FINAL ENVIRONMENTAL AND SOCIAL ASSESSMENT(ESA) REPORT

CROSS BORDER ENERGY SHUGNAN VI PROJECT (PHASE II)

September 2024

1. Revision Chronology of Environmental and Social Assessment (ESA) report

Date	Update No	Changes made	Approved
February, 2019	Final version- Jan-2019		By PATRIP
April, 2021	2nd edition	The updated report includes dismantling the existing 35 kV Porshinev-Buni line.	By PATRIP
December,2022	3rd edition	Report updated to reflect new scope of Construction of 9 km of 110kV transmission line with fiber-optic cable installation from Pastbaju village to Vamar town, Rushan District, GBAO, Tajikistan.	By PATRIP
October,2023	4th edition	The report has updated to reflect new scope of work: upgrade remaining 8.7km of the Buni-Vomar 35kV transmission network to 110kV capacity.	By PATRIP
September,2024	5th edition	The report update reflects a route change that upgrades the remaining 8.7km of the Buni-Vomar 35kV transmission network to 110kV capacity, incorporating the new proposed design.	Under review

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Abbreviations and Acronyms	
CEP	Committee for Environmental Protection
DEP	Department on Environmental Protection
EE	Ecological Expertise
EA	Environmental Assessment
EHS	Environmental, Social, Health and Safety
E&S	Environmental and Social
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental & Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMMP	Environmental and Social Management and Monitoring Plan/Program
FI	Financial Institution
GBAO	Gorno-Badakhshan Autonomous Oblast
GIIP	Good international Industry Practice
GOT	Government of Tajikistan
GRM	Grievance Redress Mechanism
HSE	Health, Safety, Environment and Social
IFC	International Finance Cooperation
IP	Indigenous Peoples
JPC	Jamoat Project Commission
M&E	Monitoring and Evaluation
NGO	Non-Governmental Organization
NSIFT	National Social Investment Fund of Tajikistan

O&M	Operations & Maintenance
PAP	Project Affected Person (or Party)
PE	Pamir Energy
RPF	Resettlement Policy Framework
RAP	Resettlement Action Plan
PCBs	Polychlorinated biphenyls (in power transformer oil)
SEE	State Ecological Expertise
WB	World Bank

1. INTRODUCTION & BACKGROUND

1.1 Project Information

Project Name: Shugnan VI (Phase II) Cross –border Energy Project

Project Locations: Republic of Tajikistan, VMKB

Implementation Partner: AKF(UK) & Pamir Energy

1.2 Background

The Shugnan VI Phase II project funded by PATRIP and the Project's overall objective is to contribute to PATRIP Foundation's vision: Promote sustainable economic development and social integration in the region, particularly benefitting youth and women The program includes several components:

Construction of 9 km of 110kV T-line including the installation of fiber-optic cables from Pastbaju village to Vamar town in Rushan District in GBAO, Tajikistan. This will improve access to power supply for 178, 750 people (27, 745 households) and 2,000 governmental and commercial entities in VMKB, Tajikistan.

Construction of additional 2,5km and 4km of 110kv transmission line in the section of Buni-Vomar as an additional stage of the project.

Upgrade of 23km Shirgovad-Zigar transmission lines from 10kV to 35kV; including installation of 35/0,4kV substations, VMKB, Tajikistan

Rehabilitation of Khorog distribution networks (includes rehabilitation of the transformers); including Myasokombinat, UPD-2, ZhBK-Botsad, Dasht, Khorog-Roshtqala and Khorog-Ishkoshim feeders, VMKB, Tajikistan.

The project implementation has been started since January 2021 and was initially supposed to be completed by December 2022. Besides of construction of the Transmission Line have been planned construction on the TL in Afgan sides. Activities on the Tajik side are being implemented as per the initial plan, however, activities on the Afghan side have been on pause since July 2021. The Afghan side of activities make up 50% of the total budget and was aimed at electrification of 13 villages in Shughnan Vulusvoli of Afghanistan. Given the uncertainty associated with resumption of any energy sector development activities in Afghanistan, Pamir Energy proposes to re-allocate the Afghan side activities to the Tajik side and extend the project duration to December 2023.

1.3 Rationale for re-allocation of activities

The following points below summarise the rationale behind reallocation of activities on the Afghan side to the Tajik side under Shughnan VI Phase II:

- Before pausing the project activities on the Afghan side on August 2021, Pamir Energy was at an

advanced stage for the procurement of equipment and materials for the Afghan side. To date, the supplier has delivered 72% of wooden poles and 100% of accessories for the construction of transmission and distribution network on Afghan side, which are being stored at the Pamir Energy warehouse. Storing electric, metallic and wooden equipment and materials for a long period of time can damage the quality and thus affect the longevity of the materials and equipment, especially since the storage does not have controlled temperature and is prone to high humidity. Therefore, the materials need to be used as soon as possible to avoid unnecessary wastage and inefficiencies.

The project's total budget will remain unchanged. All the newly proposed activities will be implemented within the already approved budget, using the already procured materials for Afghanistan activities.

In 2021, Pamir Energy had announced a tender for construction on the Afghan side and had subsequently identified two potential contractors and proposed to PATRIP. As both bidders are Tajik companies, Pamir Energy propose to sign an agreement with the same companies to perform the work in Tajik side, as the nature of the work also involves the construction of transmission and distribution lines. The construction work' procurement strategy as suggested by PE is dictated by necessity to commence and complete the proposed project by December 2023, to remain within the budget given that the unit prices of the works obtained during the tender for Afghanistan are very much the same as in Tajikistan in reliance to comparison with other tender results held by PE (SECO, UNDP, WB and PE financed projects) on the Tajik side for the last 3 months. The only difference from tender for Afghanistan results is transportation cost which PE adopted following the known rates. If this was deemed a reasonable and feasible option for the PATRIP Foundation, this course of action would save a considerable amount of time and accelerate and enable swift implementation of activities.

- In proposing interventions for reallocation of activities on the Tajik side, Pamir Energy has been prioritizing options that would build on past PATRIP-funded projects in the region which include: Darvaz I (2013), Rushan I (2018), and Shughnan VI, Phase I (2020) projects, where PE renewed transmission and distribution lines along the border to reduce technical losses and increase the quality and capacity of available electricity. Therefore, Pamir Energy is prioritizing the rehabilitation of most dire sections of transmission and distribution networks in Khorog town and surrounding areas and in some parts of Darvaz district. Thus, reallocation of activities towards Tajik side will synergize with the previous PATRIP funded projects as well as complement the construction of the 11MW Sebzor HPP to improve transmission of green energy from PE main grid to its beneficiaries

- Finally, the reallocated activities toward Tajik side are fully aligned with PATRIP's priorities, as this will improve energy supply, create employment for locals and will serve as a a mitigating force to the current socio-economic crisis in Viloyati Mukhtori Kuhistoni Badakhshon (VMKB) that occurred as a result of recent conflicts (November 2021 and May 2022) in the region, impact of COVID-19 and Russian-Ukraine war that left majority of migrants unemployed and dramatically lowered the flow of remittances to the region which is considered the main source of income for many families.

Another additional proposal under the Shugnan VI (phase II) project upgrades the remaining 8.7km of the 35kV transmission network between Buni and Vomar to 110kV capacity.

With the support of the PATRIP Foundation and other development partners, PE was able to upgrade the voltage of a significant part of its transmission network between its key generating units and main load centers, from 35kV to 110kV. Through Shugnan VI Phase I and II, PE has in total been able to upgrade 43,5 km transmission network to 110kV capacity between Khorog-Bizmich-Porshinev-Buni-Vomar. These upgrades have increased the overall efficiency of PE's network and improved power provision to the population. There remains 8.7km of the 35kV transmission network between Buni and Vomar which has not yet been upgraded to 110kV capacity.

The design proposed earlier has been revised, which is the focus of the 5th edition of the report. The main reason for changing the route of the transmission line and the placement of the towers is the construction of a new highway between the Buni and Sokhcharv sections. This initiative was led by Pamir Energy in consultation with the highway authority. To ensure safety, the towers must be installed at a safe distance from the planned highway. As a result of the new design, 14 towers will be relocated due to the road construction. The original plan involved using the existing 35 kV transmission line route, which crosses agricultural land in some areas as well as wetlands. However, the new design, prompted by the public road construction, offers a more positive environmental and social impact, enhancing community health and safety. Relocating the 14 towers away from agricultural land will minimize environmental and social effects in the following ways:

It will mitigate the impact on agricultural land and the livelihoods of the community.

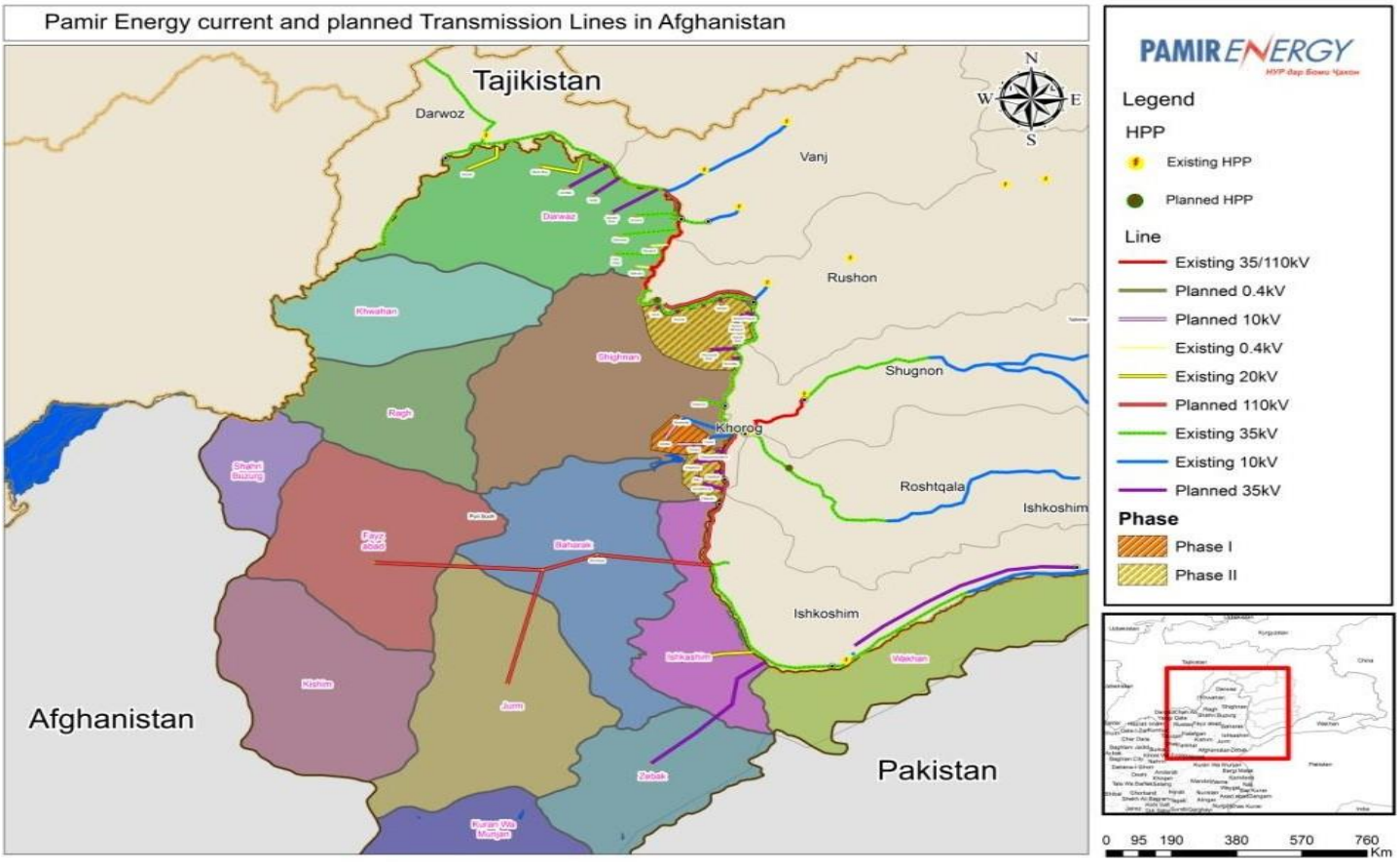
The project will avoid installing towers in graveyards.

The new design places the transmission line farther from residential areas, reducing health risks associated with electromagnetic fields (EMFs), which are a form of radiation.

1.4 Projects Details:

As part of the project's first phase, with the financial support of the GFFO (via PATRIP Foundation), PE is constructing a 6.5 km and 19.6km section of 110kV double circuit transmission line from Porshinev to Buni and from Khorog to Bizmich of Viloyati Mukhtori Kuhistoni Badakhshon (VMKB), Tajikistan.

Figure 1 Pamir Energy current and planned transmission lines in Tajikistan (source: Digital Transformation, DRR and GIS Unit, Pamir Energy)



Pamir Energy's existing facilities (storage) will be used for material storage and if necessary to accommodate small number of workers during construction phase. In agreement with PATRIP Foundation, as an additional stage of the project, Pamir Energy will construct additional 2,5km and 4km of 110kv transmission line in the section of Buni-Vomar per the below map.

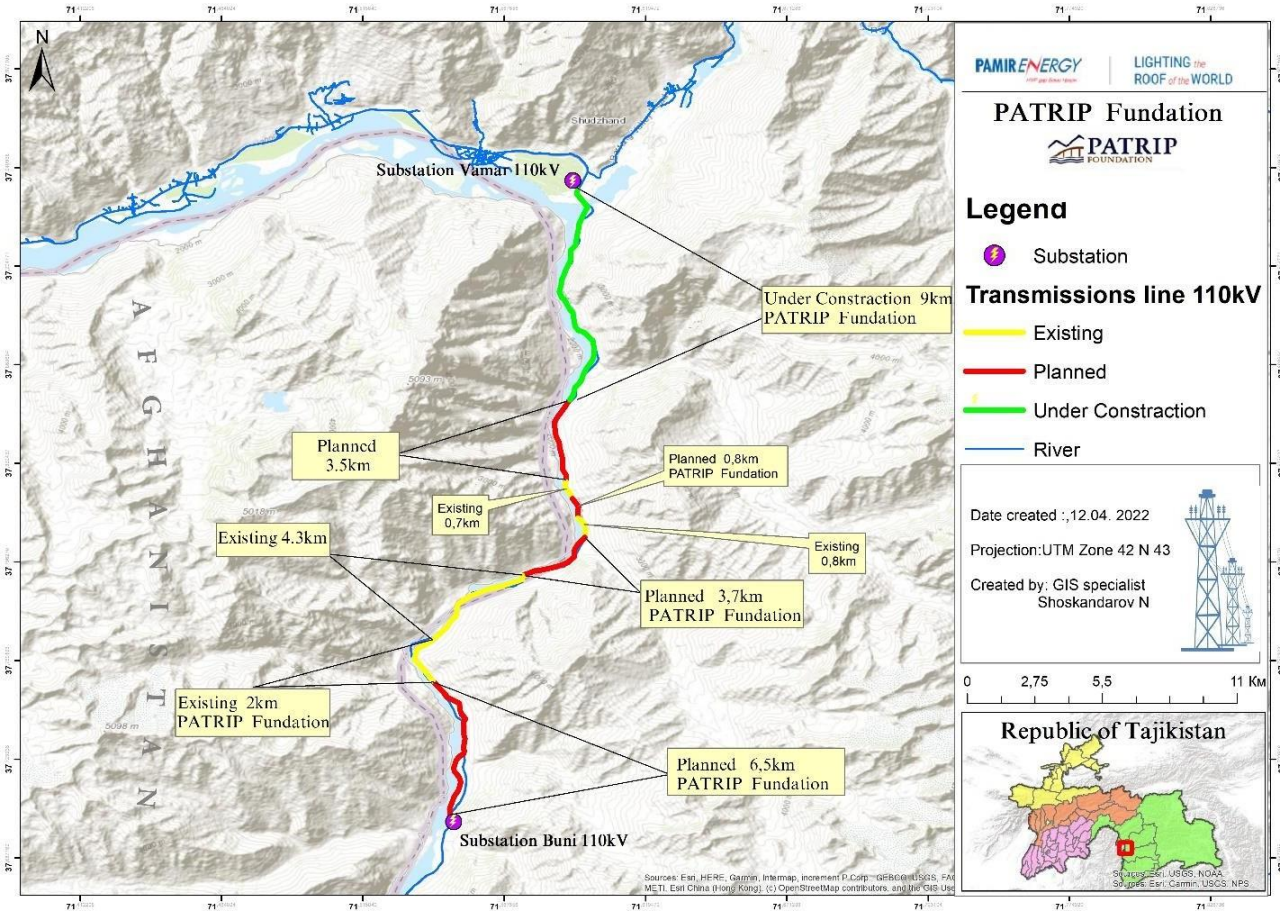


Figure 2 Construction of additional 2.5 and 4km transmission lines in the section Buni-Vomar

In total, 25 metallic towers will be located in the additional sections.

The additional activities PE with Phase II is to rehabilitate the existing Distribution Network (DN) and Transmission Line (TL) that already have design. The reasons for rehabilitating the existing DN and TL is because, they haebeen constructed during the early Soviet period, are in operation for more than 45 years, whereas their life expectancy is 25 years, and are in very poor condition. Moreover, the DN in target areas is still on bare wire subject to significant commercial losses and technical losses (wind, rain, snowfall) interrupting operation of the system. The DN and TL need to be replaced with ABC cable to reduce technical losses, be more resilient and also has friendlier operation from the health and safety perspective.

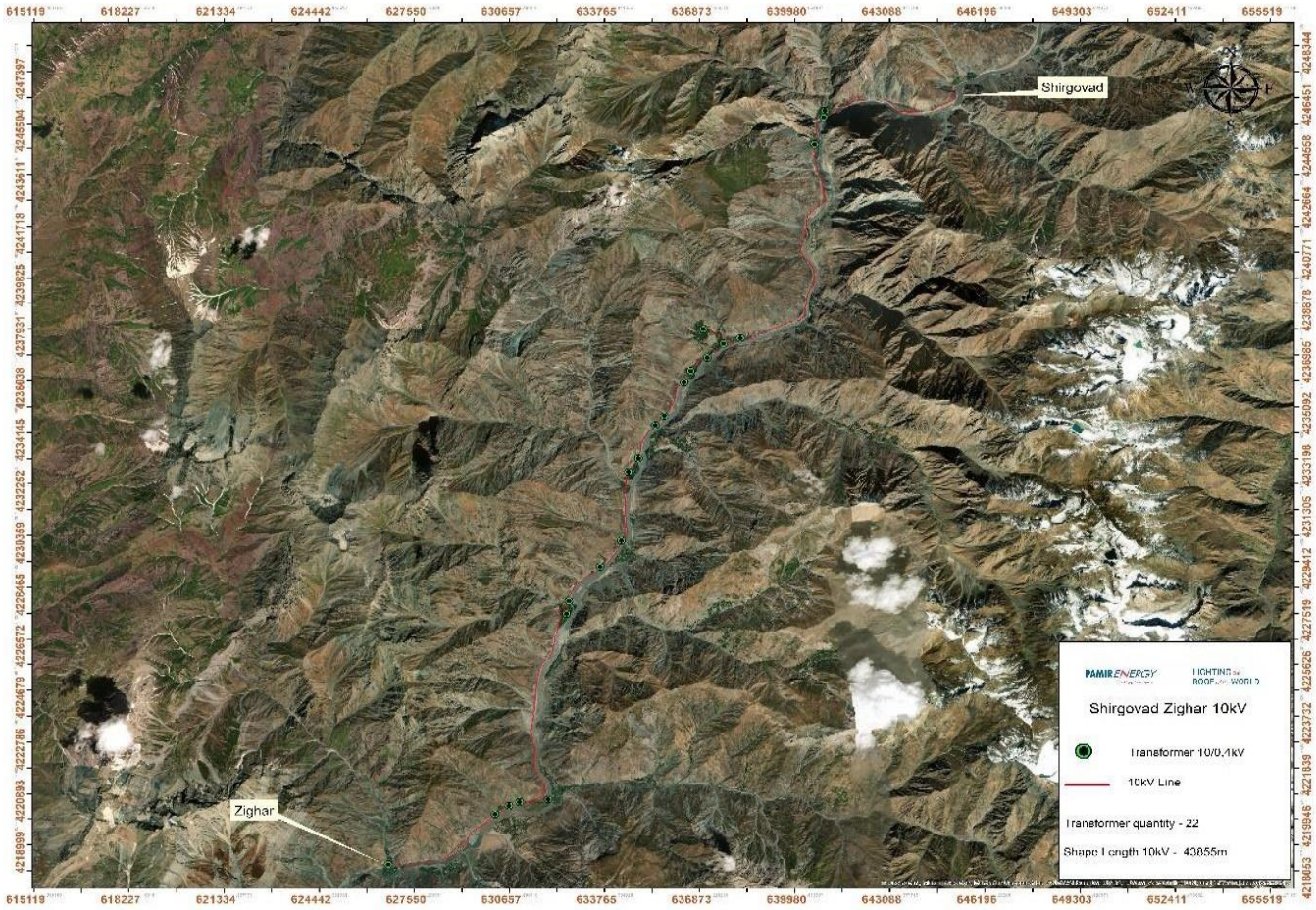


Figure 3 Route of planned for upgrading the existing 23km Shirgovad-Zigar transmission lines from 10kV to 35kV; including installation of 35/0,4kV substations.

Feeder Myasokombinat:

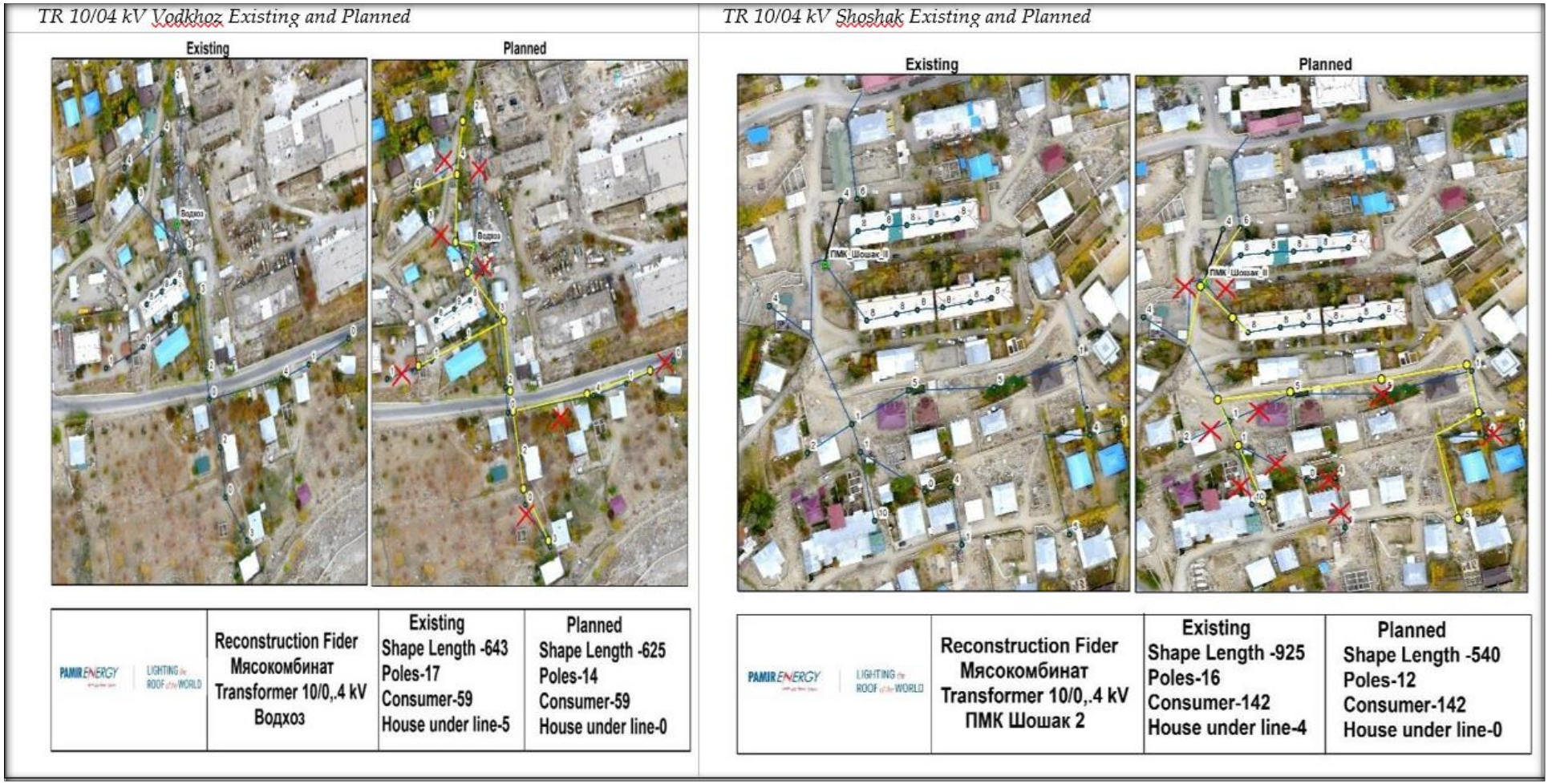


Figure 4 Location of transformers, showing the existing condition and planned

TR·10/04·kV·RP-PЦTA_Existing·and·Planned¤

Existing

Planned

PAMIR ENERGY LIGHTING the ROOF of the WORLD	Reconstruction Fider RP Tranformer 10/0.4 kV RP-РЦТА	Existing Shape Length -1798 Poles-52 Consumer-109 House under line-6	Planned Shape Length -1479 Poles-41 Consumer-109 House under line-0

TR·10/04·kV·Universam_Existing·and·Planned¤

Existing

Planned

PAMIR ENERGY LIGHTING the ROOF of the WORLD Create by GIS specialist Saidmamadov M	Reconstruction Fider Мясокомбинат Transformer 10/0,.4 kV Универсам	Existing Shape Length -1669 Poles-45 Consumer-156 House under line-7	Planned Shape Length -1248 Poles-39 Consumer-156 House under line-1

Feeder UPD 2

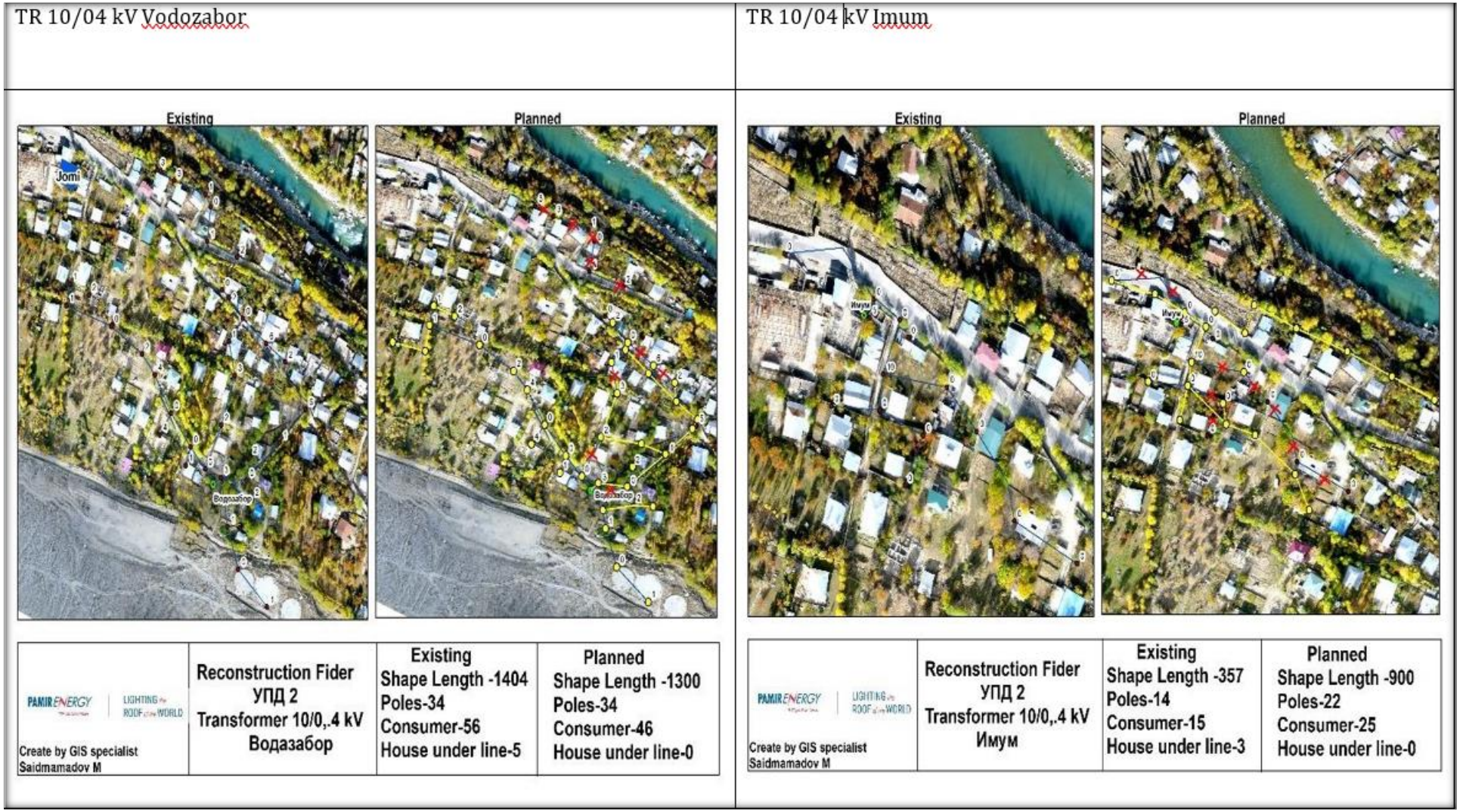


Figure 5 Location of transformers, showing the existing condition and planned

TR 10/04 kV Maydoni Mashq

Existing

Planned

PAMIR ENERGY | LIGHTING the ROOF of the WORLD Create by GIS specialist Saidmamadov M	Reconstruction Fider УПД_2 Transformer 10/0,.4 kV Майдони машки 2	Existing Shape Length -1110 Poles-34 Consumer-64 House under line-4	Planned Shape Length -1100 Poles-33 Consumer-64 House under line-0

Feeder Dasht

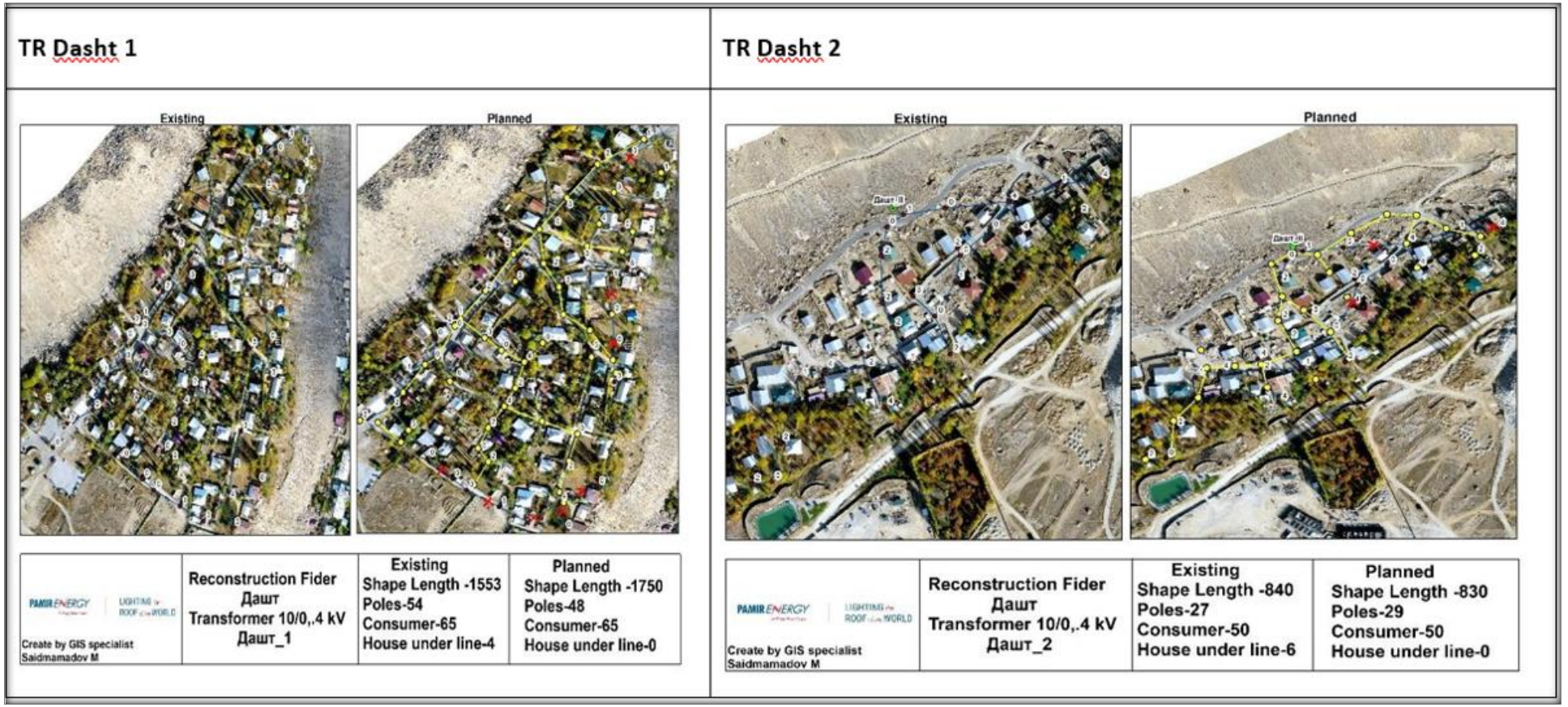


Figure 6 Location of transformers, showing the existing condition and planned

Provided maps showing the existing location of transformers, towers and route of lines. The planned design is also shown. In the current situation, the lines pass through gardens and also cross residential buildings, which is not safe for people's lives, as well as power losses and the risk of cutting down trees. With the planned disagn, all existing risks and problems have been taken into account and it is planned to move the lines from the transformers, and thus achievea reliable and safe supply of electricity, and also avoid cutting down trees.

No additional facilities neither temporary not permanent will be required.

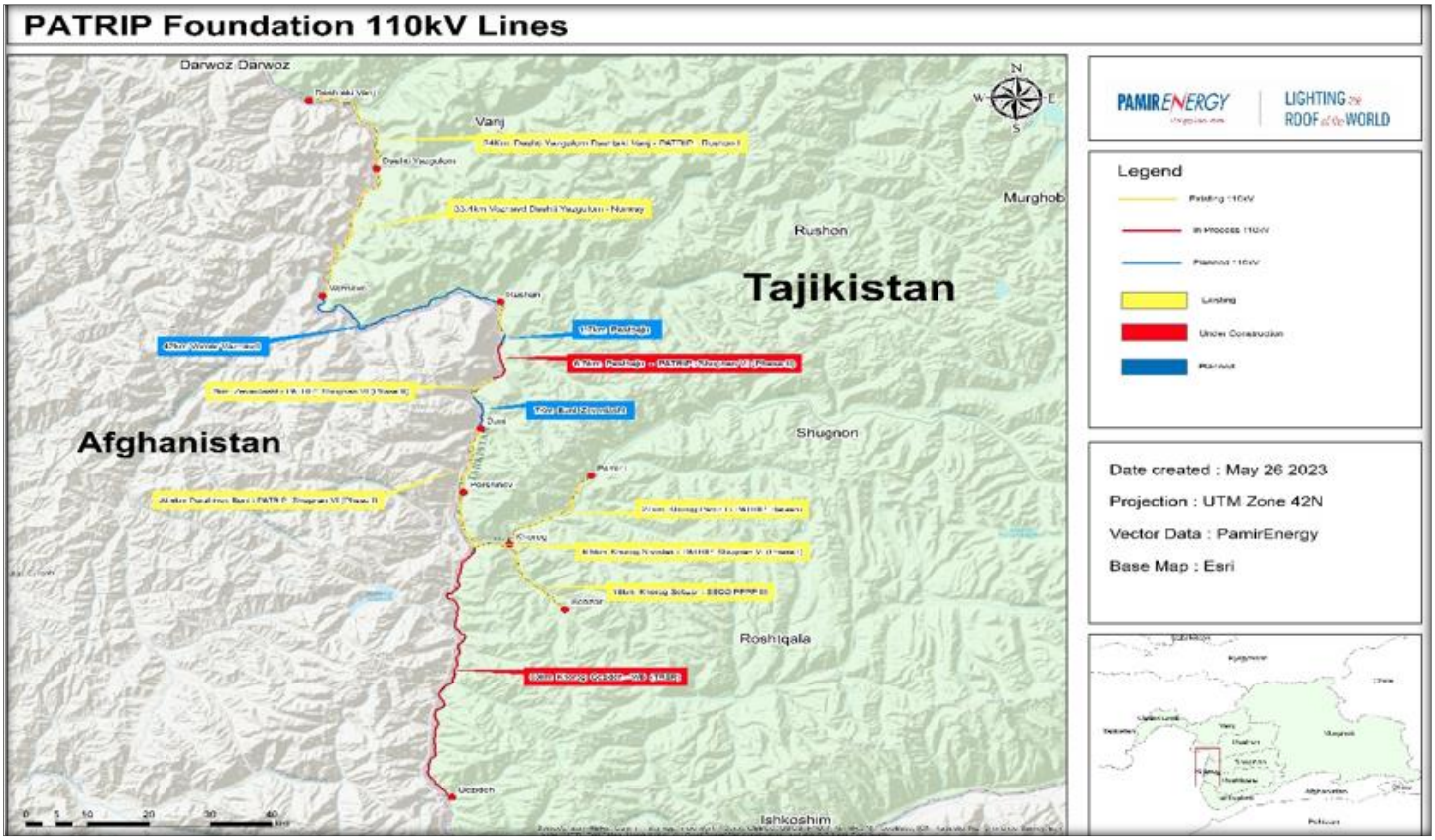


Figure 7 Route of planned the remains 8.7km to upgrade the 35kV transmission network between Buni and Vomar to 110kV capacity

(source: Digital Transformation, DRR and GIS Unit, Pamir Energy)

The provided maps illustrate the current location of transmission lines alongside the planned construction of new ones. The upgrade plan includes a 1.7 km section in the Pastbaju-Pastkhuf area of Rushan District and a 7 km segment in the Buni-Chokhkandez area of Shugnan District. In total, the transmission line to be upgraded spans 8.7 km in the Buni-Vomar route, which will necessitate the installation of 40 metallic towers.

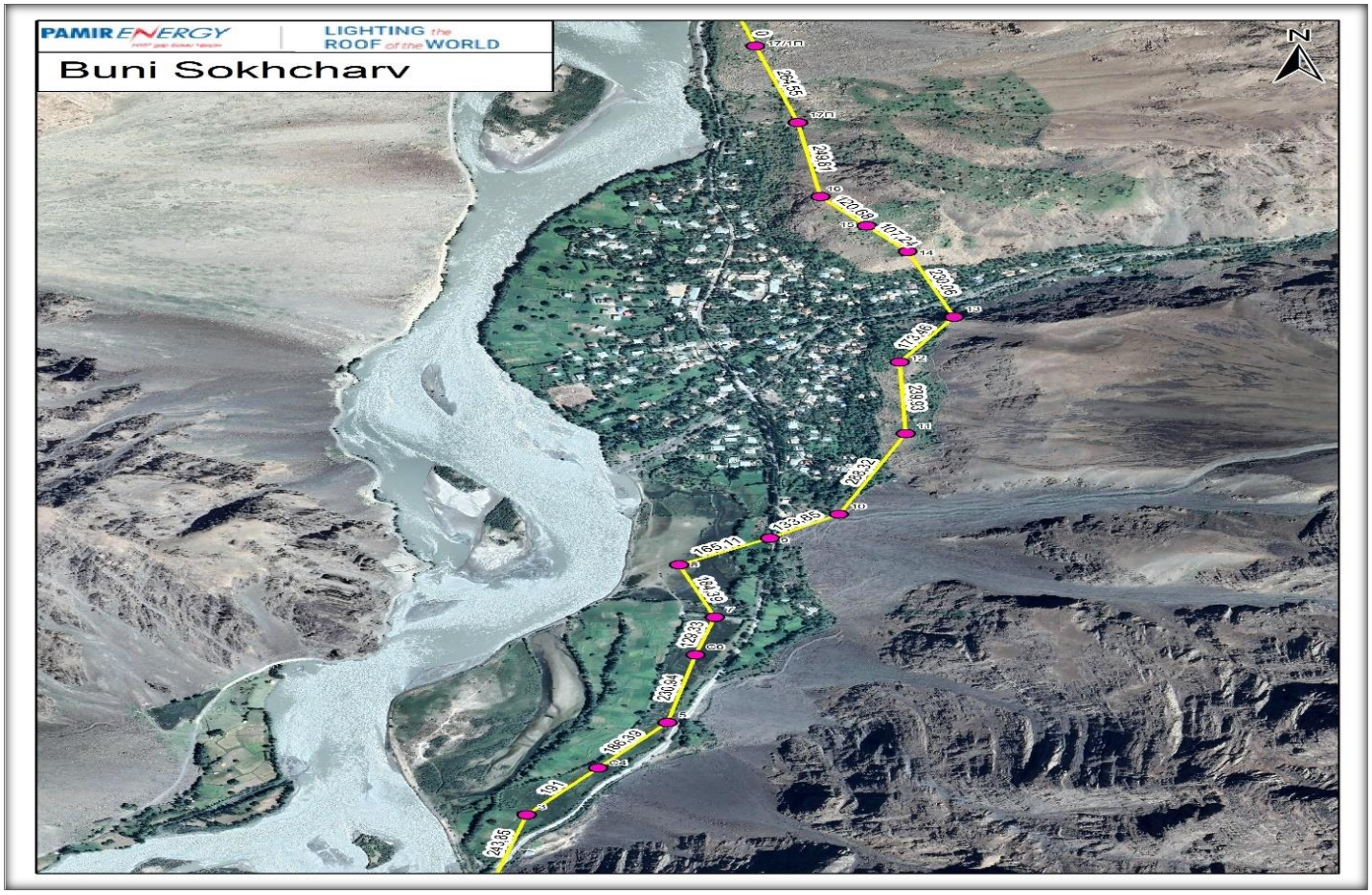


Figure 8 The new route of constraction 7 km of 110 kV Transmission Line network between Buni and Vomar

(source: Digital Transformation, DRR and GIS Unit, Pamir Energy)

With the new design proposal, the locations of 13 towers have been modified. Previously, most were positioned in agricultural land; currently, only 1 tower remains in that area, while 26 towers will be installed on barren land and pasture lands (see below provided figure 8, the new route of the TL)

This project may impact only 68,9 m² (0,0069 hectares) of agricultural land. Detailed information regarding the type and location of the towers can be found in Table 8.

AKF (UK) will be the main donor focal point and provide oversight and support on grants management and procurement processes and challenges. Pamir Energy will be responsible for the direct implementation of all project activities.

GFFO (source of financing) through PATRIP (technical assistance from GFC consultants).

.The following documents were already obtained for the project:

- Tender announcement for supply of equipment and materials for construction of 1) 35kV interconnectiongoods, 2) 35kV transmission line

- Allocating of land plot for construction of transmission line- **Received Resolution of Rushan district 16.12.2020**
- Allocating of land plot for construction distribution points 35 kV- **Received Resolution of Shugnan district17.12.2020**
- Allocating of land plot for construction of 110 kV transmission line (Buni-Vamar)-in Pastbaju and Pastkhuf villages- **Received Resolution of Rushan district 3.04.2020**
- Allocating of land plot for construction of 110 kV transmission line (Buni-Vamar) in Buni,Sokhcharv,Chokhkandez, Zevardasht villages - **Received Resolution of Shugnan district 2.04.202**

Table 1 Permitting Obligations Associated with this Project

Document	Status	Actions
Ecological decision of the statecommission/expertise	In process (23 April 2021)	Request from Committee of Environment Protection (CEP)
Land acquisition	Obtained	Request from Committee of land management
Waste management permit	Will be obtained during the construction	Request from CEP
Tree-cutting	Will be obtained during the construction	Request from CEP

E&S Assessment prepared by: Asligul Mamadatoeva, PE's Social & Environmental Expert.

1.5 Project Description

Pamir Energy designed and route the transmission and distribution lines in a way that it will notresult in any displacement both physical (relocation or loss of shelter) and economic displacement (loss of assets or access to assets that leads to loss of income sources or means of livelihood). However, when towers are built on agricultural or other productive lands, Pamir Energy in collaboration with local authorities, following the county legislation, prepares the land donation document(Appendix 2, Requirement for Land Donation). Pamir Energy will ensure completion of the voluntary land transaction in written consent. The donation will be verified by two witnesses who are community leaders but not beneficiaries of the subproject, to ensure that the land was voluntarily donated without any form of duress. The signed waivers will be submitted to PATRIP and verified by the Bank in order to ensure that the voluntary land donation has been conducted in accordance with the above criteria.

In total, 27 metallic towers (110 kV) will be installed for distribution purposes, nine of which canbe located in agricultural land, two in pasture land. Near the river band will be installed nine towers and 5 towers in the barren land. The total square of agricultural land that can be impactedby the project is almost 407.5 m^2. The detailed information with the type and location of the towers is provided in table 2.

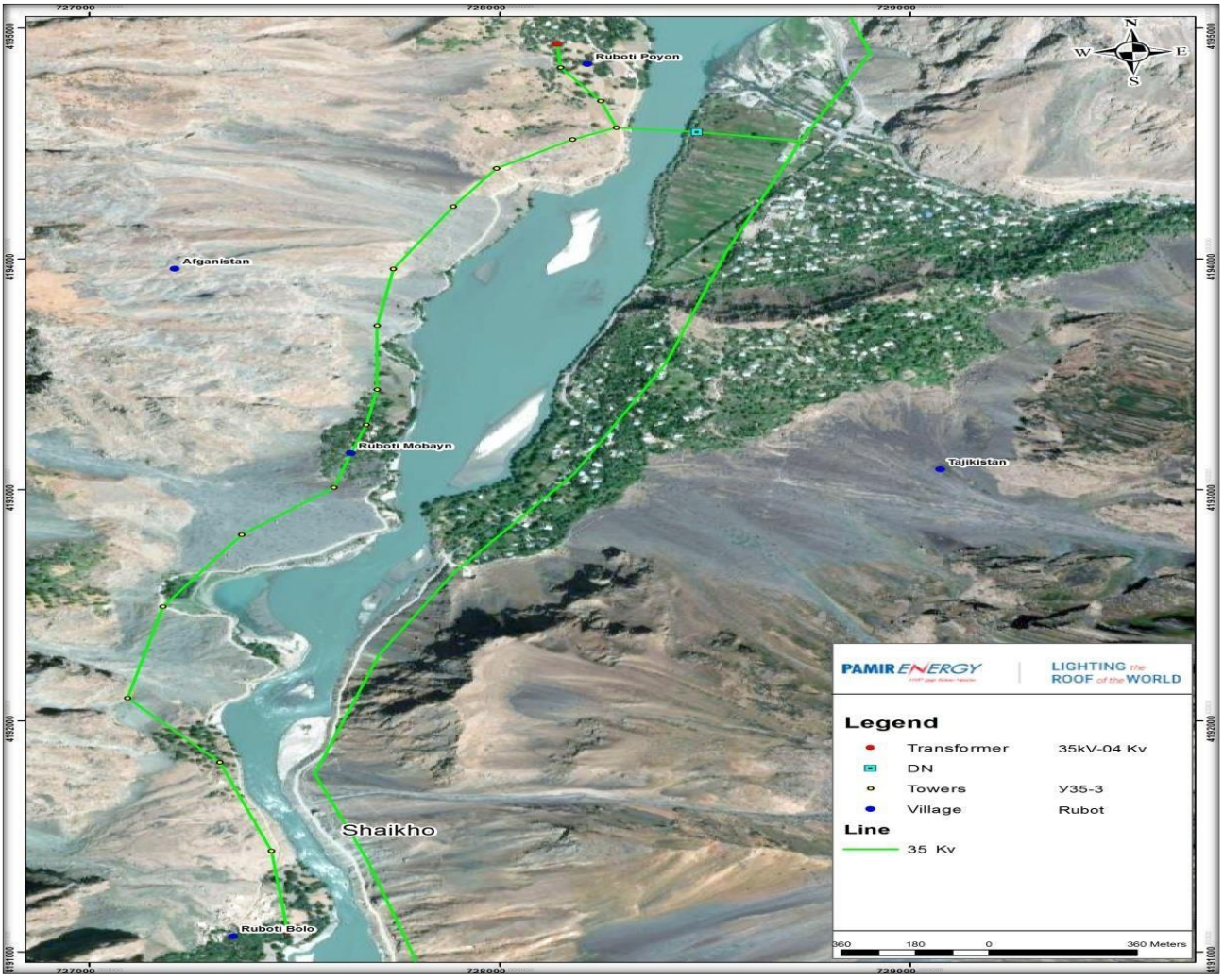
In total, 27 metallic towers (110 kV) will be installed for distribution purposes, nine of which canbe located in agricultural land, two in pasture land. Near the river band will be installed nine towers and 5 towers in the barren land. The total square of agricultural land that can be impactedby the project is almost 407.5 m^2. The detailed information with the type and location of the towers is provided in table 2.

Under the construction of additional 2,5km and 4km of 110kv transmission line in the section of Buni-Vomar, a total of 25 metallic towers will be installed, 12 of which are going to be located inthe agricultural land and 13 of them in barren and pasture land. The total square of agricultural land that can be impacted by the project is almost 475.9 m^2. The detailed information with the type and location of the towers is provided in table 3.

The following figures show the transmission route, tower locations and location of distributionpoints for the two sections of 110kV lines

- Step-down transformers of different power (depending on the consumer's load) 35 / 10kVwith a power of 25kVA - 63kVA will be installed for each village.

- Distribution networks will be built on wooden poles on reinforced concrete attachmentsand will be installed using self-insulated wires.
- Internal installation of households and other objects in villages will be provided.



Pamir Energy will build 3 distribution networks and connect them to the existing 35 kV Buni- Vomar electric grid. The total length of the line is 4.5 km, the line will be built with wooden supports on reinforced concrete attachments.

- For each village the step-down transformers of different power (depending on theconsumer's load) 35 / 10kV with a power of 25kVA - 63kVA will be installed.
- The distribution networks will be built on the wooden poles on reinforced concreteattachments and will be installed using self-insulated wires.

- The households will be supported with internal installation.

- Distribution networks will be built on wooden poles on reinforced concrete attachmentsand will be installed using self-insulated wires.
- Internal installation of households and other objects and villages will be provided.

Under rehabilitation of the existing Distribution Network (DN) and Transmission Line (TL) therea total .of 440 wooden poles will be replaced the existing poles and in the existing places and also the 20 transformers will be replaced. The detailed information provided in table 4.

The construction period will last for two years, depending on the length of the construction season, which typically extends from March through November but will depend on weather. Towers will be provided by an international vendor, although it is probable they will ultimatelybe purchased and imported from China. One or two contractors, likely to be from Tajikistan, willbe appointed to complete the preparation of foundation for towers and substation, install towers and substation equipment, and place conductors on towers. It is anticipated that contractors willemploy around 40 workers for construction, many or most of them from local communities, andthat Pamir Energy would employ about four others for supervision of engineering, environmental, and social performance. Civil works contractor(s) will likely be from Tajikistan.

Figure 9 Examples of towers: angle tower at left, three suspension poles on uneven terrain at upper right, and example of foundation at lower right

Construction activities for the transmission line will involve earthworks, including excavation,drilling, and possibly limited blasting; concrete works to install foundations for tower legs and poles; transportation and storage of steel, towers parts and insulators; tower assembly and erection; and land restoration.

As noted, the transmission line corridor will run parallel to the Panj River, primarily on the terraces and mountainsides of the river. To reduce the impacts of construction, Pamir Energy will require the contractor(s) to use little or no mechanized equipment other than rock drills, concrete mixers, and hand tools. Concrete, water, steel parts of the towers, insulators, and other materialswill be carried by hand from trucks on the road to the tower locations, and towers will be assembled in place. Figure 11 shows examples of the manual construction methods used on a nearby 110kV line, which will also be used for this line. When towers are in place, 110kV conductors (wires) will be placed on the towers and energized.

The project will also include construction and operation of a new 110/35kV substation in Khorog on land allocated to Pamir Energy adjacent to the Khorog hydropower plant. The substation will cover an area of about 0.,6 hectares and will include connecting transmission lines, transformers, breakers, and other electrical equipment, all within a chain-link fence. Construction will take oneto two years and will involve about 15 workers.

The proposed project (upgrading the 8.7km of the 35kV transmission network between Buni and Vomar to 110kV capacity). mainly is planned to supply of materials and equipment for construction of 8,7km section of 110kV double circuit transmission line, including line accessories and fibro-optic cables between Buni and Vomar, VMKB with split into two lots.

PE will allocate a budget to carry out this Activity. PE will prepare Lots based the Bill of Quantities (BoQ) and specifications based on the Detailed Design of the 8.7 km 110kV double circuit transmission to procure the necessary equipment and supplies for the construction of the line. The process under this activity will include the preparation of tender documents, tender announcement, selection of supplier, and subsequent supply of materials required for the construction.

The second acticity under this project is construction of 8.7 km section of 110kV double circuit transmission line, including installation of fibro-optic cables between Buni and Vomar, VMKB.

To carry out the construction works for the 8.7 km line, PE will prepare the Lots bases Scope of Works (SoW) and tender documents for the selection of a suitable contractor to carry out the works. The tender process will then commence, following PATRIP Foundation procurement guidelines. Once the contract is awarded, the contractor will carry out the construction and installation the proposed transmission line. The construction period will last for two years (2023-2025) and will involve 20 workers

Figure 10 Tower construction process will not use mechanized equipment other than hand tools. The partly assembled tower at top right shows its modular nature, which facilitates hand transport. (source: Pamir Energy)

1.6 Analysis of alternative

The exact location of the transmission corridor and distribution network in the targeted villages(where the energy infrastructure – transmission and distribution network will be built) is identified through the detailed design works which are being conducted during the preparationstage. As a result of the detailed design, routing of transmission and distribution lines, among theavailable options, the best option has been chosen, which will avoid not only the hazardous areas for the project, but also avoid any damages to areas with unique historic, archaeological or scientific interests. One of the unique historical places in the area is 'Qal'ai Vomar' and while designing the route avoiding of this area was prioritized. However, in some places the towers will be installed in lands used by local people for agricultural purposes and the detailed mechanism is described in Chapter 1.3 Land issues. The transmission line will not affect the riparian forests in the area.

1.7 No-project alternative

The main alternative to the project is the "no-project" alternative. Without the project, no specific changes to the present environmental or social conditions will occur, which implies that there will continue to be a lack of reliable electricity supply in the region and even no electricity accessat all in the targeted villages in this project. This will cause continued hardship for the population who will have to use other commodities such firewood for example for cooking and heating. It is highly likely that this would also increase the clearing of already sparse wood resources.

1.8 Land Issues

The effects of the project on the existing land use pattern could be temporary or permanent, direct or indirect. Land in household plots that have buildings or houses within the 45-meter-wide corridor will be impacted directly and permanently since buildings will be demolished. Land uses where towers will be located will also be affected since they will be occupied by concrete foundations and steel towers.

Permanent direct impacts. Such impacts will occur on all land that Pamir Energy will need for project infrastructure: the tower locations and the substation. If rights to use the land have beengranted to any individuals, those rights will have to be terminated and allocated to Pamir Energy, with current rights-holders granted new land or compensation, at their discretion. This is addressed in the Resettlement Policy Framework.

Temporary direct impacts. Land use will be affected temporarily immediately around construction sites, which would be at locations near the towers and at the Khorog substation. Inaddition, there will be some small areas that may be needed for temporary storage of materials.If such land is needed, Pamir Energy and/or the contractors will negotiate with and lease this land from current rights-holders and will return the land when construction is complete.

Tables 2 and 3 show the land that will be required for permanent use by Pamir Energy.

Table 2 Land required for permanent use (initial project design)

Land use type	*Number of towers*	*Area required*	
		Square meters	*Hectares*
Agricultural Land	10	407.53	0.04
Barren Land	5	187.38	0.02
Residential Land	0	0	0
River Bed	9	547.94	0.055
Pasture Land	3	50.87	0.005
Totals	***27***	***1194***	***0.12***

Table 3 Land required for permanent use for construction of the additional 2.5 and 4 km 110 kV TL

Land use type	*Number of towers*	*Area required*	
		Square meters	*Hectares*
Agricultural Land	*12*	*475.9*	0*.048*
Barren Land	-	-	-
River Bed	9	*369.6*	0.037
Pasture Land	4	155.2	0.016
Totals	**25**	**1000.7**	**0.1**

Table 4 Land required for permanent use for construction of the additional 8,7 km 110 kV TL

Land use type	*Number of towers*	*Area required*	
		Square meters	*Hectares*
Agricultural Land	1	68,9	0.*0069*
Barren Land	15	797.8	-0,0797
River Bed	6	275.5	0,0275
Pasture Land	18	764	0,0754
Totals	**40**	**1704.2**	**0.1895**

The more detailed information with the type and location of towers is provided in tables 6, 7 and 8. Also, part of the land will be affected temporary during the construction period, so Pamir Energy will ensure the implementation of the necessary mitigation measures to avoid damage tocrops and trees.

One of the most important point during the project design process was to avoid the agriculturalland. However, in some places where there is no alternative place, the towers are located in the arable land. In order to determine the impact of the project on the agriculture, the team went through the route of the transmission lines and calculated the approximate amount ofland that can be affected during the construction. In total, 27 metallic towers (110 kV) will be installed for distribution purposes, ten of which can be located in agricultural land, two in pasture land. Near the riverbed, nine towers will be installed nine towers and 5 towers in the barren land. The total square of agricultural land that can be impacted by the project is almost 0.04 hectares. Detailed information with the type and location of the towers is provided in the tables below.

The current transmission line spans 8.7 km and is supported by 141 wooden poles. With the planned upgrade of the power transmission line, these 141 poles, which have predominantly been located on agricultural and arable land, will be replaced with 40 metal poles. This change will significantly reduce the amount of land used for the transmission infrastructure.

From 40 towers only one will be installed in the agricultural land, 15 in the barren land, 9 in the river band and 18 in the pasture lands.

- Household plot/buildings: although several such plots and buildings are within 45 meters of the existing 35kV line, Pamir Energy will require the design contractor to avoid any such plots so that no houses or buildings are located in the corridor. Thus, no temporary or permanent direct impacts are expected on household plots or buildings. (It is noted that Pamir Energy was successful in achieving this goal for the Phase I of the project and fully expects to continue this success with the remained lines.)

- River: 9 towers will be placed on rocky outcrops high above the river. Except for the area occupied by concrete foundations, grazing could continue if the land supports sufficient vegetation (if so, it will be replanted after disturbance—see below). Thus, there will be no effect on riparian land uses.

- Arable land, grassland (hayfields): The design avoids such lands where possible Even in locations where such land cannot be avoided, the only land directly and permanently affected would be the small areas where concrete foundations are located. There will be ten towers on arable land. Also, temporary effects would be felt on the footpaths to the tower locations and under the towers; these areas would revert to the original land use when construction is complete. In addition, Pamir Energy will schedule construction works on these lands so they occur before the planting/growing season and/or after harvest so as to minimize the impact on agricultural production. All areas disturbed during construction will be revegetated as much as possible by seeding with native grasses.

- Grazing/pasture land: same as arable land, except that some grazing land, especially for

- goats, is nearly barren and such areas will not be avoided. In total 3 towers will be located in pasture land, disturbed areas will be revegetated as much as possible (seeded with native grasses)

- Orchards: same as for arable land, plus if trees could reach within six meters of an energized conductor, they will be cut to a height of under four meters. Such cutting will be repeated every 6-8 years as needed to maintain a six-meter clearance between trees and conductors.

- Trees/shrubs (private or state): same as orchards

- Rocky/barren land: Nine towers will be on barren land, and this will require 0.05 hectares of land for permanent use. As needed, land will be restored to its original conditions, or more stable condition if possible.

- *Other:* if used for economic purposes, any other land will be avoided where possible.It is important to note that, except for residences and buildings and tall trees, land within the protection zone can continue to be used as before: crops and grass can be planted and grown, and grazing can continue as before, under the line and even between the foundations under the towers. Pamir Energy will restrict the use of tall equipment, but the actual impacts on land uses are expected to be relatively minor.

Significance of impacts on land use

To aid in the impact analysis, land use sensitivity criteria were developed based on land use types and relative environmental and social value. Land use sensitivity criteria are shown in Table 5.

Table 5 Land use sensitivity criteria

Sensitivity	Sensitivity
High -	Household plots - Land protected for biodiversity, cultural heritage, orother purpose
Medium -	- Arable land used for crops or other valuable plantings - Orchards - Land used for grazing
Low	Rocky land and other land not in productive use

Significance of potential Impacts

Since no households will need to be resettled, the most important impacts are likely to be where current uses are for crops or other plantings on arable land, where orchards are currently located, and where other trees and shrubs are located. Since current users will be compensated with replacement land allocations (as required by the law, the replacement allocations must be of equivalent land) or in cash, at the land users' discretion (with a preference for replacement).

As summarized in Table 6, the overall impact on land uses will be minor

Table 6 Summary of significance of potential impacts to land use

Type of land	***Sensitivity***	***Potential Impact***	***Magnitude and duration***	***Impact significance***
Protected areas	High	No such areas to be affected	None	None
Households	High	Relocation and demolition of houses in 45-meter	None	None

plots		protection zone		
		Some buildings may need relocation/replacement	Low temporary	Moderate adverse
Fragmented forest and orchards	Medium-high	Land clearing at towers and substation, tall trees cut initially and periodically thereafter	Medium permanent	Moderate adverse
		Loss of land at tower locations, crop	Minor permanent	Minor adverse
Arable land used for crops, hay	Medium	loss during construction and maintenance		
		Restrictions on buildings and tall trees in protection zone	Low permanent	Minor adverse
Grazing land	Low	Loss of land at tower locations	Very low permanent	Negligible adverse
		Restrictions on buildings and tall equipment in protection zone	Very low permanent	Negligible adverse
Barren land/ Land not in use	Low	Rights transferred to Pamir Energy	Very low permanent	Negligible adverse

Assessment of the land needed for installation of metallic towers

(source: Regional Project Implementation Unit, Pamir Energy)

Table 7 Assessment of the land needed for installation of metallic towers

Location	Type of tower	Q-ty tower	Base	S-square м² for one tower	∑ total square м²	Land Use Type						
						Agriculture Land	Barren Land	Residential Land	Type of land	River Bed	Pasture Land	Remarks
Pastkhuf	У110-4	12	4,10	37,2	446,4	+1	+9			+1	+1	
	У110-4+5	6	5,6	57,80	346,8		+4			+1	+1	
	П110-4	5	2,8	23,0	115	+1				+3		
	ПС 110-4	4	2,4	19,4	77,6		+2			+2		
	УС110-6	2	3,5	30,3	60,6					+2		
	У110-2+9	1	7,5	90,3	90,3		+1					
	У110-4+5	1	5,:	57,8	57,8		+1					
	У110-4	1	4,10	37,2	37,2		+1					

Vomar	У110-2	1	4,8	46,24	46,24					+1		
	У110-6	1	3,5	30,3	30,3		+1					
	П110-4	3	2,8	23,0	23,0		+3					
	ПС110-4	2	2.4	19,4	38,8		+3					
Total		**39**										

Assessment of the land needed for installation of metallic towers for construction of the additional 2.5 and 4km 110 kV TL.

(source: Regional Project Implementation Unit, Pamir Energy)

Table 8 Assessment of the land needed for installation of metallic towers for construction of the additional 2.5 and 4km 110 kV TL.

Location	Type of tower	Q-ty tower	Base	S-square м² for one tower	∑ total square м²	Land Use Type					
						AgricultureLand	BarrenLand	ResidentialLand	Type of land	RiverBed	PastureLand
Pastbajuv For 2,5km	У110-4	5	4,1	37,2	186	2+				3+	
	У110-4+5	2	5,6	57,8	115,6	1+				1+	
	ПС110-4	2	2,4	19,4	38,8	1+				1+	
	П110-4	1	2,8	23	23					1+	
	УС110-6м	1	3,5	30,3	30,3					1+	
	У 110-2+5	1	6,3	68,9	68,9	1+					
	У110-2м+9	1	7,5	90,3	90,3					1+	
	У 110-4м	2	4,1	37,2	74,4	2+					

Pastkhuf For 4 km	У 110-4м	3	4,1	37,2	111,6					1+	2+
	У110-4м+5	1	5,6	57,8	57,8	1+					
	У110-4м+5	2	5,6	57,8	115,6	1+					1+
	П110-4Вм	3	2,8	23	69	2+					1+
	ПС110-4Вм	1	2,4	19,4	19,4	1+					
Total		**25**				**12**				**9**	**4**

Assessment of the land needed for installation of transformer substation, metallic and wooden towers

(source: Project Shugnan VI Phase II)

Table 9 Assessment of the land needed for installation of transformer substation, metallic and wooden towers

Location	Type of tower	Q-ty tower	Base	S-square м² for one tower	∑ total square м²	Agriculture Land	Barren Land	Residential Land	Type of land	River Bed	Pasture Land
	У35-3	5	2,19x2,19	10,17	50,85						+
	Intermediate wooden poles 35kV type ПВ-6 on concrete slabs ПТ 2.2 - 4.25	231	1x1	1	231	+				+	

VL-35kV Shirgowad -Nulvand	Angle wooden poles 35kV type УАВ-2 on concrete slans ПТ 2,2-4,25	75	Δ4,5x4,5	10,12	759	+				+	+
Transformer substation Shirgowad- Nulvand	MTS 35/0.4kV	17	3x3	9	153	+					
VL-0.4kV Shirgowad -Nulvand	Suspensio n wooden poles 0,4kV type П1ДБ-1 on concrete slans ПТ2,2-3,25	83	1x1	1	83	+					
	Angle wooden poles 0,4kV typeУ1ДБ-2 on concrete slans ПТ2,2-3,25	30	3,5x1	3,5	105	+					

VL-0.4kV Kharog	Suspensio n wooden poles 0,4kV type П1ДБ-1 on concrete slans ПТ2,2-3,25	8 1	1x1	1	81			+			
	Angle wooden poles 0,4kV typeУ1ДБ-2 on concrete slans ПТ 2,2-3,25	2 3	3,5x 1	3, 5	80,5						
Transformer substation	MTS 35/0,4 kV	3	3,3	9	27	+					

Table 10 Assessment of the land needed for installation of metallic towers (upgrading 8,7 km)

(source: Regional Project Implementation Unit, Pamir Energy)

Location	**Type of tower**	**Q-ty tower**	**Base**	**S-square м² for one tower**	**∑ total square м²**	**Land Use Type**					
						Agriculture Land	Barren Land	Residential Land	Type of land	River Bed	Pasture Land
Pastkhuf For 1,7km											
	У110-4	3	4,1	37,2	111,6					2+	1+
	УС110-6м	2	5,6	57,8	115,6					1+	1+
	УС110-4	2	3,5	30,3	60,60		2+				
Buni-Sokhcharv For 7km	УСС	9	4,1	37,2	334,80		5+			2+	2+
	У110-4+5	16	5,6	68,9	68,9	1+	8+			1+	6+
	П110-4Вм	3	2,8	23	69,00						3+
	П110-4Вм	3	2,8	23	69,00						3+
	ПС110-4Вм	3	2,4	19,4	58,20						3+
	П110-4+4Вм	2	3,2	27	54						2+
Total		**40**									

1.9 E&S Assessment Justification

E&S risks and impacts that need to be further assessed in this report have been identified duringthe screening and categorization exercise. The justifications for ESA are:

- The project requires construction of new electrical transmission lines. Therefore, it was categorized as a Category B project as it has a limited potential of environmental and social risks/impacts. It is expected to have only impacts that are either reversible or manageable through legal/standard solutions.

This stage is intended to ensure that the ESA focuses on those issues that are most important for design, decision-making and stakeholder interest and will be subject to a further E&S assessment. Several potential risks and impacts that might arise during preparation/implementation/construction/operation stage. The topics triggered are:

Physical and biological topics

- **Landscapes and views** will be affected temporarily due to construction and maintenance activities and permanently by the presence of the towers and conductors. Given the presence of the existing transmission lines, this is not expected to be a major impact.

- **Soil quality** in the project area could be affected due land-clearing and vegetation removal where necessary, and excavations for tower foundations. This may cause erosion and topsoil loss, if not managed carefully. Spills of fuel or other hazardous materials could also affect soil quality. Contractors will be required to prevent erosion and spills, so thereshould be limited or no impacts.

- **Geomorphologic hazards**. Some portion of the t-line corridor lies within a high-risk zone for avalanches, debris flow, rockfalls, and earthquakes. The design will take this into account so as to minimize the risk of damage to the line in the future, and construction will take steps so as not to cause earth movement.

- **Air quality** could be affected by dust from a movement of vehicles and equipment on unpaved roads and from earthworks and open piles of spoil, and vehicles and equipment powered by combustion engines would emit pollutants. Impacts would be temporary andwith proper controls would be very minor and localized.

- **Noise** could be emitted from a movement of vehicles and equipment as well as from construction activities. The impacts will exist only temporarily and with proper mitigation

measures, it will not be a mayor issue.

- **Water quality** in the project area could be affected due to erosion from tower sites and from spills of fuel or other hazardous materials. Contractors will be required to prevent erosion and spills, so there should be limited or no impacts.

- **Plants and animals** could be affected by disturbance during construction and by permanent use of their territories. Given the nature of the terrain, the small areas that will be affected, and the limited biodiversity, this will not be a significant issue.

Social and economic topics

- **Community health and safety.** A number of actions that will be carried out during construction and operation may affect community health and safety (e.g. traffic, fall & electrocution hazards from towers, worker influx, electromagnetic fields etc.). In general, the potential for impacts on communities and community members is related to the distance that people live from the transmission and distribution lines.

- **Influx of workers** from outside the region could disturb local communities with disruptive behavior, use of local resources such as hospitals and schools, and introduction of disease. There will be relatively few outside workers, and all workers will be subject to a strict Code of Conduct, so there should be very little or no impact.

- **Traffic accidents** and inconvenience could be caused by increased project traffic on the roads to or along the transmissions corridors. The contractor will be required to develop and implement a traffic management plan to minimize impacts and to repair any damage to the road that construction may cause.

- **Electromagnetic fields** could cause health effects if workers or persons living in close proximity to the proposed project transmission line were exposed to high levels for long periods of time. However, levels will be low, workers will only be exposed for short periods, and no one will live directly near the line, so there will be no health effects.

- **Physical or economic displacement** could occur if houses or valuable property are located within a protection zone under the transmission line. The current routing design intends to locate the towers so no houses or other buildings are in the protection zone. However, in total 9 towers will be located in agricultural land, that will be donated for the project. As only small areas will need to be taken for towers, no compensation is required. As for land under the line between the towers, agriculture and grazing will not be affected, except that tall equipment cannot be used and no buildings will be allowed in the protection zone. Small amounts of land will be used for footpaths for workers to travel between the road and tower locations and possibly for equipment storage. In places where the towers are located in agricultural land, Pamir Energy will ensure to start the installation after ensuring that the households collect their crops, to minimize the negative impact. Mostly in these places the work will starts by the end of October. If due to some reasons, property or crops are damaged during construction or maintenance operations, or animals are injured or killed, their owners will be compensated with replacement.
- **Worker health and Safety.** Construction workers will be exposed to elevated risks of rockfalls and debris flows during construction period, and will be at risk of falls from heights and from working around trucks and machinery. Contractors will be required to develop and implement safety plans and to train all workers.

2. APPLICABLE STANDARDS

This ESA aims to help the project to achieve compliance with the E&S standards set in PATRIP Foundation E&S Policy. Those standards are:

- KfW Sustainability Guidelines requirements, which encompasses acceptable international standards such as World Bank Group Sustainability Framework as well as relevant Environmental Health & Safety Guidelines for the purpose of the project.

- International standards and guidelines such as the IFC Environmental and Social Performance Standards (see link) and various IFC Environmental, Health and Safety Guidelines.

2.1 National Legal and Regulatory Framework

The "framework environment law" or ***Law on Environment Protection*** was adopted in 2011 (21 July 2011, № 208). The previous Law on Nature Protection was adopted in 1993 and amended in1996, 2002, 2004 and 2007, then replaced by this new law in 2011. The new Law stipulates thatTajikistan's environmental policy should give priority to environmental actions based on scientifically proven principles to combine economic and other activities that have an impact onthe environment with nature preservation and the sustainable use of resources. The Law defines the applicable legal principles, the protected objects, the competencies and roles of the Government, the State Committee for Environment Protection, local authorities, public organizations, and individuals. The Law stipulates measures to secure public and individual rights to a safe and healthy environment and requires a combined system of ecological expertiseand environmental impact assessment of any decision on an activity that could have a negative impact on the environment. The Law also defines environmental emergencies and ecological disasters and prescribes the order of actions in such situations, defines the obligations of officials and enterprises to prevent and eliminate the consequences, and establishes liabilities of the persons or organizations that cause damage to the environment or otherwise violate the Law. The Law establishes several types of controls over compliance with environmental legislation: Statecontrol, ministerial control, enterprise control, and public control. State control is affected by theCommittee for Environment Protection, the Sanitary Inspectorate of the Ministry of Health, the Inspectorate for Industrial Safety and the Mining Inspectorate. Public control is carried out by public organizations or trade unions and can be exercised with respect to any governmental body, enterprise, entity or individual.

2.2 Environmental and social impact assessment in Tajikistan

Two laws establish requirements for impact assessment: the ***Law on Environment Protection*** introduced above and the ***Law on Ecological Expertise***. Chapter V, Articles 35-39 of the Law on Environment Protection introduces the concept of state ecological review (literally, "state ecological expertise" –

SEE), the purpose of which is to examine the compliance of proposed

activities and projects with the requirements of environmental legislation and standards and with the ecological security of society. These laws emphasize the cross-sectoral nature of SEE, whichmust be scientifically justified, comprehensive, and objective and which should lead to conclusions in accordance with the law. SEE precedes decision-making about activities that mayhave a negative impact on the environment. Financing of programs and projects is allowed onlyafter a positive SEE finding has been issued. Among activities and projects subject to state ecological review are construction and reconstruction of various types of facilities irrespective oftheir ownership.

The laws require that all types of economic and other activities be implemented in accordance with existing environmental standards and norms and have sufficient environmental protection and mitigation measures to prevent and avoid pollution and enhance environmental quality. Environmental impact studies analyzing the short- and long-term environmental, genetic, economic, and demographic impacts and consequences have to be prepared and evaluated priorto making decisions on the sitting, construction, or reconstruction of facilities, irrespective of their ownership.

An Environmental Impact Assessment (EIA) study is a component of the State Ecological Expertise, as set out in the 2011 amendments to the Environmental Protection Law and in the Law on the State Ecological Expertise (2012). The EIA is the responsibility of the project proponent (in this case, Pamir Energy). The State Ecological Expertise for all investment projects is the responsibility of the Committee for Environmental Protection under the Government of Tajikistan (CEP) and its regional offices. Also, the 2012 Law on the State Ecological Expertise requires that all civil works to be assessed for their environmental impacts and the proposed mitigation measures reviewed and monitored by the Committee on Environmental Protection.

The legal and regulatory system for EIAs also includes:

- Procedure of Environmental Impact Assessment, adopted by the Resolution of the Government of the Republic of Tajikistan No. 509 as of 01.08.2014
- Procedure to implement State Ecological Expertise, approved by the Resolution of the Government of the Republic of Tajikistan No. 697 as of December 3, 2012
- Guidelines on the composition and order of development of content and structure of documentation to be submitted for review as part of SEE
- List of objects and types of activity for which preparation of documentation on Environment Impact Assessment is mandatory, adopted by the Resolution of the Government of the Republic of Tajikistan No. 253 as of June 3, 2013.

2.3 Other relevant legislation on environmental and social issues

The ***Law on Environmental Information*** (2011) is underpinned by Article 25 of the Constitution, which states that governmental agencies, social associations, and officials are required to provide each person with the possibility of receiving and becoming acquainted with documents that affect her or his rights and interests, except in cases anticipated by law. The Law defines the legal, organizational, economic, and social bases for providing environmental information and establishes the right of individuals and legal entities to receive complete, reliable, and timely environmental information. Article 4 provides the right of access to environmental information and Article 8 defines the conditions for restricting access to environmental information (none ofwhich should be relevant here).

The ***Water Code*** (2000, last amended 2012) establishes policies on water management, permitting, dispute resolution, usage planning and cadaster. It promotes rational use and protection of water resources exercised by all beneficiaries and defines the types of water use rights, authority androles of regional and local governments for water allocations among various users, collection offees, water use planning, water use rights and dispute resolution. The Code provides Water User Associations with the mandate to operate and maintain on-farm irrigation and drainage infrastructure.

The Constitution of the Republic of Tajikistan establishes exclusive state ownership of land. The***Land Code*** (1996, last amended 2016) establishes the rules that control the assignment and termination of the rights to use (or lease) land. Rights to use land can be primary or secondary. Primary use rights include perpetual use, limited or fixed-term use up to 20 years, life-long inheritable tenure. The only secondary use/right is the right to lease, again up to 20 years. The Land Code establishes seven categories of land uses, including agricultural, urban/populated, industrial and other infrastructure, conservation and other protected land, national forest/wood reserves, water reserves, and state land reserves. Of most concern here are the first three, plus water reserves. In GBAO, most issues of land relations are under the jurisdiction of the region itself. Districts (jamoats) and cities have authority to provide land allotments for agricultural land and to withdraw land for nonagricultural uses (Land Code, Article 7). They are also responsiblefor protecting users' rights, terminating rights to use land, registering the rights to use land plots,and generally controlling land use and protection. They specifically approve land tenure documents dealing with works of regional importance.

Article 48 of the Land Code outlines the rules for state "confiscation" of land plots for state and public needs. Requirements include assignment of an equivalent land plot ("if desired"), construction of equivalent house and structures, and "full compensation for all other losses, including loss of profits…." These provisions apply only to those who have the legal right to use the land by virtue of possession of a "certificate on the legal right to use the land." The Regulation concerning compensation of land users' losses and losses of agricultural production was approved by Resolution of the Government of the Republic of Tajikistan No. 641 (30 December 2011). It establishes the detailed order of reimbursement of land users' losses. The amount of compensation is determined by an interdepartmental commission

established at the district level where the acquisition is to take place (that is, at the GBAO level). If the land user does not agree

with the amount or type of compensation for losses and damages, the land user can apply to the court with a request for additional compensation, or may appeal the decision to terminate the rights.

This law is directly relevant since it will control the termination of rights of current users and issuance of certificates of rights to Pamir Energy to use the land for the transmission line project.

The Law on Land Administration (2008, last amended 2016) obliges the authorities to map and monitor the quality of land, including soil contamination, erosion, and water logging.

The Law on Sanitary and Epidemiological Safety of the Population (2003, amended in 2011) introduced the concept of sanitary and epidemiological expertise that establishes the compliance of project documentation and economic activities with the state sanitary and epidemiological norms and rules, as well as strengthened provisions on sanitary-hygienic, anti-epidemic, and information measures.

The Law on Pastures (2013) defines the basic principles of pasture use, including protection of pastures and the environment, and attraction of investments for more effective use and protection of pastures. The Law specifies the powers of local administrations to control environmental safety and pasture use in accordance with state regulations and standards. The law prohibits the implementation of a number of activities in pastures, such as cutting down trees or bushes, building roads, misuse of grazing land, pollution of the environment with waste, and grazing of livestock beyond the established rate. The law requires users to ensure effective use of pastures,including protection of pastures against degradation and pollution. It provides geobotanical research on pastures to assess the potential productivity of natural forage land.

The Law on Dekhkan Farms (2016) provides the legislative basis for the establishment and operation of private dekhan farms. While, according to the Law of 2009, dehkan farms were subjects of economic activities that carry out activities without the formation of a legal entity, the new Law allows dekhan farms to obtain the status of legal entities. It also clarifies and fixes the rights of members of dehkan farms as land users. The law improves the management of dehkan farms and defines the rights and duties of their members. It allows farmers to legally erect field camps on land as temporary buildings, which makes it possible to significantly improve productivity at the agricultural season. The law requires dehkan farms to take measures to improve soil fertility and improve the ecological status of lands, make timely payments for water and electricity, and provide statistical information to government agencies.

The Law on Environmental Information (2011) is underpinned by Article 25 of the Constitution, which states that governmental agencies, social associations, and officials are required to provide each person with the possibility of receiving and becoming acquainted with documents that affect her or his rights and interests, except in cases anticipated by law. The Law defines the legal, organizational,

economic, and social bases for providing environmental information and establishes the right of individuals and legal entities to receive complete, reliable, and timely environmental information. Article 4 provides the right of access to environmental information and Article 8 defines the conditions for restricting access to environmental information (none ofwhich should be relevant here).

The Forest Code (2011) regulates forest relations and is aimed at creating conditions for the rational use of forests, including their conservation and protection. The Forest Code requires coordination with the Forestry Agency for construction sites that will affect forests, which are defined as forested areas which have environmental, social and economic interest for the state and that cover at least 0.5 hectares and are at least 10 meters wide. Projects must take measuresto protect forests from sewage, waste, emissions, etc. The project is not likely to affect any area large enough to be considered a "forest" within the meaning of the law.

Protection of cultural heritage is grounded in paragraph 44 of the Constitution, which requires all citizens to respect and protect historical and cultural monuments. The ***Law about Culture*** (1997) establishes rights concerning cultural activities, including non-material cultural heritage,and requires protection, management, and monitoring of historical and cultural monuments. Material heritage is found in archaeological sites, sites of ancient settlement, tumuli, remnants ofancient settlements, castles, industries, channels, roads, ancient burial places, stone sculptures,graven images, antiquity items, and places of ancient settlements. The Ministry of Culture and itslocal representative offices are primarily responsible for protecting cultural heritage. The ***Law of Tajikistan on Regulating Traditions, Celebrations, and Rituals*** (2007, last amended 2018) limits expenditures and activities related to religious and family observances and festivities.

The ***Labor Code*** prohibits forced labor and child labor. Article 8 of the 2016 Labor Code prohibits forced labor. The Labor Code also sets the minimum age at which a child can be employed as well as the conditions under which children can work (Articles 21, 74, and Chapter 15). The minimum employment age is 15; however, in certain cases of vocational training, mild work maybe allowed for 14-year-olds (Article 21). In addition, there are some restrictions on what type ofwork can be done by workers under the age of 18, and what hours of work are permissible. Examples of labor restrictions include that those between 14 and 15 cannot work more than 24hours per week while those under 18 cannot work more than 35 hours per week; during the academic year, the maximum number of hours is half of this, 12 and 17.5 hours, respectively. The Labor Code also establishes requirements for leave, compensation, dispute resolution, and otheraspects of employment. The Code will apply to Pamir Energy and all contractors, including foreign contractors.

Occupational health and safety is also governed by the Labor Code, specifically Section V, Chapters 34-38. The law specifically includes construction and operation of facilities in the typesof occupations that are subject to labor protection laws (Articles 349, 352). Among other requirements, the law requires employers to: Be responsible for ensuring safe working conditions and safety of work at every workplace (Articles 331, 348) and for informing workers of workplace conditions and the results of

labor inspections (Article 332)

- Apply the means to protect workers individually and collectively (including protective clothing and equipment) (Article 335)
- Provide appropriate work and rest regimes (Chapter 7)
- Training workers in their jobs and safe methods of work (Articles 348, 350)
- Provide instructions on labor protection (Article 336)
- Test and verify the knowledge of workers in working safely (Article 348)
- Provide certifications of workplaces at least every five years (Article 348)
- Investigate accidents (Articles 342, 348)
- Provide sanitation and medical services (Article 348)
- Provide access to premises by state officials (Article 348)
- Providing social insurance for accidents and diseases (Article 348).

The law gives workers the right to refuse to undertake work that endangers the employee's health or life (Articles 335, 337, 345). In addition, workers engaged in hazardous working conditions are entitled to free medical and preventative care (Article 333), additional paid leave (Article 95) and other benefits and compensation (Article 237). In case of disability or death, employers must provide compensation in multiples of average annual earnings as well as other amounts required by law (Article 343).

Under the ***Law on Public Associations*** (2007, last amended 2019), a public association may beformed in one of the following organizational and legal forms: public organization, public movement, or a body of public initiative. Article 4 of this law establishes the right of citizens to found associations for the protection of common interests and the achievement of common goals. It outlines the voluntary nature of associations and defines citizens' rights to restrain from joining and withdrawing from an organization. This legislation requires NGOs to notify the Ministry of Justice about all funds received from international sources prior to using the funds and to post financial information on their websites.

The 2014 ***Law on Public Meetings, Demonstrations and Rallies*** (Article 10) bans persons with a record of administrative offenses (i.e. non-criminal infractions) under Articles 106, 460, 479 and 480 of the Code for Administrative Offences from organizing gatherings. Article 12 of the law establishes that organizers must obtain permission fifteen days prior to organizing a mass gathering.

The ***Law on Self-Government Bodies in Towns and Villages*** (1994) and the ***Law on Local Public Administration*** provide the legal basis for local government. The former law assigns to Jamoatsa

broad range of competencies and the mandate to support community efforts to address local socioeconomic needs. The 2009 amendment aims to strengthen local self-governance and

accountability by delegating budget authority to Jamoat councils, and introducing a system of direct election for Jamoat council members. A 2017 amendment allows Jamoat councils to retainnon-tax revenues earned through the provision of administrative services and a percentage of local property taxes.

Other Tajikistan legislation that may apply to project-related activities are listed below:

- Law on Protection of Atmospheric Air (will require permit for emissions)
- Law on Hydrometeorological Activity (no specific requirements)
- Law on Land Administration Law on Land Valuation Law on Environmental Audit (maybe required by Committee for Environmental Protection)
- Law on Securing Sanitary and Epidemiological Safety of the Population
- Law on Radiation
- Safety Law on Production and Consumption of Waste (permit will be required)
- The Law on Environmental Education
- The Law on Environmental Monitoring
- The Law on Specially Protected Natural Areas (none could be affected)
- Law on Protection of Fauna (will require permission to take fauna)
- Law on Protection of Flora (will require permission to cut flora)
- Water Codex (permission for water usage required).

2.4 International obligations

In addition to national legislation and regulations on environmental issues, Tajikistan is alsoparty to several international treaties focused on environmental issues:

- Vienna Convention for the Protection of the Ozone Layer, 1996, as updated
- UN Convention to Combat Desertification, 1997
- UN Convention on Biological Diversity (CBD), 1997, as updated by Cartagena and Nagoya protocols
- Ramsar Convention (joined 2000)

- Bonn Convention on the Conservation of Migratory Species of Wild Animals (joined 2001), as updated by Bukhara Deer Memorandum, 2002
- UN Framework Convention on Climate Change, 1998, with related update Kyoto Protocol, accessed on December 29, 2008, and entered into force on March 29, 2009
- Stockholm Convention on Persistent Organic Pollutants (ratified 2007), as updated
- Aarhus Convention (UNECE Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters)(joined 2001), as updated by Kiev Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, on May 21, 2003
- Convention on International Trade in Endangered Species of Wild Fauna and Flora,2016
- UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage (joined 1992)
- Rotterdam Convention on Prior Informed Consent (PIC) procedure on September 28, 1998, ratification pending
- The United Nations Convention to Combat Desertification (1997)
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (2016).

3. BASELINE CONDITIONS

3.1 Introduction

To provide a context within which the impacts of the project can be assessed, a description of physical, biological, human/socio-economic and cultural conditions (as applicable for this assessment) that would be expected to prevail within the project area. The Baseline includes information on all E&S Topics that were identified during categorization as having the potentialto be significantly affected by the project.

3.2 Sources of information

This ESA is based on the following sources of information:

- Technical /Engineering documents

  (Project Institution 'Energosetproekt', 2019, Dushanbe, Tajikistan)

  The Pamir Energy technical and engineering team visited the site more than 15 times(both sides) during the period 2019-2021.

- Publicly available source of information;
  - 3rd Environmental Performance Review of Tajikistan, UNECE, 2017; https://www.unece.org/index.php?id=46564
- Consultation with key informants/ specialists;
  - Committee of Environmental protection, Khorog
  - Pamir Biological Institute, Khorog
  - Consultation with bird and aquatic expert - Abdulnazar Abdulnazarov
  - University of Central Asia – Env. Department, Khorog
  - Forest Protection Department, Khorog
  - Aga Khan Agency for Habitat
- Professional Judgement;
- Initial Environmental Review and Assessment Checklist (Asligul Mamadatoeva, Senior Environmental and Social Impact Officer, Pamir Energy, January 12, 2021)
- Initial Environmental Review and Assessment Checklist (Asligul Mamadatoeva, Senior

Environmental and Social Impact Officer, Pamir Energy, September 7, 2023

3.3 Physical Environment

3.3.1 Relief characteristics

All proposed projects ares are located in same geografical area that way the physical environmenta are same for all of them.

Projects area are mountainous with undulating landscape and lies at the altitude 2,000-3,000 m above sea level.. Stone and gravel desert dominate along with rocky mountains. The transmission lines will go through arid and semi-arid natural and agricultural landscapes.

3.3.2 Climate

Climatic conditions along the transmission line corridor is extremely continental and displays large seasonal variation. Average daily temperatures in Khorog, which is located at 2,000 meters

(6,500 feet), range from minus 6°C (21°F) in January to 23°C (73°F) in July and August. The mean annual ambient temperature is 8.9°C. Mean monthly precipitation in Khorog (1981-2010) ranges from 23 to 26.2 mm (280-315 mm average annual total) with typical annual minimums inAugust-September (2.4 to 2.5 mm) and maximums occurring during February-April (42.7 to 49.6mm).

First snow usually appears in late September-mid-October and lasts in the river valleys until May, while being present all summer long higher in the mountains. The mean annual thickness of snow cover is 40cm. The average number of days with snow cover is 117/annum. There is a lot of snow for much of the year in the region, the cold and wet season of the area is from November throughMarch. The cold days are often followed by strong sunshine due to the height from the sea levelso that large volumes of snow thawing do not penetrate the ground but are lost to evaporation and transpiration.

Wind in the Project area is primarily from the west and northwest. The mean annual wind speedis 2.4 m/s and average monthly winds are relatively constant over the year. The strongest winds (between 10-12 m/s) occur during the summer months (July to August), whereas the spring months (April through May) are the calmest time, with the strongest winds ranging between 2 to4m/s.

The mean annual atmospheric pressure is 596 mmHg and the average relative humidity is 55 percent. Climatic data for the Khorog area are illustrated in Figure 12.

Climatic conditions will be taken into account for the construction of the transmission line. The construction of the transmission line will be carried out on the basis of the Project Institution Drawings (as a result of the project design activities), which indicate the types of poles, cables, insulators and etc. to be used; one of the main criteria for the types selected is appropriateness to the climate.

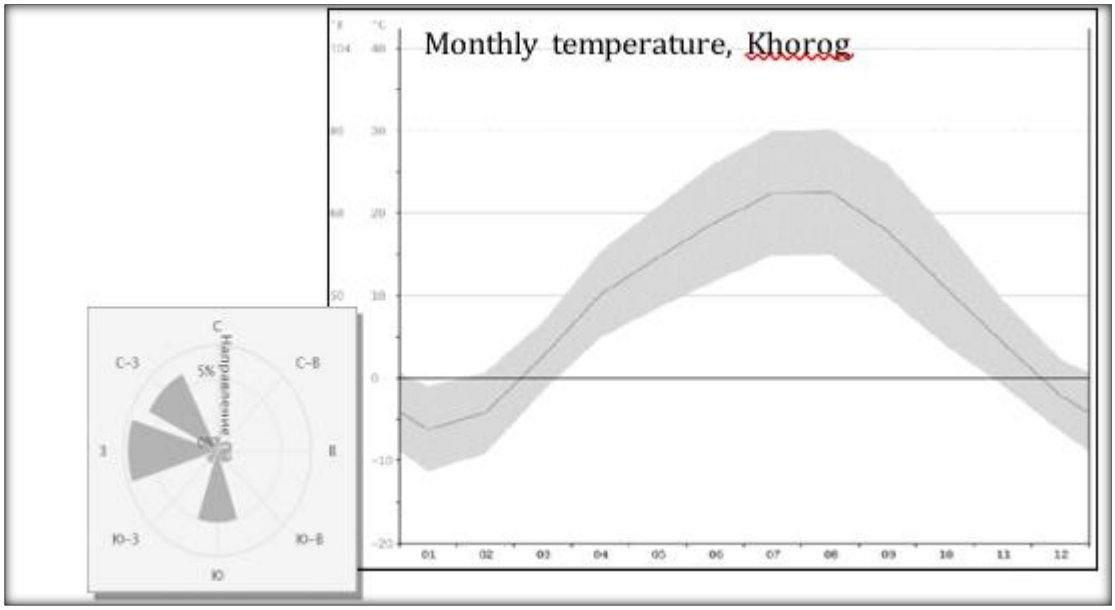


Figure 11 Monthly Temperature in Khorog

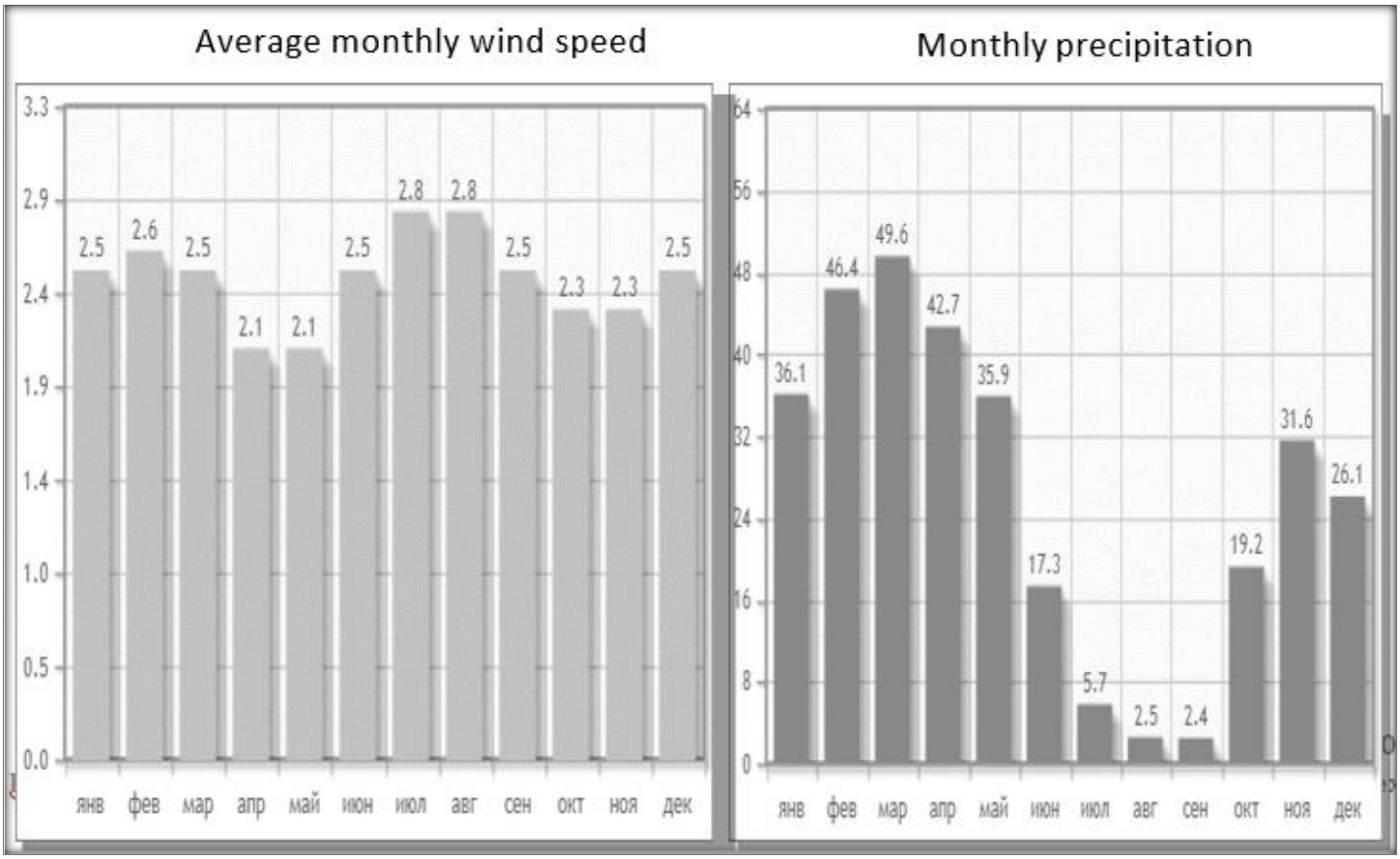


Figure 12 Climatic Data for Khorog

(source: State Administration for hydrometeorology)

3.3.3 Soil

The major soil groups that will be crossed by the proposed transmission routes are mostly infertile grey soils. Up to 3000 meters above sea level the soil is bright brown, and from 3000 meters above sea level the soil is orange-pale and in some areas turfy. Grey soils are mostly found on coarse- grained sedimentary rocks, e.g. sandstone. During rainfall, the grey soil has a small accumulation of clay. Sandy soil is mostly observed along banks of the Panj River; this results in high water infiltration rates along the river -- 50-60% -- and lower infiltration rates of 30-40% 500-600 metersaway from the river. Due to low water-holding capacity, soil fertility is fairly poor.

3.3.4 Geomorphological hazards & natural disasters

In Tajikistan geo-hazards such as rockfalls, mudflows, debris flows, landslides, avalanches, earthquakes, and solifluction occur regularly and they may damage transmission lines and towers or jeopardize the stability of operation. Avalanches occur typically near the end of the winter. Avalanches occur on steep slopes with significant snowfall/snow pack accumulation. Sudden avalanches can lead to loss of lives and infrastructure damages.

Rockfalls and mudflows are quite common to this area. Mudflows occur as sudden flows of debris with high content of soil and rock material originating after rainfall. There are three main drivingfactors that lead to mudflow formation:

- Climatic: heavy rainfall, rapid snow melt
- Geology and geomorphological features: topography leading to slope failure (source of soils and rocks), lack of vegetative ground cover, earthquakes
- Anthropogenic: deforestation, overgrazing, the consequences of mining operations and others. (It is noted deforestation is not an ongoing risk, but rather was caused by past deforestation.)

The Panj river flow increases significantly during periods of spring snowmelt, rains and glacier melt in July and August, thus water level may rise by several meters. During low water level, theriver has multiple temporary alluvial islands rarely covered with vegetation.

The following figure illustrate the geomorphological hazards and risks assessment for the section of the 110kV transmission line in Tajikistan. It was done for the purpose of determining the mostsuitable tower locations and to minimize impacts from geomorphological hazards and natural disasters.

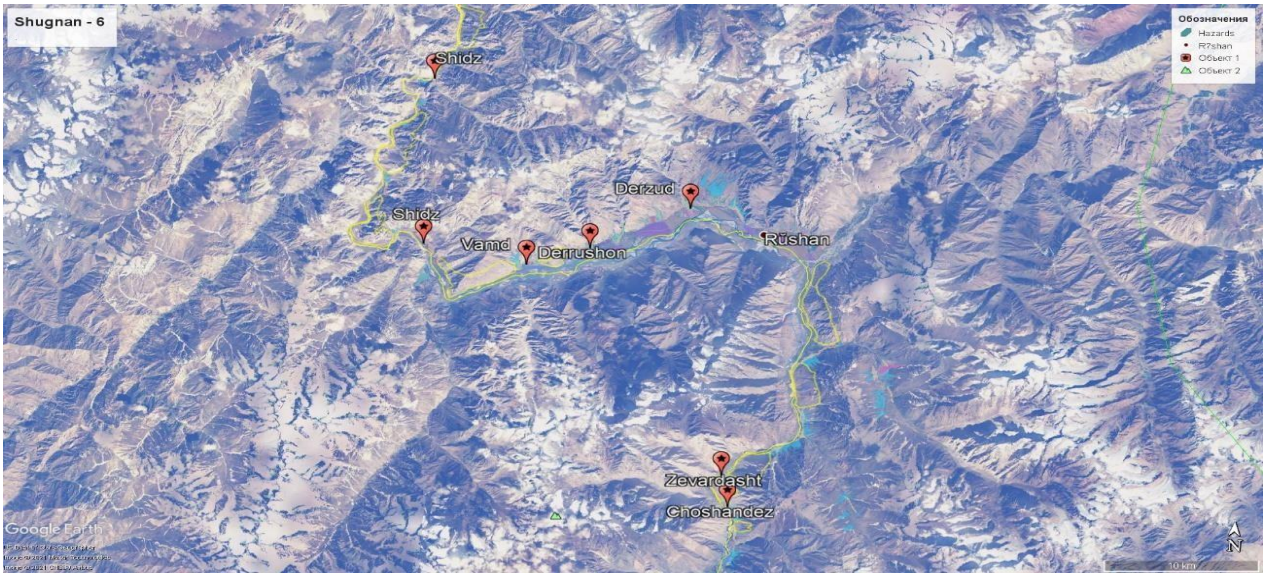


Figure 13 Natural hazards & risks along the Transmission line

(source: Digital Transformation, DRR and GIS Unit, Pamir Energy)

For construction of the 2.5km and 4km 110 kV transmission line, the same maps were preparedby DRR and GIS Unit of Pamir Energy. These maps indicate the geomorphological hazards and risks assessment for the tower locations. Based on these maps, Pamir Energy will avoid the

risky areas and in cases when it is impossible, the project design will consider the mitigation measures such as avalanche deviation structure, water deviation structure and cascading walls.

Figure 14 Natural hazards & risks along the Transmission line in the section 1.2km Buni-Vomar (poles 81-84)

(source: Digital Transformation, DRR and GIS Unit, Pamir Energy)

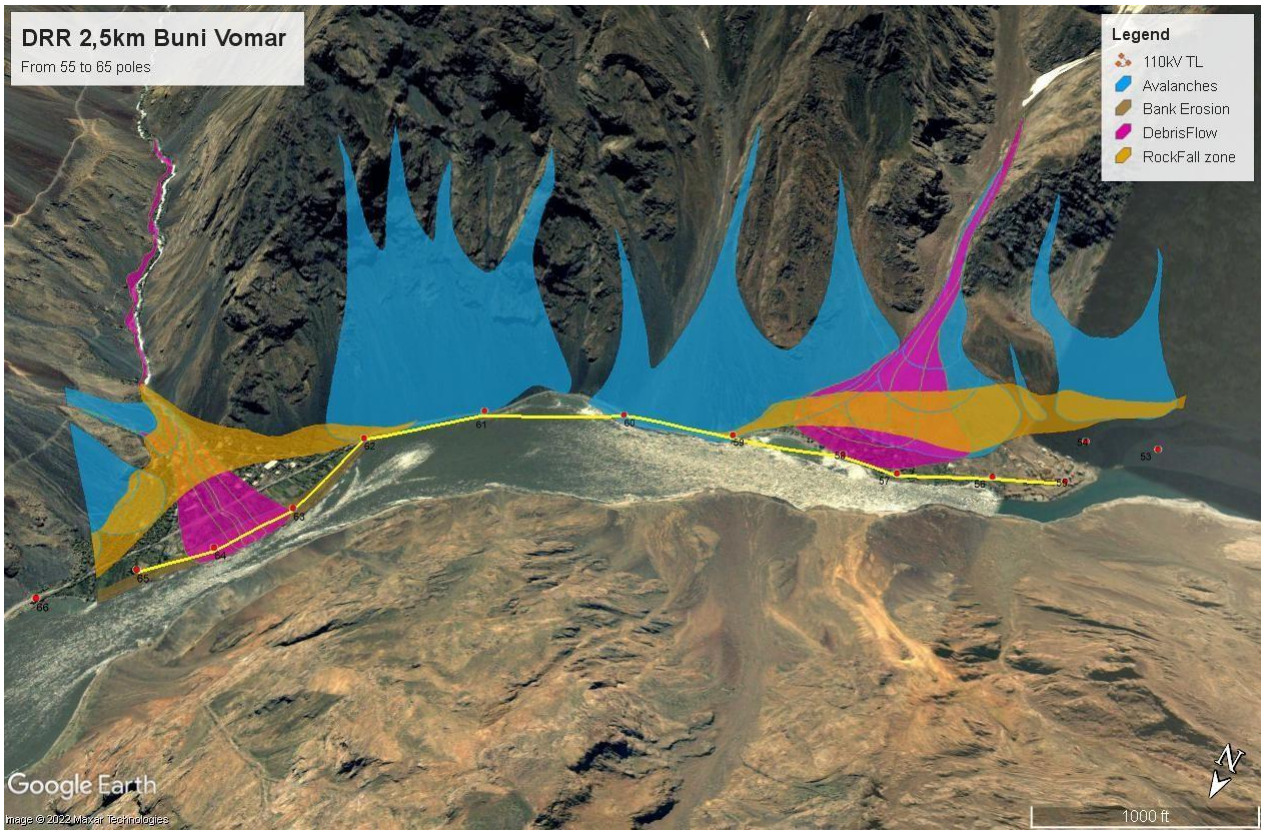


Figure 15 Natural hazards & risks along the Transmission line in the section 2.5km Buni-Vomar (poles 55-65)

(source: Digital Transformation, DRR and GIS Unit, Pamir Energy)

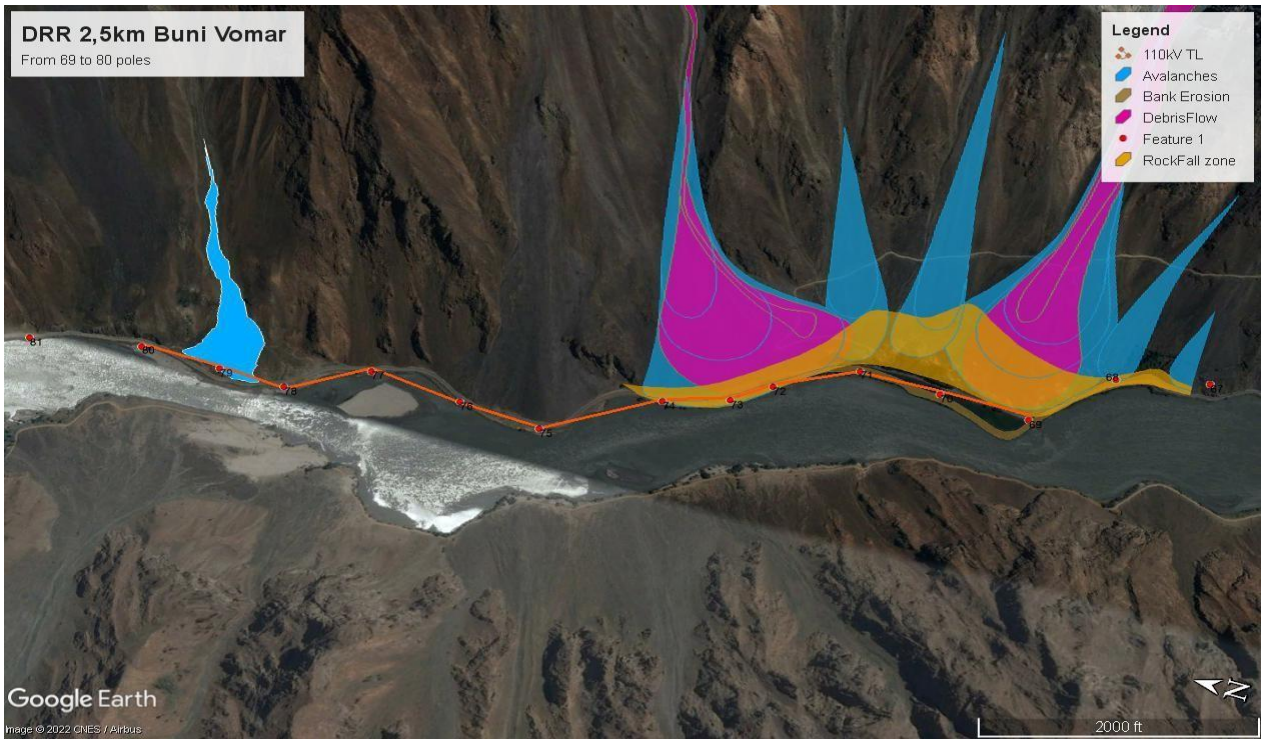


Figure 16 Natural hazards & risks along the Transmission line in the section 2.5km Buni-Vomar (poles 69-80)

(source: Digital Transformation, DRR and GIS Unit, Pamir Energy)

About 8-12 of the towers along the 18km T-line from Porshnev to Buni are located in lower altitude either close to streams, to the Panj riverbank or on islands within the riverbed itself. Even though the islands do provide a safe zone and some degree of natural protection, water level increase in spring or hydrologic outbursts could potentially expose those towers to some degreeof flooding and debris flow. Additionally, 7 poles are located in potential risk zone for avalanches.Those towers in in higher risk zones (primarily; flooding, debris flow, avalanches) are considered accordingly in the technical design with location specific mitigation measures to minimize impact and risk exposure (see mitigation measure in chapter 5.2.3).

(source: Digital Transformation, DRR and GIS Unit, Pamir Energy)

Fourteen of the towers along the km T-line from 7 km TL Buni to Zevardasht are situated at higher altitudes, where there is a significant risk of rockfalls. Additionally, three poles are located in areas that are prone to avalanches. To address these risks—primarily from rockfalls, flooding, debris flow, and avalanches—the towers in these high-risk zones are designed with specific mitigation measures that minimize impact and reduce exposure to risk (see mitigation measures in Chapter 5.2.3).

3.3.5 Seismicity

As shown on the Figure 18, the project area is located in an area where there is a 10 percent probability that an earthquake would occur within 50 years that could cause peak ground acceleration to exceed 4.8 to 6.0m/s2; this is above the threshold considered as being a high risk zone.

Figure 17 Natural hazards & risks along the Transmission line in the section 1,7 km Pastbaju-Pastkhuf (poles 85-91)

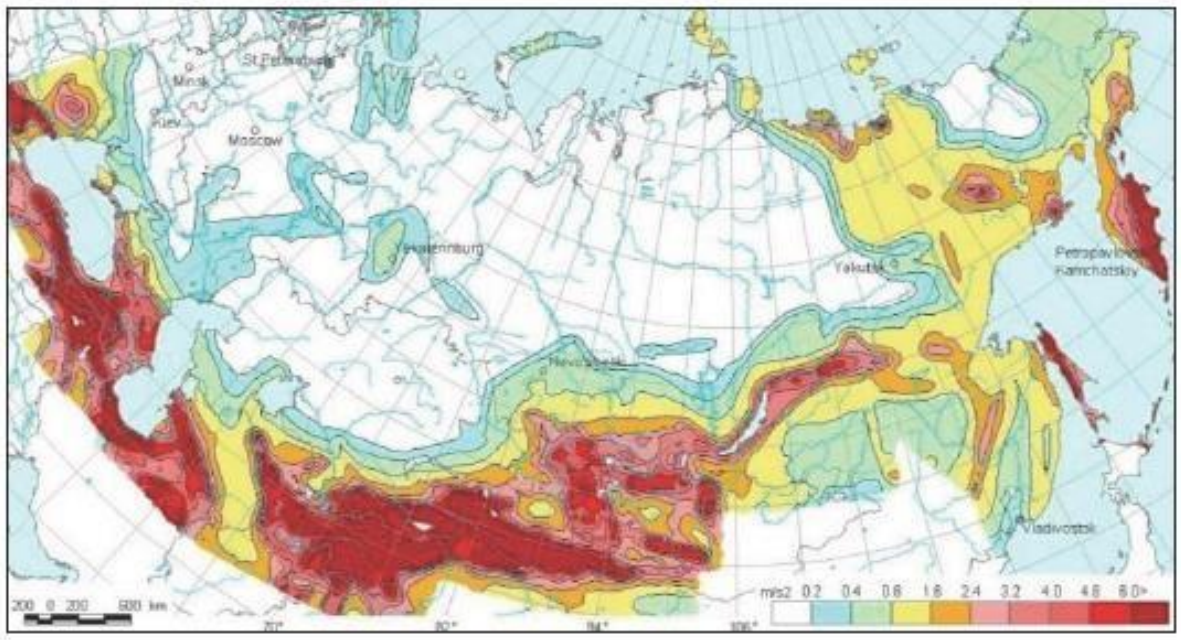


Figure 18 Peak ground acceleration with 10% probability of exceedance in 50 years

(source: U.S. Geological Survey Earthquake Hazard Program 2000).

3.3.6 Air Quality

There are no sources of industrial emissions in the project area. The primary sources of emissions are likely to be vehicle emissions, dust from vehicle passage, and burning wood for heat in winter. In general, in this area emissions are very low in comparison to more densely populated areas of Tajikistan

3.3.7 Water resources

The Project area is partly located on the right bank of the Panj River. Local hydrography is characterized by presence of the large river and its basin and by a few small mountain streams that flow under the road and enter the Panj. Groundwater from mountain springs is widely usedby local communities, including large cities such as Khorog, as their primary source of drinkingwater supply.

3.4 Biological environment

3.4.1 Ecosystems and flora

The project area lies within the Mid-Mountain Mesophyllic Forest Ecosystem zone, predominantly characterized by floodplain, small leaf and forms-meadow ecosystem groups. The Mid-Mountain Mesophyllic Forest Ecosystem zone is mostly represented by willow-poplar forests with light forest mesophyllic shrubs. These forests contain some number of rare endemic species of animals and plants. However, the area crossed by the corridor has been subject to intense deforestation, to the point that nearly all trees and shrubs are found in small forest fragments in or near village areas, plus a few orchards. Much of the area, including most of the corridor, is now barren rocky ground.

The project area is generally characterized by open steppe and/or Eurasian steppe belt vegetation. The lower open steppe is, or was, dominated by prickly cushion plants such as Acantholimon spp., wormwoods (Artemisia spp.), and needle grass (Stipaspp.). The higher Eurasian steppe supports needle grass and fescue grass (Festuca spp.). The highest zone, whichis extensive throughout the Pamir, consists of alpine sedge-meadows (Kobresiaspp. and Carexspp.) with many forb species. Perhaps the most common vegetation features along the corridor are fragments of what is known as “Tugai” (or “Tugay” or “Tugainy”) forest, a mix of three or four species of shrubs and trees. These appear only in small fragments, primarily alongthe road, and near or in settlements. Many or most trees show signs of being periodically cut forfirewood.

The typical vegetation in this region contain fertile trees (apple, mulberry, apricots, pear tree, etc.) and shrub layer (mainly sea-buckthorn and dog rose) as well as a grass layer, however, as was mentioned above the area of the proposed transmission lines is neither being used for farming nor for grazing. Also, there are cereal plants, legumes, wild growing vegetation (Vakhanpolyn, hay plant, osier, poplars, white calyx). Among the cultural vegetation could be found the wheat, barleycorn, potatoes, tomatoes and etc. The vegetation supported by riparian environments differs from the surrounding vegetation. This is due to the increased availability of water supplyand different soil forms.

3.4.2 Fauna

Faunal communities of the project area are considered part of the steppe and mountain zoogeographical zone and consist of a range of species associated with steppe ecosystems.

The typical fauna in these regions also includes snow leopard, Caucasian goats, wild ram (knownas Marco Polo in a world), brown bear, and red and grey wolf. These animals inhabit in the high mountainous zones (more than 3000 meters above the sea level). These zones are important asthey provide habitat for animal species. There is very limited wildlife occurring along most of theproposed transmission routes and corridors.

3.4.3 Birds

In total, about 200 species and subspecies of birds are found on this territory, which belong to the categories of sedentary, nesting, migratory, wintering and vagrant. Thus, the total species composition of Wakhan birds is 205 species. The qualitative characteristics of the Wakhan bird fauna by the nature of their stay should be as follows: nesting -70 species sedentary - 54 species transient - 86 species wintering - 19 species vagrant - 1 species.

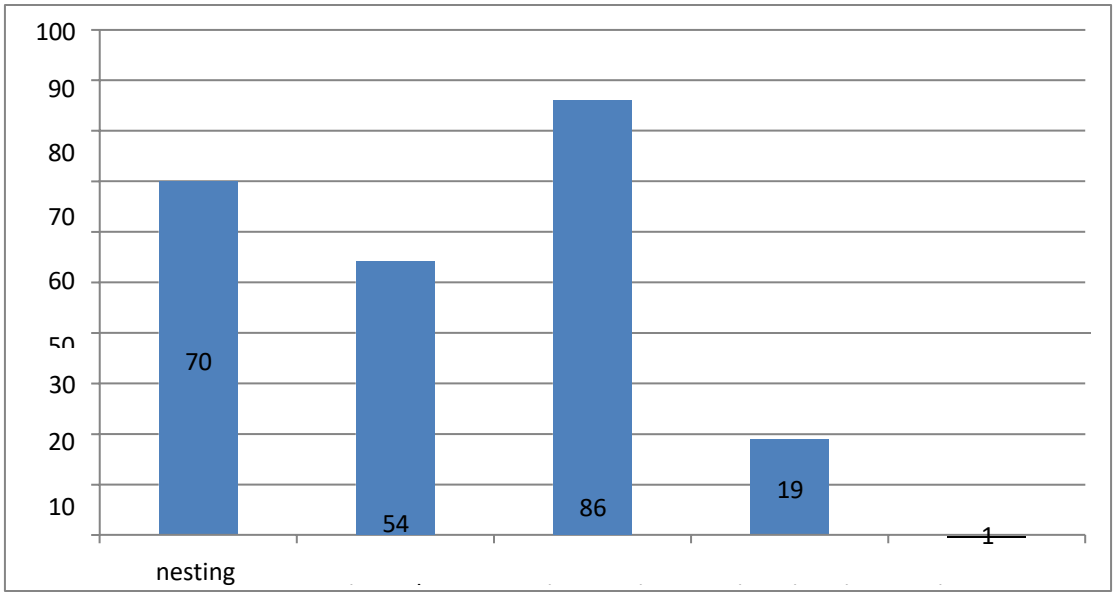


Figure 19 Diagram of the ratio of bird species by the nature of their stay

(source: A. Abdulnazarov, Fauna and bird population of anthropogenic landscapes of GBAO,Moscow, 2000)

Migrating - 86 species and nesting - 70 species are relatively numerous in terms of stay. There are 54 sedentary species, 19 species overwintering and 1 specie belongs to the category of vagrant species.

22 species are included in the list of the IUCN and Tajikistan red book and listed in Table 8.

Table 11: Bird species of conservation concern

(source: A. Abdulnazarov, Fauna and bird population of anthropogenic landscapes of GBAO,Moscow, 2000)

Table 11 Bird species of conservation concern

English name	***Latin name***	***Status***
Long-tailed	Haliaeetus leucoryphus	**EN**
Golden eagle	Aquila chrysaetos	VU -

Black vulture	Aegypius monachus	VU
Griffon vulture	Gyps fulvus	VU
Sparrowhawk	Accipiter nisus	**EN**
Kumay	Gyps himalayensis	VU
Bearded bird	Gypaetus barbatus	VU
Vulture	Neophron percnopterus	**EN**
Red-headed peregrine falcon	Falco pelegrinoides	**EN**
Sicklebeak	Ibidorhyncha struthersi	**EN**
Stone curlew	Burhinus oidicnemus	**EN**
White-capped redstart	Chaimarrornis leucocephala	VU

English name	*Latin name*	*Status*
Blue bird	Myophonus caeruleus	VU
White-leg	Enicurus scouleri	VU
Gray redstart	Rhyacornis fuliginosa	VU
Striped shrub	Carrulax lineatus	VU
Mongolian plover	Charadrius mongolus pamirensis	**EN**
Roller	Coracias garrulus	VU
Big-billed warbler	Acrocephalus orinus Oberholser	VU
Asian awning bird	Phylloscopus collybitus sindian	VU- Vulnerable
Black-breasted rudneck	Luscinia pectoralis	VU
Osprey	Pandion haliaetus	**EN**
Key: **VU – Vulnerable** **EN – Endangereted**		

According to Abdusalyamov A. (1970, 1973, 1976) and Abdulnazarov A. (2000) a total of 22 species of birds within the area of Panj River are rare and are included in the list of protected species by the IUCN and the Red Book of Tajikistan. Among them 8 species are especially vulnerable to the danger of electrical wires in terms of ecology and morphology data. In addition, Alan long tail (Haliaeetus leucoryphus) black long tail and kumay (Gyps himalayensis) are seasonal species and are very rare within this area. All other listed species are not vulnerable according to ecological features, morphometric data and choice of station.

The next table provides the list of the migratory birds in Pyanj river and their conservational status.

Table 11: Migratory bird species – nesting in Panj valley

(source: A. Abdulnazarov, Fauna and bird population of anthropogenic landscapes of GBAO, Moscow, 2000))

Table 12 Migratory bird species – nesting in Panj valley

English name	***Latin name***	***Status***
Osprey	***Pandion haliaetus***	**RL, IUCN NT**
Barbary Falcon	***Falco pelegrinoidesbabulonicus Sclater***	**RL, IUCN EN**
Saker Falcon	***Falco cherrugmilvipes Jerdon***	**RL, IUCN EN**
Lesser Sandplover	***Charadriusmongoluspamirensis Richm.***	**RL, IUCN EN**
Coracias	***CoraciasgarrulusgarrulusSemenovi***	**RL, IUCN VU**
Large-billed Reed-warbler	***AcrocephalusorinusOberholser***	**RL, IUCN VU**
Island Leaf-warbler	***Phylloscopuscollybitussindianus Brooks***	**RL, IUCN VU**
Luscinia	***Luscinia pectoralis ballioniSev.***	**RL, IUCN VU**

3.4.4 Habitat and protected areas

There is no undisturbed habitat along the corridor. While there are few or no introduced species,the remaining habitat is not considered to support viable assemblages of native species althoughthere are some remnant fauna that survive in rocky areas and in remaining forest fragments, andeven in orchards. Between villages, in areas that are less disturbed, relatively few trees and othervegetation remain other than remnant shrubs and grass species that grow in rocky terrain. Evenhere, there is evidence of grazing by goats and other livestock that can tolerate steep slopes. It isalso important to note that, at no point will the final corridor be more than 100 to 300 meters from the road. Perhaps the least disturbed areas will be those with extreme slopes immediately inlandof the road, where towers will be placed on rocky outcrops. Many of these areas are also crossedby the existing line.

None of the habitat could be considered natural other than the sheer cliffs that would never have supported significant vegetation. All other habitat would have to be characterized as modified, in all or nearly all cases heavily modified. The only potentially valuable habitat would be the forest fragments that survive, and even these are heavily exploited for firewood.

The proposed transmission line corridor does not cross, intersect, or pass near any naturally protected areas. The nearest protected area is Tajik National Park, which is in the northern partof GBAO.

3.5 Land use

The transmission line corridor will run parallel to barren slopes with only sporadic vegetation cover between villages and rocky cliffs high above the river and road (designated as road AH66).The line is designed so it will not pass over any occupied houses or other buildings, and so that it avoids orchards and trees as much as possible. In addition, to reduce the impacts of construction, Pamir Energy will require the contractor to use little or no mechanized equipmentother than rock drills and hand tools. Concrete, water, steel parts of the towers, and other materials will be carried by hand from trucks to the tower locations and the towers will be assembled in place. When towers are in place, 110kV conductors (wires) will be placed on the towers and energized.

The soils of the land which will be used for the transmission lines and poles installation is mostlygrey soil, with poor structure and are extremely low in all essential nutrients for example phosphate. These soils are thus seldom farmed on a large scale, mainly due to the high cost of fertilization and low rainfall. Especially the habitats use manure for the farmed areas. Some landin and near villages is used for garden plots and grass (for hay), and there are highly fragmentedforests in and near villages—as noted, these “forests” are heavily cut back for wood. Agriculture

comprises small-scale farming and gardening, hayfields, and orchards. Typical annual crops are potatoes, tomatoes, wheat. Some land is devoted to orchards, mostly pears, apricots, plums and other fruit. Some small areas are covered either with shrubs, pastures, or fragmented forest, all significantly impacted by human activities. This remaining forest, which is only sparsely coveredin trees, is exploited for wood and for berries and wild fruit, although this is not an important source of nutrition. The land in the study area belongs to steppe-stony meadow agroecosystemand is not being used intensively for grazing.

3.6 Human, socio-economic and cultural environment

3.6.1 4.4.1 Demography

The proposed projects will improve access to power supply for 178,750 people (27,745 households) and 2,000 government and commercial entities in Viloyati Mukhtori Kuhistoni Badakhshon (VMKB), Tajikistan

4. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

4.1 Assessment of potential impacts

4.1.1 Impact on soil

Project activities with the greatest potential to affect soils include land-clearing and vegetation removal where necessary, and excavations for tower foundations and the substation(s). If not managed carefully, land clearing and vegetation removal may cause erosion and topsoil loss (where there is erodible material and/or topsoil). The risk is much higher on steeper slopes, although many such slopes have little or no topsoil to erode. In addition, some areas could become more susceptible to landslides and mudslides, and valuable topsoil could be lost and this in turn could affect the success of the reinstatement program, whose aim will be to restore vegetation wherever possible.

Wherever there is soil and subsoil material, it will be removed and stored before excavations are made for foundations. When construction is complete, the subsoil and soil will be replaced and the surface will be replanted with seeds or seedling plants. If there is excess material, it will be removed to a location where it will remain stable and not erode, and it will be seeded. If there isexcess fertile topsoil, local households will be given the opportunity to take it for use on garden plots or orchards. If revegetation of disturbed areas has to take place near the end of the growingseason or when it is too dry for vegetation to thrive, the contractor will pay one or more local households to tend the site until vegetation is self-sustaining and the ground surface is stable. Pamir Energy will require the contractor to prepare and implement a detailed Land Management and Erosion Control Plan to ensure these and other measures are undertaken to protect and preserve soil and land stability.

Besides erosion, soil and the ground surface can be contaminated by spills of fuel, paint, or other hazardous materials. To avoid this, all such materials will be stored in areas with impermeable surfaces and the ability to contain at least 110 percent of stored material. Fueling and vehicle maintenance will take place only over impermeable surfaces or drip trays. Containers will be disposed so they cannot contaminate land or water and in places authorized by Tajikistan law. These

requirements and others will be specified in a Materials and Waste Management Plan thatwill be prepared by the contractor for approval by Pamir Energy.

4.1.2 Impact on views and landscapes

Direct impacts on views of the landscape could occur through obstruction of views or intrusion of new elements into views of receptors. In most cases, conductors will be visible from only a short distance and so are of limited concern. However, towers would extend above the landscape, including the tallest surrounding trees. Taking into consideration the lattice framework of the towers, their height, their relative height compared to the landscape, and the extreme terrain, itis unlikely that viewers would be able to see the towers or conductors from a distance greater than one or two kilometers at most.

Potential visual receptors in the region would include local residents, travelers, visitors, and tourists. The most important impact could be expected to be on tourists and others who come to visit the Pamir mountains, especially during the summer season. Their exposure would be limited in duration, and they currently see other existing transmission lines, even in unpopulated areas. People who live near the transmission line would experience a change in their customary views, and those who live in houses nearer the corridor would be most affected. Although towers could be seen in the distance up to about 1-2 kilometers away, the more significant views would bewithin about 500 meters, with the line much less noticeable at longer distances. The overall significance of the potential impact on landscape and views is considered to be minor or even negligible. No mitigation is necessary, even if it were possible.

4.1.3 Impact on soils

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surfaces and the ability to contain at least 110 percent of stored material. Fueling and vehicle maintenance will take place only over impermeable surfaces or drip trays. Containers will be disposed so they cannot contaminate land or water and in places authorized by Tajikistan law. These requirements and others will be specified in a Materials and Waste Management Plan thatwill be prepared by the contractor for approval by Pamir Energy.

4.1.4 Impacts on air quality

The primary impacts on air quality are expected to result from dust generated by the movementof vehicles and equipment on unpaved roads, during earthworks, during blasting (if blasting is necessary), and by emissions from fuel combustion in vehicles and other equipment. In addition, open piles of topsoil and spoil can generate dust in dry and windy conditions. Construction machinery will generate exhaust gases that contain air pollutants, including particulates, sulfur dioxide, nitrogen oxides, and volatile organic compounds. Since there will not be new access roads, most dust generation would be from the main road. If it is determined that project trafficis causing excessive dust in villages, Pamir Energy will require the contractor to use a bowser orother means to dampen roads to reduce such dust. As for emissions, the contractor will be required to take out of service any vehicle or other equipment that is emitting black smoke.

Besides these construction impacts, the corona effect can cause small amounts of ozone and nitrogen oxides to be generated by transmission lines during operation, especially during humid weather. This is a more important issue for lines with much higher voltage than this line. These pollutants can be harmful to health at high concentrations, but not at concentrations generated by the transmission line, which will be very low, much lower than Tajik standards.

In summary, impacts on air quality due to dust or vehicle emissions could be minor or moderateif not mitigated, but are expected to be negligible with proper dust and emissions control and low with even partial controls.

4.1.5 Impacts due to noise

Noise can be defined as unwanted sound. The sound pressure level emitted from any activity that can be heard by a receiver depends on a number of factors. The impact of the noise dependsnot only on the sound pressure level but on such things as the frequency spectrum, the durationof the noise,

the time of day, the activity causing the noise, and the attitude of the receiver. All these aspects must be taken into account in assessing the impact of noise.

Noise levels in the project area are generally low, generally in the range of 30-50 decibels or even lower. Levels are higher near the river, where the water makes noise flowing over rocks, and along the road when vehicles pass. There are no major noise sources in the immediate vicinity other than from normal human activities.

It is not expected that any houses will be within 40-50 meters of any construction site, so noise impacts will be limited.

The primary sources of noise will include:

- Machinery and equipment used during construction
- Vehicles moving along roads
- Workforce activities (voices, movement, etc.) at construction and maintenance sites during construction and maintenance
- Energized transmission line, especially in wet or humid weather (the corona effect can cause a low humming noise)
- Operating electrical equipment at the substation
- Workforce activities during occasional maintenance activities along the corridor and at the substation.

Since very little mechanized equipment will be used, the loudest noises will be from vehicles and equipment on roads and at a construction camp and from workforce activities. During tower assembly, there could be periodic loud banging noises as towers are transported, erected, and assembled. If there is blasting at a few tower locations, that would also generate noise.

To ensure that impacts from noise are minor or negligible, the following mitigation measures will be implemented:

- The contractor will mobilize to work sites only between the hours of 0700 and 1900.
- If any residence is within 0.5 kilometers of the corridor, the contractor will notify occupants before initiating construction works.
- If blasting is to take place, the contractor will notify nearby residents and post signs at least six hours prior to the time of blasting.
- If residents complain of noise, the contractor or Pamir Energy will monitor noise at the location of concern and implement mitigation measures if noise levels exceed the standards.

- Ensure that sound mufflers and dampeners on vehicles and equipment are working properly, and remove from service any vehicles and equipment that emit excessive noiseuntil noise levels are reduced.

In summary, noise will not be a problem if proper mitigation measures are implemented.

4.1.6 Impacts on surface and groundwater

The impact on water bodies can occur during the installation of some towers near the river.

Localized contamination of surface water is possible during the construction phase due to spillages of lubricating hydraulic oil and fuel onto the nearby ground surface or even into the river channel.

As noted above, fueling and handling of hazardous materials will be controlled by a ManagementPlan approved by Pamir Energy. In addition, the contractor will be prohibited from vehicle or fueling within 25 meters of the river, and always on the side of the road away from the river.

4.1.7 Impacts on flora and fauna

It is expected that the transmission corridor and distribution lines will cross land that has limited biodiversity value. Most or all of the land has been affected by human activities, either by past deforestation or by ongoing agriculture, animal husbandry, and/or wood collecting. As noted

previously, most land crossed by the transmission lines is scree and other rocky slopes, agricultural land, grassland/grazing land, and sections of severely fragmented forests. Some rocky land is used for grazing, but it would support very little vegetation and few or no animals.

The only activity with a direct effect on flora would be at tower foundations, where vegetation would be cleared. To the extent possible, such areas will be avoided during design, and since there is abundant unvegetated land that should be available in most cases. Pamir Energy will berequired to plant at least 10 saplings of the same species of all trees that have to be cut, and to collaborate with local people to tend to the trees until they are mature. During implementation of the project the Land donation agreement will be signed with the Project Affected People, this agreement includes land whichh will be used for the construction of the OHtL and cutting of thetrees. In case if the owner will not be agreed to sign the agreement project should compensate for it.

The primary impact on fauna will be disturbance due to construction. Only very small amounts of land will be taken for tower foundations, and this should have an effect on only a few individual organisms, and not on populations. Construction disturbance will be very short-term,only a few days or weeks at any one location. Mobile fauna can generally tolerate such disturbance by moving short distances away during the day, so there should be limited or no effect on mammals or other fauna.

One possible exception could be birds. Large birds in particular are susceptible to injury or death due to collision with transmission lines while flying, especially during migration, and to electrocution when they touch an energized conductor and a ground. The line is parallel to the river, which would be the migration route of choice, so collision should not be a significant concern except possibly where the line crosses small valleys that have tributary streams. In addition, there are a number of bird species of conservation concern in the area, as was shown in Table 8. Any of these species that use the corridor for nesting or feeding (listed in Table 9) wouldbe capable of moving short distances to other territories and should not be affected.

In order to avoid such cases, Pamir Energy will use the experience with Shugnan VI (phase I) ofusing the acquisition and installation of bird fences and bird's safety devises have been purchased and will be installed during wiring and also planning to purchase the lines bird repeller (a special balloon to threatening birds to change their direction).

In general, the construction of the power line does not threaten or cause large losses for the fauna. For some species, especially migratory species, poles, anchors, wires, and other elevated objects, construction may become additional resting places, safety, and temporary stops.

Impact on habitat and protected areas

The project will not affect any habitat of significant importance to species that are considered threatened, endangered, or critically endangered by IUCN or the Tajikistan Red Book. Moreover, the project will not affect habitat of significant importance to endemic or restricted-range species. The transmission line corridor, substations and distribution lines will not affect national parks, reserves, or other areas that are protected or recognized for reasons of biodiversity or other value.

4.1.8 Potential impacts on community health and safety

A number of actions that will be carried out by Pamir Energy, its contractors, and project workers may affect community health and safety. In general, the potential for impacts of construction and operation on communities and community members is related to the distance that people live from the transmission line. The primary risks, and actions to be taken to reduce or avoid the risks, are described below.

4.1.9 Impacts that result from labour influx

Poor behavior by workers could lead to disruption of local community cohesion, especially smaller communities. This can occur through unaccustomed or violent behaviour, including gender-based violence, and/or an increase in communicable diseases. This will be controlled byrequiring workers to abide by a Worker Code of Conduct that will prescribe certain behaviours and require other behaviours; the contractor will be required to enforce the Code for its own andits subcontractors' employees, with penalties leading up to dismissal. In addition, Pamir Energyand the contractor will consult with local authorities and community leaders, which will ensure they (that is, project managers) are aware of incidents and can take appropriate action if issues arise. Finally, Pamir Energy and the contractor will establish communications with law enforcement authorities so they are aware of the influx of workers, including where they will beworking and where they will reside, and can take appropriate precautions. The risk of gender- based violence (GBV) under this project is assessed to be low given the small size of workers' teams and the lack of precedents that indicate such risks in Tajikistan. Nevertheless, a number ofmitigation measures will be taken to prevent GBV-associated risks, including sensitization for project employees and communities and adoption and monitoring of Codes of Conduct for all project workers.

Increased demand on community services, such as medical and law enforcement, due to use of the services by project workers from outside the region could leave fewer services for community members. The relatively low number of workers and the requirement for the contractor to consult and coordinate with community leaders and law enforcement will ensure that added demand forcommunity services will not cause significant reductions in services available to the community. The fact that most workers are likely to be from the local communities will further reduce the potential impacts.

Increase in HIV/AIDS and/or other communicable diseases could occur due to the increase of male construction workers into rural communities and an increase in prostitutes or other sex workers who come to serve them. The relatively low numbers of nonlocal workers, the fact thatmost work will be primarily in rural areas away from settlements, and the fact that much of theworkers' spare time would be spent in Khorog or other large towns, would be expected to make this risk not significant. If ongoing engagement with community leaders or others suggests there may be

problems of this sort, Pamir Energy and the contractor will enhance training on the Codeof Conduct, monitor worker behaviour more closely, and dismiss offending workers.

4.1.10 Other activities and impacts

Project traffic could interfere with normal public traffic and could cause an increase in accidents involving pedestrians and vehicles. The contractor will be required to develop and implement a Traffic Management Plan that provides for driver training, vehicle safety, route planning to avoid sensitive areas, and coordination with local traffic authorities.

Accidents and emergencies caused by the project could affect communities. The most likely impacts during construction would be from fires and traffic accidents since there will be only limited use of hazardous or flammable chemicals. Workers will be trained in fire prevention, andimplementation of a Traffic Management Plan will reduce the potential for accidents. In addition,the contractor will be required to develop and implement and Emergency Preparedness and Response Plan or procedure. During operation, the most likely emergency would be from trafficaccidents or fires or electrical emergencies caused by sparking or other problems with lines. Proper maintenance will reduce the likelihood of such failures.

Nuisances such as noise and dust during construction could disturb nearby residents and other community members. Given the distance between most construction activities and settled areas, this is not likely to be an issue except very locally and for very short periods. Pamir Energy will require the contractor to maintain vehicles and equipment to minimize noise, and to consider the timing of construction activities so they can avoid periods when specific areas would be most sensitive. In addition, the contractor will be required to control dust from unpaved roads and construction sites during dry periods.

Uncontrolled or poorly controlled access to work sites could expose members of the public to extreme hazards, including areas near excavations (at tower foundation sites and substation), around heavy equipment (at the substation and along the road) and vehicles (along the road), under lifting operations or overhead work (at the substation, if then), and other such limited situations. To control access, all construction areas near communities and at the substation willbe marked with barriers or safety tape and there will be only one or a few access points. Excavations will have physical barriers or intact safety tape placed on all sides of the excavationat any time there is no active work at the excavation site. Any lifting operations at the substationwill have one or more flagmen on duty who can warn people away (lifting at towers will be manual).

Towers will present fall and electrocution hazards to anyone who climbs the tower once the towers are in place and then when the line energized. This is particularly a hazard to young children and teenagers. When towers are in place, there will be signs on all four sides to warn ofdanger and prohibit climbing, with signs in the Tajik and Russian languages (and any other language known to spoken by nearby residents) and with graphic danger symbols that warn of the dangers of falls and of electrocution.

Coming into contact with energized conductors could electrocute children or others. This could

happen if people, especially children, climb towers or if they come into contact with energized conductors that have fallen due to heavy snow, high winds, or tower failure. In addition, tall machinery being used under the lines could come into contact with the energized line and electrocute the driver/operator. Pamir Energy will provide information on such risks and precautionary measures to local schools to help prevent such accidents. In addition, Pamir Energy will ensure that each tower has signs, in Tajik and Russian, that warn trespassers of the risk of electrocution, falls, and other dangers. The sign will have a 24-hour telephone number to which emergency calls can be made.

4.1.11 Potential impacts on traffic and road safety

As noted above, project traffic could interfere with traffic on the public road, especially where project vehicles and equipment use roadside areas for staging and preparation areas, and from where workers will travel on foot to tower locations. To avoid such impacts, Pamir Energy will require the contractor to consult with road authorities to identify the places on roadsides whereit is safest to conduct work. In addition, Pamir Energy will prepare, or require the contractors to prepare, a Traffic management plan that establishes operating and safety requirements for drivers, vehicles, and other project activities in urban, rural, and remote areas. The Plan will require flag persons or other signals to be used when vehicles and heavy equipment could disrupt normal traffic, including when they are parked on roadsides and not visible for at least 500 meters in each direction.

4.1.12 Impacts from electromagnetic fields (EMF)

Since the intensity of magnetic fields diminishes quickly with distance from the source, few homes are close enough to transmission lines for the lines to have an impact on the magnetic field level within the home. Overall, no potential impacts are expected to occur when humans, animals, and plants are exposed to EMF. However, mitigation is called for in order to comply with the Tajikistan norms and ICNIRP guidelines. The primary mitigation is that no one may live in the protection zone, which means no one will live within 20 meters of the energized conductors of the transmission line. In addition, any person who lives within 75 meters of the line meters of the line may request that electromagnetic fields be measured in their house. If monitoring shows that EMF levels exceed 0.5kV/m or 10uT, Pamir Energy will shield or otherwise reduce levels to below that standard. If community concern remains high, Pamir Energy will hold special consultation sessions specifically to discuss EMF issues.

4.1.13 Potential impacts due to physical or economic displacement

Physical or economic displacement could occur if houses or valuable property are located withina 45-meter protection zone under the transmission line (20 meters from each conductor and 5 meters between conductors). Pamir Energy will locate the substations and towers so no houses or other buildings are in the protection zone, and so the corridor will avoid agricultural and other valuable lands as much aspossible. If towers are unavoidably located on agricultural land, those who use the land will be compensated for the land taken in coordination with local authorities. As noted above, only smallareas will need to be taken for towers. As for land under the line between the towers, agricultureand grazing will not be affected, except that tall equipment cannot be used and no

buildings willbe allowed in the protection zone. If that requires a change in land use, Pamir Energy in

collaboration with local authorities will provide compensation. In addition, tall trees (those over 4 meters high) will need to be cut back to maintain at least a 6-meter clearance from the wires. Those who own or use trees will be compensated in-kind in such cases.

To avoid or minimize potential economic and physical displacement Pamir Energy will adhere to the following measures:

- Require the design contractor to place towers so that no household plots with buildings or occupied houses are within the corridor. This will prevent any physical displacement and most economic displacement.
- Require the contractor to restore land that is not acquired for permanent use to its former use as soon as possible after construction is complete. This would be on land the contractor or Pamir Energy leases for construction storage and staging. Restoration would be agreed with the owner and could include de-compacting agricultural land where vehicles and equipment have driven, parked, or worked; and/or re-vegetation with native or grass species. If grazing lands or other lands are revegetated with native species, the contractorwill monitor during the following growing season to verify that grasses or other vegetation are successfully established.
- Require the contractor to undertake, wherever possible, as much of the construction on arable lands between the autumn harvest and spring planting in order to minimize disruption of agriculture (and thus minimize required compensation for damages).
- Require the contractor to consult with communities where trees are to be cut so that wood from these trees is donated to local people, with preference to those who lose landand those who currently exploit timber resources for personal use.
- Not authorize the contractor to begin construction until all compensation for physical and economic displacement has been paid (except compensation for damages that mayoccur during construction).

Collectively, these measures will ensure the project has only minor adverse effects on affected people, and that those effects will be overcome with compensation measures, if necessary.

4.1.14 Potential impacts on worker, health, safety and welfare

Protection of workers is recognized as being extremely important, as witnessed by the 2009 Lawon Occupational Safety, and also is receiving increased emphasis international donors and development

partners. Actions that could cause potential impacts on worker health, welfare, and safety could include:

Poor labor management practices by Pamir Energy, contractors and/or subcontractors could lead to situations where workers are exploited or taken advantage of. This could happen if they did not have written labor management procedures or did not to enter into written contracts that inform workers of compensation, work hours and leave, and other information required by Tajikistan law. This can lead to problems between workers and employers, which in turn can put work and schedules at risk, not to mention the effects on the workers. Pamir Energy has a Human Resources program that fully complies with Tajikistan law and is consistent for example with World Bank standards as well. In addition, Pamir Energy will develop a Labor Management.

Procedure (LMP), which sets out the general principles that will govern the management of project workers by the contractors and subcontractors. The procedure is based on Tajikistan law, including written employment contracts. It also requires contractors to include equivalent provisions in subcontracts and to enforce compliance. Pamir Energy will monitor contractors' working hours to ensure that daily and weekly hours do not exceed legal limits, and also do notplace fatigued workers in high-risk situations near the end of their workdays and workweeks. The need to limit working hours, especially when completing high-risk tasks, will also be emphasized in induction training and toolbox talks.

Unsafe working conditions could place workers at risk of injury or death. Such conditions couldbe caused by vehicles and equipment that do not meet safety standards (seat belts, horns, lights,tires, etc.), unprotected access to dangerous locations (unmarked excavations), poor practices and equipment for lifting operations (during conducting and substation construction), poor electricalsafety (untrained workers, inadequate tools, etc.), inadequate safeguards on tools and equipment (unprotected saws, etc.), and other poor practices. Workers will also be exposed to danger when traveling on foot between the road and tower locations, in particular when traversing steep terrain or areas of treacherous footing. In addition, contractors could fail to provide, free of charge to the workers, adequate personal protective equipment, including head, hand, hearing, eye, and foot protection, and could provide insufficient training to workers in the risks of their jobs and how to perform their work safety. To ensure workers are provided with a safe workingenvironment, each contractor will be required to develop and implement, and to train all workers in the requirements of, an Occupational Health and Safety Plan that includes requirements thatmeet Tajikistan law, and the World Bank Group EHS Guidelines, and good international industrypractice; bidders' draft. Plans will need to be submitted with their proposals and will be considered by Pamir Energy in the selection of contractors. The final Plans will have to be approved by Pamir Energy or a qualified consultant before the contractors are allowed to mobilize and begin any works or investigations. In addition, contractors will have to require subcontractors to comply with this Plan or to develop equivalent Plans. Finally, contractors willreport on a monthly basis key safety statistic to Pamir Energy.

Not giving workers to opportunity to express concerns can lead to worker dissatisfaction and affect

productivity, and equally importantly it can lead to missed opportunities to identify unsafeconditions that workers are in the best position to recognize. When workers are allowed to freely express opinions and to make their grievances known to management, with the knowledge thatmanagement will take action as needed, it can lead to more efficient and safer working conditions and also increase worker satisfaction. Pamir Energy will develop a written mechanism by whichworkers can submit, including anonymously, their opinions and grievances, and by which the company will take action in response to all such submissions. Pamir Energy will require contractors to develop their own mechanisms or alternatively may extend its own grievance mechanism to contractor employees. The contractor will make the mechanism available to subcontract employees, and ensure their grievance are addressed. Further, the contractor will be required to include in their monthly reports to the Supervision Consultant a summary of grievances, and how they were resolved.

Substandard accommodations, if they are provided, can lead to illness or disease among workers, which in turn can result in increased turnover as well as reduced productivity. If accommodationwill be needed within the project, it will be required to comply with good international industrypractice for accommodations, as recorded in the IFC/EBRD Guidance Note on “Workers' Accommodation: Processes and Standards”.

Inadequate water and/or sanitation can affect workers’ health, contaminate soil and surface water, and lead to worker illness or disease. Contractors will be required to provide workers with potable water, at no cost to the workers. Contractors will also have to provide sanitary facilities, including portable toilets in remote areas, and to enforce the Code of Conduct’s prohibition on using the bush.

Gender equality will also be given attention. Construction has historically been the province of men, as have electrical works. Special attention will be given to this issue. It is not expected thatmany women would be employed on construction crews, although there could be some involved in engineering designs and in technical teams. They will not be automatically prohibited from employment, however, so long as they can have the strength and stamina to do the work. In addition, women would be more likely to fill support roles at offices. During selection ofcontractors, Pamir Energy will consider their labor management policies, including gender nondiscrimination policies and programs that go beyond simply nondiscrimination policies, andwill require contractors to establish realistic (and binding) goals for hiring women in different positions.

4.2 Prediction and assessment of impacts

Table 13 PREDICTION AND ASSESSMENT OF IMPACTS

Table 13. Prediction and assessment of impacts				
Receptor	*Sensitivity of Receptor*	*Potential Impact*	*Description of impact*	
			Magnitude & duration of impact	*Significance*
Landscapes and visual				
Residents	Medium	Disturbance to current landscape views due to construction, vegetation corridor in forests, and presence of towers and conductors	Low permanent	Minor adverse
Residents near substation	Medium	Disturbance to current views of agricultural land due to construction, towers, conductors, and substation	Low permanent	Minor adverse
Travelers/visitors	Low	Disturbance of natural views due to construction, vegetation corridor and transmission line	Very low temporary	Negligible Adverse
Land use				
Fragmented forest areas & Orchards	Medium-High	Land clearing at towers and substation, vegetation cut to <4m under line, vegetation cleared at tower sites and substation if needed	Medium permanent	Moderate adverse

Arable land used for annual crops and grass/hay	Medium	Loss of land at tower locations and substation, possible damage and crop loss during construction and maintenance, no other restrictions	Minor permanent	Minor adverse
Grazing land (vegetated)	Low	Loss of land at tower locations and substation, no other restrictions on use	Low permanent	Negligible adverse
Barren rocky land	Low	Loss of and at tower locations and substation	Low permanent	Negligible adverse
Other land (developed)	Low	Loss of land at tower locations and substation	Very low permanent	Negligible adverse
Soils and geomorphology				
Ground surface at towerson steep and moderate slopes (affected by land-clearing)	Medium-high	Potential significant erosion of soil, impaired ability to support vegetation, increased landslides and mudflows	Medium-High permanent	Moderate to Major adverse
Ground surface on slight slopes and flat land	Medium	Slight to moderate erosion of topsoil, impaired ability to support vegetation	Medium temporary	Moderate adverse

Table 12. Prediction and assessment of impacts				
Receptor	*Sensitivity of Receptor*	*Potential Impact*	*Description of impact*	
			Magnitude & duration of impact	*Significance*
Air quality				
Residents and visitors	Medium-High	Fugitive dust generation during construction and maintenance	Low temporary	Minor adverse
		Vehicle emissions during construction and maintenance	Very low temporary	Negligible adverse
		SF6 emissions during operation of substation	Very low permanent	Negligible adverse
		Ozone and NOx emissions during operation of transmission line	Very low permanent	Negligible adverse
Noise				
Residents and visitors in rural areas	High	Line & road construction noise	Low temporary	Minor adverse
Residents and visitors near	Medium to	Construction and transformer/switchgear/line noise	Very low temporary	Negligible

substation	Low			adverse
Water resources				
Panj River	Medium to High	Sedimentation of streams from erosion due to compaction and soil disturbance	Very low temporary	Negligible adverse
		Contamination from spills	Very low temporary	Negligible adverse
		Contamination from herbicide use	No change	None (n/a)
Small streams and drainageways	Medium to High	Sedimentation of streams from erosion due to compaction, soil disturbance, rutting, road crossing	Medium temporary	Minor adverse
		Disruption of flood flows	Low temporary or permanent	Negligible adverse
		Contamination from spills	Low to Medium temporary	Minor adverse
		Contamination from herbicide use	No change	None (n/a)
Groundwater	High	Reduced recharge due to compaction of soil	Very low temporary	Minor adverse
		Contamination from spills	Very low permanent	Minor adverse

		Reduced availability due to withdrawals	No change	None (n/a)
Climate				
Receptor	*Sensitivity of Receptor*	*Potential Impact*	*Description of impact*	
			Magnitude & duration of impact	*Significance*
Climate	Low-Medium	Increased greenhouse gas emissions (CO2, SF6)	Negligible permanent	Negligible adverse
Flora				
Common trees and shrubs species	Medium	All trees and vegetation cleared at towers and substation, cut back to <4m under line	Low to very low permanent	Minor adverse
Fruit & nut trees (orchards)	High	All trees cut at towers, construction zones, access roads, substation Trees >1-4m cut in corridor	Low permanent	Minor adverse
Habitat				
Natural habitat	Medium	Loss of natural habitat	Medium permanent	Moderate adverse
Modified habitat (high- value for biodiversity)	Medium	Loss of modified habitat of high value to biodiversity	Low permanent or temporary	Minor adverse
Modified habitat	Low	Loss of modified habitat of limited value to biodiversity	Low permanent or	Negligibl

(limited biodiversity value)			temporary	e adverse
Fauna				
Common species of terrestrial fauna	Medium -low	Animal death due to crushing or direct impact	Very low permanent	Negligible adverse
		Abandonment of home territories due to construction disturbance	Low temporary	Minor adverse
		Nest abandonment/disruption of breeding animals due to construction disturbance	Low temporary	Minor adverse
		Change in species composition due to change from tall trees to lower vegetation	Very low permanent	Negligible adverse
		Worker interference with animals or nests	Low temporary	Minor adverse
Terrestrial fauna of conservation concern	High	Death of animals of conservation concern	No change	None
Migratory birds (raptors, waterfowl), bats	Low-medium	Death or injury due to collision with line	Very low permanent	Minor adverse
Large birds (raptors, etc.)	Medium	Death due to electrocution	Low permanent	Minor adverse
Owls and bats	Mediu	Loss of hibernating and nesting places in mature trees or	Low permanent	Moderate

	m	buildings		advers e
Community health and safety				
Recept or	*Sensitivi ty of Recepto r*	*Potential Impact*	*Description of impact*	
			Magnitude & duration of impact	*Significance*
Community	Medium	Worker influx: community disruption, crime, etc.	Low temporary	Minor adverse
		Direct impacts: pressure on services, emergencies, etc.	Very low temporary	Negligibl e adverse
Community members (individuals)	Medium	Disease	Very low temporary	Minor adverse
		Violent behavior (including GBV)	Low temporary	Moder ate advers e
		Nuisance and safety: noise, dust, etc.	Low temporary	Moder ate advers e
		Accidents, emergencies	Low temporary	Moder ate advers

				e
Physical and economic displacement				
Households in protection zone and at substation	High	Physical displacement / relocation	No change	None
Land users (with or without rights)s	Medium-high	Permanent loss of land at tower locations and substation	Medium permanent	Moderate adverse
		Temporary loss of land for construction purposes (paths, storage, etc.)	Low temporary	Minor adverse
		Restriction on land use under line	Very low permanent	Negligible adverse
Private wood users	Medium	Loss of wood resource	Low permanent	Minor adverse
		Wood from cut trees donated for personal use	Low temporary	Minor positive
Property owners	Medium	Loss of property, assets, animals due to construction accidents	Low temporary	Minor adverse
Worker health, safety, and welfare				
Workers (contractors	High	Poor labor management practices	Medium temporary	Moderate to major

andsubcontractors)				adverse
		Unsafe working conditions (failure to implement Safety Plan)	High permanent or temporary	Major adverse
		Inability to express concerns	Medium temporary	Moderate adverse
		Substandard accommodations (If required)	Medium temporary	Moderate adverse
Receptor	*Sensitivity of Receptor*	*Potential Impact*	*Description of impact*	
			Magnitude & duration of impact	*Significance*
		Unsanitary conditions	Medium temporary	Moderate adverse
Economic conditions				
Income	Medium	Local income due to increased employment	Low temporary	Minor positive
	Medium	Increased income by local suppliers	Low temporary	Minor positive
Key economic sectors	Low-high	More reliable power supply	High permanent	Moderate positiv

				e
Infrastructure	Low	Damaged public roads	Low temporary	Minor adverse

4.3 RECOMMENDED MITIGATION MEASURES

In the following section recommended mitigation measures are listed according to the assessment and prediction of impacts in the previous chapters. For all adverse impacts considered to be moderate or major, and for some minor impacts, measures are identified to avoid or reduce theimpacts:

4.3.1 Landscape & visual impacts

Construction and ongoing operation of the transmission line will create a minor adverse impact on aesthetics and views for visitors and some residents. During corridor optimization, the preferred corridor is designed to be farther away from populated areas and so that hilly terrainwill hide some towers from specific high-use areas, if there are any, which will have reduced the potential impact. Regardless, however, there is little that can be done to avoid some intrusion onresidents' and tourists' viewsheds in some areas. However, by blocking views of the line for some areas, the terrain will block views and help control the overall significance of the impact.

4.3.2 Land use impacts

To prevent unnecessary impacts on land use, Pamir Energy and the contractors will be required to implement a number of mitigation measures, including:

- Limiting the amount of land taken from current users to the absolute minimum needed or the project. If land allocated to Pamir Energy is not actually used, Pamir Energy will take steps to return the land to its original rights-holder and not require any return of previous compensation or other land that was granted for replacement.
- Limiting the construction footprint to the absolute minimum needed. This will include demarcating and marking all construction areas and access paths, and training workersto remain within authorized demarcated areas.
- Keeping all construction vehicles and equipment on prepared roads and construction areas and prohibiting moving onto adjacent lands not under project control.
- Limiting impacts on land away from construction zones by controlling drainage and erosion and by implementing proper spoil and waste management practices.
- The poles should be treated with wood preservatives registered in Tajikistan. The wooden poles will be imbibed at a manufacture place and not in the field to minimize soil pollution and health effects.
- Upon importing such poles to Tajikistan the regulating authorities will check these itemsand will issue Phytosanitary Inspection Certificate of compliance of the poles against theenvironmental requirements.

- The poles will be installed directly into the ground and therefore they will have to be protected from rotting by means recommended by rules and regulations; The remainingpoles of the same diameter will be installed with the concrete slabs manufactured and installed according to technical requirements. The poles should not be treated with substances containing PCB.

- Allowing people to continue using land that is not used (such as land under the conductors and under the towers) for grazing and agriculture. Restricted areas will be clearly demarcated with signs or other protective measures (e.g. fences), if deemed necessary.

Since no households will need to be resettled, the most important potential impacts are likely tobe where current uses are for crops or other plantings on arable land, where orchards are currently located, and where other trees and shrubs are located. However, this point, the projectdesign and implementation avoid any private or privately used land and hence any need for landcompensation (incl. for trees) is not foreseen to be necessary. Nevertheless, if it is unavoidable, current users will be compensated with replacement land allocations (as required by the law, thereplacement allocations must be of equivalent land) or in case, at the land users' discretion (witha preference for replacement).

4.3.3 Soil and geomorphology impacts

To ensure that impacts on soil and geomorphological conditions are avoided or minimized, Pamir Energy will require the contractor to undertake the following measures:

- Pamir Energy will ensure the design avoids areas identified as being high-risk for landslide and avalanche. If Pamir Energy or the contractor identify area of particular concern for landslides, rockfall, or avalanche in the future, they will undertake geophysical investigations to determine the risk and to identify measures to reduce the risk to transmission lines, road, and local people.

- Pamir Energy will require that towers be located at least 15 meters from the Panj river. For those towers that will have to be placed in or closer to the riverbed or in higher risk zones, special mitigation and protection measures will be installed. Protective diversion walls and reinforced concreted foundations will be used on the one hand to prevent damages from natural hazards (e.g. flooding and landslides). On the other hand, to minimize erosion and sedimentation impacts from foundations. The same design technical design concepts have been already successfully implemented within PATRIP'sShugnan VI phase I project.

- The contractor will mark the boundaries of construction zones and prohibit workers and equipment from straying beyond the boundaries. Within the boundaries, the contractor will control precipitation run-on and run-off as necessary to prevent erosion from affecting areas outside the demarcated construction zone and access roads. The contractor will ensure that proper drainage is maintained throughout construction and on permanent works so that run-on and run-off cannot destabilize slopes, damage vegetation, or erode topsoil.

- The contractor will carefully remove topsoil from locations where it is more than a few centimeters deep and store it in piles that are protected from erosion. If it will not be usedfor land restoration when construction is complete, it will be made available for local people to use in garden plots and other areas, with preference for people who received replacement land for land needed for the project (only surplus, not used as backfill, will be made available).

- If additional soil and spoil is needed beyond that generated by the project, the contractorwill take it only from licensed quarries/vendors, and/or ensure that any self-exploitation activities be undertaken with the same mitigations as described above, with full site restoration and reinstatement of vegetation when exploitation has ended.

- The contractor will manage spoil from excavations in a way that prevents damage outside the demarcated boundaries of the construction zone. The contractor will be prohibited from dumping soil down hillsides, or onto living vegetation in any area, and will be required to place excess soil in configurations that will be stable over the long term before demobilizing.

- The contractor will be required to keep vehicles on prepared roads and surfaces.

- When construction is complete, the contractor will remove piles and depressions from disturbed areas and will grade those areas to a stable contour, using as much spoil as possible. The contractor will then spread stored topsoil over the site before planting of native species of grass and/or shrubs, or broadcasting seeds of such species. The contractor will monitor the success of the revegetation program and make repairs as needed to ensure the establishment of self-sustaining maximum ground cover before demobilization.

- The contractor will restore disturbed areas as soon as practicable once construction

  activity at tower locations is complete, even if construction is continuing at other locations, and not wait until construction is complete at all locations before beginning the restoration program.

- All hazardous materials, including fuels and paint, will be stored in areas with impermeable surfaces and the ability to contain at least 110 percent of stored material. Fueling and vehicle maintenance will take place only over impermeable surfaces or drip trays. Containers will be disposed so they cannot contaminate land or water and in places authorized by Tajikistan law. These requirements and others will be specified in a Materials and Waste Management Plan that will be prepared by the contractor for approval by Pamir Energy.

- Before the contractor is paid the final invoice and allowed to demobilize, Pamir Energy will inspect all construction sites and areas (including sand and gravel borrow areas andquarries) to verify that all areas disturbed by construction have been restored as required.If the contractor has not and does not take action to correct damages, Pamir Energy willhave the option to employ a third party to restore damaged areas and reduce contractorpayments by the amount paid to the third party.

- If blasting is required, it will be designed and supervised by licensed and authorized professionals.

Explosives will be transported, stored, used, and debris managed in full compliance with national law and good international industry practice.

4.3.4 Impacts on air quality

Pamir Energy will require the contractor to implement the following measures duringconstruction:

- Dampen roads and construction areas during dry conditions, as needed to prevent visibledust.
- Dampen or cover soil and spoil stockpiles to eliminate dust generation
- Maintain all vehicles and other engines according to manufacturers' instructions.
- If any vehicle or other combustion engine emit black smoke, take it out of service until properly maintained and there are no longer visible emissions.
- Include the cost and practicality of SF6 management in the analysis of options for dielectric equipment selection.
- If SF6 is to be used, install and use only equipment with low leakage rate (>99% control),ensure equipment is properly labelled/marked, train staff in proper inspection and maintenance to prevent leakage, and manage decommissioning to minimize SF6 leakage.

4.3.5 Impacts due to noise

To ensure that impacts from noise are minor or negligible, the following mitigation measures will be implemented:

- The contractor will mobilize to work sites only between the hours of 07.00 and 19.00.
- The contractor will notify occupants of houses that are within 0.5 kilometers of a work site before initiating construction works, and will notify village and Jamoat leaders before construction is to take place in their territories.
- If blasting is to take place, the contractor will notify nearby residents and post signs at least six hours prior to the time of blasting.
- Ensure that sound mufflers and dampeners on vehicles and equipment are working properly, and remove from service any vehicles and equipment that emit excessive noiseuntil noise levels are reduced.
- If residents complain of noise, the contractor or Pamir Energy will monitor noise at the location of concern and implement mitigation measures if noise levels exceed the standards

4.3.6 Impacts on water resources

The contractor will be required to implement the following measures during construction, and will implement the relevant measures during operation and maintenance:

- Towers will be located at least 15 meters from Panj River and none will be placed in the drainageway of small tributaries. For those towers that will have to be placed in or closerto the riverbed or in higher risk zones, special mitigation and protection measures will be installed. Protective diversion walls and reinforced concreted foundations will be used on the one hand to prevent damages from natural hazards (e.g. flooding and landslides). On the other hand, to minimize erosion and sedimentation impacts from foundations. The same design technical design concepts have been already successfully implemented within PATRIP's Rushan I and Shugnan VI phase I projects.
- Vehicles and workers will use bridges when crossing the river and will not drive vehicles or equipment across the riverbed.
- Riverbanks and all land disturbed by construction will be restored and revegetated as soon as feasible after the disturbance ends.
- Fueling operations and other uses of fuels and hazardous materials will take place at least20 meters from the river or any other permanent or ephemeral stream. Fueling and vehicle maintenance will take place over drip trays or other impermeable surfaces.
- Small ephemeral or permanent streams will be diverted around construction areas or placed in temporary conduits until construction is complete so they do not become silt- laden.
- Sanitary facilities (toilets) will be provided or otherwise available at or near all work locations. Workers will be strictly required to use the facilities at all times, with penaltiesfor violations. If vendors provide portable toilets or sewage disposal, the contactor will verify the vendor has proper permits. Toilets will be at least 25 meters from the river.
- Sediment controls will be placed at the downhill/downstream boundary of uplandconstruction zones when there is a risk that sediment-laden run-off could leave the construction or camp site and either damage vegetation or reach the river. Such controls could include sedimentation ponds, silt fences, and/or other measures.
- Run-on and run-off will be diverted around or otherwise prevented from coming into contact with concrete, including waste concrete, until the concrete is fully cured. Waste concrete will be promptly removed from the construction site and disposed or used where it cannot affect surface or ground water.
- All vehicles and mobile equipment will have spill cleanup kits, and drivers will be trainedin the use

of the kits.

- Herbicides will not be used for vegetation control, nor insecticides or other pesticides forvermin control.
- Local surface water may not be used to wash trucks and equipment, including especially equipment, batching, and ready-mix truck washing and cleaning except at distances at least 20 from rivers, and with barriers placed as needed to prevent wash-water from reaching rivers.
- Wash-water from washing trucks, equipment, or concrete will be contained and evaporated, taken for discharge to a sewer, or otherwise managed so it does not contaminate soil or vegetation.

4.3.7 Impacts on flora and habitats

Even though the project will not have significant impacts on plant species or populations of conservation concern, on protected areas, or on forest habitats other than very locally, the significant deforestation and general habitat degradation that have been experienced make anyremaining trees and habitat even more valuable. Therefore, measures to avoid or minimize impacts will be required. These include:

- Prior to construction and prior to final design (that is, final selection of exact locations oftowers, construction areas, and corridor), Pamir Energy have consulted with qualified regional biologists (Dr. Navruzshoev Dovutsho) and respective authorities the tower locations and corridor. The purpose was to identify all tree and shrub specimens and

  populations. Wherever feasible, the contractor will “micro-locate” towers and the corridor (that is, will move towers by a few meters in one direction or another) to minimize the number of trees and shrubs that must be cut.
- The contractor will demarcate the boundaries of areas where construction activities willtake place, including paths for workers, and will limit disturbance to within the boundaries. In addition, the contractor will train workers not to stray onto property, including any forests, that is outside marked areas and will prohibit workers from collecting or damaging plants or the ground surface.
- The contractor will control precipitation run-on and run-on as necessary to prevent erosion from affecting areas outside the demarcated construction zones or access roads.The contractor will ensure that proper drainage is maintained throughout construction so that it does not destabilize slopes or topsoil and affect vegetation and habitat.
- The contractor will be required to manage soil from excavations in a way that prevents damage outside the marked construction area boundaries. The contractor will be prohibited from dumping spoil down hillsides, or onto living vegetation in any area, andwill be required to return excess spoil to the site once construction is complete. The contractor will remove piles and depressions and will grade the area to its approximateoriginal contour, then spread topsoil over the site before planting or broadcasting seedsof native species of grass and/or shrubs. Finally,

the contractor will monitor the success of the re-vegetation program and to make repairs as needed to ensure the establishment of self-sustaining maximum ground cover before demobilization.

- The contractor will be required to restore all areas disturbed by construction as soon as practicable once construction in that area is complete, and not to wait until construction is complete across the entire site. Pamir Energy will monitor site restoration at least once per quarter during construction and require remedial action as needed.

- Before the contractor is paid the final invoice and allowed to demobilize, Pamir Energy will inspect all construction sites and areas to verify that project footprints, temporary roads, assembly and support areas, temporary roads, and all other areas disturbed by construction have been restored as required and the vegetation cover is established and self-sustaining. Pamir Energy will require remedial action as required, and if the contractor does not take action and correct damages, Pamir Energy will employ a third party to restore damaged areas and reduce contractor payments by the amount paid to the third party.

4.3.8 Impacts on fauna

Although impacts are not expected to be significant, Pamir Energy will implement a number of mitigation measures to overcome any residual impacts.

- Pamir Energy continuously collaborates and has consulted with regional experts and environmental authorities (Abdulnazarov Abdulnazar) to receive data on relevant areas for spring and autumn migration periods to determine if migrating birds cross the corridor, and if so whether they are likely to be at an altitude that could lead to collisions in the future. In the opinion of the experts and authorities, there is some, though not

  excessive risk of future mortality due to collisions. Pamir Energy will therefore install so-called “bird diverters” at intervals on transmission lines at valley crossings to discourage perching and loafing, and to discourage birds from approaching the line.

  The bird’s safety devises have been purchased (234 pcs) and will be installed during wiring. In addition, 50 pcs of line bird repelers (a special balloon to threatening birds to change their direction) were purchased and will be installed in the points advised by Mr. Abdulnazarov. Mostly these are the populated and forest areas, where birds stop for finding food.

- If cutting and/or construction within 100 meters of mature trees with cavities used by owls or bats cannot be avoided, cutting and/or construction within 100 meters must be delayed until after bats have emerged from hibernation, young owlets and bats have permanently left the nests, and roosts are not being actively used.

- If mature trees with hollows that support or have supported hibernating or nesting bats must be cut, the contractor will place “bat boxes”, approved by a qualified expert, in a place approved by

the expert. Pamir Energy will replace bat boxes as needed for the firstfive years of operation. At least two bat boxes will be placed for each such bat-supportingtree that is cut.

- The contractor will clearly mark construction zones and train workers to remain within demarcated areas. Within such zones, specific areas will be designated for washing, eating, smoking, toilets, and other personal activities, and such activities will be confinedto those areas. The contractor must establish and enforce rules to prohibit workers fromhunting, exploiting, feeding, or disturbing animals and birds, and must train workers in those rules and enforce penalties for violations, including dismissal.

- The contractor must place ramps of some sort (e.g., logs or boards placed in the excavation so they reach the top) in excavations that remain open at night to allow small animals toescape if they fall into the excavation.

- The contractor will adopt rules against disturbing or destroying plants and wildlife, andprovide induction training for workers these rules. The contractor will enforce these rules with appropriate penalties, up to and including dismissal.

- Pamir Energy will require the design to provide spacing between conductors (lines) andinsulators so as to prevent electrocution by the bird with the largest wingspan that is likely to be present (approximately 2.5 meters for the Himalayan vulture).

- The power line will be built with wooden utility poles and therefore is expected to be safefor birds, however, given that the target area is known as a habitat for rare bird speciesand migratory bird flyways, the PE will ensure that the T-line(including transformer substations) design include standard protection measures and devices to avoid or mitigate the impact of electricity power line within migratory fly zones and avian protection areas (for example, the use of the isolated wire CIP-3as currently planned bythe PE)

4.3.9 Impacts on community health and safety

- Poor behavior by workers will be controlled by requiring workers to abide by a WorkerCode of Conduct that will prescribe certain behaviors and require other behaviors; the contractor will be required to enforce the Code for its own and its subcontractors' employees, with penalties leading up to dismissal. In addition, Pamir Energy and the contractor will consult with local authorities and community leaders, which will ensure they (that is, project managers) are aware of incidents and can take appropriate action ifissues arise. Finally, Pamir Energy and the contractor will establish communications withlaw enforcement authorities so they are aware of the influx of workers, including where they will be working and where they will reside, and can take appropriate precautions. The risk of gender-based violence (GBV) under this project is assessed to be low given the small size of contractors' teams and the lack of precedents that indicate such risks in thearea.

- To avoid increased demand on community services, such as medical and law

enforcement, the contractor is required to consult and coordinate with community leaders and law enforcement to ensure that added demand for community services will not cause significant reductions in services available to the community. The fact that most workersare likely to be from the local communities will further reduce the potential impacts.

- To prevent increase in HIV/AIDS and/or other communicable diseases the contractor with Pamir Energy will enhance training on the Code of Conduct, monitor workerbehavior closely, dismiss offending workers and continuously engage with community leaders.

- To ensure safe project traffic and road safety the contractor will be required to develop and implement a Traffic Management Plan that provides for driver training, vehicle safety, coordination with local traffic authorities, and traffic control at road construction.

- To avoid accidents and respond to emergencies workers will be trained in fire prevention, and implementation of a Traffic Management Plan. In addition, the contractor will be required to develop and implement and Emergency Preparedness and Response Plan orprocedure.

- To minimize noise and dust nuisances during construction, Pamir Energy will require thecontractor to maintain vehicles and equipment to minimize noise, and to consider the timing of construction activities so they can avoid periods when specific areas would bemost sensitive. In addition, the contractor will be required to control dust from unpavedroads and construction sites during dry periods.

- To control access, all construction areas near communities and at the substation will be marked with barriers or safety tape and there will be only one or a few access points. Excavations will have physical barriers or intact safety tape placed on all sides of the excavation at any time there is no active work at the excavation site. Any lifting operations at the substation will have one or more flagmen on duty who can warn people away (lifting at towers will be manual).

- When towers are in place, there will be signs on all four sides to warn of danger and prohibit climbing, with signs in the Tajik and Russian languages (and any other language

  known to spoken by nearby residents) and with graphic danger symbols that warn of thedangers of falls and of electrocution.

- To prevent contact with energized conductors that could electrocute children or others. Pamir Energy will provide information on such risks and precautionary measures to localschools to help prevent such accidents. In addition, Pamir Energy will ensure that each tower has signs, in Tajik and Russian, that warn trespassers of the risk of electrocution, falls, and other dangers. The sign will have a 24-hour telephone number to which emergency calls can be made.

4.3.10 Physical or economic displacement

To help avoid or minimize potential economic and physical displacement, Pamir Energy will implement or require the following measures:

- To design and place towers so as to avoid or minimize the number of household plots with buildings or occupied houses that are within the corridor. This prevents any physical displacement and most economic displacement. Pamir Energy plans to implements the project so no one will need to be resettled.

- Acquire rights to use the absolute least amount of land necessary for the project. If land whose rights are terminated is not actually used, Pamir Energy will work with authoritiesto return rights to the land to the previous rights-holder, even if replacement land has been provided.

- Require the construction contractor to mark the boundaries of lands that Pamir Energy has been allocated, and any others construction zones, and require workers to remain within those boundaries and disturb no other land that other people use.

- Require the contractor to restore land that is not acquired for permanent use to its former use as soon as possible after construction is complete. This would be on land the contractor or Pamir Energy leases for construction storage and staging. Restoration would be agreed with the owner and could include de-compacting agricultural land where vehicles and equipment have driven, parked, or worked; and/or re-vegetation with native or grass species. If grazing lands or other lands are revegetated with native species, the contractorwill monitor during the following growing season to verify that grasses or other vegetation are successfully established.

- For work that will affect arable lands, require the contractor to undertake, wherever possible, as much of the construction between the autumn harvest and spring planting inorder to minimize disruption of agriculture (and thus minimize required compensation for damages).

- If necessary (though not foreseen at this point) prepare a compensation plan according to final locations of towers and substation and the construction contractors select their construction sites. The plan will identify the land that will be needed, owners and personsto be compensated (if any), by in-kind compensation (land for land). It is noted that someinformation may be withheld from disclosure from public disclosure in order to protect privacy. At this point the project design and implementation avoid any private or

  privately used land and hence any need for monetary land compensation (incl. for trees)is not foreseen to be necessary.

- Require the contractor to consult with communities where trees are to be cut so that wood from these trees is donated to local people, with preference to those who lose land and those who currently exploit timber resources for personal use. Otherwise, wood is to be donated for community distribution and use.

- Not authorize the contractor to begin construction until all compensation for physical and economic displacement has been paid (except compensation for damages that may occur during construction).

Collectively, these measures will ensure the project has only minor adverse effects on affected people, and that those effects will be overcome with compensation measures.

4.3.11 Land Acquisition and Compensation Payment

No agricultural and private land will be obtained for construction of the sub-stations, so no displacement and relocation will occur as a result of mentioned components of the Shuganan VI(Phase II) project. If any damages to the soil and crop as the result of the construction activities will occur,it will be compensated by the construction contractor

Agriculture can continue under the line itself so no compensation will be paid unless crops are damaged in some way or other uses are limited by the presence of the line. If trees grown for timber, firewood, or fruit/nuts need to be cut to avoid interference with the energized conductors, their owners will be compensated sufficiently with replacement trees. If inevitable, all land acquisition and compensation would meet the requirements of Tajikistan law and wouldbe based on the LACP (Annex H) as a guide. At this point the project design and implementationavoids any private or privately used land and hence any need for monetary land compensation (incl. for trees) is not foreseen to be necessary.

Nevertheless, people owning or using land in the corridor will thus be a high-priority stakeholder group who will require active and regular engagement as well as being provided accurate information, in particular about potential land compensation and livelihood restoration schemes and employment opportunities. Any voluntary contribution from community members will be accepted and will be formally acknowledged if it concerns land plots and land use.

The Entitlement Matrix provided below with details in tabular format shows the project positionon land acquisition and compensation activities of the project

4.3.12 The Contractors obligation

PE will engage contractors to carry out construction works for the various Project components. All construction activities will be executed according to the general and specific requirements for ESHS Management, as defined in the tender documents and particular attention will be paid to the following measures:

- Community interaction and safety
- Damage to people and property

Contractors will be informed about all obligations stemming in relation with land acquisition and the following provisions will be included in the relevant Contractor Management Plans:

- PE will provide contractors with access to land that has already been acquired for the Project, avoiding arable land, pastures or land with trees, to the greatest possible extent;
- If for some reason the contractors need to use other land (which has not been acquired for the Project by PE), they may engage in voluntary rent agreements with the users of this land. As PE has

ultimate responsibility for contractor performance in relation to environmental and social issues, PE will monitor this voluntary transaction and ensure that it is aligned with WB ESS5 requirements;

- PE will ensure that the contractors restore all rented land to its previous condition following completion of the rental period.
- If any permanent damage, which cannot be mitigated, occurs on this rented land, contractors will be required to compensate long term losses in accordance with WB ESS5requirements, at full replacement cost.
- Compensation must be paid at replacement cost value for permanent impacts as well asfor all temporary disturbances e.g. damages to crops, prepared soil, etc. during construction. All other affected assets that will be encountered during corridor preparation or construction will also have to be compensated by the construction contractor. Repairs of any damages to assets and restoration to their former condition; OR Cash compensation for any affected assets (crops, trees, structures, etc.) at full replacement cost, using the methodology and compensation rates defined by the independent valuators for losses caused by HPP Sebzor components
- Contractors will also be required to use only land which has been officially acquired and compensated prior to construction (either by PE or by the contractor, through voluntary agreements). If any land outside of these areas is disturbed by contractors' workers (crops, trees, structures), damages will be promptly recorded, discussed and agreed with the owner of assets which have been damaged (user of the land in question) and compensation for these damages will be provided by the contractor. Any complaints will be addressed through the Project Grievance Redress Mechanism.
- Construction works that need to be completed in the direct proximity to houses, will be

  conducted as much as possible either manually or with smaller machinery as to minimize any risk of damaging property;

Entitlement Matrix

Table 14 Entitlement Matrix

Loss	Compensation
Loss of Building/ House	No physical displacement occurs with the implementation of theproject
Loss of land, cropsand trees	• For work that will affect arable lands, require the contractor to undertake, wherever possible, as much of the constructionbetween the autumn harvest and spring planting in order to minimize disruption of agriculture. • The disturbed should be restores areas as soon as practicable once construction activity at tower locations is complete, evenif construction is continuing at other locations • Agriculture can continue under the line itself so no compensation will be paid unless crops are damaged in someway or other uses are limited by the presence of the line • *If a*ny damages to the soil and crop as the result of the construction activities will occur, they will be compensated bythe construction contractor
Loss of trees	At this point, the project design and implementation avoids any privateor privately used land, and hence any need for monetary land compensation (incl. for trees) is not foreseen to be necessary.
Loss of public land	No public land will be used by the project
Loss of businesses	No relocation of private businesses is envisaged by the project
Waged employment. e.g. traders, employees	No offset jobs lost are foreseen.

Access to natural resources. e.g. water sources, firewood	• No impact on the natural resources. (water sources, firewood) is foreseen. • If during the implementation of the project, any damages to the natural resources (water, firewood) will occur, the construction contractor will compensate for damages and where it is necessary to restore the destroyed
Loss of crops due to construction activities	• For work that will affect arable lands, require the contractor to undertake, wherever possible, as much of the construction between the autumn harvest and spring planting in order to minimize disruption of agriculture. • As a priority to involve in the construction works project affected people, as one of the ways to offset their losses • *If a*ny damages to the soil and crop as the result of the construction activities will occur, they will be compensated by the construction contractor
Loss of trees due to construction activities	• At this point the project design and implementation avoids any private or privately used land and hence any need for monetary land compensation (incl. for trees) is not foreseen to be necessary.
"Orphan Land" Reduction of cultivation area on remaining land	• In case the land owner asks to be expropriated and provided him another piece of land, the Implementation partner (Pamir Energy) will discuss this issue with relevant government and community agencies to provide him with another piece of land

4.3.13 Worker health, safety and welfare

- Pamir Energy will develop a Labor Management Procedure (LMP), which sets out the general principles that will govern the management of project workers by the contractors and subcontractors. The procedure is based on Tajikistan law, including written employment contracts. It also requires contractors to include equivalent provisions in subcontracts and to enforce compliance. Pamir Energy will monitor contractors' workinghours to ensure that daily and weekly hours do not exceed legal limits, and also do not place fatigued workers in high-risk situations near the end of their workdays and workweeks. The need to limit working hours, especially when completing high-risk tasks, will also be emphasized in induction training and toolbox talks.

- To ensure workers are provided with a safe working environment, each contractor will be required to develop and implement, and to train all workers in the requirements of, an Occupational Health and Safety Plan that includes requirements that meet Tajikistan law, and the World Bank Group EHS Guidelines, and good international industry practice. Plans will need to be submitted with their proposals and will be considered by Pamir Energy in the selection of contractors. The final Plans will have to be approved by PamirEnergy before the contractors are allowed to mobilize and begin any works or investigations. In addition, contractors will have to require subcontractors to comply with this Plan or to develop equivalent Plans. Finally, contractors will report on a monthly basis key safety statistics to Pamir Energy.

- Pamir Energy will require contractors to develop their own worker grievance mechanisms or alternatively may extend its own grievance mechanism to contractor employees. The contractor will make the mechanism available to subcontract employees, and ensure their grievance are addressed. Further, the contractor will be required to include in their monthly reports to the Supervision Consultant a summary of grievances, and how they were resolved.

- If accommodation will be needed within the project, it will be required to comply with good international industry practice for accommodations, as recorded in the IFC/EBRD Guidance Note on "Workers' Accommodation: Processes and Standards".

- Contractors will be required to provide workers with potable water, at no cost to the workers. Contractors will also have to provide sanitary facilities, including portable toilets in remote areas, and to enforce the Code of Conduct's prohibition on using the bush.

- During selection of contractors, Pamir Energy will consider their labor management policies, including gender nondiscrimination policies and programs that go beyond simply nondiscrimination policies, and will require contractors to establish realistic (andbinding) goals for hiring women in different positions.

4.3.14 Residual impact assessment conclusions

Most adverse impacts that are minor or negligible will be reduced or avoided altogether by the use of good international industry practices and required mitigation measures. The more serious potential impacts described above will be avoided or reduced to acceptable levels by implementation of the mitigation measures. Avoidance strategies, mitigation measures, and bestmanagement practices are presented in previous chapter and as part of the ESMP.

5. KEY FINDINGS OF STAKEHOLDER ENGAGEMENT

The purpose of stakeholder engagement is to allow for stakeholders to interact with the decisionmaking process, express their views and influence mitigation and technical solutions to concernsvoiced during the process.

In-depth stakeholder consultations will be conducted in due course and also once technical design plans have been sufficiently developed to share concrete data with stakeholders e.g. on routing and specific location of transmission corridors and distribution lines.

Following concerns and suggestions were identified within stakeholder engagement and will be considered by Pamir Energy and its contractors:

5.1 Stakeholder consultations

Table 15 Stakeholder consultations

Concern/Suggestion	**Stakeholder**	**Responses by the Project**
Installation of bird diverters	*Pamir Botanical Institute*	*PE intends to install bird diverter*
Trees Cutting	*Environmental Protection Agency*	*PE intends to avoid cutting trees, incase of need consult with EPA and get official permission*
Land Donation Issues	*Local Communitiesand Jamoats*	*PE will sign an agreement with all affected households and start the work only after the crop is harvested*

5.2 PAMIR ENERGY's point of contact

The point of contact for stakeholder engagement mechanism is Pamir Energy's Senior Environmental and Social Officer. During implementation, there will be other Community Liaison Officers to assist.

Description	*Contact details*
Name	Asligul Mamadatoeva
Address:	75 Gulmamadova Street 736000 Khorog, GBAO, Tajikistan

E-mail:	mavluda.mamadatoeva@pamirenergy.com
Telephone:	+992 35 222 23 10

5.3 GRIEVANCE REDRESS MECHANISM

Issues and complaints can arise during the course of the project from actions by Pamir Energy or its contractors and subcontractors. At present, Pamir Energy operates a "customer hotline" thatis used to report power outages and other issues. During construction, Pamir Energy will establish a separate mechanism to deal with construction-related issues, including issues regarding compensation and resettlement.

Project-affected-people and any other stakeholder may submit comments or complaints at any time by using the project's GRM. The overall objectives of the GRM are to:

- Provide a transparent process for timely identification and resolution of issues affecting the project and people, including issues related to the resettlement and compensationprogram.
- Strengthen accountability to beneficiaries, including project affected people.

The GRM will be accessible to the full range of project stakeholders, including affected people, community members, civil society, media, and other interested parties. Stakeholders can use theGRM to submit complaints, feedback, queries, suggestions, or even compliments related to the overall management and implementation of the project, including the resettlement and compensation program. The Grievance Resolution Mechanism (GRM) is intended to address

issues and complaints from external stakeholders in an efficient, timely, and cost-effective manner. A separate mechanism will be used for worker grievances.

Pamir Energy will be responsible for managing the stakeholder GRM, but many or most grievances are likely to result from actions of the construction contractors and so will need to be resolved by the contractors themselves, with Pamir Energy oversight. Typical grievances for transmission line projects could include issues related to:

- Land acquisition and compensation
- Construction damages to property, crops, or animals
- Traffic
- Environmental impacts such as erosion

- Nuisances such as dust or noise
- Worker misbehavior.

The GRM will be in place and operational well before Pamir Energy begins construction activitiesand will function until the completion of all construction activities and beyond, till the contractor's defect liability period ends. Initial compensation, for land and property needed forthe project, will be completed before construction begins. People who reside near the line and others who may be affected will be informed, in meetings and with brochures, of the GRM's purpose, functions, procedures, timelines and contact persons. Additional measures will be taken to inform those who are determined to be eligible for compensation.

The project GRM will include three successive tiers of extra-judicial grievance review and resolution:

- The first tier will be the Pamir Energy E&S team, including the Community Liaison Officer. They will deal quickly with issues that can be quickly resolved, and would always involve direct communication with the person(s) who submitted the grievance.
- The second tier will be a Grievance Resolution Committee (GRC1) that includesrepresentatives of Pamir Energy and of the complainant's village and Jamoat. The GRC1 will deal with issues that could not be resolved in the first tier.
- The third tier will be a Grievance Redress Commission (GRC2) that included one or more senior Pamir Energy managers and one or more Jamoat and/or village leaders. GRC2 will resolve issues that could not be resolved by GRC1.

Grievances would be handled as described in the following figure.

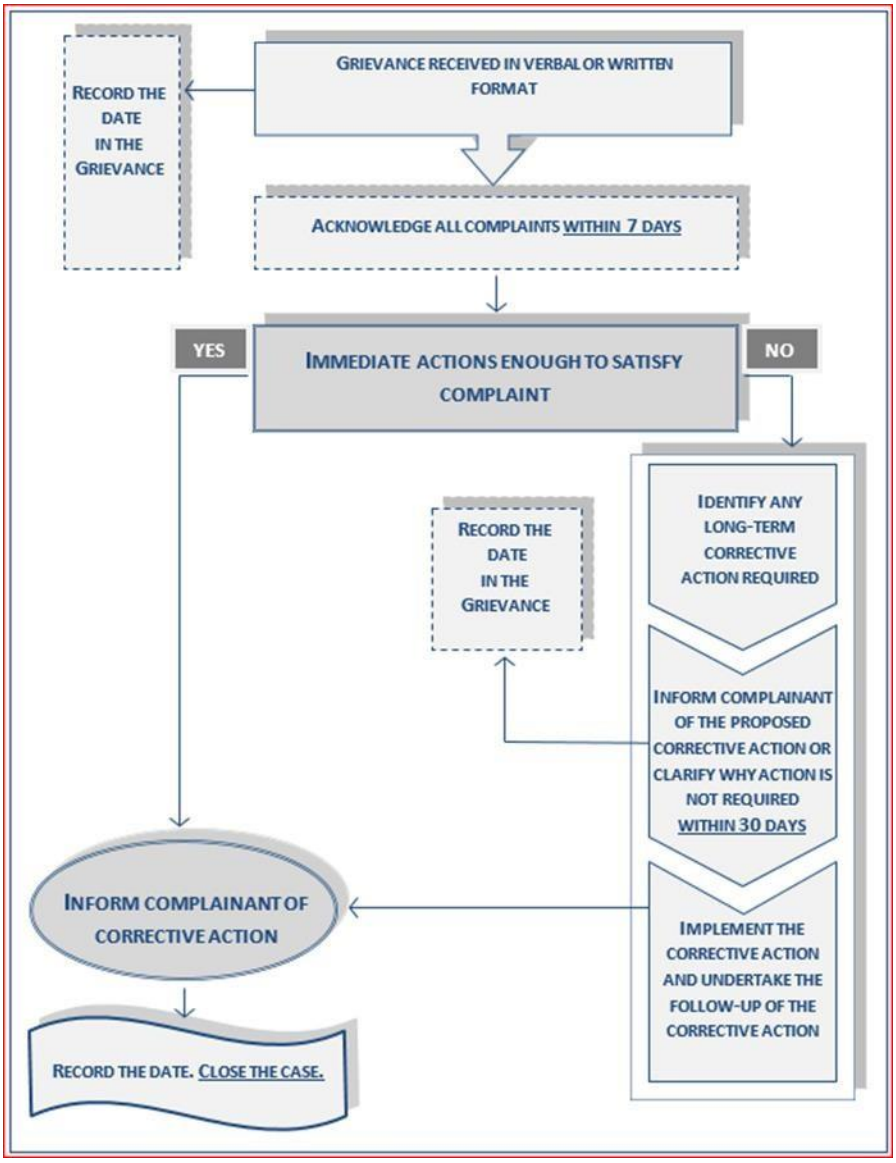

Figure 20 Typical grievance resolution process

5.3.1 Grievance Log

The HSE Department will maintain a grievance log. This log will include at least the followinginformation:

- Individual reference number
- Name of the person submitting the complaint, question, or other feedback, addressand/or contact information (unless the complaint has been submitted anonymously)
- Details of the complaint, feedback, or question/her location and details of his/ her complaint
- Date of the complaint
- Name of person assigned to deal with the complaint (acknowledge to the complainant,investigate, propose resolutions, etc.)
- Details of proposed resolution, including person(s) who will be responsible for authorizingand implementing any corrective actions that are part of the proposed resolution
- Date when proposed resolution was communicated to the complainant (unless anonymous)
- Date when the complainant acknowledged, in writing if possible, beinginformed of theproposed resolution
- Details of whether the complainant was satisfied with the resolution, andwhether thecomplaint can be closed out
- If necessary, details of GRC1 and GRC2 referrals, activities, and decisions
- Date when the resolution is implemented (if any).

6 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORINGPLAN

Table 14 describes and outlines the Environmental and Social Management Program/Plan (ESMP) for the project. It has been developed to clearly identify measures that must be implemented to avoid, reduce, or otherwise mitigate potential impacts of moderate or major significance. It also identifies best management practices (BMPs) and other mitigation measuresthat will minimize, reduce, or eliminate many of the impacts of minor or even negligible significance which could escalate to become more important if they are not handled properly.

It is expected that mitigation measures will be sufficient to reduce all risks to acceptable levels. In many cases, the ESMP requires development of detailed plans to manage specific risks and hazards and includes an overview of the relevant requirements of those plans. Primary responsibility for implementing mitigation measures during construction will rest with the contractors, although Pamir Energy will have responsibility for some of the actions and for supervising the contractors. Pamir Energy may oversee contractor performance, in which case they would have immediate responsibility for approving plans and supervising construction, orthey may elect to appoint a Supervision Consultant (variously known as the Engineer, Consultant, Consulting Engineer, Owner's Engineer, or other names) to approve the contractor's environmental and social management plans and oversee environmental and social performance of construction contractor(s)

It is important to note that Pamir Energy, in part through its contractors, will also be responsible for complying with relevant requirements of Tajikistan laws, the World Bank Environmental and Social Framework, the World Bank Group's General Environmental, Health, and Safety (EHS) Guidelines, and the EHS Guidelines for Electric Power Transmission and Distribution, which may have more detailed requirements than the Plan presented here.

Following this table of mitigation measures, provides the Environmental and Social MonitoringPlan (or Program). This Plan is necessary to ensure there is close scrutiny over actual environmental and social performance so that prompt action can be taken if mitigation measuresare not being implemented or if the measures are not adequately mitigating actual impacts. Theobjectives of the monitoring program are to:

Meet Tajikistan legal, World Bank, Pamir Energy and community obligations

Identify project impacts during preconstruction, construction, demobilization, and operation • Verify that mitigation measures are being implemented as required

Evaluate the effectiveness of mitigation measures and identify any shortcomings

Allow refinement and enhancement of mitigation measures if needed to further reduce impacts

Allow development of mitigation measures to deal with unforeseen issues or changes in operations

Allow Pamir Energy, Government authorities, and the World Bank to verify that their respective requirements are being met.

5.4 Environmental and social management plan for the Shugnan VI phase II project

Table 16 Environmental and social management plan for the Shugnan VI phase II project

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
Prepar	E&S	Pamir Energy (PE) plans to route the transmission line corridor, and associated distribution lines in a way to prevent damage on valuable ecosystems and habitats; on valuable historic, religious, cultural, archaeological and paleontological resources and on community lands and livelihoods. In doing so, Pamir Energy will put particular focus on: - Avoiding vegetation and forest clearance - Using as much as possible existing right-of-way (e.g. along existing road corridors) - Aligning transmission corridors to avoid critical habitats (e.g. nesting grounds, heronries, rookeries, bat foraging corridors, and migration corridors)	Design	Pamir	Project
	Risk		documents	Energy	planning
	Manag		(feasibility		documents
	ement		study)		
	Project				

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	sitting	- Avoiding known areas of historical/cultural/archaeological interest - Avoiding habitations, since proposed transmission lines have capacity of 110kV - Avoiding private and privately used land for tower locations - Where feasible, minimize tower locations on arable land used for crops, hay, and orchards - Locating no towers in cemeteries - Locating towers at least 15 meters from Panj river - For towers placed in or closer to streams, the riverbed and higher risk zones; protective diversion walls and reinforced concreted foundations will be used to prevent damages from natural hazards (e.g. flooding and landslides) and to minimize erosion and sedimentation impacts from foundations. - Spacing to avoid electrocution of large birds (>2.5m spacing) - Where feasible, align corridor to avoid the need to cut back trees, including orchards			
	Project	Pamir Energy ensures local communities are preferred for the supply of goods	Site	Pamir	Random site
	design	and services to the project and project personnel, where appropriate. If	observations	Energy	inspection
		materials and competences are available locally, they should be	Community		

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		sourced			
		locally provided it does not disturb local economy (preference for local hiring).	meetings		
	Project	Pamir Energy considers all associated facilities throughout the E&S risk	Design	Pamir	Project
	design	management activities, such as:	documents	Energy	planning
		- Access roads needed for construction and maintenance - Distribution network, transformers, substations - Workers camps, material storage areas if any	(feasibility Studies)		documents
	Stakeh	Pamir Energy engages and communicates with communities and plans	Project	Pamir	Document
	older	sufficient time for participation. Moreover, PE ensures regular consultations	Documentation	Energy	review
	Engage ment	with the local authorities and communities regarding the management of construction. On-going consultation processes will also identify marginalized groups and include:	Minutes - Stakeholder Engagement &		Grievance records
		- Outreach to all identified stakeholders - Realistic information on employment opportunities - Meetings with community leaders and citizens as appropriate - Implementation of Grievance Mechanism	Consultations		

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Grievance Mechanism	Pamir Energy documents all grievances from workers, communities and other stakeholders formulated on a register along with the responses given. Anonymity, if required, shall be guaranteed. A template of the grievance form can be found in Annex 2.	Grievance Mechanism register	Pamir Energy	Review of grievance register
	Occupational Health & Safety	Pamir Energy (together with consultants) sensitizes its cooperation partners within this project on OHS. Among other things this includes to provide H&S training to contractors, sub-contractors and workers.	Trainings record. Incident documentation. Project reporting.	Consultant Pamir Energy	Check Training records Check incidents reports
	Land Acquisition	Pamir Energy engages with communities and authorities at the earliest stage to understand the land ownership and land use. Furthermore, PE engages with the local community and potential affected households to understand their needs and identify the risk of damage to their livelihood basis through the project (e.g. take of pastureland, lack of access to water, orchard and fruittrees).	Minutes of Meetings Grievance Mechanismrecords	Pamir Energy	Project planning documents

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Land Acquisition	- Limiting the amount of land taken from current users to the absolute minimum needed or the project. To accomplish this, designers were required to avoid household plots and to minimize towers and corridor crossings of arable land. In addition, if land allocated to Pamir Energy is not actually used, Pamir Energy will take steps to return the land to its original rights-holder and not require any return of previous compensation or other land that was granted for replacement. - Limiting the construction footprint to the absolute minimum needed. This will include demarcating and marking all construction areas and access paths, and training workers to remain within authorized demarcated areas. - Keeping all construction vehicles and equipment on prepared roads and construction areas and prohibiting moving onto adjacent lands not under project control. - Limiting impacts on land away from construction zones by controlling drainage and erosion and by implementing proper spoil and waste management practices. - Allowing people to continue using land that is not used (such as land under the conductors and under the towers) for grazing and agriculture.	Minutes of Meetings Grievance Mechanism records Management Plan for Land Acquisition and Compensation if needed	Pamir Energy	Review of grievance register

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Biodiversity and Natural Habitats	Pamir Energy ensures a “Bird friendly design” of the transmission lines to minimise bird collision mortality. Pamir Energy continuously collaborates and has consulted with regional experts and environmental authorities to receive data on relevant areas for spring and autumn migration periods to determine if migrating birds cross the corridor, and if so whether they are likely to be at an altitude that could lead to collisions in the future. In the opinion of the experts and authorities, there is some, though not excessive risk of future mortality due to collisions. Pamir Energy will therefore install so-called “bird	Site Observations Consultations with regional environmental experts & authorities	Pamir Energy Contractor	Random site inspection
		diverters” at intervals on transmission lines at valley crossings to discourage perching and loafing, and to discourage birds from approaching the line.			
	Grievance Mechanism	Pamir Energy documents all grievances from workers, communities and other stakeholders formulated on a register along with the responses given. Anonymity, if required, shall be guaranteed. A template of the grievance form in Annex G will be applied.	Grievance Mechanism & grievance record register on site and in the office.	Pamir Energy	Review of grievance register

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Labour Conditions	Pamir Energy and its contractors ensure minimum labour conditions will be applied (no child labour, no forced labour, non-discrimination) as required by ILO Conventions. Contribution from community in the form labour is allowed, provided that contribution is voluntary and does not negatively affect livelihoods.	Site visits/verification	Contractor	Inspection reports (also from labour authorities), Review of grievance register and training record
	Labour Conditions	Pamir Energy and its contractors ensure the workforce has access to primary healthcare on site, providing prescriptions. - As a minimum, first aid kits need to be available on every construction site. - Emergency services (next hospital, health centre or doctor) needs to be identified and made available to workers in case of need. - Communications established with nearest medical facilities and personnel regarding works to be completed, arrange for support as appropriate Should worker camps be requested, Pamir Energy and its contractors provide workers with acceptable housing conditions ensuring the provision of adequate space, supply of water, adequate sewage and garbage disposal system, appropriate protection against heat, cold,	Site visits & Observations Grievance Mechanism	Contractor	Random site inspection

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		damp, noise, fire, security and disease-carrying animals, adequate sanitary and washing facilities,			
		ventilation, cooking and storage facilities and natural and artificial lighting, and in some cases basic medical services (comply with IFC/EBRD guidance "Workers' Accommodation: Processes and Standards").			
	Occupational Health & Safety	Pamir Energy ensures H&S training to contractors and workers on the main risks on workers' health and safety related to work place (hazardous substance management, work at height, electric, traffic safety), the safe work practices, the emergency procedures and the requirement of incident reporting. Additionally, PE ensures: - Medical clearance for workers to perform their tasks - Assessment of risks and identification of mitigation measures for all tasks, with PPE as last resort - Designing tasks for maximum safe operations - Only trained workers allowed to complete tasks	SOP's and site visits, Minutes of Meetings	Contractor Pamir Energy	Check Training records

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Occupational Health & Safety	Pamir Energy and its contractors record accidents and near misses and safety statistics continuously. Moreover, PE and contractors implement incentive programme for incident recording. - Workers will be trained in fire prevention, and in the implementation of a Traffic Management Plan - Required to develop and implement and Emergency Preparedness and Response Plan or procedure.	Trainings record. Incident documentation. Project reporting.	Contractor Pamir Energy	Check Training records Check incidents reports
	Occupational Health & Safety	Pamir Energy and its contractors monitor the security warnings and adapt a proactive attitude vis a vis security situation. Evacuating workers if necessary.	Trainings record. Incident documentation. Project reporting.	Contractor Pamir Energy	Check Training records Check incidents reports
	Occupational Health & Safety	Pamir Energy and its contractors ensure the use of Personal Protective Equipment (PPE) tailored to the hazard exposed to for workers. As a minimum foot plus head, hand, ear, eyes protection, depending on working position. Moreover Contractor ensures:	Site Observations	Contractor	Random site inspection
		- Worker transport (passenger vehicles only, no riding on heavy equipment, wear safety belts, etc.) - Work within boundaries, penalize supervisors and workers for violations			

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		- Install physical barriers at deep excavations to prevent accidents			
	Emissions (dust, noise, gases)	Pamir Energy and its contractors reduce source of dust emissions at construction sites by: - Watering transportation roads during dry and windy conditions. Generally keeping roads in good condition. Covering truck loads with canvas to avoid dust blow. - Minimising drop heights for material transfer activities such as unloading of friabl materials. Cover stockpiles when not used. - Using equipment and vehicles in appropriate technical conditions. Provide emissions control equipment where applicable (e.g. filters). Use low sulphur content fuels, in line with legal provisions in force as well as local availability. Ensure vehicles and equipment are switched off when not in use.	Site Observations	Contractor	Random site inspection, inspection of roads

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
Implementation / Construction	Noise and vibration impacts	Pamir Energy and its contractors reduce noise and vibration impacts during construction. - Limiting the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas or close to residential houses (typically between 10 pm and 7 am). Avoiding vehicle movements at night. - Using of state-of-the-art technology and limiting the number of machines operated simultaneously. - Ensuring the use of modern and well-maintained equipment (e. g. use of silencers). - If blasting is to take place, the contractor will notify nearby residents and post signs at least six hours prior to the time of blasting. - If residents complain of noise, the contractor or Pamir Energy will monitor noise at the location of concern and implement mitigation measures if noise levels exceed the standards	No work conducted between 10pm and 7 am/ Grievance Mechanism Site observation	Contractor	Random site inspection, Review of filed grievances, review of timesheets of workers
	Soil and ground	Pamir Energy and its contractors maintain high standards in housekeeping on site.	Dedicated storage areas in place	Contractor	Random site inspection, Review of

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	water contamination	- Identifying and storing appropriately (define dedicated storage areas with secondary containment) all hazardous substances like fuel or chemicals and provide solutions to remediate unforeseen leakage and spills Pamir Energy and its contractors enforce appropriate waste management practices: - Giving priority to reuse of waste material upon disposal. Use licenced waste contractor as feasible and relevant. - Collecting and segregating wastes and ensure safe storage and in line with legal requirements. - Fueling operations and other uses of fuels and hazardous materials will take place at least 20 meters from the river or any other permanent or ephemeral stream. Fuelling and vehicle maintenance will take place over drip trays or other impermeable surfaces. - Sanitary facilities (toilets) will be provided or otherwise available at or near all work locations. Workers will be strictly required to use the facilities at all times, with penalties for violations. If vendors provide portable toilets or sewage disposal, the contactor will verify the vendor has proper permits. Toilets will be at least 25 meters from the river. - All vehicles and mobile equipment will have spill cleanup kits, and drivers will be trained in the use of the kits. - Wash-water from washing trucks, equipment, or concrete will be contained and evaporated, taken for discharge to a sewer,	Waste Manifests		waste inventories

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		or otherwise managed so it does not contaminate soil or vegetation. - Herbicides will not be used for vegetation control, nor insecticides or other pesticides for vermin control. - For towers placed in or closer to the riverbed; protective diversion walls and reinforced concreted foundations will be used to prevent damages from natural hazards (e.g. flooding and landslides) and to minimize erosion/sedimentation impacts from foundations and to prevent soil and groundwater contamination (see design details in Annexes to ESA_Shugnan VI).			
	Soil Management	Pamir Energy and its contractors implement best practices for soil management: - Ensuring appropriate storing of topsoil removed. After construction topsoil will be used as backfill for restoration of the area.	Site verification, photographs	Contractor	Random site inspection

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		- Limiting stockpile height to 2 m maximum to avoid soil compensation. - Reinstatement of construction working area to the best possible after construction activities are completed. - If construction takes place on inclined surfaces/slopes, ensure preventive erosion control measures are applied. - Mark the boundaries of construction zones and prohibit workers and equipment from straying beyond the boundaries. Within the boundaries, control precipitation run-on and run-off as necessary to prevent erosion from affecting areas outside the demarcated construction zone and access roads. - Ensuring that proper drainage is maintained throughout construction and on permanent works so that run-on and run-off cannot destabilize slopes, damage vegetation, or erode topsoil. - Carefully remove topsoil from locations where it is more than a few centimeters deep and store it in piles that are protected from erosion. If it will not be used for land restoration when construction is complete, it will be made available for local people to use in garden plots and other			

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		areas, with preference for people who received replacement land for land needed for the project. - If additional soil and spoil is needed beyond that generated by the project, it will be taken only from licensed quarries/vendors, and/or ensured that any self-exploitation activities be undertaken with full site restoration and reinstatement of vegetation when exploitation has ended. - Managing spoil from excavations in a way that prevents damage outside the demarcated boundaries of the construction zone. Prohibited to dump spoil down hillsides, or onto living vegetation in any area, and it will be required to place excess spoil in configurations that will be stable over the long term before demobilizing. - Required to keep vehicles on prepared roads and surfaces. - When construction is complete, remove piles and depressions from disturbed areas and will grade those areas to a stable contour, using as much spoil as possible. The stored topsoil will then be spread over the site before planting of native species of grass and/or shrubs, or broadcasting seeds of such species. - Monitor the success of the revegetation program and make repairs as needed to ensure the establishment			

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		of self-sustaining maximum ground cover. - Restore disturbed areas as soon as practicable once construction activity at tower locations is complete, even if construction is continuing at other locations, and not wait until construction is complete at all locations before beginning the restoration program.			
		- Restore disturbed areas as soon as practicable once construction activity at tower locations is complete, even if construction is continuing at other locations, and not wait until construction is complete at all locations before beginning the restoration program.			

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Water Resources Protection	Pamir Energy and its contractors implement best practices for water management: - Prioritising the use of rainwater/storm-water over surface water/groundwater abstraction by using harvesting equipment and systems on site. - Reusing wastewater wherever feasible. - Restricting excavation activities during periods of intense rainfall. - Using temporary bunding to reduce the risk of sediment, oil or chemical spills to the receiving waters. - Carrying out excavation works in cut off ditches to prevent water from entering excavations. - Water harvesting conducted - No excavation during intense rainfall - Towers will be located at least 15 meters from Panj River and none will be placed in the drainageway of small tributaries. - For towers placed in or closer to the riverbed; protective diversion walls and reinforced concreted foundations will be used to prevent damages from natural hazards (e.g. flooding and landslides) and to minimize erosion/sedimentation impacts from foundations and to prevent water contamination (see design details in Annexes to ESA Shugnan VI). - Vehicles and workers will use bridges when crossing the river and	Site verification, photographs	Contractor	Random site inspection, Project planning documents

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		will not drive vehicles or equipment across the riverbed. - Riverbanks and all land disturbed by construction will be restored and revegetated as soon as feasible after the disturbance ends - Small ephemeral or permanent streams will be diverted around construction areas or placed in temporary conduits until construction is complete so they do not become silt-laden. - Sediment controls will be placed at the downhill/ downstream boundary of upland construction zones when there is a risk that sediment-laden run-off could leave the construction or camp site and either damage vegetation or reach the river. Such controls could include sedimentation ponds, silt fences, and/or other measures. - Run-on and run-off will be diverted around or otherwise prevented from coming into contact with concrete, including waste concrete, until the concrete is fully cured. Waste concrete will be promptly removed from the construction site and disposed or used where it cannot affect surface or ground water. - Local surface water may not be used to wash trucks and equipment, including especially equipment, batching, and ready-mix truck washing and cleaning except at distances at least 20m from rivers, and with barriers placed as needed to prevent wash-water from reaching rivers.			

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Community Health & Safety	Pamir Energy and its contractors restrict access to construction sites to non-authorized persons: - Preventing physical access to the site fencing and/or guarding - Using appropriate signage - Informing site users, community leaders, authorities (informal/official) during stakeholder meetings about access restrictions - Access controlled - All construction areas near communities and at the substation will be marked with barriers or safety tape and there will be only one or a few access points. Excavations will have physical barriers or intact safety tape placed on all sides of the excavation at any time there is no active work at the excavation site. Any lifting operations at the substation will have one or more flagmen on duty who can warn people away (lifting at towers will be manual). - When towers are in place, there will be signs on all four sides to warn of danger and prohibit climbing, with signs in the Tajik and Russian languages (and any other language known to spoken by	Site verification	Pamir Energy	Random site inspection

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		nearby residents) and with graphic danger symbols that warn of the dangers of falls and of electrocution. - To prevent contact with energized conductors that could electrocute children or others. Pamir Energy will provide information on such risks and precautionary measures to local schools to help prevent such accidents. In addition, Pamir Energy will ensure that each tower has signs, in Tajik and Russian, that warn trespassers of the risk of electrocution, falls, and other dangers. The sign will have a 24-hour telephone number to which emergency calls can be made.			
	Community Health & Safety	Pamir Energy and its contractors implement <u>good practices for traffic safety</u>: - Scheduling traffic activities to avoid peak hours on local roads if feasible. - Setting traffic speed limits, verify drivers' behaviour with respect to driving speed and safety. Ensure safe driving by project personnel, e.g. through training/induction/incentives	Observations Training attendance lists Grievance Mechanism	Contractor	Random site inspection

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		(best driver awards). - Avoiding as much as possible driving at night. - Avoiding off-road vehicle traffic. Use existing roads. - Required to develop and implement a Traffic Management Plan that provides for driver training, vehicle safety, coordination with local traffic authorities, and traffic control at road construction			
Implementation / Construction	Biodiversity and Natural Habitats	Pamir Energy and its contractors implement good practices for natural habitats protection: - Scheduling activities to avoid breeding and nesting seasons for any identified critically endangered or endangered wildlife species. - Using existing roads for access as much as feasible - Limiting vegetation clearing to areas within the site boundary where it is absolutely necessary to reduce habitat disturbance. o Avoid clearing mature trees. o Ensure revegetation of cleared areas where possible after construction using native species. o Revegetate with recovered plants and other appropriate local flora - Avoid using pesticides to perform vegetation clearance.	Site observations	Contractor	Random site inspection

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
		- Mark and stay within boundaries of construction zones and paths - Train/warn workers to remain within boundaries, penalize supervisorsand workers for violations - Strip and store topsoil and subsoil/spoil in separate piles withinconstruction boundaries, protect from erosion - Install drainage control as needed to control erosion that would affect off-site areas - Restore disturbed areas and clear site of all debris and waste when worksare complete - If cutting and/or construction within 100 meters of mature trees withcavities used by owls or bats cannot be avoided, cutting and/or construction within 100 meters must be delayed until after bats have			
		emerged from hibernation, young owlets and bats have permanently leftthe nests, and roosts are not being actively used. - If mature trees with hollows that support or have supported hibernating or nesting bats must be cut, “bat boxes”, will be placed and approved by a qualified expert. Pamir Energy will replace bat boxes as needed for the first five years of operation. At least two bat boxes will be placed for each such bat-supporting tree that is cut.			

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Cultural Heritage	Pamir Energy and its contractors ensure all chance finds of cultural heritage (e.g. graves, old ceramic, old building fragments) are reported immediately to the relevant authority. If possible, avoid excavation in the ultimate neighbourhood of a chance find, fence the chance find and await instructions from the competent authority. Contractors (and their supervisors) need to be aware on which authority is to be contacted in case of find. Contact numbers/addresses must be readily available.	Contractual documentation Chance finds records	Contractor /Implementing Partner	Random site inspection
O	Occupational Health & Safety	Pamir Energy minimises risks of electrocution for workers: only qualified personal equipped with adequate protection equipment can perform the maintenance works	Contractual documentation Site observation	Pamir Energy	Check Training records Check incidents reports
	Community Health and Safety	Pamir Energy avoids as much as possible use of hazardous substances such as wooden poles preservatives or PCB containing transformers	Contractual documentation Site observation	Pamir Energy	Random site inspection

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Community Health and Safety	Pamir Energy minimises risks of electrocution for community: - Access to climb electricity pylons needs to be restricted - Use of signs, barriers (e.g. locks on doors, use of gates, use of steel posts surrounding transmission towers, particularly in urban areas) - Education / public outreach to prevent public contact with potentially dangerous equipment - When towers are in place, there will be signs on all four sides to warn of danger and prohibit climbing, with signs in the Tajik and Russian languages (and any other language known to spoken by nearby residents) and with graphic danger symbols that warn of the dangers of falls and of electrocution. - To prevent contact with energized conductors that could electrocute children or others. Pamir Energy will provide information on such risks and precautionary measures to local schools to help prevent such accidents. In addition, Pamir Energy will ensure that each tower has signs, in Tajik and Russian, that warn trespassers of the risk of electrocution, falls, and other dangers. The sign will have a 24-hour telephone number to which emergency calls can be made.	Contractual documentation Site observation	Contractor	Check Training records Check incidents reports

Ph.	Topic	Measure	Means of Verification	Responsibility	Monitoring procedure
	Biodiversity and Natural Habitats	Pamir Energy ensures that if pesticides are to be used for agriculture program or for right of way clearing, only those that are low in human toxicity, that are known to be effective against the target species, and that have minimal effects on non-target species and the environment shall be used. Pamir Energy will ensure that no hunting or killing of any wild animals or birds will occur in the project area. PE ensures that operational staff and workers do not cut and use forest wood for cooking and other purposes. Moreover, all staff instructed not to disturb any wild animal and their habitat.	Pesticide Specification sheet Site verification	Contractor	Random site inspection

Environmental and social monitoring plan for Shugnan VI Phase II Project

Table 17 Environmental and social monitoring plan for Shugnan VI Phase II Project

Activity	What (Is the parameter to be monitored?)	Where (Is the parameterto be monitored?)	How (Is the parameter to bemonitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Who (Is responsible for monitoring?)
All construction works	Technical progress and implementation of mitigation measures, compliance with Tajikistan E&S law, World Bank ESF, and ESMP	Selected past and all current work areas	– Observations during normal activities – Inspections – Monthly reports and incident reports	Continuous or asnecessary	Verify implementation of mitigation measures	Pamir Energy (or Supervision Consultant)
			E&S monitoring audit	First year of construction, additional visit in case of poor E&S performance	– Verify implementation ofESMP – Identify needed modifications toESMP	Third-party consultant appointed by Pamir Energy
		All active work areas	Observations	During daily rounds (continuous)	Verify implementation ofOHS Plan	Contractor safetymanager
			Inspections	At least weekly		

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
			Observations	During daily rounds		
	Working conditions, biodiversity management, and erosion control	Active and recent tree cutting areas, active sites on steep slopes, active construction sites	Inspections	At least weekly	Verify relevant aspects of ESMP are being implemented	Contractor E&S manager and/or specialist(s)
		New construction sites	Inspections	Before construction begins	Verify supervisors are aware of requirements, construction boundaries are marked, etc.	
Activity	Working conditions (equipment, tools, etc.) and workers (PPE)	All active work areas	Observations	During daily rounds (continuous)	– Verify safety of working conditions and workers – Provide guidance tosupervisors and workers	Safety Officers
			Inspections	At least weekly		Contractor safetymanager

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
	Worker and supervisor safety training	All active work areas	Records checks &interviews	Daily or as needed before beginning newwork	Ensure workers are trained to work safely	Supervisor (foreman)
				Spot checks (at least once every site monthly)		Contractor safetymanager
Progress reports/meeting	Technical progress and status of ESMP implementation: – Safety – Biodiversity survey and restoration activities – Erosion control & site	Recently and currently activesites	– Interviews with contractor E&S & technical staff – Review monthly contractor and Supervision Consultant E&S reports – Review worker & stakeholder grievance registers	Monthly	Verify technical progress and E&Sprotection	Mandatory attendees: – Contractor E&Spersonnel – Supervision Consultant (if any) – Pamir Energy project E&S specialists and HSE Department

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
	stabilization					representative
	– Site restoration – Grievance management		– Site visits			
Drivers and vehicle	Driver qualifications	Office	– Verify valid driver's license and operator's permit as required – Check with traffic police if needed	– Before allowed to vehicles/equipment – Annually	Trained drivers	Contractor PM & safety manager

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
safety			– Skills test as needed			
	Mobile plant/ vehicle safety (horns, backup alarms, lights, tires, safety belts, fire extinguisher, cleanup kit, first aid kit, etc.)	All mobile plantin use	Inspect and completechecklist	Daily before first use	Minimize traffic accidents, protect workers and other drivers/pedestrians	Driver/operator
			Review checklists andvehicles	Spot checks: at least monthly for each vehicle		Contractor safetymanager
Marking boundaries of work areas	Boundary is clearly marked	All active work areas	Observations and photographs	– The day before workis to begin – At least once during each stage of construction works	- Limit areas ofimpacts - Verify no off-sitedamage	Contractor supervisors & E&Spersonnel

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
Air quality	– Visible dust – Dust coating leaves on nearby vegetation	Unpaved roads & other construction areas	Observations	Continuous during daily rounds	Determine need for damping roads to suppress dust	All contractor managers, supervisors, E&Spersonnel,
	Black smoke from vehicles, equipment, other engines	All engines			Determine need to remove engine from service until repaired	
Flora and fauna surveys (design team and preconstruct ion	– Mature trees (and buildings) with hibernating/ nesting bats & birds logged, photographed, &marked – Trees to be cutmarked – Fauna present and/or	Selected areas being surveyed, while surveys areongoing	– Visits to ongoingsurveys – Spot checks of specimens marked aftersurveys – Debriefs by	- Visits and spot checks: at least one site daily during surveys - Debriefs: daily verbal or	Verify surveys are identifying species of concern, mature trees, natural habitat	Contractor E&S manager & specialists

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
surveys)	at risk identified, including birds ofconservation concern (if any)		surveyteam(s)	email/written		
Land clearing activities	Compliance with Land Management and Erosion Control Plan, including: – Boundary marking before construction	All areas beingcleared	– Visits/inspections – Reports from supervisors to E&S manager	– Before clearing – Daily during clearing – After clearing and before construction	– Limit extent of clearing – Verify topsoil salvaged – Verify drainage controlled and erosionavoided –	– Contractor E&Spersonnel – Contractor PM (spot checks)

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
(roads,towers, substation, & construction areas)	begins – Working within boundaries – Topsoil storage and spoil storage – Drainage control to prevent erosion	All areas under construction	Inspections	At least weekly	Verify implementation of LC&EC Plan	Contractor E&S personnel
	Condition of land/vegetation atboundary		Observations and photography	Before clearing begins	Allow verification of working within boundaries	Contractor E&S personnel
	Site restoration	Construction sites	Inspections	When and immediately after construction ends at that site	To verify restoration	Contractor E&S personnel

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
Excavations andcuts	Areas of excavations marked, edges of excavations marked (tape, rock barriers, etc.)	Foundation locations, cuts onsteep slopes	Before ground broken	Before excavations	Limit area of disturbance	Contractor E&S personnel
	Works are within boundaries	Tower locations, substation location	Observation, photographs	Daily during works	Limit area of disturbance	Contractor E&S personnel & supervisors
	Soil salvaged and stored separately from subsoil/spoil	All excavations	Observations and photographs	At least once during works at each site	Topsoil conserved and protected from erosion	Contractor E&S personnel
	Workers received relevant training	Work sites andrecords	Interviews, records review	Prior to work at excavation sites	Verify workers canwork safely	Contractor safetymanager

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
	Barriers (tape, rocks, etc.) placed to prevent falls	Perimeter of excavations >1mdeep	Observation	When excavation is complete	Protect workers andothers against falls	Supervisor
				Spot checks (including when no active work is ongoing, such as weekend)		Contractor E&S personnel

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
Vegetation cutting	Implementation of Flora and Fauna Survey Plan – Trees to be cutmarked – If flora species of concern identified: logged, photographed, &marked – Mature trees with bats/birds logged, photographed, &marked – Fauna signs and presence documente	Areas where trees and shrubs are to be cut	Observation	Immediately prior to cutting/clearing and during ongoing cutting/clearing	Verify species and specimens of concern are identified	Contractor E&Smanager

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
	d, risks identified					
Tree and shrub plantin	2+ trees and shrubs of same species planted per tree cut/removed	In location suitable for growth selected by qualified	Observation and photography	During spring followingcutting	Verify plantings	Botanist appointed by contractor
				Prior to demobilization	Verify success to allow final	

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
gs	Survival of 2+ plantings per tree/shrub cut	biologist			payment	
				Annually for 5 years after planting	Verify success or identify need for replanting	Botanist appointed by Pamir Energy
	2+ bat boxes placed per bat-supporting			Within one month of treecutting	Verify placement	
Bat box placement	tree cut or building removed	In location selected by qualified expert	Observation	One year after originalplacement	Verify in place	Contractor- or Pamir Energy-appointed biodiversity expert
	Implementation of Land Management and Erosion Control Plan					

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
Land restoration	– Stable contours after construction – Placement of topsoil (if any) on bare ground – Planting native species (seeds or plants)	All areas where land was disturbed that will support vegetation	Observation and photography	Within one month of end of activities at that site	Identify need for repairs or verify restoration	Contractor E&S personnel
	Establishment of self-sustaining vegetation cover	All restored areas except slopes not capable of supporting vegetation cover	Observation & photography	Each month (spring, summer, fall) until vegetation cover determined to be self- sustaining and one yearafter that	Verify vegetation is established & determine if further action or repairs needed	Botanist appointed by contractor (and Pamir Energy after construction ends)

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
Identify need for bird diverters on line	Migration of raptors and water birds across transmission line corridor, passage of bats across corridor	Main river valleysfor birds, near forests for bats	Observations (monitoring plan to be developed under 2.10 in 0)	Spring and autumn migration seasons (as recommended by expert) for two seasons	– Identify if bird diverters are needed toavoid collisions – Identify if measures are needed to prevent bat mortality	Pamir Energy (by appointment of aconsultant)
Noise generation	Noise levels	Workplaces	Noise meters	Monthly at typical worksites	Verify noise is within standard or identify need for mitigation	Contractor E&S personnel
		Off-site locations		Within 24 hours of request or noise complaint by worker orexternal party		
		At nearest residence when works are within 0.5km		While work is ongoing within 0.5km of village		
	Slope slippage (landslide potential)	Within 200m of blasts	Observation	Same work shift as blast	Determine risk of landslide and need for corrective action	Personnel assignedby blast master

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
Blasting	Pre-blast condition	Buildings within 0.5m of blast	Inspection and photography	Prior to blast	Establish pre-blastcondition	Personnel assignedby blast master & Contractor PM
	Post-blast condition: cracks, settling, flyrock damage, etc.			Within 24 hours after blast	Identify blast damage	
	Blasting contractor compliance with legal requirementsfor transport, storage, use	Magazine and blasting sites	Inspection	Monthly	Verify compliance, ensure safety	Contractor E&Smanager
	Sanitation, water,etc.	Kitchens, break areas, toilets, accommodations	Inspections			

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
Ensuring adequate hygiene	Toilets & potablewater	Work locations	Observations	Daily during rounds	– Verify workers havepotable water – Verify toilet facilities are available	Safety Officers and/or E&S specialists, supervisors, managers
			Inspections	At least weekly		Contractor E&S specialist and/ orsafety officer
Worker grievance resolution	Worker grievance register	Work sites and Contractor recordsoffice	Review of register	Weekly	Verify grievances arebeing recorded and resolved	Contractor HR manager and PM
	Grievance handling and resolution		Interviews with managers responsible for resolution and with complaining workers	Before monthly progressmeeting	Verify grievances are being addressed properly	Contractor HR manager, supervisors
External stakeholder	Stakeholder grievance register	Contractor recordsoffice	Review of register	Weekly	Verify grievances are being recorded and resolved	Contractor HR manager and PM

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
grievance resolution	Grievance handling and resolution	Community	Interviews of selected stakeholders who submitted grievances and with persons responsible for addressing	Before monthly progress meetings	Verify grievances are being addressed properly	Contractor E&S manager, social specialist/CLP
	Worker behavior in communities	Community	– Reviews of grievance log – Interviews with communityleaders	Quarterly	Determine need for training/dismissals / etc.	Contractor HR manager, PM, social specialist/CLO
	Community satisfaction withproject	Community	– Reviews of grievance log – Interviews with communityleaders and local residents	Quarterly	Identify community issues	Social specialist, CLO
Stakeholder engagement	Pre-blasting consultation (if blasting is needed)	Community	– Consultation with leaders and with residents within 500m of blasts	Prior to blasts	Warn communities of upcoming blasts	Contractor E&S manager/foremen
Resettlement and	Compliance with RAP					

Activity	What *(Is the parameter to be monitored?)*	Where *(Is the parameterto be monitored?)*	How *(Is the parameter to bemonitored?)*	When *(Define the frequency / or continuous?)*	Why *(Is the parameter being monitored?)*	Who *(Is responsible for monitoring?)*
compensation		As specified in RAP				
Erosion control, land stability	Effectiveness of erosion control and land restoration	Tower locations andsubstation	Observations during routine maintenance patrols	Semi-annually duringoperation	Identify need for further land stabilization and erosion control	Pamir Energy

Annex 1 - Requirements for voluntary land donations

Voluntary land donations are only acceptable provided that the Implementation Partner verifies and demonstrates that all voluntary land transactions meet the following criteria:

Criteria	Yes + explanation	No + explanation
1. The land in question is free of squatters and no people with customary rights or no legal title are using it;		
2. The land in question is free from any dispute on ownership or any other encumbrances;		
3. No household relocation is involved;		
4. The amount of land being donated is minor and will not reduce the donor's remaining land area below that required (e.g.., no more than 10% of total agricultural land holding donated) to maintain the donor's livelihood at current levels;		
5. The donor is expected to benefit directly from the project;		

6. The donor is aware that refusal is an option;		
7. The donor has been appropriately informed and consulted about the project and the choices available to him/her;		
8. A grievance redress mechanism is in place to hear complaints regarding land acquisition;		
9. Land transfer will be completed through registration after the donor has confirmed in writing his/her willingness to proceed with the donation;		
10. For community or collective land, donation has occurred with the consent of individuals using or occupying the land.		

The Implementation Partner, through field technical teams, will verify the fulfillment of these criteria and provide further explanations on each criteria. If all criteria are fulfilled, the Implementation Partner will ensure completion of the voluntary land transaction in written consent form (see sample waiver below). The donation will be verified by two witnesses who are community leaders but not beneficiaries of the

subproject, to ensure that the land was voluntarily donated without any form of duress. The signed waivers will be submitted to PATRIP and verified by the Bank in order to ensure that the voluntary land donation has been conducted in accordance with the above criteria.

6. A SAMPLE VOLUNTARY DONATION OF LAND AGREEMENT

The following agreement has been made on__ of_____between___aged_____, resident of _____zone of_____district_____the_____.

1. That the land with certificate no…… is a part of... , is surrounded from eastern side by……, western side by……, northern side by ……., and southern side by……..

2. That the Owner holds the transferable rights of land. (area in square meters), with plot no… .....at the above location (include a copy of the certified map, if available) .

3. I committed that the land is free of squatters, no people with customary rights or no legal title are using it, no household relocation from the land and that there is no dispute on ownership and there is no any encumbrances in regards to the land

(That the Owner testifies that the land/structure is free of squatters, no people with customary rights or no legal title are using it, no household relocation will be needed and that there is no dispute on ownership or any other encumbrances in regards to the land).

4. I ensures that the minor amount place in my garden that I donated and will not impact to the fruits trees and will not reduce the productivity of the trees.

5. I am appropriately informed about the project and the choices available (including refusal). ((That the Owner has been appropriately informed and consulted about the project and the choices available (including refusal) as well as possible ways to address grievances.))

6. I hereby grant to the Pamir Energy Company this place in my garden for the construction and development of the new Tline for the benefit of the community

(That the Owner hereby grants to the… .....(name of the Recipient) this asset for the construction and development of the.....for the benefit of the community and that the Owner's property rights will be handed over to and registered in the name of..... (name of the Recipient).))

7. I will not claim any compensation against the grant of this obstruct the construction process on the garden

(That the Owner will not claim any compensation against the grant of this asset nor obstruct the construction process on the land in case of which he/she would be subject to sanctions according to law and regulations.)

8. The Pamir Energy Company agrees to accept this grant of asset for the purpose mentioned.

That the ..... (name of the project Proponent) agrees to accept this grant of asset for the purposes mentioned.

Name and Signature of the Owner **Signature of Subproject Proponent/Representative**

…….. …….. (Signature, name and address) (Signature, name and address)

Witnesses 1: **Witnesses 2**:

1…… 2…… (Signature, name and address) (Signature, name and address)

ANNEX 2

Grievance Form Template

Grievance Form	
Reference No :	
Full Name:	☐ **I want to remain anonymous**
Please mark how you wish to be contacted (mail, telephone, e-mail).	☐ **By phone: _____** **_____B yTelephone (Please provide Telephone number):** ☐ _____ ☐ **By E-mail:_____** **Other:_____** ☐ **I don't want to be contacted**
Preferred Language forcommunication	☐ *… IP to include languages spoken in the region…* ☐ *…IP to include languages spoken in the region…* ☐ **Other, please specify: _____**

Description of Incident or Grievance: *What happened? Where did it happen? Who did it happen to? What is the result of the problem?*	
Date of Incident/Grievance:	☐ **One time incident/grievance (date_____)** ☐ **Happened more than once (how many times?_____)** ☐ **On-going (currently experiencing problem)**
What would you like to see happen to resolve the problem?	