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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR SISIAN-KAJARAN (NORTH-SOUTH CORRIDOR) ROAD PROJECT, ARMENIA

Volume 5. Cumulative Impact Assessment



Source: projections of the proposed road collated from the '3D description of the Sisian-Kajaran Road', Armenian Road Department, 2022 [<https://www.youtube.com/watch?v=fu-dgAwjSsU>]

June 2023

**ENVIRONMENTAL AND SOCIAL IMPACT
ASSESSMENT (ESIA)
FOR SISIAN-KAJARAN
(NORTH-SOUTH CORRIDOR)
ROAD PROJECT,
ARMENIA**

Volume 5. Cumulative Impact Assessment

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Prepared for:

**The "Road Department" Fund under the Ministry of Territorial Administration
and Infrastructure of the Republic of Armenia**

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DETAILS OF DOCUMENT PREPARATION AND ISSUE:

Version	Prepared by	Reviewed by	Authorised for issue	Issue Date	Description
1	ESIA Consultant's expert team (as listed in ESIA Volume 1)	Maia Gachechiladze-Bozhesku	Maia Gachechiladze-Bozhesku	22.05.2023	Draft for review by Lenders and the Client
2		Sean O'Beirne Artak Ter-Torosyan		29.06.2023	Final Draft for approval by Lenders and the Client, translation into Armenian and public disclosure

DISCLAIMER

An Environmental and Social Impact Assessment (ESIA) is necessarily predictive in that it gets completed well before the project being assessed is actually implemented. The information on which the assessment is based comes from multiple sources including the feasibility report, the detailed design document, reports on studies that were conducted as part of the feasibility investigations, records of meetings, other publications, various databases, data that is collected by the team conducting the ESIA, anecdotal information and others. It is extremely difficult to verify the information that is used other than through testing the logic of that information as well as that can be done. In preparing this document, care has been taken to ensure that whatever information has been available has been accurately reproduced in the ESIA. Should information be found in this document that is incorrect then it is respectfully requested that the incorrect information be brought to our attention so that the ESIA can be updated accordingly. We cannot be held accountable for information that we have accepted and reproduced in good faith regardless of the consequences of such information being incorrect. Anyone reproducing information contained in this ESIA does so entirely at their own risk.

LIST OF ABBREVIATIONS

Aol	Area of Influence
BAP	Biodiversity Action Plan
CH	Cultural Heritage
CIA	Cumulative Impact Assessment
CJSC	Closed Joint Stock Company
E&S	Environmental and Social
EIA	Environmental Impact Assessment
ESAP	Environmental and Social Action Plan
ESMP	Environmental and Social Management Plan
ESIA	Environmental and Social Impact Assessment
IBA	Important Birds Area
IFC	International Financial Corporation
IFIs	International Financial Institutions (European Bank for Reconstruction and Development, Asian Development Bank and European Investment Bank).
KBA	Key Biodiversity Area
MoE	Ministry of Environment
NB	Nota bene
NSRC	North-South Road Corridor
NTS	Non-technical Summary
OHS	Occupational Health and Safety
RF	Resettlement Framework
PBF	Priority Biodiversity Feature
SEP	Stakeholder Engagement Plan
VEC	Valuable Environmental (and social) Component
ZCMC	Zangezur Copper Molybdenum Combine

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PREAMBLE

This document is the **Cumulative Impact Assessment** report for the proposed greenfield Armenian Sisian-Kajaran section of the North-South Road Corridor (NSRC) (the Project). It forms **Volume 5** of the Environmental and Social Impact Assessment Report (ESIA) for the Project.

The ESIA Report consists of several volumes with related annexes, as follows:

- Volume 1 – Project Definition including Project introduction, context and rationale, project description, alternatives, legal framework, and ESIA methodology;
- Volume 2 – Biodiversity including baseline analysis, impact / risk assessment (including Critical Habitat Assessment and Appropriate Assessment) and mitigation;
- Volume 3 – Physical Environment including baseline analysis, impact / risk assessment and mitigation measures in relation to air quality and climate, noise and vibration, landscape, etc.
- Volume 4 – Social Environment including socio-economic, gender and cultural heritage baseline analysis, impact / risk assessment and mitigation, as well as stakeholder engagement;
- **Volume 5 – Cumulative Impact Assessment (this Report);**
- Volume 6 – Environmental and Social Management Plan (ESMP); and
- Volume 7 – Conclusions and Recommendations.

The ESIA is subject to public disclosure for a minimum period of 120 days according to the international lenders' requirements. In addition to the ESIA report, the ESIA disclosure package includes:

- Non-technical Summary (NTS) which is a concise and over-arching document summarising the results of the ESIA in non-technical language;
- Stakeholder Engagement Plan (SEP) that guides information disclosure and meaningful engagement with Project stakeholders, as well as a grievance mechanism;
- Resettlement Framework (RF) that guides issues related to Project-induced physical and economic displacement, land acquisition, compensations, and livelihood restoration;
- Biodiversity Action Plan (BAP) that articulates actions that can help ensure the conservation or enhancement of potentially affected habitats and species considered of particular conservation value; and
- Environmental and Social Action Plan (ESAP) that contains actions required to implement the Project in compliance with the international lenders' requirements.

1 INTRODUCTION

This report (Volume 5 of the ESIA) contains an analysis of potential cumulative impacts of the Project and other projects in the region. Where potential adverse impacts have been predicted, mitigation measures are presented and enhancement measures suggested for positive impacts. These mitigation and enhancement measures are taken forward into the Environmental and Social Management Plan (ESMP) for the Project (Volume 6 of the ESIA).

2 CUMULATIVE IMPACT ASSESSMENT

2.1 Introduction

This section contains a cumulative impact assessment (CIA), i.e., E&S impacts of the Project are considered in combination with potential impacts from other projects or activities that are being or will be carried out in the Project Area of Influence in the near future. The CIA includes projects / activities for which there is sufficient publicly available information to identify their relationship with the Project in time and / or space and assess the possibility of cumulative impacts. The CIA also includes natural environmental and external social drivers that could affect E&S receptors affected by the Project.

Cumulative impacts are defined as impacts that result from the successive, incremental, and/or combined effects of a project when added to other past¹, present and/or reasonably foreseeable future projects. Cumulative impacts may occur because of different impact mechanisms. For example, additive impacts may occur when similar impacts from different projects join to cause an incremental impact on the same environmental or social receptor, whereas synergistic impacts may occur when different impacts from different projects interact to cause a combined impact on the same environmental or social receptor, that is a greater than the sum of the individual parts.

The CIA methodology is based on a step-by-step process, described in the International Financial Corporation's (IFC) guidelines *Cumulative Impact Assessment and Management - Guidelines for the Private Sector in Emerging Markets* (2013)² and complies with the requirements of Council Directive 85/337/EEC *on the assessment of the effects of certain public and private projects on the environment* (1985, with amendments). In accordance with the IFC guidelines, the CIA is carried out in six steps:

- Step 1 – Scoping Phase I – identification of valued environmental and social components (VECs), spatial and temporal boundaries of the assessment;
- Step 2 – Scoping Phase II – identification of other projects to include in the CIA;
- Step 3 – gathering background information on the identified VECs (this information is presented in ESIA Volumes 2 (Biodiversity), 3 (Physical Environment) and 4 (Social Environment) and is not repeated in the current report);
- Step 4 – assessment of the cumulative impacts on the identified VECs;
- Step 5 – assessment of the significance of predicted cumulative impacts; and
- Step 6 – cumulative impact management.

¹ In the current CIA past projects are the projects with persisting impacts that may affect the natural and social environment in the Project area.

² https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_cumulativeimpactassessment.

The assessment of the potential cumulative impacts is qualitative and based on the E&S Consultant's expert judgement using impact significance criteria.

2.2 Scoping Phase I – Determining VECs and Spatial and Temporal Boundaries

VECs are defined as 'ultimate recipient of impacts' (IFC, 2013). For this CIA, the VECs equate to sensitive or valued E&S receptors that might be affected by the Project and are identified in ESIA Volumes 2, 3 and 4.

A higher likelihood of cumulative effects would exist for those VECs, the impact on which, after implementation of mitigation measures, may exceed thresholds of negligible significance³. Within the ESIA framework, these are impacts with a minor to moderate adverse residual significance and minor to major positive residual significance. No impacts of major adverse residual significance are expected from the Project.

The key VECs identified for the CIA are as follows:

- Local communities (population) in terms of a) impacts on public health due to air and noise pollution, and b) community health risks related to traffic accidents;
- Users of roads in terms of a) regional connectivity and improved access to the region from outside, and b) road safety;
- Project workers in terms of a) exposure to high levels of air and noise pollution, and b) worker safety risks relate to road accidents;
- Biodiversity in terms of a) impacts on species and habitats including habitat loss inside Critical Habitats or Priority Biodiversity Features (PBF), and b) impacts on national protected areas, Emerald Network Sites, KBAs/IBAs;
- Land resources (land use and agricultural activities);
- Soil in terms of soil cover disturbance and soil contamination;
- Groundwater resources (groundwater availability and quality);
- Public infrastructure: a) healthcare facilities of the Project region, and b) social infrastructure facilities (education, healthcare, recreation etc.)⁴ along the roads used for Project-related transportation;
- Landscape;
- Tangible cultural heritage (CH) in terms of a) potential physical damage to the tangible CH sites and resources including damage caused by vibration from construction works and vehicle movements (both during construction and operation phases), b) possibly restricted access to the sites that are not physically damaged, and c) potential loss or damage to undiscovered CH assets;
- Intangible cultural heritage;
- Employment and labour markets (municipal and local level); and
- Economy.

³ This is in line with the principle indicated in the IFC Guidelines, which suggests relying the identification of VECs on *inter alia* considering whether the project's incremental contributions to cumulative impacts are significant.

⁴ Such facilities include schools, kindergartens, healthcare facilities, sports, recreation, cultural facilities, administrative buildings and public spaces, churches, and cemeteries.

The following VECs **were excluded** from the CIA as the residual significance of the Project impacts on them is predicted to be below the threshold (negligible):

- Surface water resources;
- Existing roads of the Project region; and
- Other existing infrastructure: a) power supply infrastructure, b) waste disposal facilities, c) water and sanitation systems, d) linear infrastructure that are known to interfere with the proposed roadway (gas pipelines, an irrigation water pipe, two overhead transmission lines), and e) underground telecommunication, power, and other cables that may potentially intersect the proposed roadway).

Ambient air quality⁵, noise and vibration levels are not viewed as individual VECs per se, but rather considered as potential risks to a) local population / community health, b) project workers /occupational health, and c) cultural heritage sites and social infrastructure facilities.

Baseline natural and physical environmental concerns have been identified via stakeholder engagement and screened for inclusion in the scope of the current CIA as either potential E&S risks or potential VECs:

- Erosion in Darbas – this is a very localised process in the village, erosion is considered with the ESIA in broader terms and is taken as affecting a soil VEC ;
- Radioactivity in the Lernadzor area – this was investigated together with the head of Lernadzor Administrative Unit following the scoping meetings and appeared to be related to Kajaran mines; the joint site visit involving the ESIA Consultant's environmental expert and the Head Lernadzor Administrative Unit confirmed that the mines are in ca. 6 km from the proposed road with no expected interaction and the concern was resolved. Therefore, this issue was scoped out of the ESIA as irrelevant (and so not considered in the CIA.
- Crossing of the Project roadways with the existing gas and irrigation pipelines – this would affect the public infrastructure VEC (see above) and thus was scoped into the CIA;
- Air quality around mining sites in the Kajaran area – according to the dispersion modelling (ESIA Volume 3, Section 3.1), the Project air quality impacts during the construction and operation stage are of local nature and do not extend to Kajaran mines, which are some 6km from the proposed road. Thus, this concern is not included in the scope of the CIA; however, air quality is considered in the context of community and occupational health (see above);
- Drinking water quality – this is part of the groundwater quality VEC included in the CIA.

The **temporal boundaries** for the CIA are accepted to encompass the construction and operation stages of the Project:

- Construction is expected to start in early 2024 and will last for six years;
- The road is designed for an operational life of 25+ years.

⁵ It is recognised that there are several points where the proposed and existing roads will cross, thus potentially leading to cumulative emissions of exhaust gases. However, such emissions are not considered to be adding significantly to the Project emissions, especially given that the local traffic will be diverted to allow for construction activities as per the construction management plans and traffic management plans.

The **spatial (geographical) boundaries** of the CIA equate to the Project's Areas of Influence (Aols) for various E&S receptors identified in ESIA Volumes 2 (Biodiversity), 3 (Physical Environment) and 4 (Social Environment). In addition, spatial boundaries of the CIA consider possible wider Aols for E&S receptors associated with the other projects/activities.

2.3 Scoping Phase II – Identification of Other Activities (Projects) for the Inclusion in the CIA

The tasks carried out for this step of the CIA included:

1. Identification of a 'long-list' of projects that are potentially relevant to this CIA (see **Table 1**, left column). A long-list of projects was identified keeping in mind the above-listed VECs and extent of possible impacts, and based on:
 - a. a desktop review of the publicly available Ministry of Environment's (MoE) databases of EIA-permitted projects under construction and / or operations, as well as projects for which an EIA permit application has been submitted under Armenian law; and
 - b. consultations with the heads of Project-affected administrative units in July-August 2022.

Availability of sufficient information to inform this CIA and a potential for a cumulative impact with the Project were pre-requisites for compiling the long list of projects for review.

2. Screening of the long-list projects for relevancy and scale of potential impacts on VECs and spatial and/or temporal overlaps with the Project (see **Table 1**, middle column). This exercise identified several projects / activities with potential for affecting one or more VECs and thus are scoped into the CIA (see **Table 1**, right column).

Table 1. Analysis of the Projects that Can Contribute to the Cumulative Impact on the VECs

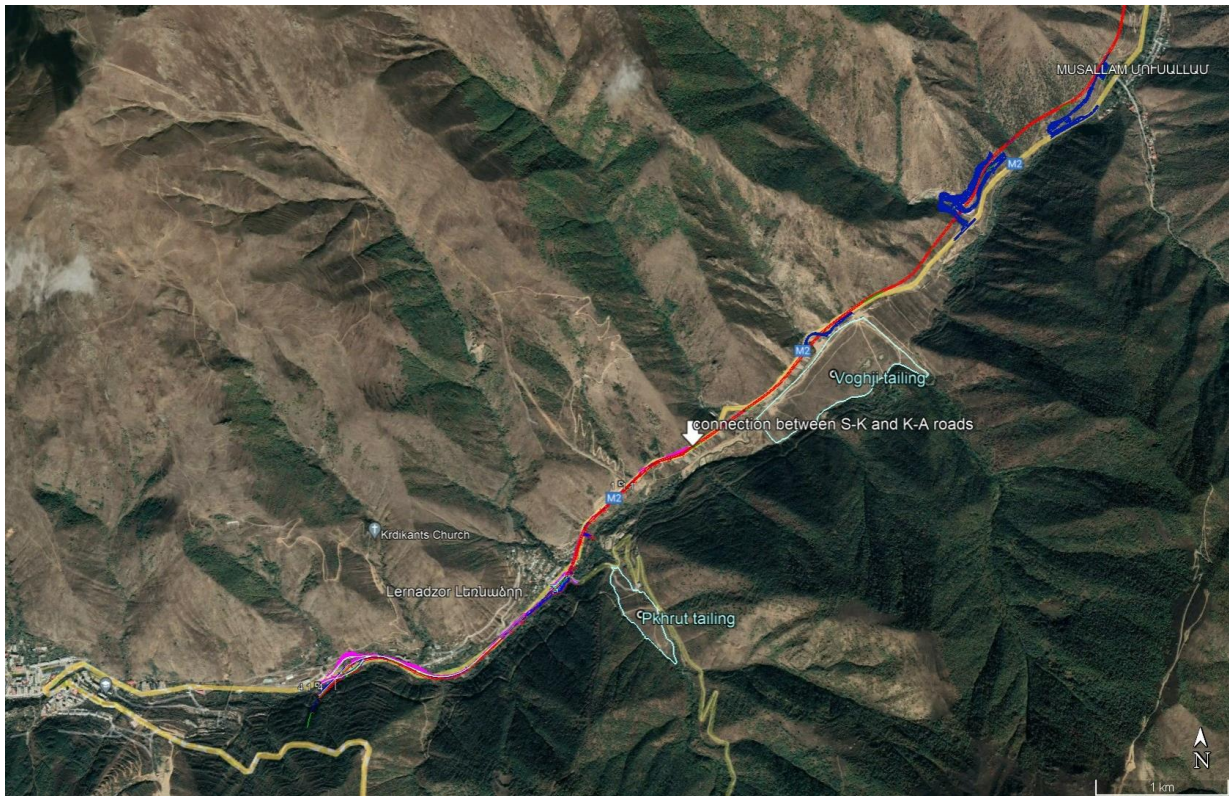
Past, present, and future projects	Interaction with the Project (spatial, temporal, activity-type)	Included / not included in CIA
Construction of additional power lines for the Project needs (a future project)	This activity is necessary for the functioning of the new tunnels and road lighting and will have spatial and temporal interactions with the Project. The planned power lines are seen as associated facilities for the Project ⁶ . The routes of the power lines are unknown yet, however they must be completed prior to the Sisian-Kajaran Road commissioning.	Included
Operational Shamb and Geghi HPPs (past projects)	These HPPs are located relatively close to the Project road route and use resources of local rivers that are supposed to be the sources of technical water for the Project. However, surface water abstraction for Project needs is assumed not to result in material changes in the rivers' flow downstream the HPPs and not to affect HPPs' generation capacities. As	Not included

⁶ While associated facilities are expected to be assessed in ESIA's conducted per international Lenders' requirements together with the main developments, in this case no information was available to carry out a reasonable assessment of impacts of the power lines. Thus, a high-level assessment of this associated facility has been performed in the context of this CIA.

Past, present, and future projects	Interaction with the Project (spatial, temporal, activity-type)	Included / not included in CIA
	the Project's residual impact on such VEC as surface water resources is seen as negligible, and given that the HPPs' discharge is strictly monitored by regulators against the national water quality limits, and as the interaction with these past projects are minimal, the HPPs are not included into the CIA.	
Kajaran-Agarak section of the North-South Road Corridor (NSRC) program made of two separately tendered lots: the road and the tunnel with its access (a future project)	This planned road connecting Agarak and Kajaran is part of the North-South Road Corridor program (similarly to the Project road) and will connect to the Project road in about 1 km from Lernadzor (Figure 1). The Kajaran-Agarak road will be funded by Eurasian Investment Bank and envisions construction of a 32km road and a 7.2 km tunnel, and rehabilitation of a 4km access to the tunnel. The construction is expected to commence in autumn 2023 and last about 3.5 years overlapping with the Project's construction phase. The planned activity would result in similar E&S impacts, as the Project, including those on land resources, biodiversity, road users and road infrastructure.	Included
Rehabilitation / re-cultivation of Voghji tailing facility (a future activity related to a past project)	The tailing facility is at 57+600 km to 59+500 km chainage of the proposed road and around 3km from planned Tunnel 09 (Figure 1). Spoil from the tunnel construction or the nearest slope cuts could be used for site rehabilitation (see discussion about this tailing facility among alternative SDAs in ESIA Volume 1, Section 3.9). This option was conceptually discussed at the meeting with the MoE in April 2023. In order to confirm the usability of spoil for this development, a reclamation design for the tailing facility needs to be developed which may take about nine months. <i>NB: This activity was procured by the Ministry of Environment (MoE) but then cancelled in 2023 due to high project costs; it may be progressed in the future and in this case a temporal overlap will occur</i>	Included
Rehabilitation / re-cultivation of Pkhrut tailing facility (a future activity related to a past project)	The tailing facility is 1km from the southern edge of the proposed road (Figure 1). The preparation of the reclamation design for the facility is currently ongoing and it does not envision use of spoil.	Included
Reconstruction of the Sisian Medical Centre (a present project)	Reconstruction of the medical centre in Sisian started in April 2022 and its duration is 1-1.5 years. This activity is expected to be completed before the start of the Project construction phase.	Not included
Construction of the industrial water supply system for CJSC Zangezour Copper Molybdenum Combine (ZCMC) (a future project)	Construction of the water pipeline from Geghi reservoir to the company's pumping station near Lernadzor in order to supply water to the ZCMC enrichment plant could potentially overlap with the road construction (in particular, with the construction of Tunnel 08, Bridge 21, and earthworks at 46-50km). The route of the pipeline is under design and not known yet, the consultations held with the pipeline designers allow to assume a <i>very tentative</i> route of the pipeline (Figure 2). The construction of the pipeline is expected to start at the end of 2023 and last for 3-6 months potentially. There is a risk that ZCMC starts constructing the pipeline, which would then need to be relocated due to the Project. Spatial and	Included

Past, present, and future projects	Interaction with the Project (spatial, temporal, activity-type)	Included / not included in CIA
	temporal overlaps at the construction stages of both projects are also possible.	
Hydrotechnical and hydrogeological works in the area adjacent to Geghi reservoir (a future project)	Hydrotechnical and hydrogeological investigations are planned by ZCMC limited to the area adjacent to Geghi Reservoir (Figure 2). They will not overlap with the planned Project road construction in this area.	Not included
Development and operation of the Sisian basalt mine (a future project)	The planned mine will be located 300 m northwest of Ishkhanasar settlement, Sisian Community and 1,600 m from the northern end of the Project road (Figure 3). The construction is expected to start in 2023. The land take compared to the Project's land acquisition (293 ha, excluding SDAs and other temporary sites) is seen as negligible. The conservatively high modelling estimates for the Project construction and operations show that the predicted noise and air impacts do not extend to Ishkhanasar village. The air and noise impacts of the proposed enterprise will be localized. This activity is subject to the national EIA and, as such, the MoE will strictly require that it is sited and designed so that air quality and noise thresholds are not exceeded in the settlement. While there could be a temporal overlap with the Project construction and operation, the potential for a spatial overlap and a cumulative impact is very low and mainly linked to the pressure on the same public roads (e.g., the M2) and creation of new jobs. These cumulative impacts are seen as limited in magnitude and not taken further.	Not included
Present activities with the Project-affected villages: <ul style="list-style-type: none"> • installation/rehabilitation of a new irrigation water system in Lor village; • (re)construction of a potable water system in Darbas village; • Completion of a school construction in Darbas village. 	According to interviews held with the heads of the Project-affected administrative units, all mentioned activities are planned for completion in the first part of 2023. Once commissioned they are not expected to generate impacts with temporal or spatial overlaps with the Project (for the location of Lor and Darbas see Figure 4). Even if these projects are not completed by mid-2023 and are delayed into early 2024, when the Project pre-construction works may start, no cumulative impacts are expected as the initial Project pre-construction works will be related to cultural heritage (CH) clearance activities and mobilisation of the Contractor. Thus, the spatial or temporal overlaps are unlikely.	Not included
Construction of a diesel transport service station, a new warehouse for explosives, renewal of the diesel vehicle fleet, installation of emergency service basins at duker crossings No. 1, 2 and 4 (future activities)	ZCMC CJSC plans to construct several facilities over 3.5-4 years starting in July-August 2023. In general, the project components, except for duker crossing No. 1, are located 9-10 km away from the proposed road. Duker crossing No.1 will run through the valley near Kavchut village and will extend to its slopes, below chainage 54+000 and 55+000 km of the proposed road (for the location of Kavchut village see Figure 2). The installation of the emergency service basin will be limited to bottom section of the pipes in the valley, in the disturbed land area. While there could be a temporal overlap with the Project construction, the potential for a spatial overlap and a potential for cumulative impact are very low.	Not included

Past, present, and future projects	Interaction with the Project (spatial, temporal, activity-type)	Included / not included in CIA
<p>Construction and operation of a sand quarry in Lernadzor settlement (a future project)</p>	<p>The quarry will occupy 0.31 ha and will be within the boundaries of Lernadzor, being more than 1 km from the southern end of the proposed road. It is expected to be commissioned in 2023 (for the location of Lernadzor village see Figure 1). In the context of the Project's land needs (293 ha, excluding SDAs and other temporary sites) the potential of this development to add to the cumulative impact on land resources together with the Project is seen as negligible. The conservatively high modelling estimates for the Project construction and operations show that the predicted noise and air impacts do not extend to Lernadzor village. The air and noise impacts of the proposed enterprise will be localized. This activity is subject to the national EIA and, as such, the MoE will strictly require that it is sited and designed so that air quality and noise thresholds are not exceeded in the settlement. While there could be a temporal overlap with the Project construction and operation, the potential for a spatial overlap and a cumulative impact is very low and mainly linked to the pressure on the same public roads (e.g., the M2) and creation of new jobs. These cumulative impacts are seen as limited in magnitude and not taken further.</p>	<p>Not included</p>
<p>Construction of the automated minecart system for the transportation of the friable ore minerals (SARD-1200 system) (a future project)</p>	<p>ZCMC CJSC intends to transport ore from their mine to the crushers through an automated minecart (railway) system instead of currently used trucks (for the location of ZCMC see Figure 2). The construction could potentially start at the end of 2023 in a limited corridor, between the mine and the plant. This project will not add to cumulative impacts on VECs together with the Sisian-Kajaran Road Project. There is a positive impact associated with ZCMC's initiative in the company generating less greenhouse emissions once the minecart is commissioned.</p>	<p>Not included</p>
<p>Linear infrastructure crossed by the Project road (past projects that operate now)</p>	<p>The existing linear facilities will be relocated to the territory outside the Project road alignment; this would result in the additional land acquisition for some of the linear facilities. This relocation impact on land is considered as the Project's <i>indirect impact</i> and as such is included in the Project's Resettlement Framework and Resettlement Plan (that is, the same compensation entitlements are due for the Project's direct land take and indirect land take resulting from infrastructure relocation). The relocation activities will be implemented as per the Utilities Protection and Relocation Plan (see Volumes 4. Social Environment and Volume 6. ESMP) before the Project construction will start in these locations.</p> <p>The regular operation of these facilities and the Project operations may overlap, but with no (or very limited) expected impacts on the VECs.</p>	<p>Not included</p>



Note: red line is the Project road; purple line is the Kajaran-Agarak road's access leading to the tunnel in Kajaran

Figure 1. Map showing: i) Voghji Tailings Facility, ii) the point where the planned Sisian-Kajaran and Kajaran-Agarak Roads connect; and iii) and Pkhrut Tailings Facility

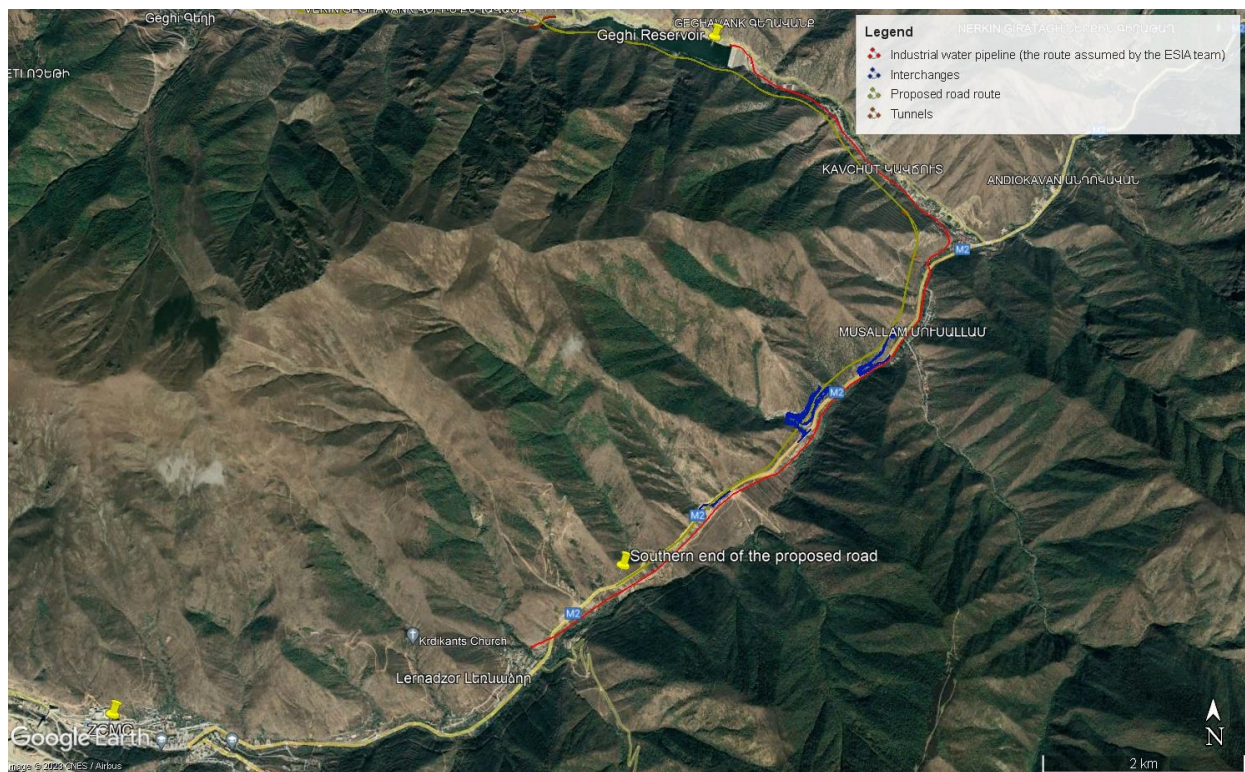


Figure 2. Map showing a tentatively assumed route of ZCMC's industrial water pipeline relative to the Project



Figure 3. Map showing the location of the proposed Sisian basalt mine relative to Ishkhanasar Village and the Project road and interchange



Figure 4. Map showing the location of Darbas and Lor Villages relative to the Project road

In addition, the baseline analysis was reviewed to identify any social and/or environmental **stressors or external factors** that may influence the condition of the VECs (see also **Section 2.2**). In relation to the Project, such stress factors could be:

- climate change with increasing frequencies of severe weather which may increase the risk of floods, mudflows, landslides and snow avalanches, worsening desertification and land degradation (**ESIA Volume 3, Section 3.2**);
- geohazards (flooding, snow avalanche, seismic and mudflow risks) known to exist largely in the Geghi area (**ESIA Volume 3, Section 3.5**);
- erosion caused by livestock husbandry, uncontrolled establishment of earth roads, and use of fallow agricultural lands that is observed on the slopes close to almost all settlements within the Project region (**ESIA Volume 3, Section 3.5**); and
- risk for any new developments requiring earth works to lead to impacts on cultural heritage due to the abundance of sites of cultural, historical, archaeological, natural, paleontological and spiritual importance in the region (**ESIA Volume 4, Section 2.3**).

These drivers or factors are considered in the next steps of the CIA when making judgments about the significance of cumulative impacts (**Table 3**).

2.4 Steps 4 and 5 – Assessment of the significance of the cumulative impact on the VECs

As the CIA is future-oriented, it is focussed on understanding whether cumulative impacts will affect the sustainability or viability of VEC conditions due to a combination of development impacts and natural forces. ‘Sustainability or viability’ are interpreted as VEC sensitivity i.e., the degree to which they are susceptible to or unable to cope with injury, damage, or harm.

The identified VECs include a wide range of individual and site-specific E&S receptors with varying sensitivities and values. Based on the sensitivities assigned to the E&S receptors in ESIA Volumes 2, 3 and 4, conservative sensitivities were assigned to the generic VECs (**Table 2**). These sensitivities were fed into the assessments of the significance of cumulative impacts (**Table 3**).

Table 2. Sensitivity of VEC Accepted in the CIA

Receptor Group	Sensitivity / value
Local communities (health and safety)	Medium
Road users	Medium
Project workers	Medium
Biodiversity (Critical Habitats, PBFs, and protected areas)	High
Land (land use and agriculture)	High
Soil (soil destruction and contamination)	Medium to high
Groundwater	High
Public infrastructure (healthcare facilities)	Medium
Landscape	Medium to high
Cultural heritage	Low to high
Employment and labour markets (local and municipal level)	Medium
Economy	Low to medium

In CIA, impacts are measured in terms of the VEC response and, ultimately, significant changes condition (IFC, 2013). The significance of cumulative impacts is judged in the context of thresholds or limits of acceptable change, within which the VEC condition is considered to be tolerable but beyond which further change in condition is not tolerable. For this CIA, the reference criteria established in thematic sections of ESIA Volumes 2, 3 and 4 are used as thresholds. In the absence of established thresholds, e.g., for use of land resources or road users, expert judgments are offered drawing upon the consolidated opinions of four

experienced experts from the ESIA team (namely, environmental, social, health and safety, and resettlement experts).

The potential cumulative impacts on the VECs are assessed below.

Table 3. Assessment of the potential cumulative impact on the VECs

Legend of the cumulative impact significance:

negative		positive	
negligible	moderate	negligible	moderate
minor	major	minor	major
minor to moderate	absent	minor to moderate	absent

VECs	Construction of additional power lines for Project needs	Kajaran-Agarak section of the North-South Road Corridor program	Rehabilitation / re-cultivation of Voghji and Pkhrut tailing facilities	Construction of the industrial water supply system for CJSC ZCMC	Synthesis of impacts on the VEC
<p>Local communities 1. Impacts on public health due to air and noise pollution</p>	<p>Currently, no information on the planned power connections (including proposed routes, connection points, capacities) is currently available. Construction of the power lines may potentially affect ambient air quality and noise levels in the settlements nearby. However, such impacts would be avoided or minimised as the design, construction and operation of the power lines would also need to comply with the Project Lenders' E&S requirements and national regulations (NB. The design and E&S requirements for the power lines are documented in the Project's Environmental and Social Management Plan). The aggregated construction-related transport may add to noise and air impacts at the settlements along the construction transportation routes negligibly, and the resulting public health impacts are considered as negligible.</p>	<p>The Kajaran-Agarak road will connect to the southern end of the Sisian – Kajaran Project road, about 900m from the nearest residential area of Lernadzor administrative unit. Although no spatial cumulative impact is expected on the health of the local communities due to the construction and operation of both road sections (as the connection point is far from the residential areas (see Figure 1), additional traffic triggered by the construction of the Kajaran-Agarak road can contribute to additive air and noise impacts at the settlements along the construction transportation routes. This cumulative impact at the construction phase is seen as minor to moderate. At the operation phase similar impacts are related to sporadic maintenance traffic, and the cumulative impact is seen as negligible. It is also anticipated that this development will comply with international E&S lenders' standards.</p>	<p><i>Voghji</i> tailing facility is located next to the southern end of the proposed road, about 1km from the nearest settlement (Lernadzor). <i>Pkhrut</i> tailing facility is located ca.1 km from the southern end of the proposed road, and 0.3 km to the nearest settlement (Lernadzor). It is unknown whether both tailing facilities will be re-cultivated simultaneously. The nature of re-cultivation works and assumed cooperation between the Voghji tailing facility and the Project suggests that the spoil transportation will occur in-between the Project sites (Project tunnels (e.g. Tunnel 09) or SDAs) and Voghji tailing facility. The residential areas <i>along</i> the roads, which can potentially be used for spoil transportation and Project-related transportation include e.g. parts of Kavchut and Dzagikavan (former Musallam) villages adjacent to the road from Qirs to M2 Road and along M2 Road (Figure 1). Due to limited number of affected residential houses (e.g. in Kavchut and Dzagikavan - up to 10 private houses and 3 apartment</p>	<p>Several settlements can be expected to be located on the possible route of the pipeline if it is constructed along the existing underground pipeline infrastructure, within its easement, then will cross the M2 road and will connect to the company's existing water pipeline (see Figure 2). In this case, a part of the pipeline and the new road from its southern end to Geghi reservoir (from section 56+000 to 51+000) will run in parallel and the Aols for impacts on air quality and noise may overlap. If construction phases of the two projects coincide in time, the air and noise pollution will increase for the settlements located along the route, which is considered as having a potential for a negative cumulative impact of minor to moderate significance.</p>	<p><i>Negligible to minor to moderate potential negative cumulative risks to public health due to air emissions and noise nuisance are predicted for the projects' corridors in the Geghi area, a small area around the western part of Lernadzor, and at the settlements located along the routes that will be used by the construction transport of the planned and/or concurrent projects.</i></p>

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			houses) and negligible additive air and noise impacts from the aggregated transportation, the resulting public health impacts are considered as localised and negligible .		
2. Public safety risks related to traffic accidents	Increased traffic of service vehicles on existing roads used for transportation of materials, equipment, and workers during the construction stages of this development and the Project can be expected. However, the cumulative public safety risks related to increased probability of traffic accidents will be short-term and not exceed the residual level of the Project risk (minor) as the additional number of service vehicles due to this activity would be limited.	Construction of this section of the road will overlap with the Project road construction. It is likely that delivery vehicles servicing both projects will use the same roads. This would result in cumulative public safety risk related to increased probability of traffic accidents on these roads for some 3-4 years. The cumulative public safety risk is seen as minor to moderate .	Increased traffic of service vehicles on roads used for transportation of materials, equipment, and workers to the tailing facilities and the Project road sites can be expected during the road construction phase. The cumulative public safety risk related to increased probability of traffic accidents is not expected to exceed the residual level of the Project risk (minor) as the additional number of service vehicles due to this activity would be limited.	Construction of the industrial water supply pipeline will require construction vehicles moving between Kajaran and Geghi reservoir. Part of Project construction vehicles would travel along the same local roads. Such combined additional traffic of heavy vehicles would result in cumulative public safety risk related to increased probability of traffic accidents. The cumulative community safety risk is seen as short-term and minor to moderate as the additional number of service vehicles due to this activity would be very limited.	<i>Short- to medium-term negligible to minor to moderate negative cumulative impact on public safety due to road accidents during Project construction, on routes that will be used by construction transport for planned and/or concurrent projects.</i>
Road users in terms of regional connectivity and road safety	This activity is necessary for operation of Project infrastructure, which in turn will provide better regional connectivity and road safety for the road users.	Construction of this section of the road will complement the North-South Road Corridor Road Project and provide a new road connection for the whole country. Both roads are designed to meet international road safety standards with their operation improving overall road safety nationally.	No cumulative impact on the VEC is expected.	No cumulative impact on the VEC is expected.	<i>Major positive cumulative impact for road users in terms of regional connectivity and road safety is expected from the realisation of the planned projects.</i>
Project workers 1. Exposure to high levels of air and noise	Occupational health and safety risks for the power lines and Project road are expected to be managed per IFIs standards. Negligible cumulative impacts on air and	Construction activities are not expected to overlap geographically, apart from those at the highway connection point. As construction would be managed in line with	Voghji tailing facility is located along the southern edge of the proposed road. Spoil from the road construction is to be used for site rehabilitation. It is assumed, that works will be coordinated to avoid impacts on workers above permissible	Project workers can be affected by additive air and noise pollution impacts if the implementation of both projects overlaps in time due to their likely spatial	<i>There is a minor to moderate short-term risk of worker exposure to higher air and</i>

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pollution	noise levels that would affect project workers at the different sites are expected as the activities and associated impacts will be very localised.	occupational health and safety standards, no additive impact on the VEC is expected.	limits. Pkhrut tailing facility is located at ca.1 km from the road, and so no combined impacts on project workers are expected even in case of simultaneous activities. No cumulative impact on this VEC is expected.	proximity.	noise levels in the Geghi area due to the construction activities of two concurrent projects.
2. Worker safety risks related to traffic accidents on the local roads	For Project workers commuting to the construction sites, the risk of being injured due to traffic accidents correlates with the number of vehicles on the roads, weather conditions, behaviour of other road users and many other factors. However, the cumulative risk is not expected to exceed the Project's residual level of the risk (minor) as all projects are expected to comply with the road safety requirements and the Project staff driving any vehicles will undergo dedicated trainings.				Minor cumulative risk is predicted to worker safety during the construction stage due to the Project and the concurrent projects
Biodiversity 1. Impacts on species and habitats inside Critical Habitats / PBFs and beyond them	The cumulative impact on Critical Habitats and PBFs, in particular habitat fragmentation, is possible during Project and power line construction. The impact is not expected to exceed the residual levels for the Project (from negligible to moderate depending on the receptor). Avoidance of Critical Habitats is prescribed for the power line routing and if Critical Habitats simply cannot be avoided. The operational overhead transmission lines would pose additional risks of electrocution and collision to birds. Though the road per se would not add to these impacts. Mitigation/offset measures will be designed and implemented to achieve no net loss, and where appropriate, a net gain of	Impact on same critical species and habitats and PBFs is possible during construction of this section of the road. However, it is also anticipated that this development will comply with international and lenders' E&S standards. Thus, the no net loss and possibly a net gain status will be expected to be achieved for any identified Critical Habitats if these cannot be avoided.	Critical Habitat is identified in the area near the Voghji tailing facility, thus cumulative impact is possible. However, it would be managed by firstly avoiding if possible, then reducing it to the extent possible, and then offsetting if it happens to be unavoidable. So, eventually no net loss will be assured.	There is identified Critical Habitat in the area between the ZCMC and Geghi reservoir. Cumulative impact during the pipeline construction is possible. It is expected that the mitigation hierarchy will be applied and thus the cumulative impact is seen as negligible.	'No net biodiversity loss' status, and where appropriate a 'net biodiversity gain is expected to be achieved for all Critical Habitats that might be affected by the projects funded by Lenders. Mitigation applied by private sector developers would bring the impact to negligible.

VECs	Construction of additional power lines for Project needs	Kajaran-Agarak section of the North-South Road Corridor program	Rehabilitation / re-cultivation of Voghji and Pkhrut tailing facilities	Construction of the industrial water supply system for CJSC ZCMC	Synthesis of impacts on the VEC
	biodiversity for both projects.				
2. Impacts on National protected areas, Emerald Network Sites, and KBAs	The proposed road does not cross national special protected areas, but is close to some Emerald sites and falls within KBAs. Thus, activities related to the construction of additional power lines can have cumulative impact on the VEC. The Appropriate Assessment for the proposed road shows no physical impact on Emerald sites. The power lines shall be routed to avoid these areas similarly to how the Project does this. Thus, the cumulative impact would be absent or negligible.	Construction of this section of the road could cross Meghri KBA which is also affected by the Project Road. The Appropriate Assessment for the Project shows no physical impact integrity on Emerald sites, and the same would be expected from the Kajaran-Agarak section of the NSRC. Thus, the cumulative impact would be absent or negligible	The tailing facilities are located in the Meghri KBA. However, rehabilitation activities would not exacerbate negative impacts on biodiversity, improving conditions of the facilities rather than creating possible risks to biodiversity of the KBA. <i>*Exceptional colour of the block due to opposing impacts on the VEC.</i>	The area of the proposed pipeline is located within Meghri KBA. The Project's Appropriate Assessment concluded that after implementation of adequate mitigation measures no impacts will be expected on the Zangezur Sanctuary, Zangezoor IBA/KBA, Meghri KBA in terms of the integrity of these protected areas or internationally recognized areas of biodiversity. The pipeline's construction activities could cause negligible adverse short-term cumulative impact due to noise and air emissions, however no operational impacts are expected.	<i>While the projects are not expected to affect Protected Areas, some negligible short-term negative cumulative impact can be expected for the Meghri KBA.</i>
Land resources Land use and agricultural activities	Insignificant but permanent land acquisition will be required to install transmission towers, and restrictions on land use / agricultural activities will be imposed in buffer zones. Avoidance of physical resettlement is one of the requirements for routing the lines. The cumulative impact is not expected to	Properties will need to be acquired permanently for this concurrent project within the limit of Lernadzor administrative unit (and beyond towards Agarak and Meghri). The Lernadzor rural area will be affected negligibly by the Project resettlement impacts as well (refer to the Project's Resettlement Framework and	No additional land will be acquired for rehabilitation. Thus, no cumulative impact on the VEC is expected.	Pipeline construction works can result in temporary and permanent land take and land use restriction, including possible impacts on agricultural land. The cumulative impact is not expected to exceed the Project's residual impact significance (minor to moderate).	<i>Negligible to moderate cumulative impacts on land resources, land use and agricultural activities are predicted in the Geghi and Lernadzor</i>

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	exceed the Project's residual impact significance (minor to moderate).	ESIA Volume 4). This is a negligible cumulative risk that the already affected adjacent properties, or properties belonging to the same households can be affected. If viewed in wider context, given that this project will require own SDAs (tentatively proposed in be in Meghri area, some 30km from the Project southern end), cumulative impact on the resources in this area are seen as minor to moderate .			<i>areas, and potentially in power line buffer zones.</i>
Soil	Earthworks at the sites of proposed transmission towers and construction of temporary roads to the tower sites would result in disturbance of soil cover and potentially in soil contamination at the construction sites due to inadvertent spills of hazardous materials or poor waste management. These impacts are generally similar to impacts on soil during the proposed road construction by type but are much less significant in terms of extent as the aggregated area of RoWs for the power lines would comprise a small share of the proposed road footprint. Upon completion of construction works, part of the land disturbed for the power line construction would be rehabilitated, and soil cover within these areas would be	Similar to the Project road, construction of the Kajaran-Agarak road section may result in disturbance of soil cover and potentially in soil contamination at the construction sites due to inadvertent spills of hazardous materials or poor waste management. The total footprint the Kajaran-Agarak road would be approximately twice less than that of the Project road. Provided that appropriate mitigations are applied, the cumulative impact on soil is expected to be minor to moderate .	No additional land will be acquired for rehabilitation of the tailings facilities and no disturbance of untransformed soils is expected. Moreover, the properly rehabilitated tailing facilities would have restored and non-contaminated soil cover and may be potentially used as grazing lands or for planting trees. Therefore, rehabilitation activities would not exacerbate Project-related negative impacts on soil but rather cause positive impact on soil resources of the Project region. <i>*Exceptional colour of the block due to opposing impacts on the VEC.</i>	Pipeline construction works would result in disturbance of soil cover due to excavation works and potentially in soil contamination within its route due to accidental spills of hazardous materials or poor waste management. The pipeline would be underground, and disturbed soil cover within the pipeline route will be restored upon completion of the construction works. Therefore, the pipeline's impact on soil is considered to be short-term, reversible and having negligible significance. Provided that appropriate mitigations are applied, the cumulative impact on soil is not expected to exceed the Project's residual impact significance (minor).	<i>Negligible to moderate cumulative impacts on soil are predicted in the Geghi and Lernadzor areas, and potentially in power line routes.</i>

VECs	Construction of additional power lines for Project needs	Kajaran-Agarak section of the North-South Road Corridor program	Rehabilitation / re-cultivation of Voghji and Pkhrut tailing facilities	Construction of the industrial water supply system for CJSC ZCMC	Synthesis of impacts on the VEC
	restored. Therefore, the total area subject to irreversible impact on soil would be very limited, and respective impact on soil is viewed as negligible. Provided that appropriate mitigations are applied, the cumulative impact on soil is not expected to exceed the Project's residual impact significance (minor).				
Groundwater resources	No cumulative impact on the VEC is expected assuming that the power lines are designed to avoid the impacts on groundwater sources and that this concurrent project complies and implemented in line with national E&S regulations and the IFIs' requirements. Precaution is expected to be taken to avoid accidental spills of sanitary water, contaminant spills, etc.	Construction of the proposed roads can result in potential impacts on groundwater via spillage of hazardous materials, especially hydrocarbons, a potential change in the groundwater hydraulics due to tunnelling and the associated dewatering. It cannot be fully excluded that the groundwater resources do not extend to larger areas, that is to the sites of both projects. Yet, with the mitigation that is envisioned in both projects the cumulative impact is not expected to be more than minor .	Rehabilitation of the tailing facilities may generate groundwater contamination risk. However, no significant impacts on the groundwater resources are expected during earthworks in the section of the road close to the tailing facilities. Significant road construction impacts may be associated with the tunnelling but the nearest Tunnel (09) is ca 4.5-5 km from the tailing facilities. Thus, no cumulative impact on the VEC is expected.	During excavations, groundwater resources may be affected by spillage of hazardous materials. Given the spatial proximity of the two projects, and a possible temporal overlap, cumulative impacts are possible. However, given the mitigation measures envisioned in both projects, it is not expected that such cumulative impacts would increase residual significance (minor) of the Project's risk to this VEC.	<i>Limited cumulative impact on groundwater resources is expected, mainly in the Geghi area</i>
Public infrastructure Healthcare facilities	Existing medical infrastructure in the Project area (especially the Kajaran Medical Centre which is the closest to most of the planned developments) may experience additional demand for medical services generated by the workers of all these projects. However, the cumulative pressure would not significantly add to the impact predictions made for the Project (moderate significance).				<i>Cumulative impacts on health care facilities are possible in the area</i>
Landscape	Installation of the power lines for the project needs can affect the landscape. However, the visual impacts of the road construction itself are considered far greater,	The Kajaran-Agarak road starts on the M2 road near Lernadzor and will bypass the settlement. The Project road is in the west of this point, joining the M2 1km from Lernadzor. As such no	Rehabilitation of the tailing facilities will have minor positive landscape impacts due to a transition from an industrial to a natural site. However, it will not mitigate visual impacts caused by road construction (adverse moderate),	No cumulative impact on the VEC is expected.	<i>Negative cumulative impacts on landscapes are predicted for the power lines and</i>

VECs	Construction of additional power lines for Project needs	Kajaran-Agarak section of the North-South Road Corridor program	Rehabilitation / re-cultivation of Voghji and Pkhrut tailing facilities	Construction of the industrial water supply system for CJSC ZCMC	Synthesis of impacts on the VEC
	thus the cumulative impact will not exceed the Project's residual significance (adverse moderate). In addition, the lines can be routed judiciously to reduce possible visual impacts.	cumulative impact on the VEC is expected due to spatial distance between the projects (though each of them may lead to minor to moderate negative impacts).	mostly in other locations.* *exceptional colour of the block due to opposing impacts on the VEC.		the Project together, whereas the re-cultivation of the tailings would positively transform the landscape.
Cultural heritage 1. Tangible cultural heritage	The routing of the power lines will avoid known cultural heritage sites and extend the archaeological field surveys. Given the abundance of cultural heritage, it is possible that unknown sites will be subject to direct and/or indirect loss or damage during this development (e.g., during soil stripping). To address the cultural heritage impacts associated with the Project (ESIA Volume 4) mitigation measures are developed for each site, and a chance find procedure will be applied. It is expected that similar arrangements will be made for the power lines. Thus, no cumulative impacts above minor would be expected.	Road construction invokes risks of physical damage to cultural heritage sites. The spatial extent of both projects increases the number of potential cultural heritage sites at risk. The cumulative impact is not expected to exceed the Projects' residual significance (minor), as this road section will also have the relevant cultural heritage mitigation measures and a chance find procedure.	No cumulative impact on the VEC is expected, as there is no ground disturbance beyond the already transformed areas.	There are two cultural heritage sites (№75 and №76) that may appear rather close to the potential pipeline route (currently being designed). The cumulative impact is not expected to exceed the residual risk significance (minor), provided the pipeline is routed further from the cultural heritage sites and a chance find procedure is applied.	There is a potential for negative cumulative impacts on tangible cultural heritage in the Geghi area and in the wider context – along the power lines and Kajaran-Agarak section.
2. Intangible cultural heritage	No cumulative impact on the VEC is expected.	An indirect positive impact is predicted on preservation of local traditions, practices, and rituals owing to SMEs and tourism activities in the region, attracted by reliable road connection opportunities (adding on to the Project's similar minor to moderate opportunities).	No cumulative impact on the VEC is expected.	No cumulative impact on the VEC is expected	Potential cumulative support to the revival of intangible cultural heritage features due to the North-South Corridor initiative is

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					<i>predicted.</i>
Employment and labour markets Municipal and local level	Negligible additive positive impacts can be expected from this development in terms of direct, indirect, and induced jobs in the same locations. It will add to the Project's impacts on the labour markets, which are predicted to be moderate positive on their own but will not change the overall significance of the cumulative impact.	The Kajaran-Agarak road construction is expected to result in increased vacancies in labour markets creating a wider range of employment opportunities for communities and the region. This will simply add to the expected direct, indirect, and induced jobs to be created as part of the Project.	No cumulative impact on the VEC is expected (or is so low that not considered).	Negligible additive positive impacts can be expected from this development in terms of direct, indirect, and induced jobs created in the same locations. The Project's impacts on the labour markets, which are predicted to be moderate positive on their own will be supplemented but will not change the overall significance of the cumulative impact.	<i>The planned developments are expected to combine in positive cumulative impacts on employment markets at local and municipal levels as all will generate construction and operations jobs.</i>
Economy Regional and municipal level	The development will add to the impact due to taxes to be paid to the state budgets and procurement opportunities. This additive impact will not materially increase the Project's minor-to-moderate positive impact on economy. The cumulative impact would remain the same significance.	Completion of this section of the road can serve as an additional trigger for tourism and trade development in the region.	No cumulative impact under the VEC is expected (or is so low that not considered).	The development will add to the impact due to taxes to be paid to the state budgets and procurement opportunities. The development will support operations of the company which is the major employer and tax payer in the municipality. Overall, the cumulative impact would not significantly increase the Project's minor-to-moderate positive impact on economy.	<i>All planned developments are expected to combine in positive cumulative impacts on economy at the regional and municipal (including local) levels associated with taxes to be paid to state budgets, procurement opportunities and development of SMEs.</i>

2.5 Step 6 – Cumulative Impact Management

Possible cumulative impacts on VECs only slightly change (add to or deduct from) the residual significance of the Project impacts, i.e., for the majority of VECs the cumulative impact is assessed as remaining the same significance as the road Project alone. **The CIA did not identify any major negative cumulative impacts.**

Recommended Impact Prevention, Mitigation and/or Enhancement Measures to be Implemented by the RD

- Proactively engage with ZCMC CJSC regarding the potential overlap of their facilities to be constructed in the Geghi area with the planned road.
- Inform the developers of concurrent projects reviewed in this CIA, namely:
 - *Construction of power lines for Project needs;*
 - *Kajaran-Agarak section of the NSRC;*
 - *Rehabilitation / re-cultivation of Voghji and Pkhrut tailing facilities;*
 - *Construction of the industrial water supply system for CJSC ZCMC,*

about the workplans / schedules of the Project road construction to allow for mutual adjustments and thus avoidance and/or minimisation of additive air and noise pollution impacts on local communities and workers. Areas of potential simultaneous occurrence of activities to be discussed and coordinated relate to:

- the Geghi area (works on the Project's construction sites and works in the CJSC ZCMC pipeline corridor starting at the Geghi reservoir);
- Western part of Lernadzor settlement (houses along at the western edge of Lernadzor which is close to the road leading from the M2 to Pkhrut tailing facility), and
- Settlements located along the routes that will be used by the construction transport of the planned and/or concurrent projects in the Sisian and Kajaran Communities.
- Instruct the designers of the power lines that will serve the Project to select the route of the power lines so that to avoid protected areas, KBAs/KBIs, and Emerald sites and consider the groundwater levels when siting the towers.
- In order to balance cumulative traffic loads, when optimising transport of construction materials, equipment and workers, and developing the Project's Construction Traffic Management Plan, consider envisioning therein higher 'baseline' traffic loads that may be associated with the concurrent projects included in this CIA (where the implementation of the projects overlaps in time).
- Request the Construction Contractor to clearly indicate the boundaries of the Project construction sites and implement security provisions to prevent unauthorised / accidental access.
- Request the Construction Contractor to ensure topsoil stripped during the site preparation/excavation works is properly stored and implement measures to prevent inadvertent spills of hazardous materials or poor waste management (detailed in the Waste Management Plan, Hazardous Materials Management Plan and a Spill Management Plan) to control these possible risks to soils within the Project construction sites;
- Request the Construction Contractor to inform Project workers in case of temporal overlaps of construction activities with other projects; where relevant, include OHS

risks of such overlaps in the OHS risk assessment (which is part of the Project's E&S management system).

- To mitigate cumulative impacts on biodiversity, seek firstly to avoid biodiversity, and only if avoidance is not possible implement additional measures to achieve "no net loss" and, where possible, a "net gain" through offsets or additional conservation actions.
- Request the Construction Contractor to avoid creating new access routes for project activities and/or local community access. Existing access roads must be prioritized for use to minimize impacts on biodiversity.

These mitigation and enhancement measures are taken forward into the Environmental and Social Management Plan (ESMP) for the Project (Volume 6 of the ESIA). The Road Department, the Project Implementation Agency, will hold the overall responsibility for their implementation.