation of national environmental requirements during the construction implemented from May 2018 to June 2019 are available.

149. As per information of local NENU representatives and Regional committee for environmental protection, local environmental specialists did not report on violations or any environmental problems in 2018 and 2019 caused by Contractor during the construction of TL.

150. However, absence of Environmental appraisal issued by SEE and EIA, could also impact the strictness of environmental supervision by the environmental bodies.

151. Currently no environmental specialist appointed by NENU to monitor environmental safeguards compliance on this project as well as no environmental staff hired by Contractor.

5.2 Expansion of 500kV Surkhan substation

152. Surkhan substation will be expanded for 7 hectares to the north of the existing infrastructure. Land allocation procedure is in process. The situational plan of the SS Surkhan is shown in Figure-2 (scale 1:12000).

153. The key components for the expansion of Surkhan SS includes following[1]:

- shunt reactor 500 kV (3 nos.)
- 500 kV SF6 circuit breakers (4 nos.)
- Disconnectors (11 nos.)
- 500 kV current transformers (15 nos.)
- 500 kV voltage measuring transformers (18 nos.)
- Surge arresters 500 kV (18 nos.)
- Tire supports (13 nos.)

154. There are following environmental features in this area:

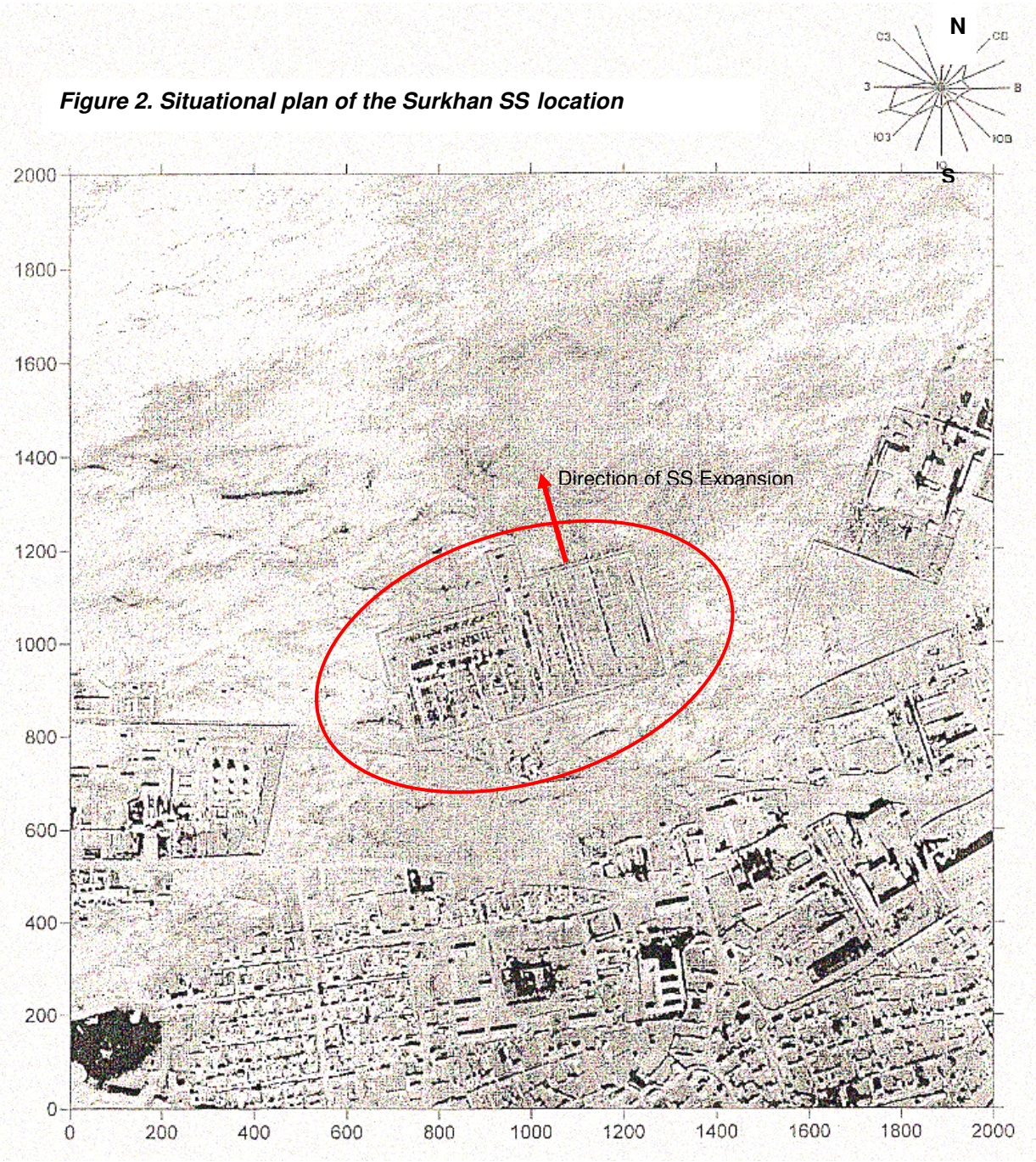
- wind is about 29 m/sec,
- minimal temperature is -25^{o}C
- maximal temperature is +50^{o}C

[1] Designs of the key electro-technic equipment for Surkhan Substation – materials of JSC "SREDAZENENERGOSETPROEKT"

- seismicity is 7 scores as per MSK-64 scale

155. Field visit confirmed that it is located in the deserted area. The nearest residential houses are located at the distance of 200-300 meters from the South side of the substation. The area of expansion to the North is barren, no any vegetation and houses are observed.

Figure 2. Situational plan of the Surkhan SS location



Photograph 1. The view to the future expansion area from the Surkhan SS inside. Area is barren and of desert type.

5.2.1 *Brief Inspection of area of Surkhan SS (existing facilities)*

156. Surkhan SS was constructed in 1980th. It is protected and fenced facility with very restricted access for entering and militarized guards. Only SS personnel and persons with special permission can enter the substation.

157. It consists mainly of Transformer Unit, Outdoor switchgear 220 kV, Outdoor switchgear 110 kV and Outdoor switchgear 500 kV. Schematic plan of the substation can be seen in Picture 4 below.

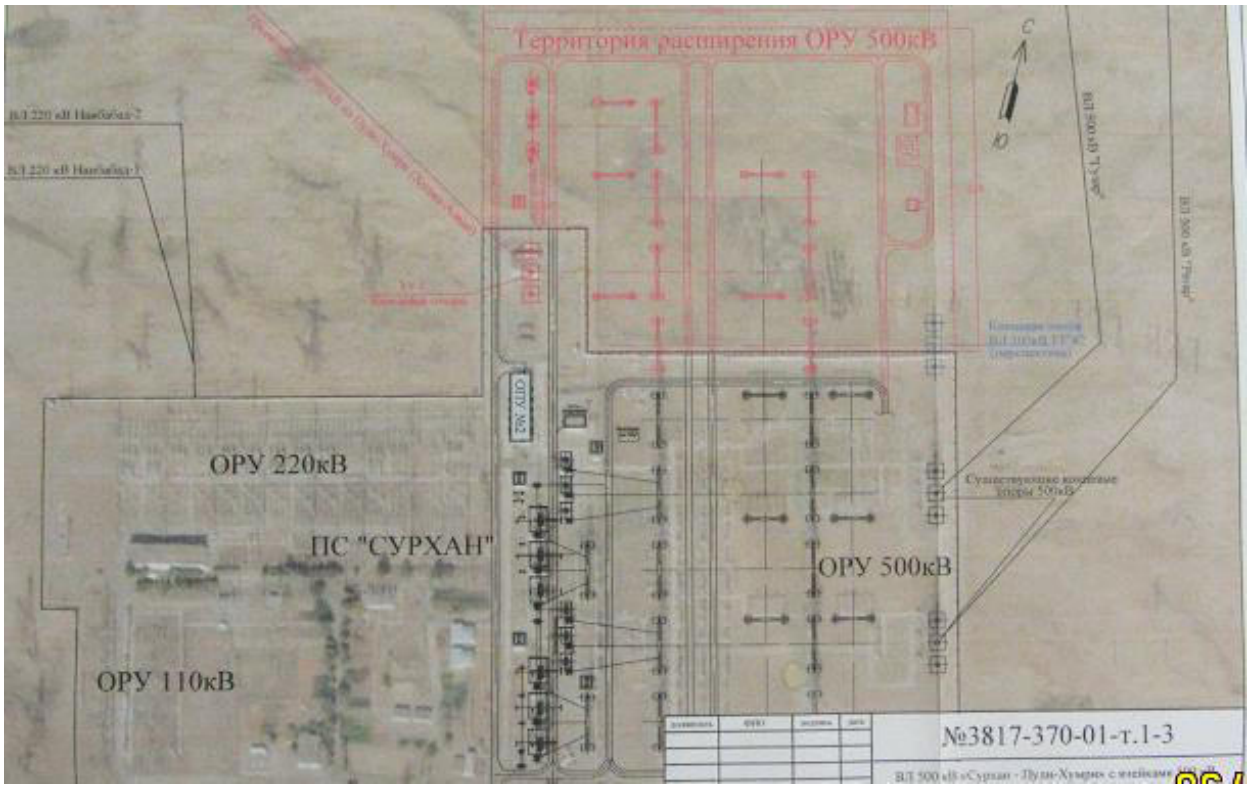


Figure 4. Scheme of the Surkhan SS main parts – the red color part is proposed expansion of SS switchgear 500 kV

158. In 2018 State Nature Committee of Uzbekistan issued Appraisal for the environmental quotas on waste generation and disposal and maximum allowable emissions for the substations and electric network facilities in Surkhandarya region including Surkhan substation. This Appraisal is valid during 5 years.

159. The special environmental department in “UzbEnergonaladka” which is the part of Uzbenergo conducts environmental monitoring (inspection) of energy facilities in the country, keeps documentation related to emissions and waste quotas etc.

160. The brief field survey of the existing Surkhan SS and meetings with administration and personnel of the substations resulted to following findings in contexts of health and safety issues and capacity of the personnel:

- there are number of HS instructions, including for SF6 safety requirements (since 2009) and descriptions of duties for each category of the SS personnel. Instructions are being updated every 3 years;
- attestation of the personnel for knowledge of HS requirements was conducted in 2019
- waste disposal are in line with quotas on waste disposal/generation approved by State Nature Committee (SEE). Most of waste are delivered to relevant waste treatment organization for the secondary use or utilization (as Vtorchermet, Vtortzvetmet, petroleum storage depot etc.);
- there is no practice, no equipment and specialists in Uzbekistan currently to test the transformers oil for PCB when there is need to replace the transformer oils. Usually oils are being send to laboratory of the Chemical Center of “Uzbenergo” for testing on cleanliness class, flash point, mechanical impurities, moisture contents, colour, ionol content, density in order to determine suitability of oil for further treatment and use;
- no any signs of oil spills or spoils, waste generated by project were observed at the inspected area of the substation. There are warning signs and also necessary fences for different equipment of the SS.

161. Head of Surkhandarya Regional Committee of environment protection has no any complaints on SS functioning and recommended only planting of more trees/vegetation in appropriate sites of the substation.

162. Some views of substation area are presented below.

Photograph 2. View of Surkhan SS from the main road


Photograph 3. Switchgears 110 KV and 220 kV


Photograph 4. Switchgear 500 KV to be expanded

Photograph 5. First metal supports (towers) installed for the TL Surkhan-Puli-Khumri (Khodja-Alvan)

Photograph 6 Substation is also protected by wired fencing and militarized guards. HS Engineer is equipped by relevant PPE.

Photograph 7. The part of metal waste at area adjusted to SS will be delivered to the specialized company for the secondary use (Vtorchermet)

5.3 Construction of 500 kV OHL (TL)

163. About 90% of TL construction was done by JSC "Electrokishlokkurilish". The status of works done and remained is presented in Table 1 below:

Table 1. Status of TL construction in Uzbekistan

№ п/п	Activities	Unis	Total for the project	installed	Remained to be installed	Executed (%)
1	Installation of Foundations	PK	127	113	14	88,98
2	Metal towers	PK	127	83	44	65,35
3	Wire AC400/51	tons	610		610	0
4	Cable TK70	tons	28,6		28,6	0

164. TL starts from Surkhan SS site and route passes mostly through barren hilly areas (90%) and only few foundations are located at agricultural lands. No any soil spoils or any type of waste (metals, bitumen remnants, plastic bottles, etc.) were observed at the areas near the towers.

Photograph 8. Angle towers at agricultural lands and other ones – in barren area can be seen.

Photograph 9. Installed at agricultural and barren lands

Photograph 10. Installed angle tower.

Photograph 11. Djarkurgan channel – installed towers can be seen. The distance from the nearest residential house is more than 30 m.

Photograph 12. Towers installed in Termez district.

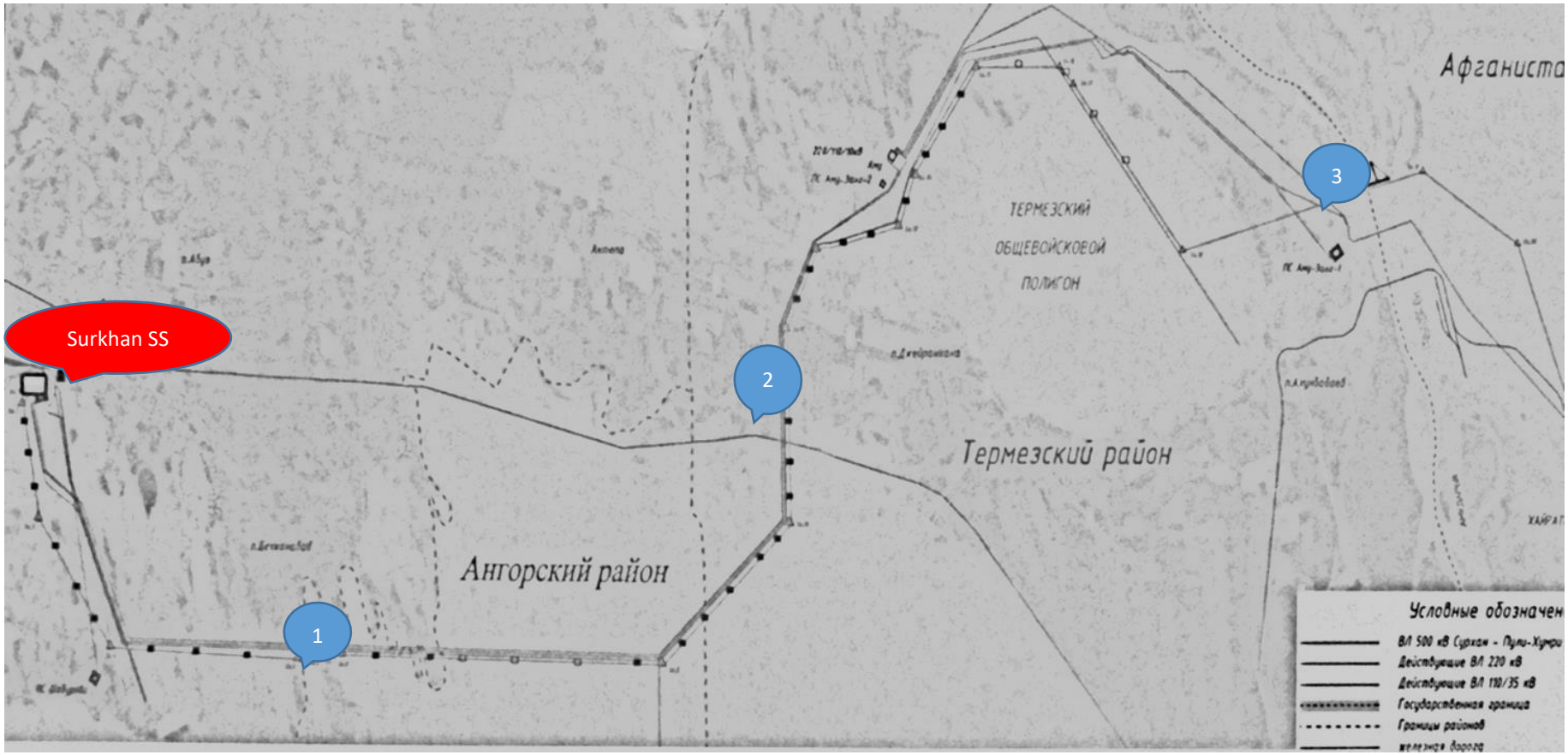
165. Construction of tower foundations consists of mainly excavation works up to 3 meters. The foundations of each tower were treated then by bitumen wrapping. Bitumen were brought in form of solid reel and then boiled in caldron on site. Metal parts of tower were gathered with machinery. No works at heights were done so far. Typical foundations installed by Contractor are presented at Picture 15 below.

Picture 15. Type of installed foundations

166. The TL route crosses 3 water bodies (see also Picture 16 below):

- (1) Djarkurgan channel in Angor district – site N5
- (2) Surkhandarya river in Termez district – area between site N10 and N11
- (3) Amudarya river in Termez district – area between site N18 and N19 .

167. Installed towers do not have any bird protection devices yes. TL crosses 2 rivers that is why bird migration ways and potential bird collision with wires should be considered in EIA, which has not been prepared yet.



Picture 10. OHL route crosses one irrigation channel and two rivers

168. No possibility for due diligence review to see the status of labor camps area, because all of them were demobilized already.

169. It was highlighted that EIA should contain all requirements on environmental protection, occupation safety and health during construction of remaining foundations, installation of towers, works at heights and other works. Works should be implemented as part of general requirement for conduction construction works as indicated in relevant national regulatory documents and relevant IFC guidelines.

170. Relevant reporting system on implementation of environmental protection measures at the project sites has to be established. Requirements on conduction environmental monitoring of water quality during construction period should also be included in the Environmental Management Plan.

171. Also, Public Consultations as part of EIA process must be conducted and national Public Information Disclosure process followed.

172. It was learnt that there is no GRM at the project level, therefore, people do not know where and how to apply in case of complaints or inconveniences due to project works.

5.4 Corrective Measures

173. Based on the results of due diligence, a Corrective Actions Plan was developed for associated facilities in order bring these components in compliance with ADB safeguards requirements – see Table 2 below.

Table 2. Corrective Action Plan

Identified Issue	Action	Responsible	Implementation period
Absence of national environmental impact assessment report (EIA)	As per concluded agreement with relevant agency as ENERGO PROEKT finalize preparation of EIA report. It should be prepared in accordance with national environmental legislation as well as to satisfy ADB SPS requirements.	Department of capital construction of NENU PIU	August-September 2019
Absence of environmental appraisal from the State Ecological Expertise of the Committee of environmental protection of Uzbekistan	1. Submit EIA report and obtain Environmental Appraisal from the SEE 2. Provide copy of Environmental appraisal along with EIA report to the Surkhandaya Regional Committee of environmental protection and environmental protection departments in Djarkurgan, Termez and Angor districts	Department of capital construction of NENU	September or October 2019
Preparation of Site-Specific Environmental Management Plan (SSEMP)	The contractor needs to prepare SSEMP to properly implement the mitigation measures and monitoring	Construction Contractor and approved by NENU.	Before start of re-construction.

	requirements as mentioned in the EIA study. Any topic specific environmental management plans (Waste Management Plan) will also need to be prepared.		
No GRM established at the construction sites	Develop and implement GRM for the project	NENU develop and PIU to monitor	October 2019
Absence of environmental monitoring and impact on air, water and soil during construction	Establish environmental monitoring system through: - Monitoring of air quality (dust NOx, SO2) at the construction sites close to residential areas (quarterly) - Water bodies at the points where TL crosses the river/canal (oil residual, BOD, COD, turbidity) As per environmental monitoring plan to be developed within national EIA conclude agreement with the Surkhandarya regional analytical laboratory of the Environmental department and carry out environmental monitoring	Contractor PIU to monitor results and implementation of mitigation measures if required	Start after commencement of civil works and continue through whole period of the project construction
No reporting system on environmental safeguards requirements implementation/compliance	Establish reporting system on environmental safeguards implementation: ES of PIU and ES of Contractor	NENU (PIU)	Before construction
Lack of capacity and awareness on environmental supervision, monitoring, importance of environmental values	Conduct training for PIU, supervision consultants and Contractors on environmental safeguards and monitoring, reporting	International ES to be hired by NENU	Before construction On-the job trainings on waste management, safeguards compliances
Lack of environmental person in NENU, consultant and contractor staff	Provision of environmental person in NENU, consultant and contractor staff	NENU Consultant and Contractor	Before construction

6. BASELINE DESCRIPTION

174. Two social safeguard specialists, one environmental specialist, male field surveyors, and technical surveyors conducted field work in the subproject areas between the 31st of July and the 10th of August 2019. Socio-economic surveys of the affected households were conducted as part of the LARP preparation. The environmental team preparing the IEE surveyed the physical and biological conditions of the areas. Gaps in baseline information collected will be addressed after detailed design stage.

175. This Section presents a summary of the socio-economic, physical and biological characteristics of the project areas.

6.1 Baseline features of the overall project area

176. Figure 6-1 shows the geological features which can be found in the overall project area. It indicates the predominant presence of conglomerates, pebbles, sand, loams, travertines and salt. Other features such as sandstone, siltstone, clay, maris, gypsum, conglomerates, and limestone are also present, although with less expression.

177. Afghanistan is located in a tectonically active region where earthquakes have historically caused damage, not only from strong ground shaking and surface rupture, but also from liquefaction and extensive land sliding in mountainous areas. Figure 6-2 shows locations and magnitudes for earthquakes.

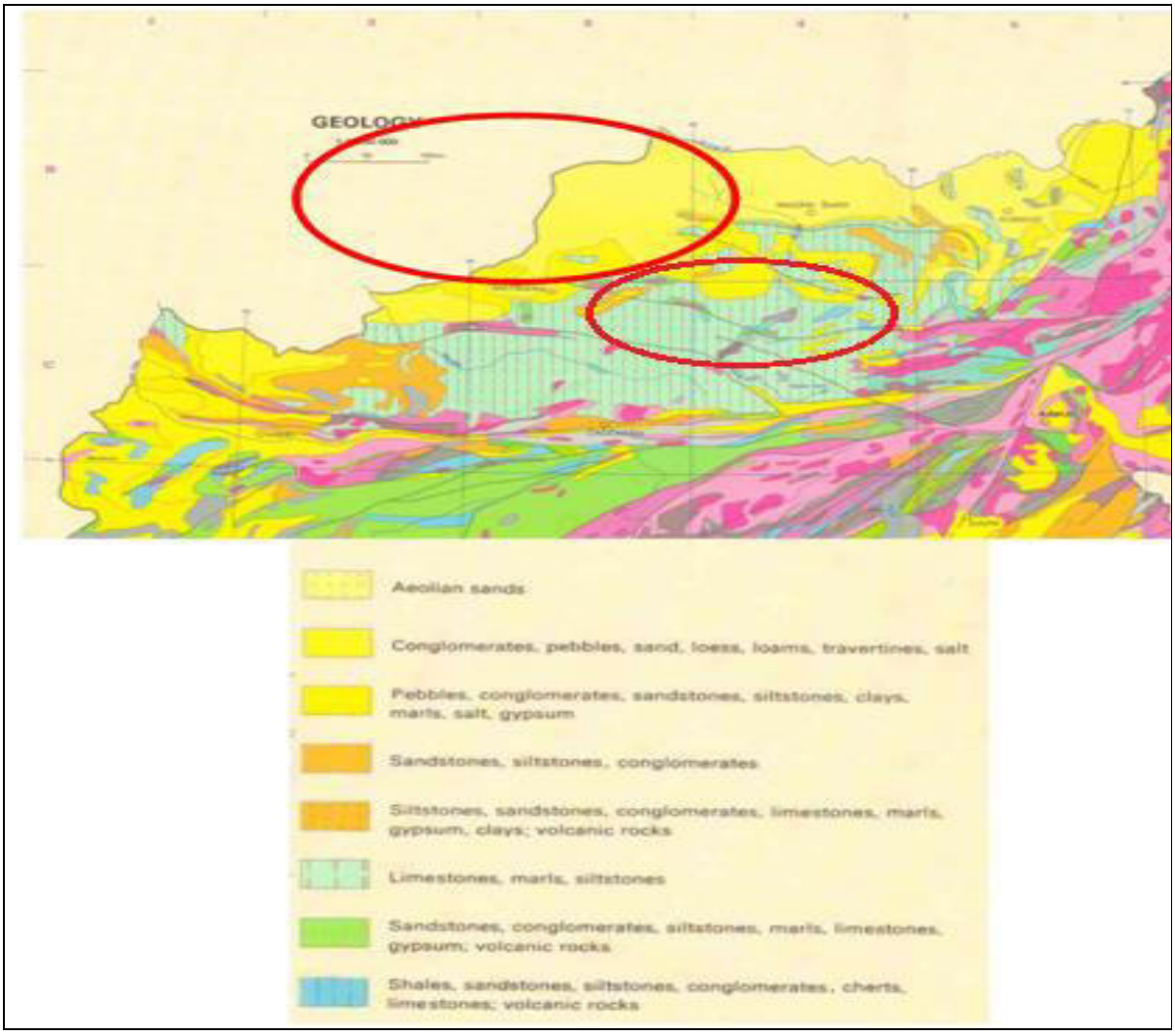


Figure 6-1: Geology of Afghanistan (with investigation area)

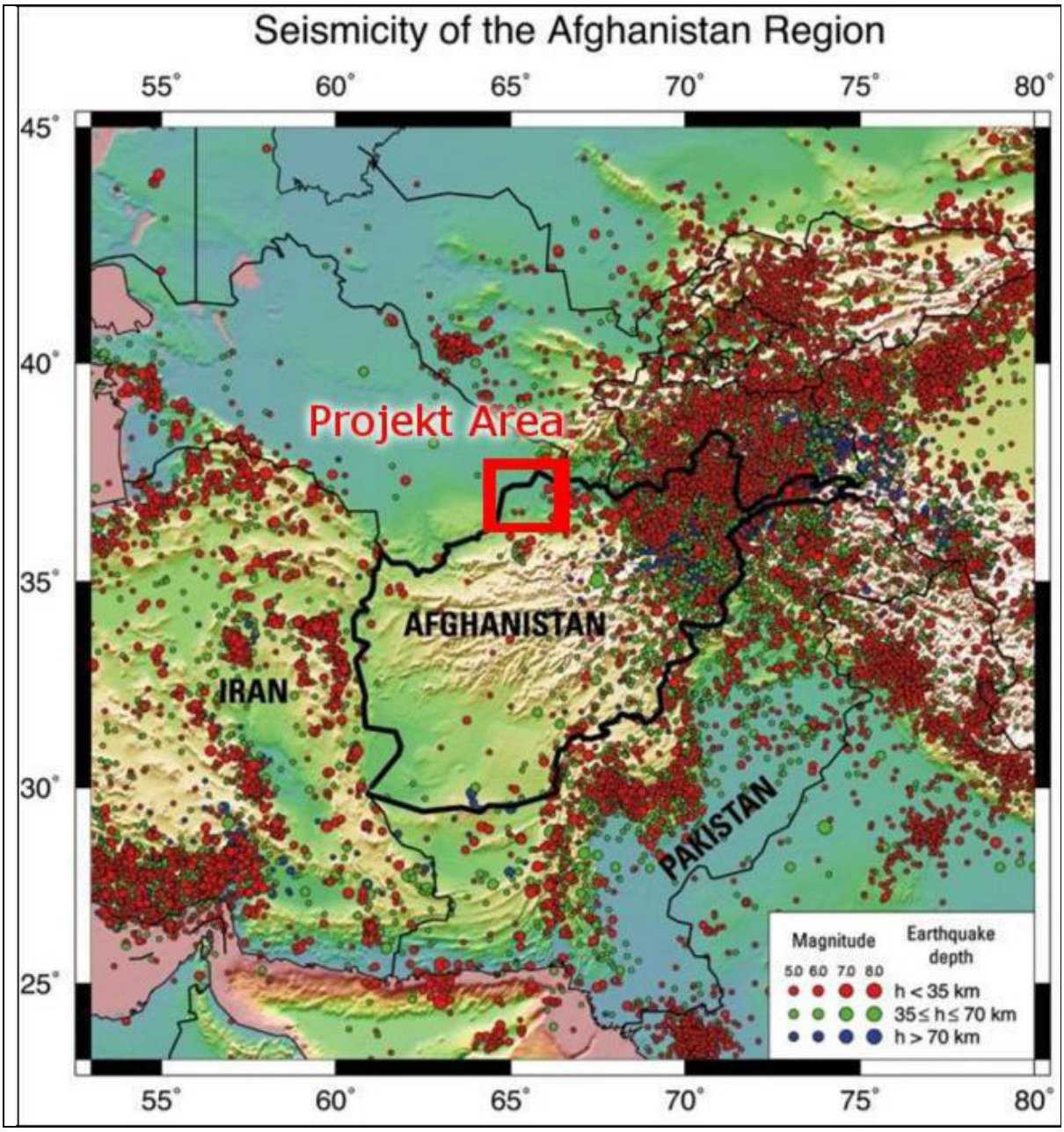


Figure 6-2: Seismicity in Afghanistan (with investigation area) (Engdahl, van der Hilst, and Buland, 1998)

178. In comparison to the investigation area, there are other areas in Afghanistan where the seismic risk is considerably higher.

179. The investigation area is characterized by a continental dry climate. As shown in Figure 6-3 the mean annual precipitation in the project area is around 250 mm per year and mean temperature around 18°C. The dryer zones receive below 100 mm average yearly rainfall (typically in spring) with high variability in between. The last few years have brought very little rain to the Investigation area, which has made the area dry.

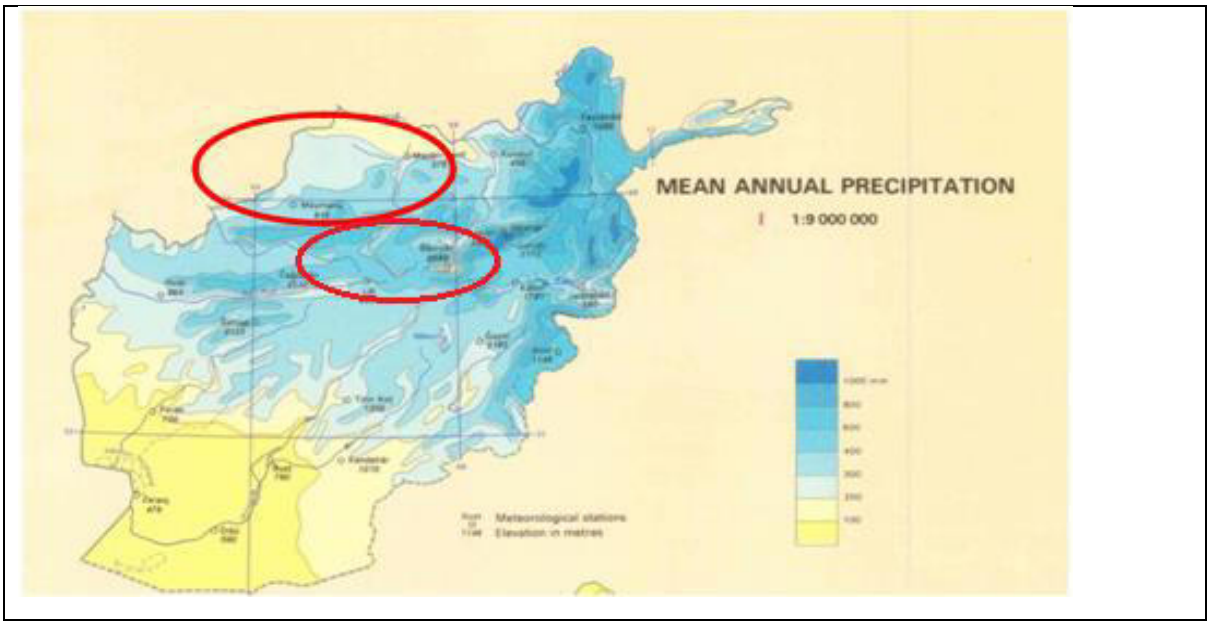


Figure 6-3: Mean annual precipitation in Afghanistan (with investigation area)

6.2 Project (part 1): Between Afg-Uzb Border (Hairatan) and Na 'ebabad

180. This section of the transmission line crosses the provinces of Mazar e sharif and Samangan.

6.2.1 Physical environment

Geology and seismicity:

181. The geological situation of the Investigation area is marked by quaternary sediments, and quaternary sands and dunes. There are important oil and natural gas reserves as well as sulphur, sand and gravel deposits.

182. According to the Scale of Richter, the earthquake hazard is assumed to be 6.0 local magnitudes (ML) in the Investigation area, meaning a medium risk.

Landscape:

183. The landscape of the Investigation area is marked by the general features of the Afghan semi-desert and grass steppe. The river valleys are characterized by settlements and agricultural fields. The vegetation varies according to the fertility by mineral content of the local soil and rainfall pattern and project impact on the patches of grass land savannah that does not remain in the corridor will not be significant and with respect to its use for grazing will not cause issues with grazers. This will be reconfirmed at after detailed design stage. Generally, vegetation is sparse in the Investigation area (Figure 6-4).

Figure 6-4: Semi-desert with very poor pastures (only after wet years) along the line corridor near Sheberghan

184. Scenic Areas are located between Hairatan and Na' ebabad, where the Transmission line leads between settlements and main-road on the Northern Side and the Mountain Range on the Southern Side. However, in this section the Transmission line will run parallel to an existing one, so that no additional visual impact will be created.

185. The Investigation area is presently not a touristic area.

Climate and air:

186. The Investigation area is characterized by a continental dry climate. Rainfall is below 250 mm per year and mean temperature around 18°C. The dryer zones receive below 100 mm average yearly rainfall (typically in spring) with high variability in between. The last few years have brought very little rain to the Investigation area, which has made the area dry. The mean temperatures in the Investigation area range from 3°C in January to 38°C in July[2].

187. Being a land locked country, the international trade of Turkmenistan passes through Aqina and Turkmen borders. Hence, the major source of air and noise pollution is heavy traffic load on Aqina – Sheberghan, Sheberghan and Kabul roads. Use of fuel wood for cooking purposes and fugitive dust from quarries also contribute to air pollution in the Investigation area. Noise is caused by quarrying actions. The area is not concerned with industrial air pollution. All in all, there is not much air pollution and noise caused in the line corridor or its vicinity.

Water resources:

188. Despite being situated in the semi-desert and endowed with scarce water resources, Shulgar River and Polemamocry River are found in the Investigation area, which are crossed by the line corridor: 36° 32′ 41.56″ N 68° 04′ 12″ E

[2] The analysis in this report is based on the Ashrae 90.1 calculated climate zone.

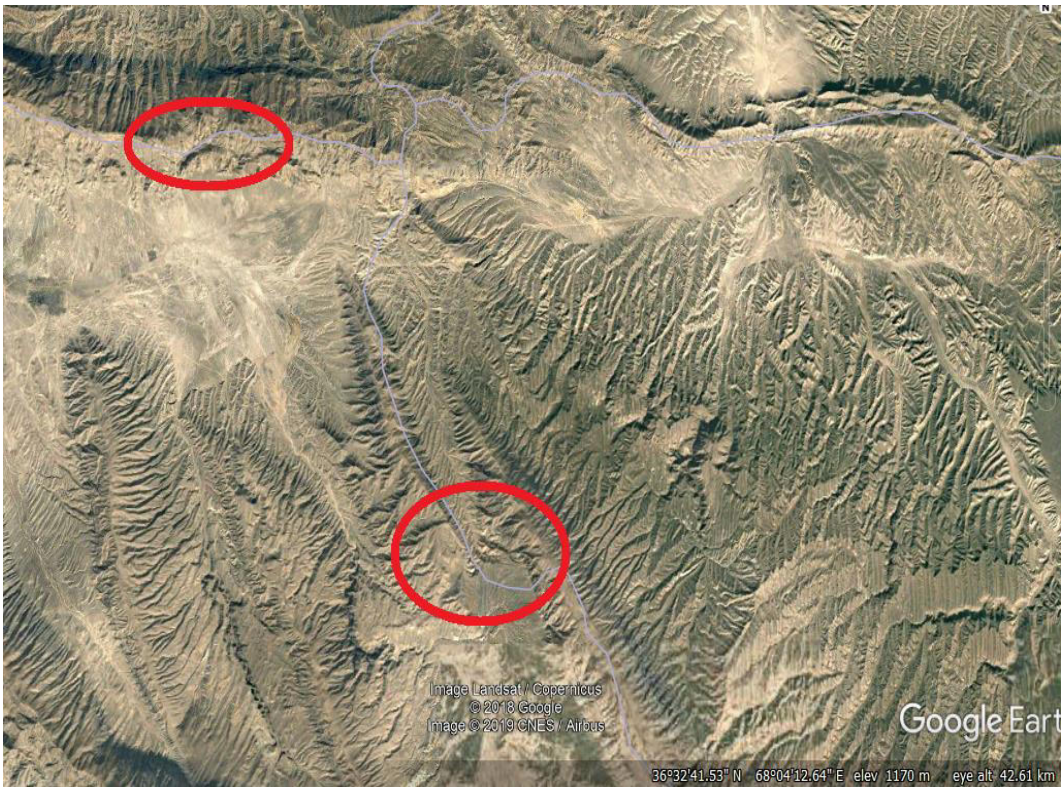


Figure 6-5b Water Crossing of the OHL , Environmental Officer surveying the Area

189. In the vicinity of the investigation area Balkh River (Mazar-e Sharif): The Balkh River rises in the Band-e Amir lakes in the Hindu Kush. In its upper reaches the river is known as the Band-e Amir River (Rud-e Band-e Amir). The river flows west, then north, and terminates in irrigation canals in the area of the cities of Balkh and Mazar-e Sharif or in the desert. In times of exceptional flood the river drains into the lowlands of Turkmenistan. In ancient times it terminated in a delta at the Amu Darya, but has not reached that river since irrigation canals were developed centuries ago.

190. No water storage facility is present in the Investigation area hence most of the water is received either from rainfall or snow. The drought during the last few years resulted in most of the perennial flood streams remaining dry during most part of the year. There is only a low probability of flooding in the proposed transmission line corridor.

191. Although there is no actual information on the groundwater depth in the corridor of the Line Section from Sheberghan to Mazar-e Sharif it can be assumed, that the groundwater table can be found at minimum 15 m depth there.

192. The majority of Afghans use groundwater as their prime and often only source of drinking water. Groundwater has traditionally been utilized for irrigation purposes through the use of karezes, springs and willow hand dug open wells. In more recent years, deep drilled wells have become a more common means of extraction. Today, all traditional groundwater irrigation systems have reduced or dried up completely. The groundwater levels continue to fall.

6.2.3 Human environment

Population:

193. Balkh Province has a total population of 1,123,948. There are 119,378 households in the province and households on average have 7 members. Samangan Province has a total population of 468,000 and Baghlan Province has a total population of 863,700.

194. Along the line corridor, the majority of the population lives as a joint/extended family system. The elder of the house is responsible for all social matters and other activities of the house including income and expenditure, etc. The size of most of the extended households located along the line corridor is between 10 to 30 persons, while the average total extended family size is to the extent of 26 persons. The gender composition reveals that the proportion of males and females is to the extent of 57% and 43% respectively.

Literacy and education:

195. The overall literacy rate in Jawzjan Province is 31%, however, while two fifth of men are literate (40%), this is true for just over two tenths of women (21%). In the population aged between 15 and 24 the situation for men is slightly better with 46% literacy, whereas for women the figure shows little change (22%). The Kuchi population in the province has particularly low levels of literacy with just 1.6% of men and 0.1% of women being able to read and write. On average 40% of children between 6 and 13 are enrolled in school, however, again the figure is around half of boys (45%) and one third of girls (33%). Amongst the Kuchi population, one in fifty boys (2%) and no girls (0%) attend school in Jawzjan during the winter and summer months

196. The overall literacy rate in Balkh Province is 44%, however, while more than half of the men are literate (54%), this is true for just about one-third of the women (32%). However, in the population aged between 15 and 24 the situation for men is slightly better with 58.3% literacy, and there is a smaller improvement for women (35.4%). The Kuchi population in the province has particularly low levels of literacy with just 6.1% of men and none of women able to read or write. On average 58% of children between 6 and 13 are enrolled in school, including around two-thirds of boys (66%) and almost half of girls (48%). Amongst the Kuchi population, nearly half of the boys (47%) and one in five girls (20%) attend school in Balkh during the winter months, however, only a quarter of the boys (25%) and about one in ten girls (9%) attend school in the province during the summer. Forty percent of the population living along the line corridor has access to schools.

Occupation and Sources of Income:

197. The Investigation area features no industrial or major commercial activities except for activities in a few urban areas (e.g. Sheberghan Topping Plant). The major occupations in the Investigation area are service, business (e.g. transport, shops, hotels), and labour (skilled/unskilled). Carpet waving is mostly done by females. Also, a significant proportion of the population is engaged in daily wage labour. Other people are working abroad or are involved in farming. Partly the household income is also supplemented through the sale of livestock (especially goat/ sheep).

Health situation:

198. In Balkh Province 39 health centers and 7 hospitals with a total of 477 beds could be found in 2005. There were also 280 doctors and 270 nurses employed by the Ministry of Health

working in the province, which represented an increase of about 9% in the number of nurses and 18% increase in the number of doctors in the province compared to 2003. In Samangan Province Health services provided by the Ministry of Health are fairly basic with 6 health centres and 3 hospitals with 60 beds. They are reasonably well staffed with 21 doctors and 33 nurses. To cater to the pharmaceutical needs of the patients, there are 24 pharmacies, two are run by the government and the rest are privately owned. In 2006, two dozen women completed a midwifery course. The percentage of households with clean drinking water increased from 7% in 2005 to 18% in 2011.The percentage of births attended to by a skilled birth attendant fell from 29% in 2005 to 20% in 2011

199. According to the field survey, 30% of the population living along the line corridor has access to health facilities.

Access to Safe Drinking Water:

200. In Balkh Province, on average only 31% of households use safe drinking water. This rises to 67% in the urban area, and falls to 12% in rural areas. Four of five households (80%) have direct access to their main source of drinking water within their community, however almost one in five households (18%) has to travel for up to an hour to access drinking water, and for 1% of households travel to access drinking water can take up to 6 hours.

201. Thirty-two safe drinking water wells have been dug up, resolving the water shortage problem for 2,200 families in the Hazrat Sultan district of northern Samangan province, an official said on Saturday.

202. Eng. Abdul Raab Hakimi, head of rural rehabilitation and development department, said the wells were completed under the Citizen Charter programme at a cost of 10 million afghanis.

203. Hakimi said the wells had been dug up in Gorgeri, Alikhel, Gadiha, Chenzai, Kart-i-Shafakhan and Kart-i-Sulh villages of the district.

204. Sirajuddin Fitrat, the district's administrative chief, said the wells were 40-60 metres deep and equipped with hand pumps, giving 2,200 families access to safe drinking water

205. Safe drinking water is not available to the population in the Investigation area. However, in some places, the women are involved in fetching drinking water from nearby water source (a reservoir which exist in the town center), where the community is fetching water for domestic purposes. Stream and wells water is reasonable for some domestic purposes such as washing dishes. Generally, the minority of the households (20%) has access and availability of a drinking water facility nearby their residence. The major sources of drinking water observed in the Investigation area are streams, wells along the streams/ springs, and lift pumps installed at nearby water sources.

Ethnicities:

206. The major ethnic groups living in Balkh Province are Tajiks and Pashtuns followed by Uzbek, Hazaras, Turkmen, Arab and Baluch. Dari is spoken by about 50% of the population and 58% of the villagers. The second most frequent language is Pashtu, spoken by the majorities in 266 villages representing 27% of the population, followed by Turkmen (11.9%) and Uzbek (10.7%). Balkh Province also has a population of Kuchis or nomads whose

numbers vary in different seasons. In winter 52,929 individuals, or 2.2% of the overall Kuchi population, stay in Balkh living in 80 communities (source: World Food Program (2008), Afghanistan Provincial Profiles Faryab, Jawzjan, Balkh).

207. According to the field survey, the main ethnic groups/ tribes living along the line route are Uzbeks (53%), followed by Tajiks (27%-30%). Others are Pashtuns (13%) and Turkmen people (4%-6%). Each tribe has own traditions and customs and is furthers divided into sub-tribes/ clans. The political administration is supported by tribal elders (Arbabs/ Maliks), man and women (Shuras), of different clans who are recognized by the government. The Arbabs/ Maliks supervise and coordinate the implementation of law and order and exercise their functions as mediators and as members of special tribal councils (Jirga/ Shura), which are organized when required. Generally, they are organized in order to take some decisions on certain major types of disputes/ conflicts. The FCR provides legal cover to the local council (Jirga/ Shura) to settle disputes arising out of blood feuds, relating to women, wealth and land disputes. The Jirga/ Shura are represented by the Arbabs/ Maliks, who also serve as a medium of communication for the public participation.

Gender aspects:

208. In the COI, about one half of the population is female. In the tribal area, the women have a limited role in decision-making process at household level.

209. Women in rural areas/ villages along the transmission line corridor are involved in several activities such as fetching of drinking water from streams/ wells as well as tube wells located at the edge of stream; collecting fire wood in the nearby hilly area; washing clothes and household utensils; child rearing; livestock rearing especially goat/ sheep, livestock grazing etc.

210. Men are the main responsible for agriculture activities (cultivation, irrigation, harvest). Women help the men of their family mostly in cultivating and harvesting and also process the products. However, in some families in the tribal area, the extent of women's involvement remains limited to domestic matters only. In most of the cases men sell the agricultural products and spent the income for their families, including women.

Land Use Pattern and Agriculture:

211. Agriculture is a major source of revenue for 48% of households in Jawzjan province, including 67% of rural households and 8% of households in the urban area. 40% of rural households and 9% of urban households own or manage agricultural land or garden plots. However, almost three quarters of households in the urban area (74%) and one quarter of households in rural areas (26%) derive some income from trade and services. Around a third of households in both urban (32%) and rural (38%) areas earn income through non-farm related labour. Livestock also accounts for income for one-sixth of rural households (16%) (NRVA, 2007).

212. The most important field crops grown in Jawzjan Province include wheat and barley, melon, watermelon and maize. The most common crops grown in garden plots include grapes (73%) and vegetables (23%). Almost all households with access to fertilizer use this on field crops (97%) and to a much lesser degree on garden plots (2%), although a very small number of households use fertilizer on both field and garden (2%).

213. On average 74% of households in the province have access to irrigated land, whereas almost one third of rural households (30%) and 38% of urban households have access to rainfed land. The town of Sheberghan is surrounded by irrigated agricultural land (NRVA, 2007).

214. The most important field crops grown in Balkh Province include wheat, barley, maize, flax and melon/ water melon. The most common crops grown in garden plots include fruit and nut trees (67%), grapes (13%) and vegetables (4%). Melons/ water melons (6%) and cotton (2%) are also frequently gown in garden plots in the province. Mazar-e Sharif is located in one of Afghanistan's most fertile regions, extensively irrigated by the Balkh River and producing cotton, grain, and fruit. The town's industries include flour milling and the manufacturing of silk and cotton textiles.

215. Agricultural cultivation or farm forestry is found at isolated areas only where spring, surface or underground water is available. A big portion of land in the line corridor is unused, barren and un- vegetated due to shortage of water availability. Some areas can be cultivated during rainfall. Scanty scrub vegetation along slopes and other uncultivated areas are used as grazing land and fuel wood gathering grounds (e.g. low mountainous areas).

216. Around Sheberghan barren land can be found in the line corridor until passing Safid River. East of the river there is irrigated land with the highest yield on provincial level. Wheat, corn, potatoes, tomatoes and onions are the main products here. Barren and rain fed lands follow along the line route to the east. Here, wheat, melons, water melons and sesame are cultivated before the land changes to semi-desert.

Infrastructure:

217. On average 49% of households in Balkh Province have access to electricity with the great majority of these (41%) relying on public electricity. Also in this province access to electricity is much greater in the urban area where 95% of households have access to electricity. However, this figure falls to just 26% in rural areas, and a little more than half of these (14%) have access to public electricity. The transport infrastructure in Balkh is also reasonably well developed, with 38% of roads in the province able to take car traffic in all seasons, and 34% in some seasons. However, in more than a quarter (27.5%) of the province there are no roads at all.

6.3 Project (part 2): Between Na'babad and Dasht-el-Alwan

218. This sub-section contains a summary of the description of the environment of line corridor between Na'babad and Dashte –el-Alwan. This description is made based on the field surveys undertaken in August 2019.

6.3.1 Main features of the investigation area

- Samangan City;
- Naybabad, Khulm district, Saighanche village, Wolgato village, Ghaznegag, Feroz-Naghcheer, Hazrat-Sultan, Rabatak and Khawaja-Alwan;
- Pule Mamokri and Shulgar and Nahre shahi rivers;

- Crossing of road from Kabul to Mazar;
- Mazar substation;
- Sandy desert and rangeland crossing along roadside;
- 110 and 120 kV transmission line from Mazar to Naeb Abad;
- Pistachio, almond and grapes garden and woodlands crossing line route;
- Substations(Naeb Abad, Khulm and Aybak);
- Several petrol stations.

6.3.2 Physical environment

219. This transmission line component crosses the provinces of Balkh, Samangan and Baghlan. Punctually Balkh, Naebabad and Dasht e Alwan which are separate localities of these provinces are crossed by the line corridor.

Soil:

220. Sandy soil and dune, somewhat loam. In deserts soil consists of sand – loam and gravel. It is a dry desert, without any water sources.

Landscape:

221. The area just east of Sheberghan and on the approaches to Mazar-e-Sharif is irrigated land which has the highest yield on provincial level. Beyond this the land is barren, scarcely in-trespassed with patches of non-irrigated farmland.

222. After Sheberghan S/S the line traverses couple of minor ,along with irrigated agricultural land. Grouped settlements are generally avoided. From there, it leads through barren or cultivated land and semi-desert steppe along the road and the existing transmission line before crossing Balkh River to reach the outskirts of Mazar-e Sharif. Only at crossings of river valleys, there are patches of azonal vegetation. Woodlands are not crossed by the line corridor. In the lowlands, all arable surfaces are cultivated lands, which are irrigated or rain-fed.

Climate and air:

223. This area is characterized by arid and semi-arid continental climate (cold winter and warm to hot summer). Since many years this area is exposed to periodic drought. Traffic, construction of new small cities and population density are the main source of air and noise pollution.

Water resources:

224. The two major rivers – Shulgar River and Polemamocry River are crossed by the line corridor. Drinking water is scarce, found approximately 60 m below ground. The underground water close to the surface of the earth is salty. Because of drought the underground water

level is continuously falling down. Semi desert vegetation crossing by transmission line is a consequence of the low precipitation levels (below 250 mm/yr.). Generally ground cover is less than 15% and wild trees are absent.

6.3.4 Biological environment of the Investigation Area

225. Based on the natural life zones of Afghanistan (Figure 6-6), the transmission line corridor traverses a grass steppe zone of the ecoregion Badkhys-Karabil-Semi-Desert extending through Afghanistan`s North-Western region.

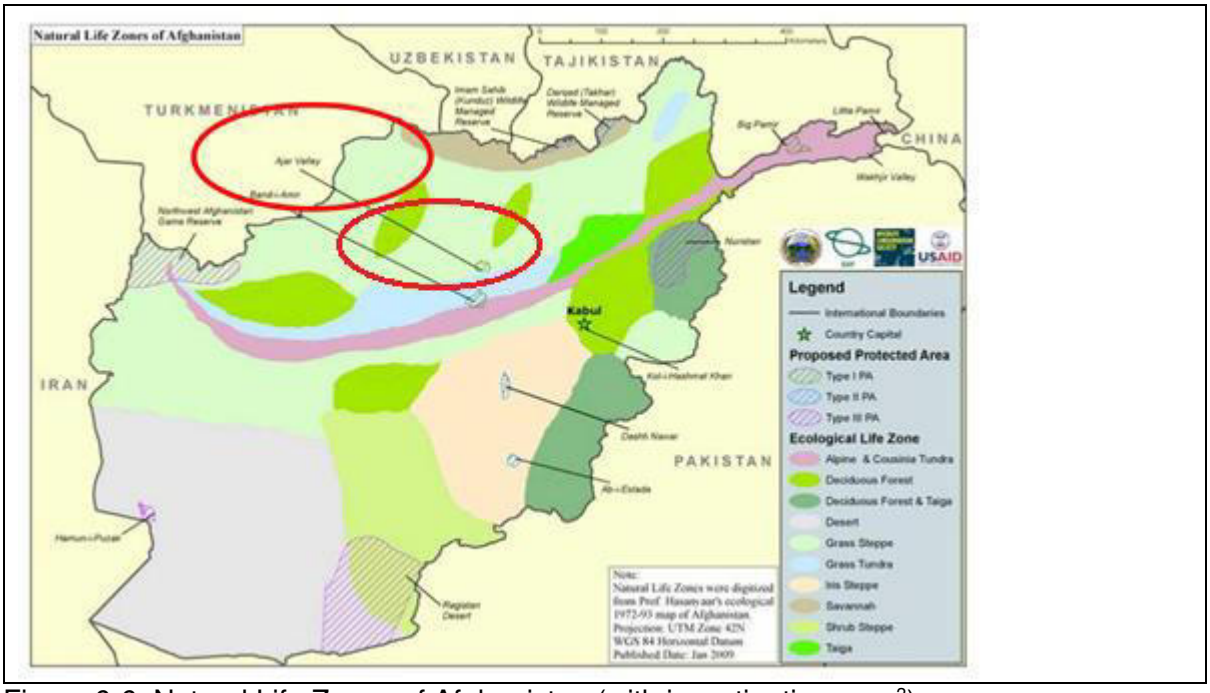


Figure 6-6: Natural Life Zones of Afghanistan (with investigation area[3])

226. Natural vegetation in Afghanistan (Figure 6-7) has been severely influenced by man and only a few high mountain and very dry desert areas retain a quasi-natural vegetation cover. In the cultivated areas, natural vegetation was cleared long ago. The severe and uncontrolled usage of natural vegetation has totally changed the vegetation type and has deteriorated its quality and density. At present, practically all grasslands and grazing types of Afghanistan are in a serious state of reduction.

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[3] Wildlife Conservation Society - WCS, (2009). *Identifying Priority Zones for a Protected Area Network in Afghanistan*. Retrieved from: http://pdf.usaid.gov/pdf_docs/PA00K5D8.pdf

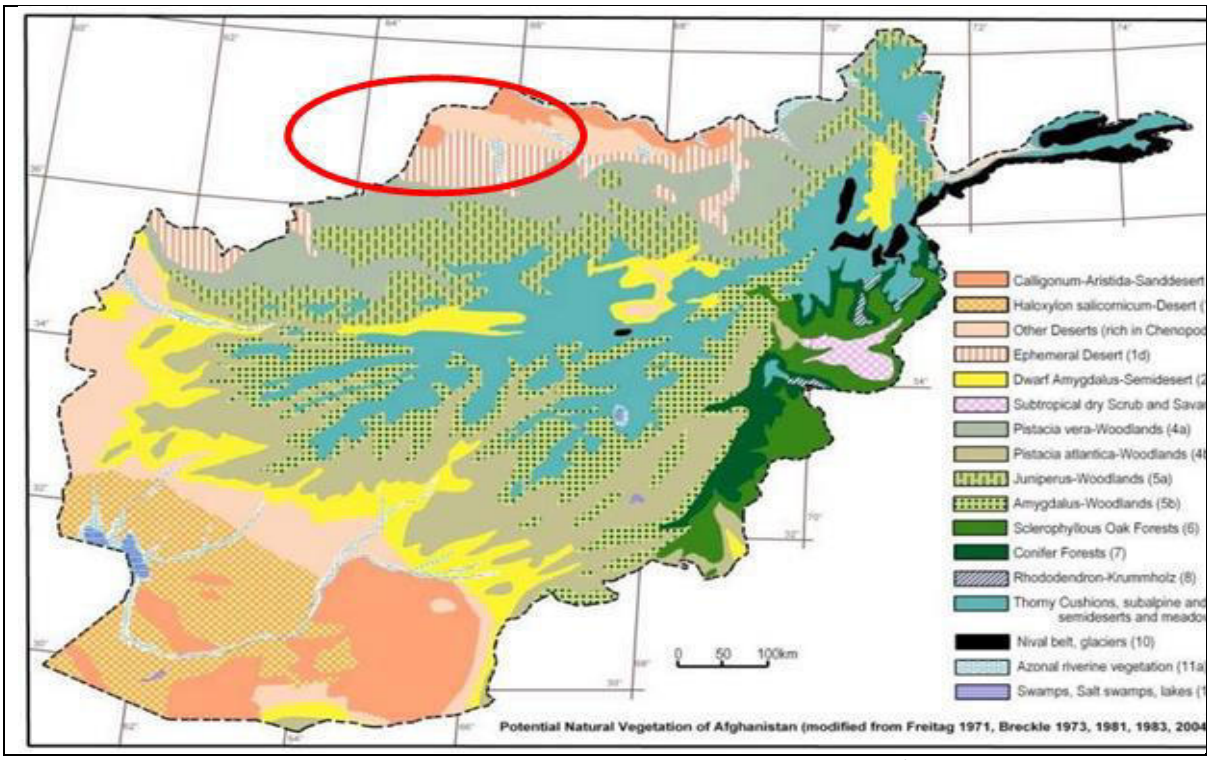


Figure 6-7: Natural Vegetation in Afghanistan (with investigation area[4]).

Floral diversity of the investigation area:

229. The vegetation along the line route varies according to the fertility and humidity of the local soil. The line corridor crosses a semi-desert landscape for most of its length. The deserts situated close to the investigation area contain active sand dune areas and dunes fixed by open vegetation. The flora of the investigation area represents mostly the representatives of genera Holoxilon sp., Colligunum sp., Aristida sp., Salsola artemesia, Poa sp., etc. They are annuals or perennial plants, using for livestock grazing.

230. On the higher slopes, far away or close to the investigation area, some wood lands of Amygdalis sp. and Pistachio sp. are found. These woodlands are heavily used and badly degraded.

[4] http://datazone.birdlife.org/site/factsheet/kole-hashmat-khan-iba-afghanistan.

	
Fig.6.2.2 a plantations, trees, bushes and grassland across the rout	Fig.6.2.2. b severely influenced Grasslands across the rout

231. Fig.6.2.2 a plantations, trees, bushes and grassland across the rout and Fig.6.2.2.b severely influenced Grasslands across the rout corridor. In the lowlands, especially near Andhkoy and the other villages and the perennial/seasonal rivers, all arable surfaces are cultivated lands. There are some plantations, trees, bushes and grassland.

232. There are few pitches of thick vegetation (forest) in few areas of the project. Occasional trees and small patches of "forest" can be found in the vicinity of houses and rivers. The only identified "forest" patches are located in river bends and are not crossed by the transmission line. No reserved forest exists in the Investigation area even up to 5 km from the proposed transmission line corridor.

Figure 6-8: Forest in Safid River Valleys

233. The vegetation presents in the project area common plant species. It is not expected that any endangered plant species can be found in the investigation area.

Fauna diversity of the investigation area

234. The Investigation area is not very rich regarding the avifauna and its diversity due to the lack of suitable habitats. Based interview from the local inhabitants and the present habitat type, In or nearby the investigation area the following wildlife species maybe found: Hemichinus megalotis, canis jupus, canis aureus, Vulpes vulpes, Vulpes rueppellii, herpestes auropunctatus, Lepus capensis, Musmusculus felis spp. Apart from this, Jackals, foxes, cats and some species of bats are commonly found in the desert and semi desert area of the investigated area. However, wolves are reported rare in the investigation area.

235. The semi-desert area of the line corridor is a typical biotope for snakes, scorpions, some species lizards, and few common reptiles in the Investigation area. Some lizards, agamas, geckoes and monitor lizards are reported by local inhabitants from the Investigation area. Goh (Varanus monitor) is the largest lizard there. Frogs and toads are common amphibians in the Investigation area.

Fish and Avifauna

236. The main source of fish fauna in the investigation area is the river Amu-Darya. There are some small and large perennial streams are also present in the investigation area that may have fish fauna. However, no data is available on the fish fauna from the investigation area. It is highly recommended to conduct detail fish faunal surveys to establish the baseline study of the investigation area.

237. Also, there is no data available on the avifauna (resident and migratory birds) of the investigation area. It is recommended to conduct study of avifauna to establish the baseline study of the investigation area. Furthermore, to establish that there is no birds migration rout (s) in the investigation area.

238. It is not expected that any endangered wildlife species (based on IUCN categories and AWEC) present in the investigation area.

Protected Areas:

239. The following Figure 6-9 shows that the investigation area does not cross any protected area or important biodiversity conservation area. The transmission line corridor is neither located near a declared or proposed protected area nor near an Important Bird Area (IBA) 1. The closest IBA is located in approximately 45 km to the north from Andkhoy. It is further not situated within a major bird migration corridor. Neither important wetlands (Ramsar Wetlands) nor wildlife sanctuaries can be found in the investigation area.

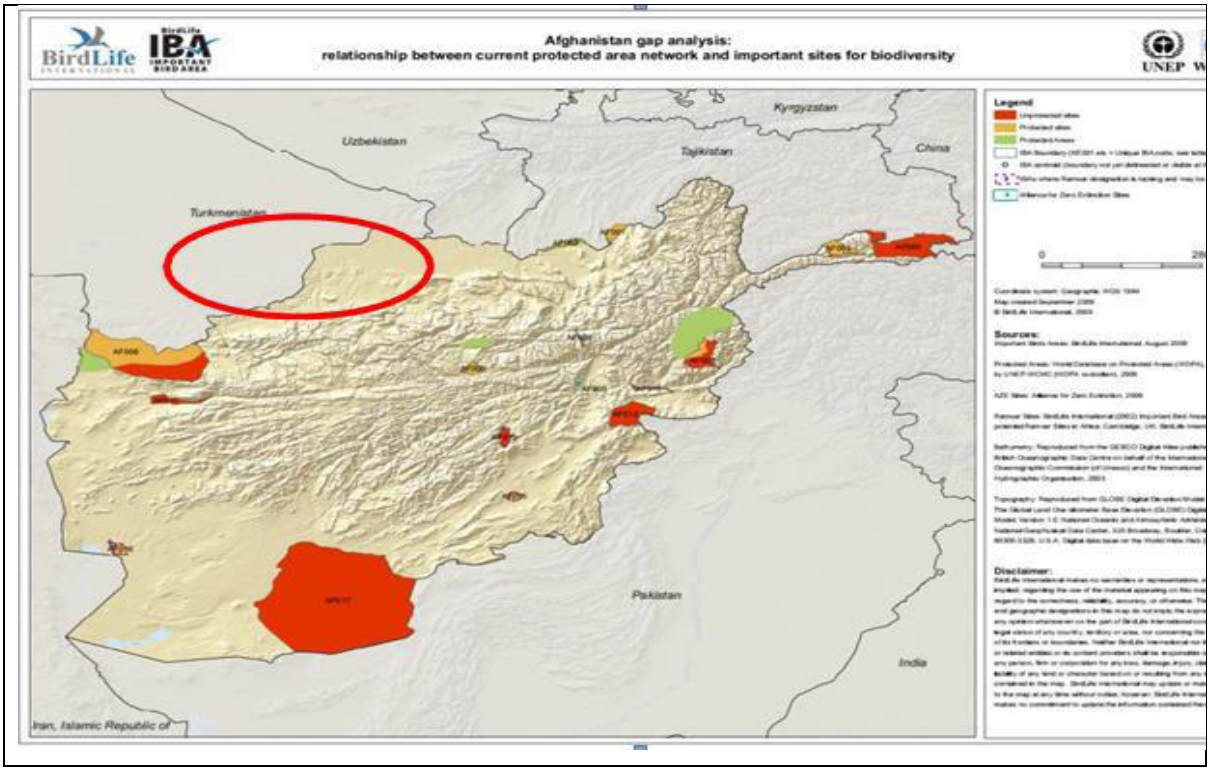


Figure 6-9: Protected Areas and Important Sites for Biodiversity in Afghanistan (with investigation area[5])

240. No protected areas (National Parks, Waterfowl Sanctuaries and Wildlife Reserves) are crossed by the transmission line corridor or are located near to it. The transmission line corridor is neither located near a declared or proposed protected area nor near an Important Bird Area (IBA). It is further not situated within a major bird migration corridor. Neither important wetlands (Ramsar Wetlands) nor wildlife sanctuaries can be found in the

[5] http://datazone.birdlife.org/site/factsheet/kole-hashmat-khan-iba-afghanistan

Investigation area. The distance to nearest protected area from line corridor will be confirmed after detailed design stage.

6.3.3 IBAT Screening Results

241. Based on initial screening of the project in IBAT, the nearest key biodiversity area is approximately 15 km away from the project site - Aktepe Reservoir and Three Lakes (Figure 6.10). This area is located in Uzbekistan. There is also another KBA and a protected area (PA) identified within 50 km of the project area (Table 6.1).

242. The IBAT provides a preliminary list of priority species that could occur within the 50km buffer. This list includes two critically endangered species and five endangered species (Table 6.2). This list should be used to guide further assessment, with the aim of confirming known or likely occurrence of these species within the project area. The presence of these species will be confirmed as part of the baseline surveys during the detailed design stage. The detail of IBAT Screening Results is provided in Annex A-2.

Table 6.1 IUCN Red List of Threatened Species (CR and EN)

Species name	Common name	IUCN Category	Group
Vanellus gregarius	Sociable Lapwing	CR	Aves
Alsophylax tadjikiensis	Tadjikistan Even-fingered Gecko	CR	Reptilia
Oxyura leucocephala	White-headed Duck	EN	Aves
Haliaeetus leucoryphus	Pallas's Fish-eagle	EN	Aves
Neophron percnopterus	Egyptian Vulture	EN	Aves
Aquila nipalensis	Steppe Eagle	EN	Aves
Falco cherrug	Saker Falcon	EN	Aves

Table 6.5 Biodiversity features likely to trigger Critical Habitat

Area name	Distance	Category
Aktepe Reservoir and Three Lakes	15 km	KBA
Amudarya floodlands near Termex	50 km	KBA
Surkhanskiy	50 km	PA

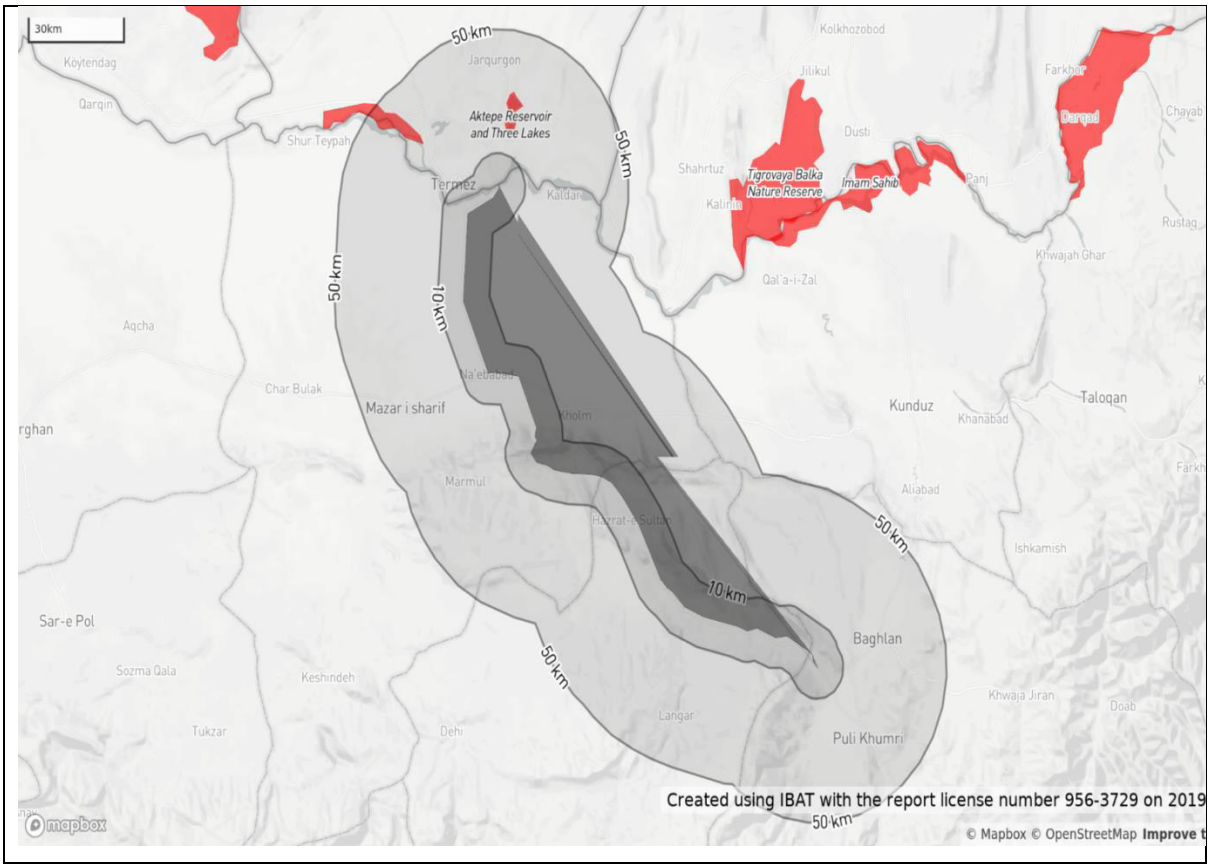


Figure 6.10 Project location's approximate proximity to KBAs and Pas

6.3.4 Human environment (part2)

Agriculture:

243. Only a relative small part of the land area along the line corridor is suitable for arable farming for horticulture including both irrigated and rain fed farming. The main crops growing near the line corridor are wheat, barley, seasem, cotton, annual clover, alfalfa, some vegetables such as onions, melons, water melons and potatoes.

244. Fruit and non-fruit trees in small tracts are seen here and there. These orchards consisted of almond, pistachio, apples etc. irrigated by Shulghar and Polemamocry rivers. Where irrigation water is not available, rain fed cropping is practiced.

245. Close to the investigation area no important agricultural activities exist. Only here and there some small gardens are observed. This line corridor is entirely crossed by semi – desert area of Mazar and Hayratan. Sand dunes, which are blown by strong wind, create problems to the agricultural land and human health.

246. Rangeland in the surrounding of investigation area is defined legally as government ownership, but it is used by nearby located settlements. Some almond and pistachio trees are under risk of being abated because of the transmission line.

Population:

247. Villages located along the transmission line are Koshak, Tochta, Mashi Negary, Kaza paz and kodo Bark. They are situated in the realm of Balkh and Deh Dady districts. They range from 100 – 200 houses including 500 – 1000 persons. The majority of the population is farmers, business men, laborers, and unemployed persons. Almost 50% of them have access to schools and health clinics.

248. Some population live close to the line corridor are langar khana kamerband – e – Balkh , new city of eng mehdy , Alam khan construction project , Walju village, first part of Hussain abad, and Ali abad , new established Wali zada city and Naeb abad side track . All these villages consist of some scattered houses, which are constructed by private sector. According to the Mazar city plan the number of the houses and settled population could not be estimated. Most of population are government officials and have access to school and health clinics.

Health situation:

249. Some of the villagers along the line route live far away from maternity hospitals, therefore the risk of child and mother mortality is very high.

250. Access to safe drinking water from wells is limited and is suspected to be contaminated with biological and chemical elements, probably causing diarrhea in the rural population.

251. Along the line corridor some new small towns exist that are situated close to the Mazar city hospitals, therefore they can easily be provided with health care services. Access to safe drinking water is questionable.

Infrastructure:

252. The main road between Dah Dady and Balkh districts and between Mazar and Kabul is crossed by the line corridor in several points.

253. The new established university of Moulana Jalaludin Balkhy is situated in a distance of 200 m from the investigation area. Non-functioning gas pipelines are located in a distance of 50 m from the transmission line. The new transmission line follows the old 220 kV and 110 kV line.

254. There are several petrol stations close to the line corridor. The north sub - station is located in a distance of 4 km from the line route. Close to the line route in the Hayratan desert, there are new Hayratan Custom and Railway.

6.3.4.1 Census of affected households (part 2)

255. The socioeconomic census survey undertaken in October 2014 in the project areas included questions about the socio-economic characteristics of the affected households (AHs) in order to obtain necessary information about their livelihood conditions. 44 affected heads of HHs were interviewed.

256. Demographic details of the APs were assessed such as age, educational level, relationship with the household head, number of household members, occupation and category of the respondents.

257. The major proportion of the respondents (43.20%) are in the 36-50 age group and 27.27% are between 20 and 35. 20.45% of the respondents are between 51 and 60 while 11.34% were over 60 years of age. The HHs have an average family size of 9. The affected population is 46% male and 54% female. 95.45% of the respondents were illiterate. The survey revealed that the affected population is comprised of Pashtuns, Uzbeks and Tajiks.

258. The main economic activity of the AHs is agriculture. The second most important activity is either businesses or labour.

259. The affected area is mainly a wheat, cotton and vegetable growing area. The main crops during the winter season are wheat, vegetables and fodder. Summer crops in all affected locations are cotton, vegetables and watermelons.

260. None of the respondents had borrowed money from any source.

7. ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION

261. Environmental impacts have been assessed considering present environmental settings of the ROW of OHTL corridor and substation projects, nature and extent of the proposed activities. Particular emphasis is given to the activities to be implemented during the construction of the project.

262. The impact assessment of the project components was structured into:

1) Design Phase
2) Construction Phase
3) Operation Phase
4) Decommissioning Phase

263. Positive impacts of the project don't require any mitigation measure however, mitigating measures are recommended to avoid or minimize negative/adverse environmental impacts at different stages of the project.

264. Some medium impacts would still remain in view of the line routing and the substation during the design phase. Some impacts with medium significance may also be generated during the construction phase. These are mainly related with surface water, health & safety aspects, land acquisition, resettlement, gender aspects, vulnerable people and historical and cultural sites(if any). Other medium impacts will occur during operation regarding visual impacts and health & safety aspects.

265. The impact assessment during each phase is provided in the following sub - sections.

7.1 Impacts during the Design Phase

7.1.1 Line routing

266. The present design of the transmission line routing is still preliminary (a pre-design report has been prepared). This design took, however, into consideration environmental and social aspects, namely:

- Keeping the new line as close as possible to the existing overhead lines in order to minimize land loss and environmental impacts, and facilitate operation and maintenance of both lines;
- Avoiding inhabited areas, villages and individual houses wherever possible;
- Avoiding protected, sensitive or otherwise restricted areas;
- Remaining in proximity of the existing roads so that reasonable access for construction, inspection and maintenance is provided;
- Avoiding areas prone to flooding and erosion, intermittent water courses and run-off areas, areas of alluvial sediment;
- Avoiding agricultural land;
- Avoiding mountain slopes running parallel to line;

- Avoiding erosion prone areas.

267. A refining of line routing will be done during the final design in order to avoid resettlement and environmental impacts to the greatest extent possible. As the detailed design is shifted under the responsibility of the construction contractor, a careful monitoring will be necessary.

268. The following mitigation measures of the EMP have to be part of the EPC contract:

- Towers will not be erected too close to rivers and creeks and fragile river banks will not be damaged.
- Selection of a transmission line corridor that bypasses settlements so that only minimum resettlement actions/ relocation of households are required.
- Cultural and religious relics will be protected and respected; a chance find procedures will be in place.

269. Under consideration of the above-mentioned facts and mitigation possibilities, the extent of impact regarding line routing is assessed to be medium.

Impact of/on	**Extent of impact (low/medium/high)**
Line routing impact of Subproject 3	Medium
Overall project line routing impact	Medium

7.1.2 Access roads

270. Due to the procedures of:

- minimization of the number and length of access roads;
- careful selection of location of access roads;
- use of existing roads/ tracks wherever possible.

271. The impact of the construction of access roads is assessed as low.

Impact of/on	**Extent of impact (low/medium/high)**
Construction of access roads impacts of project	Low
Construction of access roads impact	Medium

7.1.3 Health and safety

272. The design and location of the transmission lines will take into consideration the prevention of health and safety risks.

273. To avoid impacts of natural disasters, the infrastructure needs to be constructed respecting earthquake safety standards suited for the seismic risk level in the Investigation area.

274. To avoid Electromagnetic Field (EMF) impacts, the minimum safety distances (as per Table 4.1 and as set out in IFC EHS Guidelines) from houses to the conductors will be respected and has been included in the pre-design considerations. The maximum possible distance between the TL and the settlements has been studied and considered.

275. There is no nearby houses to transmission line that caused potential EMF impacts. If there is any chance, then lines must be diverted to suitable distance to avoid potential EMF impacts.

Impact of/on	**Extent of impact (low/medium/high)**
Health and Safety	Low

7.2 Impacts during the Construction Phase

276. The construction phase will imply the most important impacts in the physical environment, namely:

- Emission of air pollutants and noise from traffic and operation of machines and other vehicles associated with the construction activities;
- Emission of dust from earthworks;
- Generation of large quantities of waste by earthworks and vegetation removal;

- Risk of pollution of groundwater and / or water due to leaks of oil from the machines, vehicles, temporary workshops, and temporary storage facilities;
- Aggravation of the erosion.

277. The impacts of the construction activities on the biological environment are not expected to be important due to the desert-like nature of the area and its present strong degradation.

278. The socio-economic and cultural impacts of the project will be mostly felt during the construction works, namely due to:

- the need to displace land/agricultural plots for installation of the towers;

- the damages to crops due to the installation of the towers, the stringing of the lines and the movements of workers, vehicles and machinery;

- the risk of accidents resulting from the movement and operation of heavy machinery and other vehicles;

- The risk of community health and safety problems (transmission of diseases, air and noise emissions nuisance, social conflicts for jobs, etc.) and accidents (falls, trips, and injuries inside the construction areas).

279. Since the construction of a power line is a linear work, the project area will be affected only locally and temporary in its different sections. For this reason, no section will be affected for the entire duration of the construction period, which significantly reduces the negative impacts of this phase.

7.2.1 Impacts on the physical environment

7.2.1.1 Soil and erosion

280. Generally, the project area is mostly deserted areas where the transmission line passes are prone to erosion, due to the characteristics of the landscape and the climate (dry climate and little vegetation). In this sense, erosion prevention measures such as drainage systems and road-side plantation with bushes (in view of the operation phase) will have to be implemented.

281. Additional reinforcement or protection of towers due to exposure to erosion and runoff flooding will be thought. The crossing of rivers implies particular risks of erosion of the river banks, for what replanting of grass in the banks will be undertaken.

282. A risk of accelerated sand deflation occurs during the construction process. This can be mitigated by construction of sand deflation prevention structures in sensitive areas and where vegetation (grass) is removed and bare soil exposed/ land cover diminished (dust suppression). This impact will be mitigated on a case to case basis of tower location once detailed design and precise location of towers is finalized.

Impact of/on	**Extent of impact (low/medium/high)**
Erosion impacts of the project	Low
Sand deflation impacts of the project	Low

7.2.1.2 Landscape and visual aspects

283. The construction activities will have an impact on the landscape and the aesthetics of the area, due to the presence of machinery, piles of excavated soil, construction materials, noise and dust emissions, etc. However, since no natural reserve or park and no area of touristic importance will be affected, these impacts will be minor, local and only short term.

284. As soon as the construction activities end, all the construction equipment will be removed and all the debris will be collected. Measures to restore the landscape like re-cultivation of deposition and passage areas will additionally be taken.

Impact of/on	Extent of impact (low/medium/high)
Visual aspects/ landscape impacts	Low

7.2.1.3 Air quality and GHG emissions

285. The construction activities will cause air pollution through gaseous emissions (mainly NOX, SO2 and PM) of the construction vehicles and machines and dust resulting from vehicle movements and earth works. The impacts of the air pollution caused by the construction works might be locally considerable as several housing areas will be crossed by the TL. Like for the noise impacts, the air pollution caused by the construction activities will also affect the construction workers.

286. Due to the limited time of the construction period, the impacts on ambient air quality by vehicle exhausts will be low. Machines and vehicles will be checked regularly to minimize exhausted pollutants. The ambient air quality standards and community and worker noise standards as per IFC EHS guidelines standards will be met. The project is not expected to generate more than 100,000 t of carbon dioxide equivalent per year as per SPS 2009 requirement.

287. The creation of dust during construction works is also a short term impact and could be mitigated by sprinkling dusty access roads, especially in densely populated areas. However, in locations where water is scarce, it should be considered to use the water for irrigation instead. If construction works are carried out in spring, dust creation will be reduced.

Impact of/on	Extent of impact (low/medium/high)
Climates impacts	Low
Air quality impacts	Low

7.2.1.4 Noise level

288. The sources of noise during construction would primarily occur from construction equipment, vehicle and generators. The additional noise sources include vehicular traffic. In places that the line passes near settlements, schools, and other sensitive receptors the noise levels from equipment must not exceed the allowable range. In some cases, the construction noise could exceed the permissible noise levels indicated in the World Bank General EHS guidelines but would be intermittent and extend for only a limited time. Based on the Guidelines the noise impacts should not exceed the levels presented in the below table.

Receptor	One Hour L Aeq (dBA)	
	Daytime (07:00-22:00)	Nighttime (22:00-07:00)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Impact of/on	Extent of impact (low/medium/high)
Noise impacts	Medium

i. Noise Impacts on Workers and Proposed Mitigation Measures

289. The construction and transportation noise will have a negative impact on workers. Noise could cause hearing loss, impair the ability to communicate and hear high-frequency sounds and even permanent hearing loss. During construction activities during project implementation, there would be noise from construction equipment and vehicles. The levels would range from about 70 decibels (dB) for a paving breaker to about 85 dB from large trucks. The noise must not exceed the OSHA all worker permissible exposure limit of 80 dBA for eight hours day. There are generally two main ways to reduce and control worker exposure to noise in the workplace where the noise is excessive:

290. Engineering Control: this involves replacing or modifying equipment or bringing relevant changes at the source of noise or along the noise transmission path. The contractor must make sure that the low noise level machinery and tools are utilized. Maintain and lubricate equipment and machinery (oil bearings) in accordance with its respective manufacturer recommended periods. Place a noise barrier such as curtains and sound walls between the employees and the noise source. And isolate or enclose the noise source.

291. Administrative Control: this includes changes in the schedule or workplace that eliminate or minimize the labors exposure to noise. The contractor must schedule the noisy machinery operation when fewer workers are exposed in case possible, limit the time a worker spends near a noisy source, and provide a quiet area where employees can gain relief from noise sources. Furthermore, the control of the noise exposure through distance is often a simple, inexpensive and yet effective administrative noise control way. To be precise, for every double of the distance between the workers and the noise source the noise could be reduced by 6 dBA (OSHA, 2017).

ii. Noise Impacts on Communities and Mitigation Measures

292. Work outside the usual working hours/day will have negative impacts in terms of noise and disturbances in nearby communities. Therefore, it is recommended that no construction should be allowed during nighttime (22:00-07:00); particularly the construction material transportation or night construction work could be limited to relatively quiet activities, such as interior work.

293. As this project does not require a huge amount of construction work at a specific location the impacts of noise will be minimal. However, if the noise still exceeds the allowable limits the above-mentioned mitigation measures should be taken. The contractor must have a sound level meter at the site to continuously monitor and record the noise level.

294. Additional key mitigation practices for noise impacts that could apply to all phases of this transmission line and substation project include:

- Reduce noisy activities to the least noise-sensitive times of the day (weekdays only between (07:00- 22:00).
- Whenever feasible, re-schedule different noisy activities (e.g., blasting, earthmoving and cutting of hills side) to occur at the same time, since additional sources of noise generally do not add a significant amount of noise. That is, less-frequent noisy activities would be less annoying than frequent less-noisy activities.

- Heavy-duty equipment and vehicles should have sound-control devices no less effective than those provided on the original equipment. Make sure muffle and maintain all construction equipment used.
- Inform/notify nearby residents in advance when noisy activities are to be carried out.
- Route heavy truck traffic supporting construction activities away from residences and other sensitive receptors to the extent possible.
- Post warning signs in high-noise areas and implement a hearing protection program for work areas where noise exceeds 80 dBA.

iii. Noise Impacts on Sensitive Facilities and Mitigation Measures

295. As discussed earlier if there are any sensitive receptors (schools, mosque, shrine/graveyard and clinics) located near the transmission line path and construction noise may disturb their routine business. Additionally, schools are mostly morning time (8 AM to 12 PM) therefore it is recommended to schedule the construction of the poles located in the 500-meter distance to these schools during off time in the afternoon. Also, prayers are to be offered by five times in day and these times should be count while planning for construction activities in these areas. The same practice should be observed in shrine and graveyard area as well.

7.2.1.5 Water resources

296. During construction there is a threat of groundwater contamination due to the following activities:

- vehicles with tank/motor oil leakage;
- gas refilling of construction vehicles in unpaved areas;
- Dumping of hazardous construction waste or wastewater from the workers camps.
- Storage of fuels and oils in bundled containers
- This can be avoided by proper maintenance and construction site control.

297. The direct impacts of the transmission line route on surface water resources will be mainly limited in time to the construction phase and in area where to the crossing of river or perennial stream. The project crosses the river Amu-Darya and other small perennial water streams. The towers will not be placed at or close to this river (s) and streams and river banks will not be damaged. As the transmission line crosses the river Amu-Darya River. Care should be taken to avoid any spill to the river. The water can be collected from this river for the construction purposes.

298. Soil run-off with oil/ fuel during construction could pollute surface waters. In order to avoid impacts from construction of the towers, the tower sites will be located as far as possible from rivers, stream and water wells, which are especially important regarding future line crossings. Avoidance of soil run-off is necessary.

299. For the construction of temporary bridges on small stream or water course may also cause deterioration of stream beds and banks. This is the reason why construction has to be carried out carefully and a regular control of the construction site is necessary. Existing bridges

will be used wherever possible. Bridges to be constructed will be temporary and bridges which are not needed anymore will have to be dismantled.

300. Pollution of rivers by vehicles and waste will be forbidden and controlled, (e.g. no car washing in the rivers, no oil spills, etc.).

Impact of/on	Extent of impact (low/medium/high)
Groundwater impacts	Low
Surface water impacts	Medium

7.2.1.6 Waste management

301. An environmental problem often associated with construction works is improper waste disposal and handling at the construction sites and at workers camps. Indiscriminate waste disposal is not only aesthetically objectionable but also ultimately capable of polluting soil, surface water, groundwater and habitats. Decomposing waste gives rise to odor and attracts disease vectors.

302. The main solid waste generated during the construction of the proposed TLs can be generally classified as follows:

- Domestic wastes generated by the workers;
- Excavated inert material;
- Construction and demolition waste;
- Chemical waste like fuel, oils etc;
- Biological waste (from the removed vegetation);
- General refuse;

303. In detail, it is expected that the low impact waste will consists of:

- Soil and rocks from foundation activities;
- Plant debris from tower site clearance and ROW;
- Construction waste like unused/ unusable construction material, wood from framework, maintenance waste, packaging material, empty containers, etc.;
- Soil polluted by fuel, engine oil and lubricants;
- Drums and containers from fuel, engine oil and lubricants;
- Garbage from the workers like paper, plastic, drinks containers, food waste, etc.

304. In order to handle the waste in a proper manner during construction, the Construction Contractor will develop a Waste Management Plan that contains the following principles:

- A waste management hierarchy of avoidance, minimization, reuse, recycling, treatment and disposal;

- All waste will be segregated by category on site, based on their nature, and ultimate disposal sites;
- Staff training to increase awareness of waste minimization issues;

305. There are no landfills available at project locations. The generated construction waste will be recycled as much as possible on site. Together with the measures listed above the impacts caused by solid waste during the construction phase of the proposed project will be reduced to a minimum. If the Waste Management Plan is in place, the impact of solid waste on the environment will be minimal.

306. Construction sites and workers camps will be fitted with functional sanitary equipment (proper toilets, lavatories, liquid and solid waste treatment, hygienic conditions in lavatories and other sanitary infrastructure etc.).

Impact of/on	**Extent of impact (low/medium/high)**
Solid wastes impacts	Low
Liquid wastes impacts	Low

7.2.2 Impacts on the biological environment

7.2.2.1 Flora and fauna

307. The vegetation within the construction corridor is directly affected by removing plants, cutting shrubs and felling of trees. Additional indirect effects on vegetation consist in raising dust, emissions from construction equipment and soil action. Plants growing on areas outside the way leave for storing materials will also be affected. The access to the tower sites by vehicles and equipment will also cause more loss of vegetation. If the soil subsequently erodes, this destruction will be permanent.

308. The vegetation along the access roads/tracks will be destroyed permanently. The RoW corridor is 60 m wide for 500 kV line. Complete clearing will be required in the center strip of 30 m.

309. Outside this strip, but still inside the RoW all vegetation above 3 m height needs to be cleared. In the remaining area, the plantations lost due to the construction activities can be restored after the construction works are finished as long as the minimum clearance distance is respected. The replanting of trees should be encouraged.

310. Due to the location of the Project in desert and semi-desert area without forest cover, the environmental impacts are localized (i.e. at the tower foundations). Felling of fruit trees in the future ROW might be necessary, but the soil sealing leading to a loss of vegetation and habitats is very limited.

311. Mostly affected land is already heavily influenced by human activities and is mainly used for agricultural purposes. It is very unlikely to find any threatened or endangered species of flora and fauna and the project does not traverse protected areas. Some endangered

avifauna species are reported from nearby the project area. However, they species and not localized and have large home range. Therefore, no impacts on these species are expected.

312. It is suggested that an additional reforestation program in areas that do not have a conflict with height limitations of the ROW is carried out to compensate the damage of trees cutting if any. In areas where no trees can be re-grown, compensation will be paid to the owner of the removed trees.

313. As the natural habitats are not very densely populated by plant and animal species, the impacts of the construction process on flora and fauna are not expected to be significant.

Impact of/on	Extent of impact (low/medium/high)
Flora and fauna impacts	Low

7.2.3 Impacts on the human environment

7.2.3.1 Workers health and safety

314. Direct impacts on health and safety of the workers during construction of the planned transmission line may result from various factors as potential work accidents (e.g. electrocution, falling from height, blasting of rocks), noise emissions, sanitary situation, contaminated drinking water or food. Modest issues may also arise from dust generation, vehicle emissions, construction waste and regarding traffic/ pedestrian safety.

315. For avoidance/ mitigation of noise impacts on workers, all construction workers will be fitted with personal protection equipment (PPE) as ear plugs. Due to the limited time of the construction period and the sparsely populated area for the largest part of the transmission line route, impacts of noise on the population during the construction activities will be low.

316. Regarding the sanitary situation, it is the construction sites and camps will be fitted with functional sanitary equipment. Health and Safety Trainings will be implemented to inform workers about hygienic behavior as well as risks of transmission of STDs.

317. As the construction will be undertaken in an environment where other functioning transmission lines are present, the risk of electrocution may be increased in some areas, especially those where the distance between the OHL is small or where crossing of existing lines is planned.

318. Indirect health and safety impacts for workers may result from land mines. The development of EHS Management System will also include a mine clearance statement that assesses that the area is free of mines. Before the start of physical works, the assessment needs to be provided. According to the EARF, clearance assessment is provided by MACCA (Mine Action Coordination Centre of Afghanistan).

319. For impact avoidance, the construction contractor will develop an appropriate Environment, Health, and Safety Management System (EHS-MS) and implement it during the construction phase. A proper EHS Management Plan will address the health and safety of workers.

320. Necessary training regarding safety aspects to the personnel working at the line will be provided by the contractor. Personal protective equipment like safety gloves, helmet,

mufflers etc. will be provided. First aid facilities will be made available with the labor camps, construction sites, and doctors called in from nearby towns when necessary. Workers are also covered by the statutory Workmen Compensation Act by the contractor. Alcohol and drugs will be strictly forbidden at the construction site.

Impact of/on	Extent of impact (low/medium/high)
Workers Health and safety impacts	Medium

7.2.3.2 Community health and safety

321. Due to the tense social situation in parts of the project area, the influx of workers needs to be handled with great care in order to avoid social conflicts with the resident population. The general security situation needs to be carefully assessed before starting of civil works. However, due to the limited time of construction a specific area and the regular shifting of workers camps; the impact is assessed to be limited.

322. Moving construction vehicles constitute a permanent potential risk. A strict speed limitation of construction vehicles outside major roads to 10 km/h and an intense supervision of the access roads are essential to reduce the risk of accidents.

323. During construction, the crossing of roads will be unavoidable. This will interfere with traffic only marginally and for a very short time. To avoid traffic accidents, proper signalization must be placed to warn the users of the road from disturbances in or near construction areas.

324. Preventive guards should be installed around the towers to be erected in the human settlements to prevent children's entrance to the towers and climbing on it.

Impact of/on	Extent of impact (low/medium/high)
Community Health and Safety impacts	Medium

7.2.3.3 Infrastructure and traffic

325. During construction the crossing of roads and existing transmission lines will be unavoidable. Crossing of roads will interfere with traffic only marginally and for a very short time and localized. Crossing of the present transmission lines will be conducted without need of power disruption. A sufficient distance of the new conductors to the existing TL will be respected.

Impact of/on	Extent of impact (low/medium/high)
Infrastructure and traffic impacts	Low

7.2.3.4 Physical cultural resources

326. None of historical cultural site or archeological sites is known to locate in or nearby the ROW of transmission line. However, despite not having encountered evidence of cultural sites within the line corridor, there may be possibilities for chance finds during the construction phase within the investigation area, as not all sites are known or excavated.

327. During final design and construction, sites of historical relevance and cultural sites (i.e. cemetery, graveyards) will be avoided or over-spanned. Historical sites and graveyards will be avoided via by-passing or over-spanning, e.g. in case of archaeological sites located below the surface. The same procedure will be applied for location of needed new access roads.

328. In case of chance finds, the construction has to be stopped immediately and the Ministry of Culture has to be informed to agree on further steps. A Standard "Chance Find Procedure" must be referred to as standard provisions in construction contracts, when applicable. During Project supervision, the site engineer will monitor the regulations relating to the treatment of any chance find encountered are observed.

Standard "Chance Find Procedure":

a) stop the construction activities in the area of the chance find;
b) delineate the discovered site or area;
c) secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard will be present until the responsible local authorities and the equivalent;
d) take over;
e) notify the supervisory Engineer who in turn will notify the responsible local authorities and the Ministry of Culture / Department of Historical and Cultural Sites immediately (within 24 hours or less);
f) Responsible local authorities and the Ministry of Culture / Department of Historical and Cultural Sites would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the Ministry of Culture / Department of Historical and Cultural Sites (within 72 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values.
g) Decisions on how to handle the finding will be taken by the responsible authorities and the Ministry of Culture / Department of Historical and Cultural Sites. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage. Implementation for the authority decision concerning the management of the finding will be communicated in writing by the Ministry of Culture / Department of Historical and Cultural Sites.
h) Construction work could resume only after permission is given from the responsible local authorities and the Ministry of Culture / Department of Historical and Cultural Sites concerning safeguard of the heritage.

Impact of/on	**Extent of impact (low/medium/high)**
Historical and cultural sites impacts	Low

7.2.3.5 Socioeconomic conditions

329. The construction of the transmission lines will generate local employment, as a certain number of unskilled labors and semi-skilled (both men/women) will be required. Local employment during this period will increase socio-economic standards.

Impact of/on	Extent of impact
Socioeconomic conditions	locally positive

7.2.3.6 Land acquisition and resettlement

330. The impact of this section will be discussed in Land Acquisition and Resettlement Plan (LARP) is treated in a separate LARP prepared for the projects. In summary, it is expected that the impact from the transmission line component will be include the permanent acquisition of land for the 500 kV towers (76,160 m² of land), temporary land acquisition during construction, damage and possible relocation of 04 houses, total of 567 m2 (Mud houses – 432 m2, Brick houses – 68 m2, 49m2 mud wall, 18m2 brick wall) of structures will also be affected which include houses and perimeter walls, damage to around 172 fruit and 83 non fruit bearing trees, and potential damage to standing crops during construction.

331. The impacts related to land acquisition and resettlement (LAR) are treated in a separate LARP Plan (LARP) prepared for the project. The impacts from the transmission line can be minimized through adjustments to the route and the location of towers and the proper timing of construction activities so as not to impact on standing crops.

Impact of/on	Extent of impact (low/medium/high)
Impacts on: - Land acquisition and resettlement - Impacts during the Operation Phase	Medium
Impacts on the physical environment	Low

7.3 Impacts during the Operation Phase

7.3.1 Impacts on the physical environment

7.3.1.1 Soil and water resources

332. Water resources are scarce in the area and water consumption will need to be minimized during operation and maintenance of the transmission lines.

333. Water pollution during maintenance works (operation phase) will be avoided with similar mitigation measures as for construction phase.

Impact of/on	Extent of impact (low/medium/high)
Soil and water resources impacts	Low

7.3.1.2 Landscape and visual impacts

334. In order to reduce the visual impact of towers, any old towers and substations without function should be completely dismantled. Visual impacts of the new towers can hardly be mitigated. Disguising towers as palms (as done i.e. in the USA for mobile-phone towers) is not considered an option, as there are other priorities for the local population. The visual impact of a complete OHL can only be mitigated by underground construction, which would raise the cost considerably.

Impact of/on	Extent of impact (low/medium/high)
Visual impacts/ landscape impacts	Medium

7.3.1.3 Climate

335. Sulfur hexafluoride is an effective gaseous dielectric that allows the safe transmission and distribution of electricity. SF6 provides excellent insulation and arc quenching performance. The gas itself is an inert gas which has no influence on humans, animals or plants. On the other hand, SF6 is a very highly effective and persistent greenhouse gas and has to be handled very properly following guidelines as:

- IEC (DIN EN)1 60376 „Specification and acceptance of new sulfur hexafluoride";
- IEC (DIN EN) 60480 „Guide to the checking of sulfur hexafluoride (SF_6) taken from electrical equipment";

- IEC 61634 „High-voltage switchgear and control gear – Use and handling of sulfur hexafluoride (SF_6) in high-voltage switchgear and Control gear".

336. Following these guidelines and considering the recommendations of the International Council on large Electric Systems (CIGRE: SF6 Task Force: Handling and given Recycling of SF6 Mixtures) (www.cigre.org) will ensure that the amount of released SF6 into the atmosphere is reduced to an absolute minimum.

Impact of/on	Extent of impact (low/medium/high)
Climate impacts	Low

7.3.1.4 Protected Areas

337. Based on initial screening of the project in IBAT, the nearest key biodiversity area Aktepe Reservoir and Three Lakes which is approximately 15 kilometers away from the project site. There is also another KBA and a protected area (PA) identified within 50 km of the project area. In the Project area there are no protected, sensitive or designated sites.

Rare and Endangered Species:

338. There is no record of any plant or animal species encountered in the area that is listed in the Afghanistan Red Data. Based in IBAT, bird (Sociable Lapwing) is IUCN CR species that found in or nearby the project area. Other endangered species of birds that maybe found in or nearby the project area are White-headed Duck, Pallas's Fish-eagle, Egyptian Vulture, Steppe Eagle and Saker Falcon. However, these species need to be confirmed from the site as well.

7.3.1.5 Waste production

339. Generally, the amount of waste generated by maintenance of the transmission line is negligible. If a proper waste management plan is in place, the impact of waste production during the operation phase is low.

Impact of/on	Extent of impact (low/medium/high)
Waste Production impacts	Low

7.3.2 Impacts on the biological environment

7.3.2.1 Flora

340. Most of the land within the ROW is sand desert or agricultural land that can be cultivated as before, except for the tower sites. There are some trees growing in the transmission line corridor, which, in order to keep the safety clearance between vegetation and the conductor cables cannot be replanted. Herbicides will not be used for corridor clearance.

341. New access roads will promote access by cars in formerly little disturbed places. However, no forest areas occur in the Investigation area and no rare or endangered species are expected to be found in the line corridor. Thus, the impact of the proposed Project on the flora during the operation phase is assessed to be low.

Impact of/on	Extent of impact (low/medium/high)
Flora impacts	Low

7.3.2.2 Fauna

342. The risks for avifauna related to the operation of a transmission line are electrocution and collision, both leading to serious injuries and, in most cases, to dead. Big and heavy birds are in special risk, because of their reduced ability to avoid suddenly appearing power lines, especially in times of reduced sight distances (fog, rain, et.) or strong winds.

343. The risks of bird electrocution and collision can already be avoided or mitigated by an adequate design of the poles, conductors and insulators and arrangement of all conductor cables at one height.

344. Furthermore, to minimize fatal birds collision with power lines, the following measures must be applied to the power line to a possible extent:

- Constructions shall obstruct only a minimum of airspace in the vertical direction: Single-level arrangement of conductor cables; no neutral cable above the conductor cables in case possible.
- Infrastructures shall be bundled, where possible, e.g. power lines to be routed along roads, in order to maintain open un-fragmented landscapes.
- Installing visibility enhancement objects such as firefly bird flapper, marker balls, and bird diverters. In total approximately 200+ firefly bird flapper/diverter or equivalent must be installed in 50 to 60 m spacing.
- Birds are most vulnerable to collisions with wires during sunset and sunrise hours, especially during bad weather. Therefore, these bird diverters must have visible light up during dark light.

- Attachment of well-visible black-and-white markers on cables posing a high collision risk, in particular, the neutral cable of high-voltage power lines.
- Bird migration often follows local or regional flyways determined by topology, shorelines, etc. This information is not available yet. Prior to detail design of the transmission line, such investigations are needed and must comprise bird migration at day and night time and other seasonal phenomena.
- Edison Electric Institute guideline for Reducing Avian Collisions with Power Lines is recommended to be followed (aplic.org, 2012).

345. The new transmission line does not run close to any sensitive habitat. There is no IBA located in its vicinity and the future OHL is not situated within a major bird migration corridor. Aktepe Reservoir and Three Lakes is the only KBA that is location about 15 km away from the transmission line (IBAT) in Uzbekistan. Therefore, the impact of the transmission line on birds is assessed to be low. Other fauna is not considered to be impacted significantly by the Project. Disturbance of animals will be minimized during maintenance work by e.g. respecting breeding seasons.

346. The impact of the transmission line on birds is assessed to be low if measures are taken.

Impact of/on	**Extent of impact (low/medium/high)**
Avifauna impacts	Low
Other fauna impacts	Low

7.3.2.2 Fisheries

347. The main source of fish fauna in the project area is river Amu-Darya. Unfortunately, no data is available on fish fauna of the project area. It is recommended to conduct fish fauna survey in the project area and impact section to be update accordingly.

7.3.3 Impacts on the human environment

7.3.3.1 Workers and community health and safety

Natural disasters

348. Damages at transmission lines caused by earthquakes may occur as a result of tangled wires.

349. Construction of the transmission line according to earthquake safety standards suited for the seismic risk level in the Investigation area is assumed to reduce the risk as far as possible.

Noise emissions

350. The intensity of the corona noise emitted by transmission lines is influenced by weather conditions. Wet weather, fog or rain increases the noise level but these weather conditions are not frequent in the Investigation area.

351. The noise limit values for community/papulation given in section 6.2.1.4 are valid according to the national noise guidelines and noise must not increase the 55 dB (A) level.

Electric and magnetic fields

352. Electric and magnetic fields (EMF) are invisible lines of force that surround any electrical device. Power transmission lines, electrical wiring, and electrical equipment produce EMF.

353. The permissible intensity of electric field is defined as maximum values of:

- 5 kV/m in populated areas and
- 10 kV/m in the rest of line

354. In the pre-design report, the maximum Electric field at 1.70 m above ground and 10 to 15 m ground clearances in the 500 kV HVAC line corridor was determined. The conclusions are:

- The 2 kV/m condition is fulfilled at the edge of the Right-of-way for all considered ground clearances;
- The 5 kV/m condition is fulfilled in case of 12 m ground clearances;
- The 10 kV/m is fulfilled for all considered clearances and can extended up to 8 m.

355. As a precautionary measure, other projects have adopted an internationally accepted standard ROW width of 60 m along their 500 kV transmission lines. All habitation and structures are excluded from the ROW to ensure safety of people and animals from EMFs, as well as from direct electric shocks and “flashover”. No permanent human presence will be allowed within the ROW.

356. Based on a recent in-depth review of extensive scientific literature (World Health Organization’s International EMF Project), the WHO has concluded that “despite extensive research, to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health”. The low levels referred to by the WHO are levels expected to be found outside of the ROW.

357. From similar projects it can be stated that the relevant internationally accepted limit values for the public will not be exceeded if the safety distances to the nearest conductor are kept as recommended. Regular EMF measurements are recommended.

Risks of Electrocution

358. The resident population will be made aware during the construction process that the transmission line is a high voltage line and that individual household connections are impossible. Masts will be equipped with explanatory boards explaining the risks of electrocution and warn against attempts to individually connect to the line. Maintenance workers will also be made aware of electrocution risks.

Impact of/on	Extent of impact (low/medium/high)
Natural disasters impacts	Medium
Noise pollution impacts	Medium
Electric and magnetic fields impacts	Low
Risks of electrocution impacts	Medium

7.3.3.2 Land use

359. Maintenance works are not expected to have a major environmental and social impact if herbicides are not used. Minor impacts, as damages to crops during maintenance works will have to be compensated (see LARP).

Impact of/on	Extent of impact (low/medium/high)
Land use impacts	Low

7.3.3.3 Electricity supply

360. An increased stability of the electricity supply, especially if a raising demand is expected, is a locally positive impact of the Project. An increased efficiency/ reduction of transmission losses in the electricity network will be regionally positive.

Impact of/on	Extent of impact (positive/Negative)
Electricity supply impacts	Locally and regionally positive

7.4 Impacts during the decommissioning phase

361. In order not to create a long-lasting permanent visual impact, the towers and conductors of the TL will have to be completely dismantled after the life- span of minimum 50 years.

362. Recycling of metal parts (towers, conductors), waste management and disposal according to national and international standards will have to be planned for the decommissioning phase. If adequate recycling and waste management procedures are respected, the Project impact is assessed to be low.

Impact of/on	Extent of impact (low/medium/high)
Decommissioning	Low

7.5 Cumulative impacts

363. Cumulative impacts may be expected due to the alignment of the majority of the line length:

During construction:

364. The Project area communities did not experience the LAR impacts. In the meantime, comprehensive and detailed information and the socio-economic data of the affected people were collected through consultative meetings. A total number of 62 affected households have been identified and through proper implementation of the mitigation measures and LARP recommendation the impacts will be minimal.

365. During operation: the effects on the community health and safety during operation may be exacerbated by the operation of the project. These respect the corona effect (noise) and the EMF. In most of the project areas this will the first high voltage transmission line and through proper implementation of the line routing impacts mitigation measures the corona noise and other associated impacts could be minimal.

366. Noise: the noise derived from the corona effect during wet or humid weather are not expected to be significant for the project, but there is a risk of a cumulative impact in the areas where the line runs parallel to existing ones. The noise outside the ROW, and especially in the neighboring living areas will be regularly monitored during operation.

367. EMF: low levels of EMF are expected to be found outside the ROW, when the future projects are considered separately from the existing ones. In order to assess the potential impacts on the EMF outside the ROW in the areas where the new line runs parallel to existing lines, it is necessary to regularly monitor these radiations once the project is in full load operation.

368. For the overall project mostly affected land is mostly desert-like and agricultural land and already heavily influenced by human activities. As therefore, no or minor cumulative impacts on biodiversity or water features are expected.

8. ANALYSIS OF ALTERNATIVES

8.1 No Project Alternative

369. “No construction of the 500 kV line (No Project)”. This alternative would not cause any resettlement, land acquisition and other social and environmental impacts. However, it would also prevent the achievement of the broad objectives of 500 KV Surkhan – Pul-e-Khumri OHTL Afghanistan Energy Sector and of the particular objectives of its Stage B, namely:

- development of a unified Afghanistan grid;
- enable power trade between Afghanistan and Uzbekistan;
- fulfill the Energy Development 2014 - 2023 program;
- Conveys power from imports and domestic power plants in the north to the load centers at the southern end of the transmission line.

370. Given the crucial importance of the projects for the achievement of the above listed regional and national objectives, the no-project alternative is not considered acceptable and will not be further studied in this IEE.

8.2 Line Routing Alternatives

371. Beginning with first rough power line route options and based on recent high-resolution satellite scenes the technical and the environmental line survey experts together optimized the line route step by step and section for section in order to avoid settlements and single houses and to reduce the impacts on the environment e.g. by following already existing power line corridors, existing roads or by circumventing sensitive locations. The following aspects were considered in the optimization process:

- Avoid traversing or close by-passing of urban areas, densely populated areas, settlements, schools, public buildings and markets;
- Avoid traversing or close bypassing of religious or cultural sites, mosques, cemeteries, historical places, and protected areas;
- Avoid traversing of forests and surface waters;
- Keep electrical field, magnetic field, audible noise and TV interference as low as possible by staying away from settlements or houses;
- Keep impact on flora, fauna, nesting places, animal trails, migration zones and sensitive ecological areas to a minimum;
- Consider accessibility in order to avoid new access roads;
- Avoiding areas prone to flooding and erosion, intermittent water courses and runoff areas, areas of alluvial sediment.
  - Avoid pollution of ground water and rivers where OHTL crosses.
  - Consider accessibility in order to avoid new access roads.

8.3 Tower Design

372. Two types of high voltage transmission line towers have been analyzed, Tubular Steel and Lattice Tower.

Tubular steel

373. Poles made of tubular steel are generally assembled at the factory and placed on the ROW afterward. Because of its easy manufacturing, installation, and durability, many utilities in recent years prefer the use of tubular towers over lattice steel for new power lines and tower replacements.

Lattice Tower

374. This type of tower is made of steel or aluminum sections in the form of framework construction. Lattice towers are the most common type for high-voltage transmission lines and can be used for all types of voltages. These types of the tower are usually made of galvanized steel. Aluminum is also used for reduced weight, such as in mountainous areas where the access is not easy. Aluminum is also used in steel corrosive prone environments. The additional material cost of aluminum towers will be offset by lower installation cost. Design of aluminum lattice towers is similar to that for steel, but must take into account aluminum's lower Young's modulus, also recognized as the elastic modulus, which is a measure of the stiffness of a solid material.

375. The lattice tower is commonly assembled at the erection location. This makes very tall towers possible; up to 100 m. Assembly of lattice steel towers can be done using a crane. Lattice steel towers are generally made of angle-profiled steel beams (L- or T-beams).

376. As this type of transmission line towers can be transported easily than the other types and can be assembled at the site, therefore, this type of towers are recommended for this project.

9. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

377. The consultation process was carried out with the wider population in general, and with potentially displaced people/public to share information related to the project planning and execution activities, in particular. The information shared included project activities and their expected impacts on the physical, biological and socio-economic conditions. Accordingly, the concerns/issues of the affected population/locals associated with the project were documented and understood.

378. In this respect, a series of consultations were made with the local population / those affected and other stakeholders concerned. The public consultations, conducted in Aug 2019, included scoping sessions with stakeholders and focused group discussions with local communities

9.1 Identification of Stakeholders

379. Apart from the Ministry of Energy and DABS, stakeholders in the provinces affected by the project are the Ministry of Agriculture, Irrigation and Livestock, the Ministry of Rural Rehabilitation and Development, the World Food Program, the National Solidarity Program working with Community Development Councils, the National Area Based Development Program developed by District Development Assemblies.

380. The NGOs in the area are active mainly in the water and sanitation sector, in health care, education, women‘s empowerment, agricultural development, human rights, child care, socio-economic development, cultural and community development. Most are run by local politicians. In all 3 provinces they can be more involved in development works but most of them are based in the city itself with limited access to the districts.

381. Local government, local electricity departments, and the Departments for Women’s Issues at provincial level are quite active and it would be possible to involve them in supporting the project.

382. Local units of DABS and the Ministry of Energy are the overall responsible organizations for all electricity-related issues: planning, development and operation of the existing properties. They are also key players when addressing supply issues and conflicts.

383. In general, when it comes to the impacts of the project the primary stakeholders are the people in the provinces which are affected in different ways according to the type of losses to be expected and by the construction works themselves. Most negative impacts are small and short term so that the positive impacts of the project will most probably compensate the people for the nuisances caused by the civil works (apart from the compensation payment for losses).

9.2 Stakeholder Consultation

384. During the field survey, various meetings were held with regional and local stakeholders. The meetings focused on the collection of information with regard to the socio-economic conditions in the wider areas of the planned line corridor. At the same time, information on the project was provided to those stakeholders who, until that point, had not been informed. A list of interviewed persons can be found in Annex 7D of the LARP Report.

385. With regard to the primary stakeholders, apart from many individual interviews, 10 public consultation discussions were held in various districts (Dehdadi, Mazar e Sharif, NahriShahi, FirozNakhchir, Hazra e Sultan, Ayback, DahanaGhuri, and Pul-e-Khumri) about the proposed project and however, public consultation/public participation yet to be carried out for the project (photographic record has been provided on Figure 9-1).

Figure 9-1: Meeting with individual and village elders during the social survey in Aug 2019.

386. During the FGD, the main problem pointed is not the electricity connection rate, but the quality of the supply. Many villages, and especially areas with low population density, are cut off from the public grid. Where generators are used as an alternative, people complain about the high costs per kWh. The consequence is that both groups would be happy if the project not only supplied urban areas but also linked the rural areas to the new HVTL or, where the networks already exists, provide 24/24 hour supply with a stable voltage.

387. People consider themselves poor, or at least not wealthy, but every group member immediately agreed to pay the tariffs and connections costs themselves and only very few people were not willing and/or able to use electricity if it were available in sufficient quantity. One strong argument in favor of regular payment of the public supply is the current high costs for power produced by generators.

388. When asked who should organize the valuation of losses and fix the compensation, or at least who should conciliate in the case of grievances, most people favored either the traditional (tribal) shura or the new government-established shura. In three cases Community Development Councils were also mentioned.

389. Nobody expressed concern as to possible damage and losses through the construction of the HVTL. The only two predominant concerns were that the future supply would not be fair (i.e. that their village would not be included in the public network [as it had been left out once before]) and seven groups expressed the fear that compensation payments would not be made at all or that the compensation money would not cover losses adequately.

390. The majority of the people would not have any problems with land acquisition and compensation procedures. However, they all pointed out that there were vulnerable households living in their communities. In seven focus groups poor or extremely poor people were mentioned and all 20 groups referred to handicapped and women-headed households

as vulnerable. In order to show the relation between the three vulnerable groups: participants mentioned 180 poor households, 50 households depending on handicapped people and 65 women-headed households.

9.3 Conclusions and further Proceedings

391. One conclusion from the social survey and the consultation procedures is that the implementation of the land acquisition and resettlement process requires an improved gender approach. As far as security conditions allow for the integration of female staff members into the contractor‘s and the consultant‘s teams, contacts with women as land owners and women as heads of households in general should be made by female social experts.

392. With regard to the next steps after the initial consultations with various stakeholders and especially with members of the possibly affected communities, the following activities will be carried out:

- After agreement of the LARP between DABS and ADB, both reports will be put onto the homepage of the organizations concerned (concerned organizations are worried organizations).
- DABS will in parallel also provide a translation of the summary of the principles of the LARP, the land acquisition and compensation process to the district administrations concerned for further distribution to the communities possibly affected.
- With the start of the final TL design and during the Detailed Measurement Survey, a leaflet will be elaborated and printed with a summary of the land acquisition and compensation process (including the grievance redress mechanism and all addresses of the institutions concerned) and distributed to all persons identified as owners of affected land and other properties.

393. The involvement of the affected population and their representatives respectively will be ensured by their participation in the Provincial Valuation and Compensation Committees (PVCC) and in the Grievance Redress Committees (GRC).

394. Apart from the institutional participation of representatives of the population, all affected persons are invited at any time to apply to the PMO and their Due Diligence Team (DDT). Phone numbers and other information about the institutions concerned will be provided in the project leaflet mentioned above.

10. GRIEVANCE REDRESS MECHANISM (GRM)

395. In accordance with ADB safeguards, great care is taken in the project to prevent grievances. The special situation in conflict-torn Afghanistan requires special attention in order to avoid any additional development of conflicts.

396. Prevention of grievances will be achieved mainly through careful land acquisition design and implementation, by ensuring full DPs participation and consultation; and by establishing extensive communication and coordination between the community, the PMO and their consultants and coordinators, and the local governments. In order to include women, the team for the implementation of the land acquisition and resettlement (and compensation) process will be gender-sensitive and culturally-adapted.

397. This notwithstanding, complaints are sometimes unavoidable if, for example, a different understanding of the value of losses and consequently of compensation payment arises. Therefore, a grievance redress mechanism is being adopted for the project to allow the DPs the opportunity to appeal against any contested decision, practice or activity arising from the valuation of losses and the compensation/rehabilitation process. Efforts to make DPs fully aware of their rights and of the procedures for addressing complaints will continue during the updating of the LARP and at the time of compensation.

398. The various queries, complaints and problems likely to be generated among the DPs which might require mitigation include:

- DP not listed as affected;
- Losses not identified correctly;
- Compensation/assistance considered inadequate or not as provided by the
- entitlement matrix;
- Dispute about ownership;
- Internal dispute amongst owners, leaseholders, and /or sharecroppers;
- Delay in disbursement of compensation payments/assistance;
- Improper distribution of compensation payments/assistance in the case of joint
- ownership of land and other properties;
- Rehabilitation work not properly performed by contractor etc.

399. Complaints and grievances will be addressed through the following steps and actions. However, such steps will not prevent a complainant to seek redress of his or her complaint directly to the court. These are only offered as an alternative complaint resolution:

400. **First Step:** A Grievance Redress Committee (GRC) will be established for each district concerned. It includes:

  - Two members of the community along the HVTL corridor (preferably one DP and one non-directly affected person from two different villages concerned) to be

elected by the regional jirga;

- One representative of the district governor with juridical experience;
- One representative of the district DABS office concerned, and one representative of a regionally active NGO, preferably with experience in mediation/conflict management.
- The committee is to be chaired by the representative of the concerned district governor. Grievances should be sent in written to the committee and must be heard and resolved within 21 days of submission of the complaint.

401. **Second Step:** If the district-level GRC is not able to resolve the grievance within a 21-day period, the complaints should be presented via the local DABS representative to the DABS General Manager at central level. The elected representatives of the DP at provincial level will have the opportunity to mediate by providing their written comments and proposals to the manager. A final decision will be made by the Director of DABS after the assessment of the case and a careful preparation of the decision by the PMO/Due Diligence Unit representative. Grievances should be sent in written form and must be heard and resolved within 14 days of submission of the complaint.

402. **Third Step:** If no solution is reached within 14 days at DABS central level, the DP can further submit their case to the appropriate court of law.

403. While applying the Grievance Redress Mechanism, the DP can seek support from the representative of the coordinator who may also be assisted by the national and international consultants. The contact addresses/phone numbers will be disseminated via the project in-formation leaflet to be distributed amongst all possibly affected households.

404. Should the cause of grievance be the contradiction between traditional law and modern legislation, the DP may also seek support from the local jirga and/or from elders who may hear the legal position of the DP.

405. Should the issue or complaint remain unresolved through the grievance redress mechanism, the case can be referred to the appropriate court for resolution.

406. The PMO will design a pro-forma letter to be used for filing complaints. A representative of the coordinator or a member of the DDT will help filling in the form and forwarding it to the appropriate committee/authority and will assist the DP at every stage of the com-plaint process.

407. If grievances cannot be resolved at local level, the DABS will nevertheless pay the amount laid down by the PVCC (Provincial Valuation and Compensation Committee) to the DP. Additional compensation may be paid later upon decision of the DABS general manager or the court appealed to in accordance with the final entitlements of the DP.

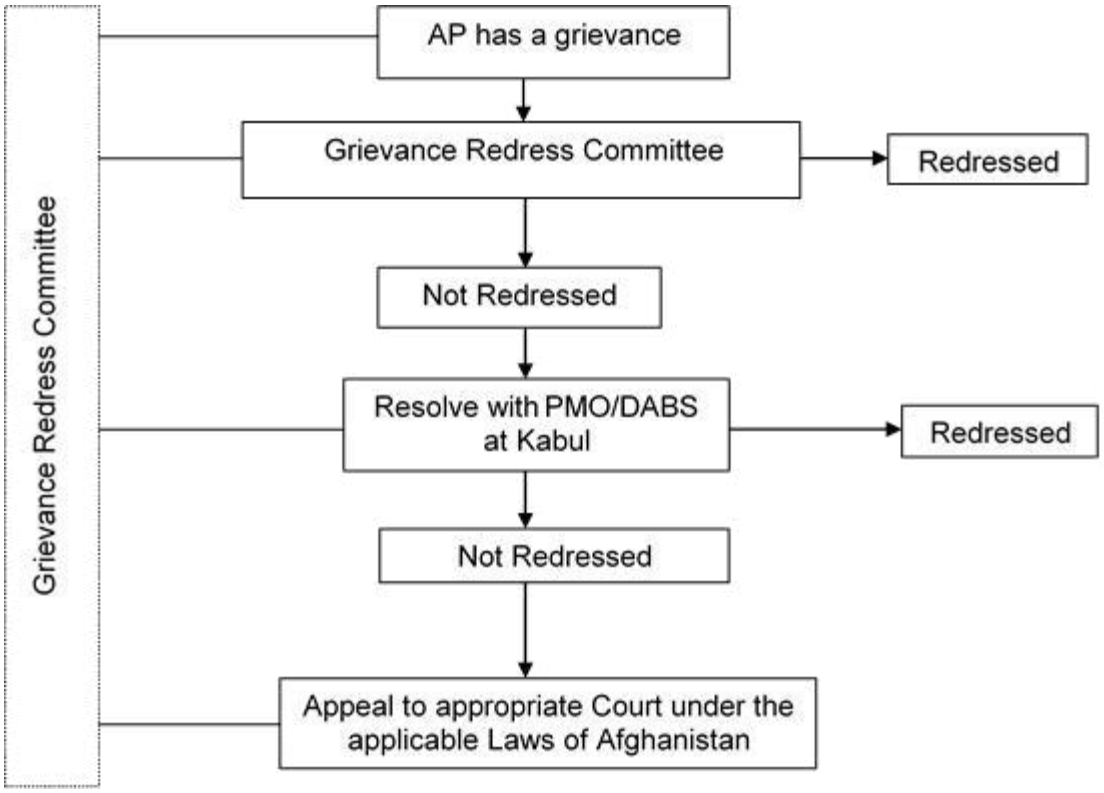


Figure 20.1 GRM Process Flow Diagram (PFD)

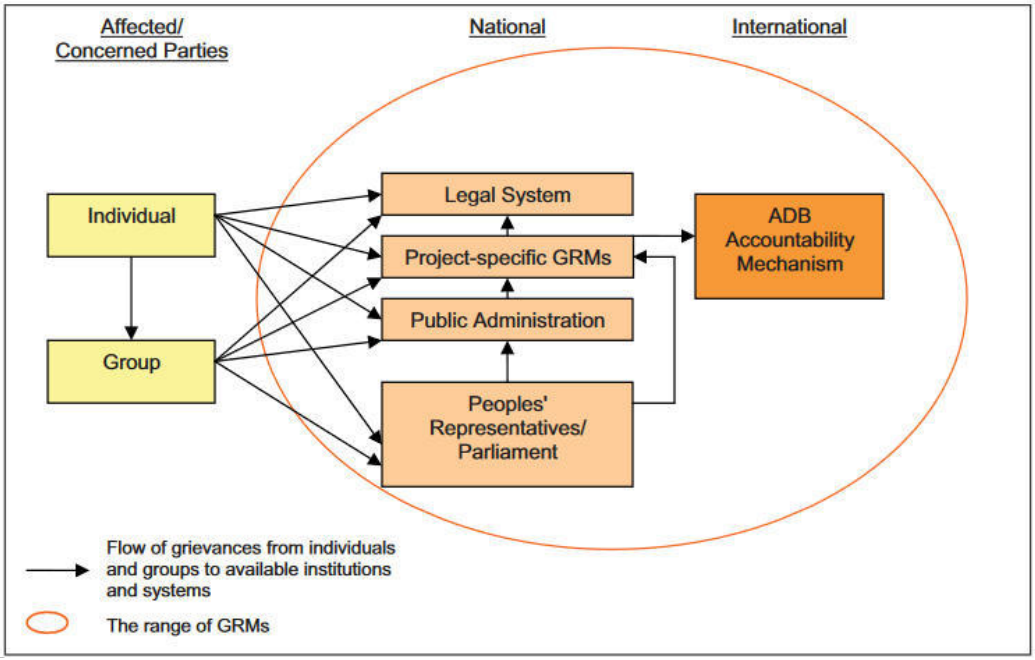


Figure 10.2 Systems and Institutions for Grievance Redress Available to Affected Persons (ADB, 2010)

11. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

11.1 Introduction

408. Environmental Management Plan is an implementation plan to mitigate and offset the potential adverse environmental & social impacts of the project as well as to enhance the positive impacts. Based on the environmental and social baseline conditions, planned project activities and impacts assessed earlier, this section enumerates the set of measures to be adopted to minimize the adverse impacts.

409. Process of implementing mitigation and compensatory measures, execution, agencies responsible for their implementation and indicative costs is discussed in this chapter. The project has overall positive impacts by providing a competitive, cost-effective, cleaner power generation. It will certainly meet the ever-increasing Demand of Power and to bridge the gap between demand and supply of power.

11.2 Purpose & Need of the EMP

410. Primarily, the purpose of this EMP is to serve as a quick reference for the consultants, contractor as well as the Proponent to implement the proposed mitigation measures effectively and to monitor the overall environmental performance of the project. The need of the EMP is mentioned as follows:

- Ensure that attention is paid to the actual environmental effects arising from construction, and operation of the proposed project;
- Ensure that anticipated impacts are maintained within the levels predicted;
- Ensure that unanticipated impacts are managed or mitigated before they become a problem; and
- Ensure that environmental management brings about real environmental benefits and achieves environmental sustainability, rather than the Environmental Approval Process being a mere paper chase to secure a development approval.

11.3 Objectives of the EMP

411. The main objectives of the EMMP during different phases of the project is to implement mitigation measures and to evaluate the effectiveness of mitigation measures as proposed in the IEE and recommend improvement if any need would arise.

11.4 Scope of the EMP

412. The scope of the EMP includes the following phases of the project:

- Planning and Design Phase;
- Implementation and Construction Phase; and
- Operation Phase.

413. All the activities performed during these phases will be controlled and monitored according to this EMP.

11.5 Mitigation measures for the design phase

Table 6.1: Environmental Mitigation Plan for the Design Phase

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Line Routing	• Resettlement and land acquisition • Damage of Physical Cultural Sites • Damage and losses of agricultural plantations • Erosion • Tree cutting	• Towers are not placed on hilltops • Towers will not be erected too close to rivers and creeks and fragile river banks will not be damaged. • Selection of a transmission line corridor that bypasses settlements so that only minimum resettlement actions/ relocation of households is required. • Protection of cultural and religious relics and graveyards. • Prior information of APs during the design phase / land survey that plantations in ROW are likely to be affected • Avoid tree cutting at possible extent as the line can be diverted.	DABS	Included in contractor's contract	Before and during pre-design phase / first land survey
			PIC	Included in PIC Contract	During final routing
Access Roads	• Land acquisition and resettlement • Damage of Physical Cultural Sites • Damage and losses of agricultural plantations	• Minimization of the number and length of access roads; • Careful selection of location of access roads; • Use of existing roads/ tracks wherever possible.	DABS	Included in contractor's contract	Before and during pre-design phase / first land survey
			DABS-PMO and PIC	Included in PIC Contract	During final design
Health and Safety	• Natural disasters	• Infrastructure needs to be constructed respecting earthquake safety standards suited for the seismic risk level in the Investigation area	PIC	Included in PIC Contract	During final design

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Health and Safety	• Impact of Electric and Magnetic Fields	• The minimum safety distances from houses to the conductors have to be respected. - Above normal ground and houses 7.0 m - To Roads 9.8 m - To other OHLs 4.5 m	DABS	Included in contractor's contract	Before and during pre-design phase / first land survey
			PIC / DABS-PMO	Included in PIC Contract	During final land survey

11.6 Mitigation measures for the construction phase

Table 11.2 Environmental Mitigation Plan for Construction Phase

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Soil and Erosion	Erosion of soil Sand deflation	• Minimization of removing topsoil at tower sites. • Loss of topsoil will be avoided by stripping and storing topsoil prior to construction (where appropriate i.e. on productive lands). • Bringing back the topsoil to its original place after having • finished erection of the tower. • Installation of drainage systems. • Replanting of grass at tower sites, river banks, access roads and other work areas that are not needed anymore. • Careful selection of locations for access roads. • Sand deflation prevention measures at tower foundations and access roads. • Use of existing roads/ tracks wherever possible.	CC / DABS-PMO	Included in construction costs	During construction
Soil and Erosion	Soil damage by quarries Blasting of rocks	• If there is a need to use filling material for access roads or tower foundations existing certified and properly managed quarries will be used • If quarries are needed, they will be redeveloped as per standard procedure. Rehabilitation will be undertaken immediately after excavation to prevent soil erosion. • Redevelopment will include replacing stockpiled soil cover, replanting grass, shrubs, and trees, and installing sediment runoff control devices.	CC	Included in construction costs	During construction

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Landscape and Visual Aspects	Impacts on the landscape of the area by construction debris, excavations, and deposit of materials	• Re-establishing of the conditions of the landscape before construction • Removal of all construction debris	CC / DABS-PMO	Included in construction costs	After construction
Air Quality	Gas and dust emissions from construction vehicles and burning of waste Dust emissions from earthworks	• Limitations of size, weight or axle loads of vehicles using • particularly difficult roads. • Reduction of speed and limited movement of vehicles. • Optimized transportation management to avoid needless truck trips. • Routine service and regular maintenance of vehicles and machines to reduce engine emissions. • Burning of rubbish on site must be strictly forbidden. • Construction equipment will be maintained to a good standard and idling of engines discouraged. • Machinery causing excessive pollution (visible smoke) will be banned from construction sites. • Despite its dust reduction potential, access roads will only be sprayed in exceptional cases due to scarcity of water • PM10 and PM2.5 monitoring.	CC	Included in construction costs	During construction period

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Surface Water	Pollution of Surface water	• All liquid materials and lubricants will be stored in closed containers or barrels. • Pulverulent construction material will be stored in containers in order to avoid rinsing out. • Temporary sewage treatment facilities will be provided for the construction site and the workers' camps. And waste water should be transported to the proper waste water treatment plant approved by the municipality. • Avoidance of soil run-off. All necessary measures will be taken to prevent impeding cross drainage at rivers/ streams and canals or existing irrigation and drainage systems. • Construction of towers in distance from river banks (min 50 m is recommended) • Avoidance of water pollution at temporary bridges at river crossings. • Where new access roads are to be constructed, they should not disturb the natural drainage patterns of the areas • Vegetation stripping should occur in parallel with progress of construction in order to minimize erosion and run off. Prohibiting construction and maintenance vehicles from driving in water ways • Dismantling of bridges that are not needed after construction.	CC	Included in construction costs	During construction period

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Groundwater	Pollution of Groundwater	• Regular maintenance of all vehicles and machines used on site is mandatory. Maintenance activities of the vehicles will be performed in regular service stations. • Maintenance and re-fuelling of the construction equipment will be done only on sealed and enclosed areas (careful handling and maintenance, especially of the fuel tanks). • On site storage of fuel, engine oil and lubricants in locked tanks and on sealed and shadow roofed areas. • All wastes generated through the use of fuel, engine oil and • lubricants like drums and containers will be collected and disposed of properly. • Staff training to increase awareness of waste minimization and appropriate waste disposal. • Appropriate sewage treatment of workers camps • Appropriate groundwater protection measures	**CC**	Included in construction costs	During construction period

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Flora and Fauna	Destruction of Flora and Fauna	• Respect of minimal ground clearance • Skillful selective clearing towards tower location to further reduce vegetation clearing. • Minimizing and marking of the extent of lay down areas and the routing of new access roads in order to minimize impacts on vegetation and habitats. • Minimization of number and length of access tracks. • A tree cutting and planting scheme on the ration of 1:1 will be prepared during the design phase. During the construction phase appropriate training will be provided to the workers and penalties will be imposed for the contractor for cutting down trees for firewood • Rehabilitation of access roads not needed anymore after having finished the construction. • Installation of birds' repellant along the transmission line potential birds route areas. • Instruction of the employees not to disturb animals; hunting will be prohibited in general. • All construction and maintenance activities in any natural habitat along the route should be conducted in accordance with best environmental practices to cause minimum disturbanceto any habitat	CC / DABS-PMO	Included in construction costs	During final land survey and construction phase

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Waste Production	Environmental pollution through waste	• Development of a Waste Management Plan within the HSE • Management Plan considering following principles: (i) waste management hierarchy of avoidance-minimization-reuse- treatment-disposal; (ii) segregation of waste; (iii) minimization of construction waste by good technical planning; (iv) training of staff. • Implementation of a Waste Management System. • Provision of construction sites and workers' camps with functional sanitary equipment. • Training of workers regarding proper waste and waste water handling according to environmental management requirements. • All construction materials will be reused, recycled and properly disposed of. All worn out parts, equipment and empty containers must be removed from the site to a proper storage location designated by DABS-PMO. • Solid waste and garbage will be collected in bins and disposed of daily, according to a brief and basic waste management plan prepared by the contractor and approved by DABS-PMO, prior to commencement of civil works. • There will be no site- specific landfills established by the contractors. All solid waste will be collected and removed from the work camps and disposed of in local waste disposal sites • Any spoil generated by the construction activity should be disposed at an approved location. • Littering should be prevented by providing adequate number of containers which will be emptied regularly. • After completion of construction the site will be properly cleaned and properly rehabilitated or re-vegetated.	CC	Included in construction costs	Prior start construction during construction phase
Liquid Waste	Sewage production at construction sites and workers' camps	• Prior to work initiating the contractor will present a simple sewerage management plan to DABS-PMO for approval • Sewerage to be discharged into soak pits or municipal sewers and construction camps to be located away from rivers. • Septic tanks must be provided at each construction campsite • All work sites to be equipped with latrines. All toilet facilities will be located at least 300 m from water sources or existing residence.	CC	Included in construction costs	During construction period

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Liquid Waste	Environmental pollution by toxic, harmful and inflammable chemicals	• Toxic, harmful and inflammable chemicals (paints, fuel, lubricants, oil and explosives) will be stored in designated sites. • Vehicle maintenance and re-fueling will be confined to areas in construction sites designed to contain spilled lubricants and fuels. • Spill waste will be disposed of at approved disposal sites, according to NEPA requirements.	CC	Included in construction costs	During construction period
Waste Production	Environmental pollution by PCB	• All products used for the transmission lines will be PCB free. • It is highly recommended not to re-use any of the old PCB contaminated material.	CC / DABS-PMO	Included in construction costs	Before starting construction and during construction
Health and Safety	General Health and Safety impacts	• Development of an EHS Policy for the construction phase. • Development of an EHS Management Plan for construction (will include a Waste Management Plan). • Installation of an EHS Management System (EHS-MS) during the construction phase. • Clean work environment including good drainage around campsites will be provided to avoid creation of stagnant water bodies • Provide adequate sanitation and waste disposal facilities at campsites • Provide education to the workforce on prevention of communicable diseases, protective measures and disease control • Provide construction personnel with required self-protection devices such as safety helmets, belts, air plugs and other protection devices. • General operational and community safety measures for blasting activities to be detailed in construction EHS management plan.	CC	Included in construction costs	Prior start of construction
Health and Safety	Work accidents	• All construction workers will be fitted with personal protection equipment (PPE). • Alcohol and drugs will be strictly forbidden at the construction site. • Availability of first aid kits and training the staff on the first aid.	CC	Included in construction costs	During construction

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Health and Safety	Noise emissions	• Optimization of transportation management to avoid needless • truck drives; avoidance of truck movements in residential areas at least during night-time. • Reduction of speed of trucks to 15 km/hr crossing residential areas. • Utilization of low sound power mechanical equipment like bulldozer, air compressor, concrete pumps, excavator, concrete mixer etc. whenever possible. • Regular maintenance and service of building machinery and other during construction works. • Shut down or throttling down of noisy machinery to a minimum. • Utilization of ear protection devices by the workers if they are • exposed to high noise levels (included in the construction site HSE Management Plan). • Continuous Noise monitoring in the project area. • Special attention will be given to regular maintenance of construction equipment for their best working condition. • Construction activities will be scheduled to avoid school and late-night hours. • When construction takes place within 500 m from villages or within 150 m from sensitive areas such as health centers, construction will be stopped from 21:00 to 06:00 hours. This will reduce night-time noise levels. • Work hours should be decided in consultation with local community and should avoid prayer times. • Blasting will be carried out only with the permission of NEPA. • Noise protection regarding blasting activities to be detailed in construction EHS management plan • Work should be restricted to specific hours within some of settlements and 150 m from sensitive receptor s (schools, hospitals, and places of religious importance).	CC	Included in construction costs	Before starting construction and during construction period
Health and Safety	Injuries and death by explosion of mines	• Provide special assessment of mine clearance by Mine Action Coordination Centre of Afghanistan MACCA before any physical works	CC / DABS-PMO	Included in construction costs	Before starting construction

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Health and Safety	Operational and Community Health and Safety Risks Transmission of diseases	• Development of Operational Health and Safety (OHS) and • Community Health and Safety (CHS) Plans • Provision of HIV/AIDS protection equipment for workers. • Implementation of health and safety workshops for construction workers. • Put in place sufficient sanitation facilities for workers. • Implementation of health and safety workshops for construction workers. • Accommodation of workers in adjacent towns has the first priority. In the case that construction camps are necessary these will be located in accordance with relevant municipal authorities.	CC	Included in construction costs	Before starting construction and during construction period
Land Acquisition and Land Use	Resettlement Losses and damages to crops	• see LARP	CC / DABS-PMO	Included in construction costs	Before Construction
Gender Aspects and Vulnerable People	Gender disparities Sexual harassment	• see LARP • Implementation of a special livelihood program for vulnerable APs	CC / DABS-PMO	Included in construction costs	During construction
Local Workforce	General Health and Safety risks Social conflicts due to influx of workers	• Measures to prevent and sanction irregular behavior of the workers • Training of workers on Health and Safety measures in workers camps • Conflict mitigation / mediation training	CC	Included in construction costs	At the beginning of construction

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Infrastructure and Traffic	Traffic disturbance Minimization of power cuts	• Ensure that traffic is not disturbed by construction through proper traffic management and signalization. • Respect of minimal ground clearance • Ensure power supply for the population during construction. If necessary, power cuts will be done only at day time with duration reduced to an absolute minimum.	CC	Included in construction costs	During construction
Physical Cultural Resources	Damage and destruction of cultural sites	• Identification of cultural sites and sensitive areas for unknown historical sites (together with local experts of the Ministry of Culture during final routing / land survey. • No construction of access road near Aquina Huzi. • Existing roads/ tracks in the vicinity of Aquina Huzi will be used for material transport. • Reduction of vehicle movements as far as possible. • Towers will be placed in the maximum possible distance to Aquina Huzi. • Shifting AP 3 about 100 m in direction of AP 2 thereby maximizing the distance to the site By-passing or over-spanning of historical sites and graveyards. • Training of the construction workers to stop earth or foundation works immediately if there are any signs for historical or cultural sites. • Report of chance finds immediately to the Ministry of Culture, Implementation of chance find procedure.	CC / DABS-PMO	Included in construction costs	During detailed land survey and during construction process

11.7 Mitigation measures for operation and decommissioning phases

Table 11.3 Environmental Mitigation Plan for Operation and Decommissioning Phase

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Soil and Water Resources	Soil and water pollution	• Provision of separate storage tanks for further treatment of the oily wastewater. • Minimize the usage of water. • Water could be extracted from Amu River.	DABS	Included in operational costs	Before operation
Landscape and Visual Impacts	Permanent visual impact on the landscape	• Complete dismantling of the old transmission line and substations without function.	DABS	Included in operational costs	Before operation
Climate	Release of SF6	• Handle SF_6 used for isolation of the circuit breakers following international guidelines	DABS	Included in operational costs	During operation
Flora	Losses of flora inside the ROW	• For ROW clearing measures no herbicides will be used.	DABS	Included in operational costs	During operation
Fauna	Disturbance of animals during maintenance works	• Disturbance of animals will be minimized during maintenance work by e.g. respecting breeding seasons.	DABS	Included in operational costs	During operation
Waste Production	Environmental pollution by solid and liquid wastes	• Reduction of waste quantity. • Recycling as much as possible. • Proper disposal of remaining waste as per waste management plan. • Adequate site drainage will be performed.	DABS	Included in operational costs	Before/ during operation
Health and Safety	Natural disasters	• Creation and implementation of an Emergency Response Plan	DABS	Included in design costs	During operation

Issue	Potential Impact	Mitigation Measure	Implementing Agency	Costs in $	Date for Implementation
Health and Safety	Electric and Magnetic fields	• Training for workers and resident population with regard to EMF • Respect of the safety distances.	DABS	Included in training costs	During operation
Health and Safety	Electrocution risks for maintenance workers and local people	• Installation of warning signs at towers. • Installation of explanatory boards at towers that individual connection is not possible at the TL • Implementation of Operational Health and Safety (OHS) and Community Health and Safety (CHS) Plans • Awareness raising activity among population and especially maintenance workers	DABS	Included in maintenance/ operational costs	During construction/ operation
Land Use	Restrictions of land use	• Land within the ROW can further be used for agriculture. • Compensations for damaged crops during maintenance. • No herbicides will be used for ROW clearing	DABS	Included in operational costs	During operation
Impacts during Decommissioning Phase	Visual impact on the landscape Efficient resource use	• Complete dismantling of the transmission line after the life-span of minimum 50 years. • Recycling of metal parts and selling as scrap metal. • Waste management procedures and disposal according to national and international standards	DABS	Included in operational costs	During decommissioning

11.7 Monitoring Measures

Design phase

414. Monitoring activities during the design or pre-construction phase will ensure that the process of final line routing complies with the following mitigation measures:

- Avoidance of protected or ecological sensitive areas;
- Avoidance of settlements in ROW to minimize resettlement activities;
- Avoidance of historical and cultural sites;
- Minimization of construction of access roads.

415. Due to the nature of the Project, the detailed line routing and selection of the tower sites will be performed by the PIC (Project Implementation Consultant). A strict monitoring by an external expert of re-routing to avoid resettlement and cultural sites is recommended for all line sections.

416. Monitoring includes further a control if the EMP is adequately updated during detailed design phase and if EMP implementation is included in tender documents and contracts.

Construction phase

417. Internal environmental monitoring is the responsibility of DABS-PMO. Monitoring of the EMP implementation will be performed by an EHS Consultant within the PIC contract during construction phase. Monitoring results will be included in the project quarterly progress reports, semi-annual environmental reports during the construction phase and annual reports after commissioning. The detailed monitoring program will be subject to review and approval by ADB.

418. In addition, external construction monitoring will be performed by an international expert (EHS External Monitor) to ensure that all requirements as stipulated in this EMP are fulfilled. Such an EHS Construction Site Monitoring Monitoring will be performed three times a year with special focus to the period of performing the detailed land survey. A monitoring report will also be prepared to validate internal monitoring results.

419. Tasks during the construction phase are the monitoring of environmental performance of contractors with regard to control measures to pertaining to erosion material storage, sitting of work site, noise, waste disposal, traffic management, workers safety, protection of physical cultural resources etc.

Operation phase

420. Environmental monitoring during the operation phase will be performed by DABS and NEPA.

421. The PMO will no longer exist after construction. Monitoring results will be included in annual environmental reports during the construction phase and in annual reports after commissioning. The detailed monitoring program will be subject to review and approval by ADB.

422. Operation and Maintenance (O&M) practice and environmental effects include soil erosion, soil contamination, surface water and EMFs.

423. During operation, when the transmission line is under full load, it is recommended to measure the electric and magnetic fields under the lowest clearance and at housings located nearby the line. Objective is to show that the internationally accepted permissible limits are not exceeded.

424. Operation phase environmental monitoring will include regular transmission line inspections to verify compliance with the EMP requirements and with relevant laws and regulations.

425. A budget provision for monitoring of the decommissioning after the life-span of the transmission line (min. 30 years) will be included in the operation cost.

Table 11.1 The Project estimated costs for EMP implementation

Project Stage	Estimated Cost (USD)
Design	2000
Construction	
▪ Site office waste water and other solid waste arrangement	2500
▪ worker PPE and occupational safety measures	2000
▪ Internal Environment Monitoring	5000
▪ Environmental Training	2500
▪ Hiring of environmental specialist and reporting	15000
Operation and Maintenance Phase	
▪ Periodic checkup (birds impacts, health and safety ▪ concerns etc.) and clearance of the project ROW	6000
Decommissioning Phase	
▪ Return the project area as it was before or making it better (planting trees, grass, etc.)	4000
▪ Removal of the material to municipality approved recycle/damping sites	3000
▪ Dust, soil erosion, noise, health and safety mitigation measures consideration	1000
Capacity building training	1500
EMP Monitoring	
▪ Periodic measurements as suggested in the EMP for noise, water quality, air quality and etc once for baseline and twice a year for SAEMR.	7000
▪ Project site visits and reports	3000
Miscellaneous /contingencies	5000
Total	**60,000**

Table 11.4: Monitoring Plan for Design Phase and Construction Phase

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring and Reporting Responsibility	Date for Implementation
Line Routing	Compliance with ADB SPS, Minimization of resettlement needs, Avoidance of cultural sites, Compensation payments (see LARP), Access road design, Design of river crossings	Avoidance of environmental and social impacts during line routing, Avoidance of resettlement requirements, Towers will not be located near river banks and flooding areas Towers will be located with minimum local environmental impact Construction activities will be restricted to as small an area as possible (incl. access roads).	Entir line e corri dor	Visual control (Field visit) of final line routing including selected deviations by independent expert	One time, before start of physical works	Included in EHS monitoring	EHS Consultant (from PIC)	During design phase, before the start of physical works
Soil a nd Erosion	• Construction standards of access roads, • Temporary bridges, • Re-planting activities	• Control of low impact construction standards • Visual control of river crossings • Visual control of re-planting activities of trees, making sure for each damaged tree a new tree is planted.	Entir line e corri dor	Visual control of record keeping of length built and length rehabilitated/ decommissioned after Project completion.	Periodically during construction	Included in EHS monitoring	EHS Consultant (from PIC)	During construction

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring and Reporting Responsibility	Date for Implementation
Landscape and Visual Aspects	• Re-establishing of the conditions of the landscape before construction • Removal of all	• Visual inspection of line corridor	Line corridor	Visual control	Once at the end of construction period	Included in EHS Audit	EHS Consultant (from PIC)	Before start of operation
Land Acquisition and	• Compensation payments • Information sessions	• Visual control • Photo-documentation of resettlement activities and	Entire line corridor	Visual control, records, survey	After final design	See LARP document	Due Diligence Team (see LARP	Before and during construction
Resettle-ment	Grievance mechanism Resettlement actions	re-installation including GPS data Grievance mechanism documents					document)	
Air Pollution	Construction standards	• Monitoring of good construction standards; • Monitoring of correct implementation of construction manual, especially related to vehicle use and maintenance	All work areas	Visual control and instrumental monitoring for PM10 and PM2.5 especially near the sensitive receptors before construction and then during construction.	Once before construction and then twice a year as part of SAEMR	Included in construction cost/ EHS ,motoring	Contractor and supervised by PIC	During construction

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring and Reporting Responsibility	Date for Implementation
Pollution of Surface Water	• Good construction principles at river crossings • Location of towers no closer than 50 m to flooding areas • No pollution sources near rivers	Visual control of downstream water quality (turbidity), • Regular measurements of up-/ downstream basic parameters, • Plan for detailed analysis • (e.g. for hydrocarbons) if pollution/ spills are suspected. • Visual control that any temporary bridges are properly constructed, do not cause deterioration of river bed and are dismantled after completion • Control of Implementation of EMP measures	Line sections with river crossings	Visual Control, and instrumental measurements and Analysis of basic surface water parameters (ph, COD, BOD, oil grease etc.), sampling upstream and downstream of river crossings	Once before construction and then twice a year as part of SAEMR	Included in construction cost/ EHS monitoring	Contractor and supervised by PIC	During Construction
Pollution of Groundwater	• Appropriate sewage treatment of workers' camps • Appropriate groundwater protection measures	• Visual inspection of pollution sources • Analysis and measurements of basic groundwater parameters.	Tower sites, work camps	Visual control, water analysis in wells and instrumental test of water for contamination.	Once before construction and then twice a year as part of SAEMR	Included in EHS monitoring	Contractor and supervised by PIC	During construction

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring and Reporting Responsibility	Date for Implementation
Flora a nd Fauna	• Respect of minimal ground clearance in design • Extent of lay down areas and routing of new access roads • Birds repellant installation • Birds nesting.	• Monitoring of final design, including specifications of tower locations and height of towers, location and length of access roads • Monitoring of tree cutting, enforcement of prohibition • Birds nesting, mammal sightings, barrow and small mammal colonies.	Entire ROW line	Regular visual inspection during construction Complete line survey after construction	Periodically before and during construction General survey after construction	Included EHS Audit in	EHS Consultant (from PIC)	During construction

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring and Reporting Responsibility	Date for Implementation
Waste Production Waste Management and monitoring.	• Economic land use, • Proper topsoil management, • Erosion control and post construction • Development of a Waste Management Plan • Reduction of waste quantity, recycling as much as possible. • Proper dumping of remaining waste. • Regular	• Visual control of economic land use, proper topsoil • management, erosion control and post construction site restoration. • This should be reviewed in the final design and also checked in the field for design compliance. • Monitoring of Waste Management Plan and control of implementation	All work areas	Design compliance, Visual control	Daily for the area waste accumulation and weekly for the waste transportation and disposal.	Included in EHS monitoring	contractor and supervise by PIC	Before, during and after construction

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring and Reporting Responsibility	Date for Implementation
Liquid Waste	• Implementation of Sewerage Management Plan • Septic tanks at each construction campsite • Measures to prevent spills of liquid wastes (i.e. oil change of	Visual control of construction sites and workers camps, especially sanitary facilities, Waste Management Plan and Sewerage Management Plan facilities	Work camp sites; Lay-down Areas	Design compliance, Visual control	Daily for the area waste accumulation and weekly for the waste transportation and disposal.	Included in EHS Audit	EHS Consultant (from PIC)	During construction
Health and Safety	• Compliance with EHS Management Plan (Work Safety / Sanitation, Noise)	• Construction Site/ EHS Audit. • Monitoring of noise level, air quality (Dust),protective equipment, • workers camp sanitation, • safe handling of hazardous materials (explosives at quarries etc.) and electrical accidents prevention, prevention of work accidents etc. during construction	All work areas, Workers camps	Visual Control of EHS Management Plan implementation. Instrumental measurement of noise level before construction and during the construction.	Weekly bases during construction	Included in EHS Audit	EHS Consultant (from PIC)	During construction

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring and Reporting Responsibility	Date for Implementation
Health and Safety	Clearance of all work areas from mines	Clearance Report of Mine Action Coordination Centre of AFG (MACCA)	All work areas	Clearance status	One time before start of works	Included in EHS Audit	EHS Consultant (from PIC)	During design phase, before the Start of physical works
Local Workforce	• Monitoring of Training of workers on Health and Safety measures in workers' camps • Conflict mitigation / mediation training	• Monitoring of measures to prevent and sanction irregular behavior of the workers • Monitoring of Implementation of Construction Manual • Grievance Mechanism related to conflicts and complaints	Workers camps, construction sites	Site visits and interviews No. of trainings conducted, content, participants Grievance Mechanism Settlement records	Yearly during construction, during EHS Monitoring Monitoring visits	Included in EHS Audit	EHS Consultant (from PIC)	During construction
Infrastructure and Traffic Safety	• Traffic Safety Plan included in EHS Plan • Implementation of measures to • enhance traffic • safety, road	• Short term impact during construction, no specific monitoring necessary.	Entire line corridor	Visual Control	Quarterly during construction	Included in EHS Audit	EHS Consultant (from PIC)	During construction

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring and Reporting Responsibility	Date for Implementation
Physical Cultural Resources	Implementation of chance find procedure	Photo-documentation of key sites close to alignment before start and after completion of construction, Visual control that sensitive areas are fenced off and secured against unintended damage during construction.	All work areas	Visual Control, Records	Yearly during construction	Included in EHS Audit	EHS Consultant (from PIC)	Before, during and after construction
Physical Cultural Resources	Material transport	Recording of kinds of materials and routes of transport	Entire line corridor and roads/ tracks	Visual Control, Records	Regular monitoring during construction process	Included in EHS Audit	EHS Consultant (from PIC)	During construction
Grievance Mechanism	Implementation of an accessible grievance mechanism for APs to address complaints at the local level	Social survey by independent expert to find out if grievances have been settled.	Community level in all provinces	Survey	3 times during construction process	Included in EHS Audit	EHS External Auditor	During Construction

Table 7 Monitoring Plan for the Operation and Decommissioning Phase

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring Responsibility	Date for Implementation
Soil and Water Resources	• Removal of temporary infrastructure • Replanting of unneeded access roads, lay down areas, and other work sites • Fitting transformers with oil pits connected to a drainage system. Provision of separate storage tanks for further treatment of oily wastewater at SS	• Visual control of downstream water quality (turbidity), • Regular measurements of upstream / downstream basic water parameters, • Plan for detailed analysis (e.g. for hydrocarbons) if pollution / spills are suspected.	All work areas	Visual inspection	Once after construction	Included in operation cost	DABS	After construction
Landscape and Visual Impacts	• Complete dismantling of the old TL and SS without function.	Visual Inspection Control of planning and implementation of re-plantation sites and activities	All work areas	Visual inspection	Once after construction	Included in operation cost	DABS Environment Department (ED)	After construction
Flora	• No use of herbicides for ROW clearing	• Supervision of maintenance procedures	Entire ROW	Periodical Inspection	Yearly during operation	Included in operation cost	DABS, Environment Department / NEPA	During operation

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring Responsibility	Date for Implementation
Fauna	Disturbance of animals during maintenance work Prohibition of hunting, Birds collusion inspection	• Supervision of maintenance procedures	Entire ROW	Periodical Inspection	Yearly during operation	Included in operation cost	DABS ED / NEPA	During operation
Waste Production	• Reduction of waste quantity, recycling as • much as possible. • Proper dumping of remaining waste.	• Monitoring of Waste Management Plan and control of implementation	All work areas	Periodical Inspection	Yearly during operation	Included in operation cost	DABS ED/ NEPA	During operation
Health and Safety	• EHS Management System/ Plan • development and • implementation during operation	• Monitoring of Implementation of EHS Management Plan	Maintenance locations	Periodical Inspection	Yearly during operation	Included in operation cost	NEPA / DABS ED	During operation
Health and Safety	• Electric and Magnetic fields	• Regular EMF measurements (after purchase of EMF meters and related training for handlers) • Control of encroachment of safety zone	Entire line ROW	Regular measurements under full load	Yearly during operation	Included in operation and training cost	DABS ED	During operation

Issue / Potential Impact	Parameters to be monitored	Monitoring Action	Location	Measurements	Frequency	Costs in $	Monitoring Responsibility	Date for Implementation
Health and Safety	• Noise (corona effect)	• Regular noise measurements (after purchase of noise monitoring equipment and related training for handlers)	Entire line ROW (especially in the neighboring living areas)	Regular measurements under full load	Yearly during operation	Included in operation and training cost	DABS ED	During operation
Land Use ROW clearing and maintenance	• Further agricultural land use in the ROW, • Use rights and use practices • Compensation payment for damaged crops during maintenance. • No use of herbicides for ROW clearing	• Monitoring of land use possibilities, compensation payments, grievance mechanism	Entire line ROW	Periodical Survey	Yearly during operation	Included in operation cost	DABS ED	During operation
Impacts during Decommissioning Phase	• Complete dismantling of the transmission line after the life-span • of minimum 50 years. • Recycling of metal parts and selling as scrap metal. • Waste management procedures and disposal according to national and international standards	• Visual control that all project related infrastructure is deconstructed, metal parts are recycled, wastes disposed and hazardous materials treated according to national and international best practice	Entire line ROW	Visual control, review of records	One time after life span of the project (50 years)	Provision for decommissioning is included in operation costs	DABS	After life span of the project

12. IMPLEMENTATION ARRANGEMENTS AND CAPACITY BUILDING

Institutional Arrangements and Responsibilities

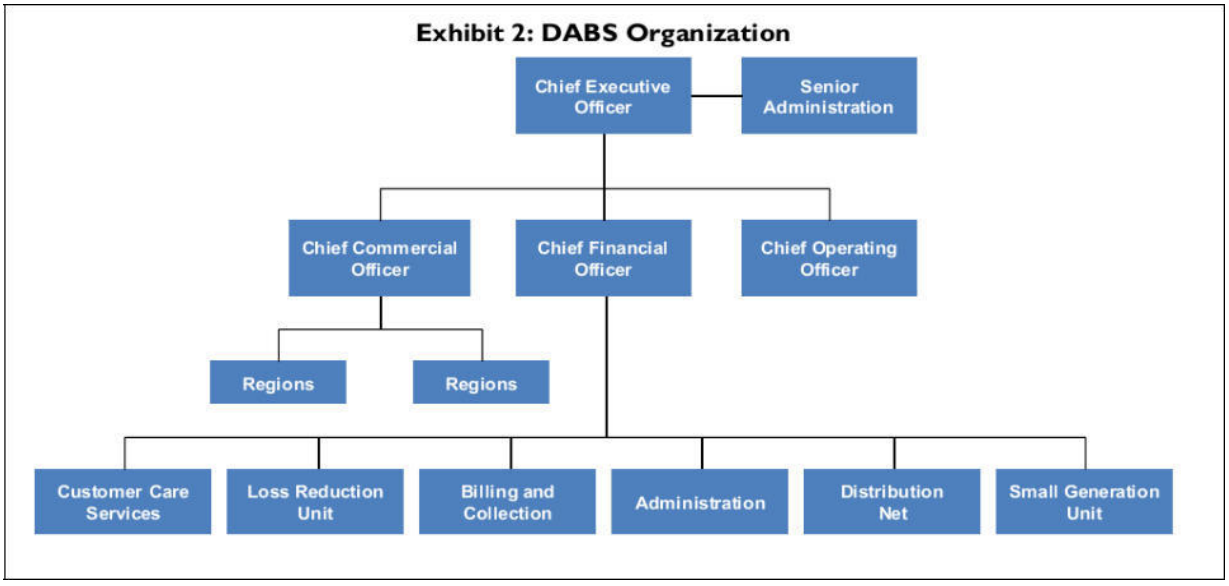
426. The environmental assessment and review procedure involves distinct processes, dynamics and different agencies. The agencies involved in the planning and implementation of resettlement and rehabilitation program are DABS as the EA and the Provincial and District governments. The DABS with the support of the management consultant and the implementation consultant will co-ordinate all activities related to the preparation, implementation and monitoring of the environmental management. All activities will be coordinated with the relevant local government agencies and community shura.

427. The Implementing Agency for the construction and operation of the transmission line will be DABS. As such, DABS will also have the task to internally monitor the implementation of the EMP. The construction will be carried by an external Construction Contractor (CC).

12.1 DABS

428. DABS is the national, yet commercialized, electric utility, which operates and manages electric power generation (units of over 100 kW), imports, and T&D throughout Afghanistan on a commercial basis. The company remains in a precarious financial state, and in 2008 it had to be rescued from collapse by donors. Improvements in collections and reductions in fuel costs due to higher imports have also contributed to an improvement in its finances. The utility is now organizing itself along the lines of a commercial company (Figure 11-1):

Figure 12-1: Organizational structure of DABS



429. DABS will be responsible for the maintenance of the line and partly for the construction supervision.

430. The Project management office (PMO) will comprise an executive committee, an integratory working group, a project management organization in the DABS (DABS–CEO).

431. The DABS-PMO will be responsible for the overall technical supervision and execution of the project. The staffing of DABS-PMO will include expertise in project management, Electrical transmission engineering, institution and finance, environment, socioeconomic, land acquisition and resettlement aspect.

432. The mitigation measures that are incorporated into the design will the verified by the DABS-PMO before providing technical approvals.

12. 2 NEPA

433. The National Environmental Protection Agency (NEPA), as an independent institutional entity, is responsible for coordinating and monitoring conservation and rehabilitation of the environment. NEPA will appoint an EIA Board of Experts to review, assess and consider applications and documents submitted by the proponent. Acting on the advice of the EIA Board of Experts, NEPA will either grant or refuse to grant a permit. A permit granted will lapse in the event that the proponent fails to implement the Project within three years of the date of which the permit was granted. NEPA should also be consulted if complicated issues arise during construction and operation stages.

12. 3 ADB

434. ADB is responsible for screening sub-projects to specify ADB's safeguard requirements; undertaking due diligence; and reviewing the borrower's/client's social and environmental assessments and plans to ensure that safeguard measures are in place to avoid, wherever possible, and minimize, mitigate, and compensate for adverse social and environmental impacts in compliance with ADB's safeguard policy principles.

435. ADB is further determining the feasibility of ADB financing; helping the borrower/client in building capacity to deliver the safeguards; and monitoring and supervising the borrower's/client's social and environmental performance throughout the project cycle. ADB discloses safeguard plans and frameworks, including social and environmental assessments and monitoring reports, on its website.

436. If a borrower/client fails to comply with legal agreements on safeguard requirements, including those described in the safeguard plans and frameworks, ADB will seek corrective measures and work with the borrower/client to bring it back into compliance. If the borrower/client fails to re-establish compliance, then ADB may exercise legal remedies, including suspension, cancellation, or acceleration of maturity, that are available under ADB legal agreements. Before resorting to such measures, ADB uses other available means to rectify the situation satisfactory to all parties to the legal agreements, including initiating dialogue with the parties concerned to achieve compliance with legal agreements.

12.4 Construction Contractor (CC)

437. The Construction Contractor will have the responsibilities to implement the EMP during the construction phase and control workers and subcontractors to respect the environmental guidelines according to international best practice. The CC will also prepare monthly reports including the progress of the implementation of the EMP. The report will contain all discrepancies from the EMP and list all EHS relevant incidents and accidents that occur during the implementation of the construction and implementation of mitigation measures. Based on

these reports and on own regular construction site audits the CC together with the PMO will prepare annual performance reports and submit them to ADB. CC is also responsible for preparation of SSEMP (s) for the project.

12.5 Project Implementation Consultant (PIC)

438. The PIC will have the responsibility of directly overseeing the CC's efforts with regards to environmental and social impact management, i.e., it will be responsible for monitoring the EMP implementation. This will be made by hiring an EHS Consultant (one International and one national). The PIC will assist the PMO in supervising the EMP implementation and compiling reports on environmental performance as well as in conducting training for building capacity on EMP implementation.

439. The mitigation measures that are incorporated as part of the contract documents will also be verified by the PIC consultant before getting the contract signed between the DABS-PMO and the contractor.

12.6 EHS External Monitoring

440. An EHS External Monitoring will monitor the correct implementation of the EMP according to international best practice. Environmental audits will take place three times during the construction process.

12.7 Capacity Building

441. At DABS there is a Social/Environmental Department. Because of the recent creation of Social/Environmental Department in DABS training of staff is highly recommended. Staff needs to be educated in health (e.g. electric and magnetic field), safety (e.g. working in height, working under high voltage conditions) and environmental issues (e.g. preserving areas of ecological value). Such a department should also deal with social issues and will be responsible for monitoring during operation phase.

442. The PIC will assist the PMO in designing and implementing the capacity building program and conducting trainings to enhance the EMP implementation capacities.

443. On the local administration level there is a need to review capacities of local administration staff to handle public consultation, expropriation, compensations, dealing with complaints (GRM).

444. In general, the EHS staff of DABS will be trained on-the-job on how to implement the EMP during mitigation and monitoring actions performed by internationally experienced experts.

445. Training on how to use an EMF meter and how to interpret the results will also be given to DABS staff.

446. One of the main needs during implementation of the Project regarding environmental aspects is the monitoring of the implementation of all requirements stipulated in the EMP.

447. Trainings should focus on the application of ADB Safeguard Policy and monitoring procedures.

12.7 National Electric Networks of Uzbekistan (NENU)

448. NENU will be responsible for the maintenance and construction supervision of expansion of Surkhan substation (in Uzbekistan) and 45 km transmission line connecting Surkhan substation to the Uzbekistan-Afghanistan border is considered as an associated facility to this project.

449. The NENU will be responsible for the overall technical supervision and execution of expansion of Surkhan substation and 45 km transmission line in Uzbekistan.

450. Furthermore, the construction works implemented as within associated facilities, Corrective Actions were developed within Due Diligence process. NENU would be required to implement the Corrective Action Plan in order to comply with ADB SPS (2009) requirements.

13. OVERALL FINDINGS AND RECOMMENDATIONS

451. In summary, the results of the investigation demonstrate that the Project will have site-specific impacts on the environment if the proposed updated EMP is implemented and all proposed mitigation measures are considered. Some medium impacts remain regarding the line routing and substations (design phase), land acquisition and land use, involuntary resettlement and vulnerable people during construction (see separate LARP document), as well as visual impacts and natural disasters during operation.

452. Careful line routing during the final design helped to minimize resettlement needs. Involuntary displacement and relocation was mitigated to an absolute minimum. As the priority to avoid involuntary displacement is respected by the construction contractor and bypasses are carefully designed, involuntary displacement was avoided at maximum.

453. There has been no significant impact on physical cultural resources (historical and cultural sites), however, it can be further verified during construction as per chance finding procedure. Especially, the construction of access roads and the final location of towers have to be taken very carefully to avoid any sensitive historical and cultural area and making future excavation activities possible. In case of chance finds of historical art effects the construction process has to be stopped immediately and the local representative of the Ministry of Culture has to be contacted.

454. The proposed transmission line including the suggested bypasses will not cross Protected Areas. At river crossings special care must be exercised in order to avoid water pollution and riverbank erosion as the TL is Crossing River at several points. In this crossing section protection measures, in addition to bird diverters, electrocution protection, and power lines in one level shall be implemented too. It shall also be considering the possibility for a deviation of the line routing during the detailed engineering phase.

455. DAB Environmental in consultation with Project Implementation Consultant (PIC) will supervise and monitor the overall design and construction phase. The duty of such supervision and monitoring shall be to ensure that the requirements stipulated in the Environmental Management Plan (EMP) are fulfilled. Focus shall be put on:

- Avoidance of houses in the ROW to minimize resettlement, if possible to zero;
- Avoidance of historical and cultural sites;
- Avoidance of ecological sensitive areas.

456. These extensive supervision activities are necessary and will be done by PIC throughout the project design and construction phase. The determination of the details is shifted to the construction contractor and could therefore not be covered by this study.

457. In cooperation with the ADB and the design monitoring experts, DABS will give the direction to redesign sections that have been identified within the IEE or are identified during the course of the design process.

458. Detailed baseline surveys for (noise, air, ecology, social etc.) will be carried during detailed design stage to update this IEE study. Also, pubic consultations will again be conducted with the findings provided in the revised IEE study.

14. CONCLUSION

459. The impact mitigation measures are proposed to minimize social and environmental impacts. If all proposed mitigation measures of site specific EMP are implemented, the Transmission Line of 500 kV can be constructed with a minimum of adverse effects on the natural and human environment.

460. It is concluded the that careful design of the transmission line route will help to minimize the major resettlement issues and damage to cultural structures/spaces (if any). Furthermore, if all the proposed mitigation measures will be implemented, the project can be constructed with minimal / negligible adverse environmental impacts.

461. For construction works implemented as within associated facilities, Corrective Actions were developed within Due Diligence process and were included in this IEE study. The developed Corrective Actions needs to be implemented by NENU in order to comply with ADB SPS (2009) requirements.

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16. ANNEXES

A: Annex A-1: List of direct lines, angles and crossings on the route of OHTL 500kV (The State border –Khodja-Alwan Afghanistan)

No:	Coordinate of location (WGS-84)	Angle No:	The picket of angle corner	Direction and magnitude of turn	The length of direct (m)	Location site	Crossing
1	2	3	4	6	7	8	9
1	N37°14'03.80" E67°26'49.61"	The State border	0+00,0		1441,5	Balkh Province	Amudarya river; Boundary zone of the State border; field roads
2	N37°13'18.90" E67°27'05.27"	Ang.1	14+41,5	Right 44°07'00"	2704,0		sands
3	N37°12'02.00" E67°26'13.00"	Ang.2	41+45,5	Right 37°49'54"	10933,0		sands
4	N37°09'39.52" E67°19'26.88"	Ang.3	150+78,5	Left 65°06'36"	14226,5		Sands
5	N37°07'17.37" E67°19'23.22"		194+75,0				
6	N37°01'59.53" E67°19'16.27"	Ang.4	293+05,0	Right 02°04'15"	6945,0	Balkh Province	Sands
7	N36°58'15.25" E67°19'01.25"	Ang.5	362+50,0	Left 22°12'18"	17311,0		Sands
8	N36°49'26.04" E67°22'49.55"	Ang.6	535+61,0	Left 69°45'47"	3200,0		Sand
9	N36°49'23.94" E67°24'58.74"	Ang.7	567+61,0	Right 23°27'34"	9073,5		OHTL 110 kV (SS Naibabad), sends, earth roads.
10	N36°47'21.09" E67°30'31.56"	Ang.8	658+34,5	Right 50°26'35"	1328,5		OHTL 20 kV in power-to-size ratio of 110 kV (SS Naibabad), OHTL 220 kV 2 circuits (Naibabad-Pul-e-Khumri), Asphalt road (Khayraton-Kholm), fences.
1	N36°46'39.56" E67°30'45.27"	Ang.9	671+63,0	Left 05°03'47"	5509,5	Balkh Province	Water paths, drains, earth roads.

12	N36°43'51.97" E67°32'00.77"	Ang.10	726+72,5	Left 08°39'23"	6108,5		Water paths, drains, earth roads at foothills
13	N36°40'58.30" E67°33'58.20"	Ang.11	787+81,0	Right 27°19'08"	1686,5		Mountains
14	N36°40'03.79" E67°33'59.66"	Ang.12	804+67,5	Left 33°59'19"			
					950,5		Water paths, drains, mountains.
15	N36°39'38.64" E67°34'21.70"	Ang.13	814+18,0	Right 39°23'43"			
					1232,0		Water paths, drains, mountains.
16	N36°38'58.90" E67°34'18.10"	Ang.14	826+50,0	Right 08°55'45"			

					1942,0		Balkh Province	Water paths, drains, mountains.
17	N36°37'57.72" E67°34'00.43"	Ang.15	845+92,0	Left 02°46'05"				
					578,0			Canyon «Tashkurgan», water paths, drains.
18	N36°37'39.33" E67°33'56.27"	Ang.16	851+70,0	Left 62°52'01"				
					198,0	1252,5		Mountains.
-	N36°37'35.43" E67°34'02.57"	The border between provinces	853+68,0					
					1054,5		Samangan Province	Water paths, drains, mountains.
19	N36°37'14.63" E67°34'36.25"	Ang.17	864+22,5	Right 15°32'02"				
					1263,0			Water paths, drains, mountains.
20	N36°36'41.97" E67°35'06.77"	Ang.18	876+85,5	Left 50°28'38"				
					1153,5			Water paths, drains, mountains.

21	N36°36'40.31" E67°35'53.22"	Ang.19	888+39,0	Right 14°12'53"		Samangan Province	
					1490,5		Water paths, drains, mountains.
22	N36°36'26.36" E67°36'50.67"	Ang.20	903+29,5	Right 10°51'35"			
					1743,0		Water paths, drains, mountains.
23	N36°36'00.12" E67°37'52.84"	Ang.21	920+72,5	Left 34°40'21"			
					2693,0		Water paths, drains, mountains.
24	N36°36'10.82" E67°39'40.50"	Ang.22	947+65,5	Right 19°10'52"			
					3430,5		Water paths, drains, mountains.
25	N36°35'47.33" E67°41'55.54"	Ang.23	981+96,0	Right 15°22'22"			
					4013,0		Water paths, drains, foothills.
26	N36°34'47.06" E67°44'18.68"	Ang.24	1022+09,0	Right 12°16'40"			

					3118,0	Samangan Province	Drains, earth roads.
27	N36°33'42.26" E67°45'54.87"	Ang.25	1053+27,0	Left 50°52'51"			
					245,5		OHTL 220 kV 2 circuits (Naibabad-Pul-e-Khumri).
28	N36°33'43.78" E67°46'04.56"	Ang.26	1055+72,5	Right 47°04'12"			
					4739,5		Field roads, asphalt road (Khayraton-Kholm), canals, small rivers, arable lands.
29	N36°32'13.27" E67°48'38.51"	Ang.27	1103+12,0	Left 10°50'04"			
					1008,0		Field roads, water paths, arable lands.
30	N36°31'59.31" E67°49'15.17"	Ang.28	1113+20,0	Right 49°11'17"			

					478,4		Water paths, canals, small rivers, arable lands.
31	N36°31'44.40" E67°49'20.31"	Ang.29	1117+98,4	Left 32°28'27"			
					2127,5		Field roads, small rivers, arable lands.

32	N36°30'58.27" E67°50'23.82"	Ang.30	1139+25,9	Left 01°33'44"		Samangan Province	
					2799,5		Field roads, small rivers, drains, water paths, arable lands.
33	N36°29'59.40" E67°51'49.40"	Ang.31	1167+25,4	Right 17°36'46"			
					1725,5		Water paths, drains, earth roads.
34	N36°29'12.00" E67°52'26.00"	Ang.32	1184+50,9	Left 12°25'20"			
					1636,0		Earth roads, drains.
35	N36°28'34.10" E67°53'11.89"	Ang.33	1200+86,9	Left 34°51'46"			
					3060,0		Earth and field roads, canals, small rivers, arable lands.
36	N36°28'15.49" E67°55'12.75"	Ang.34	1231+46,9	Right 56°21'30"			
					6159,5		Earth and field roads, drains, water paths, arable lands.
37	N36°25'11.78" E67°56'48.47"	Ang.35	1293+06,4	Left 09°06'32"			

38	N36°22'29.84" E67°57'37.33"	Ang.36	1344+59,4	Left 11°00'03"	5153,0	Samangan Province	Water paths, drains.
39	N36°19'29.69" E67°59'19.74"	Ang.37	1405+86,4	Left 31°50'47"	6127,0		Water paths, drains.
40	N36°18'30.79" E68°01'09.80"	Ang.38	1438+78,4	Left 27°15'33"	3292,0		Water paths, drains.
41	N36°18'28.55" E68°01'35.16"	Ang.39	1445+14,4	Right 20°03'40"	636,0		Water path, field roads.

						Samangan Province	
							.
45	N36°12'51.69" E68°09'23.42"	Ang.43	1606+36,9	Left 21°42'54"	13004,0		Water path, drains, earth roads, arable lands
46	N36°11'35.35" E68°17'55.91"	Ang.44	1736+40,9	Left 21°32'27"	3082,0		Water path, drains.
47	N36°11'54.57" E68°19'57.06"	Ang.45	1767+22,9	Right 32°07'05"	6653,0		Water path, drains.
48	N36°10'36.91" E68°24'05.67"	Ang.46	1833+75,9	Left 31°20'50"	3110,0		Water path, drains.
					2153,5		Water path, drains.
42	N36°17'57.59" E68°02'52.56"	Ang.40	1466+67,9	Right 19°00'37"	1425,0		Water path, drains.
43	N36°17'24.75" E68°03'32.68"	Ang.41	1480+92,9	Right 15°44'57"	5131,0		Water path, drains.
44	N36°14'59.36" E68°05'11.88"	Ang.42	1532+23,9	Left 29°02'31"	7413,0		Water path, drains

49	N36°10'54.87" E68°26'08.27"	Ang.47	1864+85,9	Right 43°58'00"	9033,0		Water path, drains.
50	N36°08'12.05" E68°31'08.66"	Ang.48	1955+18,9	Right 19°59'58"	1863,0		Water path, drains, fences, arable lands.
51	N36°07'23.37" E68°31'52.60"	Ang.49	1973+81,9	Right 59°22'39"	503,5		OHTL 220 kV 2 circuits (Naibabad-Pul-e-Khumri), Asphalt

							road (Khayraton-Kholm), water path, arable lands.
52	N36°07'08.43" E68°31'44.72"	Ang.50	1978+85,4	Left 49°08'38"	864,0		Arable lands.
-	N36°06'43.27" E68°31'59.80"	The border between provinces	1987+49,4		1708,0		
53	N36°05'53.59" E68°32'29.65"	Ang.51	2004+57,4	180°00'00"	2572,0	Baghlan Province	Drains, fences, earth roads.

Annex A-2

Integrated Biodiversity Assessment Tool

WORLD BANK GROUP BIODIVERSITY RISK SCREEN

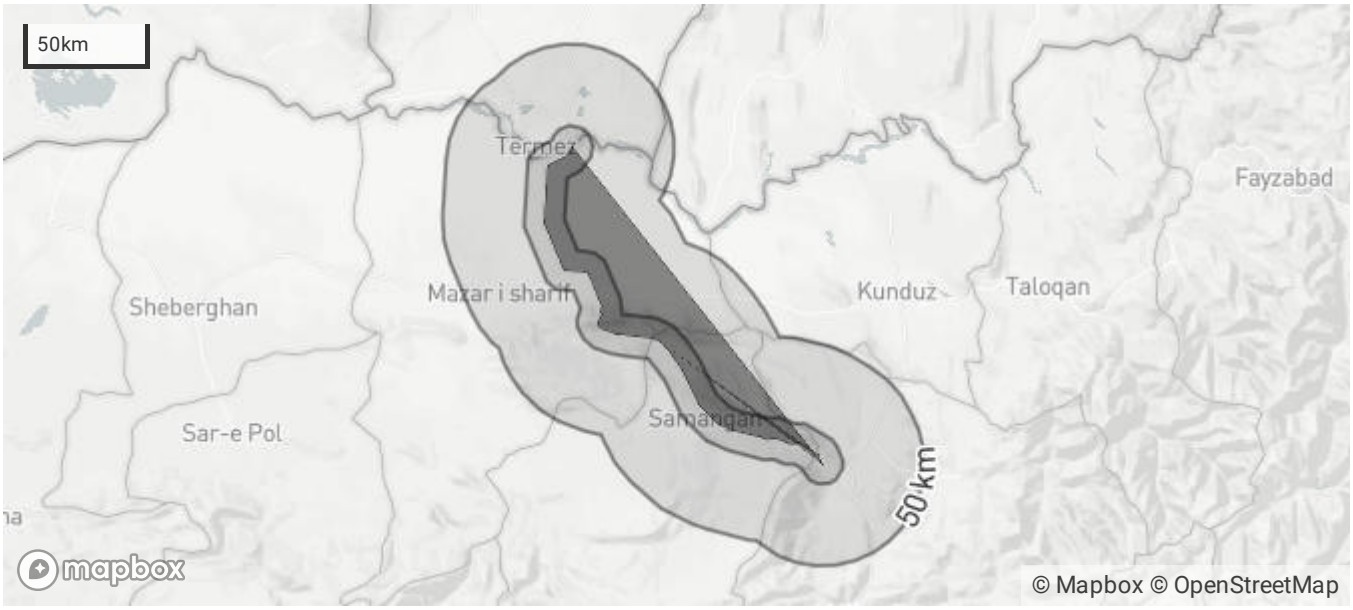
Report generated on 29/08/2019 by Stephanie Sioson under the license number 956-3729 held by ADB. www.ibat-alliance.org

Project Name: AFG Transmission

Location: [36.5, 67.9]

Overlaps with:

Protected Areas	1
Key Biodiversity Areas	2
IUCN Red List	7
Critical Habitat	Likely



Displaying project location and buffers: 10km, 50km

WORLD BANK GROUP

This report is based on IFC Performance Standard 6 (PS6) but applies to World Bank Environmental and Social Standard 6 (ESS6)

About this report

IBAT provides initial screening for critical habitat values. Performance Standard 6 (PS6) defines these values for critical habitat (PS6: para. 16) and legally protected and internationally recognized areas (PS6: para. 20). PS6 will be triggered when IFC client activities are located in modified habitats containing "significant biodiversity value," natural habitats, critical habitats, legally protected areas, or areas that are internationally recognized for biodiversity. References to PS6 and Guidance Note 6 (GN6) are provided to guide further assessment and detailed definitions where necessary. Please see https://www.ifc.org/ps6 for full details on PS6 and GN6.

The report screens for known risks within a standard 50km buffer of the coordinates used for analysis. This buffer is not intended to indicate the area of impact. The report can be used to:

- Scope risks to include within an assessment of risks and impacts
- Identify gaps within an existing assessment of risks and impacts
- Prioritize between sites in a portfolio for further assessment of risks and impacts
- Inform a preliminary determination of critical habitat
- Assess the need for engaging a biodiversity specialist
- Identify additional conservation experts or organizations to inform further assessment or planning

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment as described in PS6 and GN6. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Legal disclaimer

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Priority Species

Habitat of significant importance to priority species will trigger critical habitat status (See PS6: para 16). IBAT provides a preliminary list of priority species that could occur within the 50km buffer. This list is drawn from the IUCN Red List of Threatened Species (IUCN RL). This list should be used to guide any further assessment, with the aim of confirming knownor likely occurrence of these species within the project area. It is also possible that further assessment may confirm occurrence of additional priority species not listed here. It is strongly encouraged that any new species information collected by the project be shared with species experts and/or IUCN wherever possible in order to improve IUCN datasets.

IUCN Red List of Threatened Species - CR & EN

The following species are potentially found within 50km of the area of interest.
For the full IUCN Red List please refer to the associated csv in the report folder.

Species name	Common name	IUCN Category	Group
Vanellus gregarius	Sociable Lapwing	CR	AVES
Alsophylax tadjikiensis	Tadjikistan Even-fingered Gecko	CR	REPTILIA
Oxyura leucocephala	White-headed Duck	EN	AVES
Haliaeetus leucoryphus	Pallas's Fish-eagle	EN	AVES
Neophron percnopterus	Egyptian Vulture	EN	AVES
Aquila nipalensis	Steppe Eagle	EN	AVES
Falco cherrug	Saker Falcon	EN	AVES

Restricted Range Species

	Common name	IUCN Category	Group

Biodiversity features which are likely to trigger Critical Habitat

Protected Areas

The following protected areas are found within 10km and 50km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance	Recommendation
Surkhanskiy	50km	Assess for critical habitat

Key Biodiversity Areas

The following key biodiversity areas are found within 10km and 50km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance	Recommendation
Aktepe Reservoir and Three Lakes	50km	Assess for critical habitat
Amudarya floodlands near Termez	50km	Assess for critical habitat

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
AVES	269	15	1	5	9	11	243	0
REPTILIA	24	1	1	0	0	0	23	0
ACTINOPTERYGII	11	3	0	0	3	0	7	1
MAMMALIA	78	4	0	0	4	3	69	2

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
AGARICOMYCETES	1	1	0	0	1	0	0	0
MALACOSTRACA	6	0	0	0	0	1	5	0
INSECTA	10	0	0	0	0	0	10	0
MAGNOLIOPSIDA	14	0	0	0	0	0	11	3
BIVALVIA	3	0	0	0	0	0	2	1
GASTROPODA	13	0	0	0	0	0	8	5
LILIOPSIDA	33	0	0	0	0	0	32	1

Country-level summary

Coming soon

Recommended Experts and Organizations

For projects located in critical habitat, clients must ensure that external experts with regional expertise are involved in further assessment (GN6: GN22). Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes, especially with respect to potential developments in natural or critical habitat (GN6: GN23). Where critical habitats are triggered by priority species, species specialists must be involved. IBAT provides data originally collected by a large network of national partners, while species information is sourced via the IUCN Red List and affiliated Species Specialist Groups. These experts and organizations are listed below. **Please note that this is not intended as a comprehensive list of organizations and experts. These organizations and experts are under no obligation to support any further assessment and do so entirely at their discretion and under their terms. Any views expressed or recommendations made by these stakeholders should not be attributed to the IFC or IBAT for IFC partners.**

Relevant national or regional organizations

IBAT integrates information developed by a global network of conservation agencies, organizations and experts. These efforts are coordinated by the IBAT Alliance (BirdLife International, Conservation International, IUCN and UNEP-WCMC) who compile and maintain this information as globally standardized databases. The local partners most relevant to the area of analysis are:

Wild Bird Society of Japan Address: Maruwa Building, 3-9-23 Nishi-Gotanda, Shinagawa-ku, Tokyo 141-0031, JapanWeb: http://www.wbsj.org/

BirdLife Asia Regional Office Address: 354 Tanglin Road, #01-16/17, Tanglin International Centre, Singapore 247672 Email: singapore.office@birdlife.org Web: http://www.birdlife.org/asia

Directory for Species Survival Commission (SSC) Specialist Groups and Red List Authorities

URL: http://www.iucn.org/about/work/programmes/species/who_we_are/ssc_specialist_groups_and_red_list_authorities_directory/