

Environmental Monitoring Report

Project Number: 41193-019
Semi-Annual Report
November 2021

Mongolia: Western Regional Road Corridor Investment Program - Tranche 2

Prepared by the Project Implementation Unit (Ministry of Roads and Transport Development) for the Government of Mongolia and the Asian Development Bank.

This environmental monitoring report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

Asian Development Bank

WESTERN REGIONAL ROAD CORRIDOR INVESTMENT PROGRAM.

TRANCHE 2 PHASE.

2021

BI-ANNUAL ENVIRONMENTAL MONITORING REPORT: SECOND HALF OF YEAR 2021



EMR 2021 NO.02

PROJECT IMPLEMENTATION UNIT.

11/30/2021



CONTENTS

1	INTRODUCTION	3
1.1	ABOUT THE REPORT	3
1.2	LOCATION OF THE PROJECT	3
1.3	CONSTRUCTION PROGRESS UPDATE	5
2	ENVIRONMENTAL RESPONSIBILITIES	7
2.1	ADB REQUIREMENTS	7
2.2	DOMESTIC ENVIRONMENTAL REQUIREMENTS	7
2.3	ROLES AND REPONSIBILITIES	8
3	IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PLAN	9
3.1	OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PLAN	9
3.2	ENVIRONMENTAL PERSONNEL	9
3.3	AIR QUALITY MANAGEMENT	10
3.4	NOISE AND VIBRATION CONTROL	10
3.5	MANAGEMENT OF WATER RESOURCES	11
3.6	MANAGEMENT OF SOIL RESOURCES AND INERT MATERIALS	12
3.7	WILDLIFE PROTECTION	13
3.8	CAMP MANAGEMENT	14
3.9	WASTE MANAGEMENT	14
3.10	HEALTH AND SAFETY	15
3.11.	GRIEVANCE REDRESS MECHANISM	16
4	ENVIRONMENTAL MONITORING	17
4.1	MONITORING PARAMETERS	17
4.2	MONITORING ACTIVITIES	17
4.3	MONITORING RESULTS	17
4.3.1	Air quality monitoring	17
4.3.2	Noise monitoring	18
4.3.3	Water quality monitoring	19
5	CONCLUSION	21
5.1	SUMMARY OF ENVIRONMENTAL MANAGEMENT	21
5.2	RECOMMENDATION ON NEXT CONSTRUCTION SEASON	21
	APPENDIX 1. EMP COMPLIANCE CHECKLIST	22
	APPENDIX 2. PHOTOS	26



ABBREVIATIONS

ADB	: Asian Development Bank
COMO	: Community Outreach Monitoring Officer
CW	: Construction Work
CSC	: Construction Supervision Consultant
dB	: Decibel
DEIA	: Detailed Environmental Impact Assessment
EA	: Executing Agency
EIA	: Environmental Impact Assessment
EMoP	: Environmental Monitoring Plan
EMP	: Environmental Management Plan
EMR	: Environmental Monitoring Report
EMS	: Environment Monitoring Specialist
H&S	: Health & Safety
GASI	: General Agency for Specialized Inspection
GoM	: Government of Mongolia
GRM	: Grievance Redress Mechanism
MRTD	: Ministry of Road and Transportation Development
MET	: Ministry of Environment and Tourism
PIU	: Project Implementation Unit
TSP	: Total suspended particulate
TSS	: Total Suspended Solids
WRRICIP	: Western Regional Road Corridor Investment Project



1 INTRODUCTION

1.1 ABOUT THE REPORT

This report summarizes environmental activities performed at the active components of Tranche 2 phase of the Western Regional Road Corridor Investment Program in the second half of the year 2021, a period between July to December. Environmental protection activities, implementation of mitigation measures and routine environmental monitoring performed by the contractors under supervision of the PIU have been discussed in detail in this report.

This Environmental Monitoring Report comprises of following sections:

- ❖ Section 1 of the report provides report structure, project location and the construction progress achieved in the reported period.
- ❖ Section 2 describes environmental responsibilities of the project within the framework of domestic regulations and ADB requirements.
- ❖ Section 3 summarizes mitigation measures implemented by the contractor in each aspect of safeguard, including air quality, water, soil resources, wildlife and health and safety. Rehabilitation results of borrow sites are described in the section.
- ❖ Section 4 provides results of the environmental monitoring activities carried out in the reported period.
- ❖ Section 5 provides conclusion and recommendations for the next reporting period.

This report is prepared by the PIU Environmental Monitoring Consultant E. Khasar with inputs from the Contractors.

1.2 LOCATION OF THE PROJECT

The road is part of the Asian Highway network, Route 4 (AH4, 6,024 km) is a designated Central Asia Regional Economic Cooperation (CAREC) Corridor 4a, which links Russia (Novosibirsk) with Pakistan (Karachi). It traverses about 752 km through territory of Mongolia.

Tranche 2 section of the western regional road links the Khovd city to the Ulaanbaishint border crossing between Mongolia and Russia. Construction of the Tranche 2 road is completed in most of its sections. The active components of Tranche 2 where construction activities took place in 2021 are shown in the table below.

Table 1. The active components of the Tranche 2 section of the western regional road

No.	Construction lot	Length, km	Location	Civil works contractor
1	CW1-4	25.8 km	Tsagaannuur village – Ulaanbaishint border crossing	Longjiang Road and Bridge LLC
2	CW1	6.76 km	Western side of Ulgyi city	Hotgor Zam LLC
3	CW2	201 meters long bridge	Over Khovd river	HKB International LLC
4	CW3	11.8 km	Western side of Ulgyi city	Hotgor Zam LLC

Ulgyi bypass road. The construction lots CW1, CW2 and CW3 in the below table are together regarded as Ulgyi bypass road. The Ulgyi bypass road alignment starts diverging from UB-Ulgii road at south of province center, goes by east skirt of Urd Bukhun mountain, heads to northwest passing by east skirts of Tsagaan Chuluut and Maikhan Tolgoi mounts, crosses Tsagaan Ereg and Khovd river valley, passes Ulgii Steppe via Yamaat Ulaan mount east skirt, heads to northeast reaching Balchin Mount northwest, finally merges to Ulgii-Ulaanbaishint paved road. The Ulgyi bypass road traverses through territories of bags No.3, 10, 12 and 13 of the Ulgii soum.

Figure 1. Google image of the 18.82 km long Ulgyi bypass road



Road to Ulaanbaishint border cross. CW1-4 lot is a 25.8 km long and traverses through Nogoonuur soum territory and passes through a number of environmentally sensitive areas such as Bayan lake and Siilkhem Mountain Range SPA. It starts in 2 km north of Tsagaannuur village and ends nearby the Ulaanbaishint which is a border cross point between Bayan-Ulgyi province of Mongolia and Altai Republic of Russia. Public consultations were conducted with the administration and residents of Nogoonuur soum during the pre-construction period. Potential impacts of construction and environmental protection measures planned by the project such as establishment of water protection zones around Bayan lake and wildlife crossing planned in Siilkhem SPA were presented to the local community who are fully supportive of the project as they understand that construction of a paved road would be beneficial to them both economically (increased trade and more convenience to transportation) and environmentally (reduced dust level and recovery of multiple tracked earth roads). There are no any permanent settlements in the immediate vicinity of the road alignment. Public consultations will be conducted during construction and post-construction in 2022 once the government ban on public gathering is lifted.

Figure 2. Google image of the 25.8 km long Tsagaannuur-Ulaanbaishint road



1.3 CONSTRUCTION PROGRESS UPDATE

Lot CW1-4: The contractor for the lot is Longjin Road Co., Ltd while Inter Continental Technocrats (ICT) LLC has been working as the engineering supervision consultant. The construction works at the package CW1-4 commenced from May 2021. The contractor has mobilized 122 construction workers and 61 number of equipment and machineries onsite in the second half of 2021 construction season.

Survey works, construction of deviation for passage of traffic, construction of earthworks for road embankment, construction of embankment top layer, construction of non-frost layer, construction



of subbase layer and production of aggregates have been carried out during the reported period. As of 30 October 2021, the construction work progress was at 40.07%.

Lots CW1: The contractor for the lot is Hotgor Zam Co., Ltd while Inter Continental Technocrats (ICT) LLC has been working as the engineering supervision consultant. The contractor started its operation in March 2021. The contractor has mobilized 37 construction workers and 19 number of equipment and machineries onsite in the second half of 2021 construction season.

Works of prime coat and asphalt concrete pavement, subbase and embankment construction (layers) and cement treated base course, stone pitching for outlet and inlet of box culverts, cement-treated section between CH 0+000 - 6+680 have been completed., 2021 The contract lot achieved construction progress rate of 85.06% as of 06 October when 2021 construction work has been stopped for winter season.

Lot CW2: The contractor for the lot is HKB International Co., Ltd while Inter Continental Technocrats (ICT) LLC has been working as the engineering supervision consultant. Construction works at the lot CW2 started in March 2021. The contractor has mobilized 46 construction workers and 13 number of equipment and machineries onsite in the second half of 2021 construction season.

Bore hole drilling of piles, casting concrete for piles and pile cap and preparation of reinforcement cages of the beams and piles and a total of 54 pile foundations and three pile caps work have been completed in 2021. The construction progress rate at the end of October 2021 is at 27.78%.

Lots CW3: The contractor for the lot is Hotgor Zam Co., Ltd while Inter Continental Technocrats (ICT) LLC has been working as the engineering supervision consultant. The contractor started its operation in March 2021. The contractor has mobilized 78 construction workers and 48 number of equipment and machineries onsite in the second half of 2021 construction season.

Gravel shoulder layers of LHS and RHS, construction of Prime coat and Asphalt concrete works and cement-treated base layer between STA.8+800 and STA.16+860 have been performed in 2021. Construction of Prime Coat and Asphalt concrete work were started on 9th of September, 2021. The contract lot has achieved construction progress rate of 72.43% as of 06 October when 2021 construction work has been stopped for winter season.



2 ENVIRONMENTAL RESPONSIBILITIES

2.1 ADB REQUIREMENTS

The project is classified under category A. The ADB EIA for Tranche-2 was prepared in August 2010 and amended in 2013 and 2020. It provided description of physical environment for the project area, assessment of impacts, environmental management plan and grievance redress mechanism for construction period. The EIA concluded that Tranche 2 will not have any significant, long term or irreversible impacts on the physical, biological or socio-economic environment. Implementation of the environmental management, mitigation, and monitoring programs specified in the EIA were in compliance with ADB and government environmental guidelines and procedures.

The ADB's Safeguard Policy Statement (SPS), 2009 is applicable to the project which seeks to avoid, minimize or mitigate the adverse environmental and social impacts of projects including protecting the rights of those people likely to be affected or marginalized by the development process.

2.2 DOMESTIC ENVIRONMENTAL REQUIREMENTS

The main policy document is a set of environmental laws that were amended in May, 2012 including the Law on EIA. The purpose of the Law on Environmental Impact Assessment is to ensure environmental protection, the prevention of ecological imbalance, the regulation of natural resource use, the assessment of environmental impacts of projects and procedures for decision-making regarding the implementation of projects. The terms of the law apply to all new projects, as well as rehabilitation and expansion of existing industrial, service or construction activities and projects that use natural resources.

Lot CW1-4. DEIA for the lot was approved by MET in November 2016. It comprises of Environmental Protection Action Plan and Environmental Monitoring Plan. Required timeframe and frequency, responsible parties, budgets and corresponding domestic standards are specified in the Tranche-2 EMP. The key personnel of the contractors, including on-site environmental staffs, safety staffs, construction engineers and unit supervisors have attended EMP implementation trainings that were held at beginning of each construction season.

Ulgvi bypass (CW1, CW2 and CW3). Environmental Department of the Khovd province has issued a General Impact Assessment for the access roads on 26 Feb 2019, which concludes that no DEIA is needed and the project may proceed with specific conditions (EMP is needed). As required by the General Impact Assessment, Environmental Management Plans prepared by the PIU was reviewed and approved by the Environmental Department of Khovd province in March 2021.



2.3 ROLES AND RESPONSIBILITIES

The project EMP defines the following key roles and responsibilities including:

- (i) **Executing Agency.** Ministry of Roads and Transportation Development (MRTD) is the Executing Agency for the Project and is ultimately responsible for ensuring the implementation of the EMP;
- (ii) **Implementation Agency.** The Project Implementation Unit (PIU) resides within the Department of Roads (DOR) which is the Implementation Agency. The PIU engaged an Environmental Monitoring Specialist (PIU-EMS) to monitor implementation of the EMP;
- (iii) **PIU-EMS.** The PIU-EMS facilitates the implementation of the EMP and the grievance redress mechanism (GRM), have regular contact with the PIU and Supervising Engineer and prepare bi-annual environmental monitoring reports;
- (iv) **Construction Supervising Consultant (CSC).** The CSC supervises the site environmental management system of the contractors, provide corrective instructions, and assist the contractors to implement the EMP;
- (v) **Contractor.** Environmental responsibilities for the Contractors and their construction activities are stated in the Contract signed between the ADB, MRT and the contractors. On one hand, all the construction activities shall meet ADB's rules and standards regarding environmental protection, and on the other hand, it shall obey the environmental laws and regulations of Mongolia. The contractors for the lots CW1-4, CW1. CW2 and CW3 are responsible for implementation of the measures specified in the EMP, thus they have employed permanent on-site environmental and safety staffs and contracted with local professional laboratories to carry out the tasks.



3 IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PLAN

3.1 OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PLAN

The updated EMP of the project defines mitigation and monitoring measures and describes the institutions and mechanisms to monitor and ensure compliance. Specific measures are developed in relation to the design, construction and operation of each project component and the impacts identified in relation to physical, biological, cultural and socio-economic resources.

Key tasks for the contractors during implementation of the Environmental Management Plan are to:

1. Ensure that environmental requirements specified in the contract documents are adequately performed.
2. Carry out construction and supportive activities in compliance with all relevant Government laws, rules and regulations including environmental laws in force.
3. Manage construction works and operations to prevent or at least minimize adverse impacts on the environment.
4. Implement environmental protection and mitigation measures specified in the EMP.
5. Employ necessary personnel, local consultant to carry out environmental protection measures and monitoring activities.
6. Allocate a budget necessary for carrying out environmental monitoring activities.
7. Provide safeguard rules to protect workers from any accident and hazard associated with the construction operations and ensure protection of their health
8. Ensure protection of the health and welfare of road side communities by minimizing nuisance including pollution.
9. Observe the laws and other environmental regulations of the country and liaise with the Engineer and statutory authorities for the smooth and efficient operation to complete the Project.

3.2 ENVIRONMENTAL PERSONNEL

The PIU employs E. Khasar as the environmental monitoring consultant for the project who is responsible for facilitating implementation of the EMP, training contractors' environmental staffs and handling environmental issues related with the project on daily basis. The environmental monitoring consultant has visited the Project area during 28-30 July. The field trip was aimed to:

- i). carry out environmental monitoring works
- ii). Active construction points, construction camps and nearby soum centers to undertake observations, measurements
- iii). organize interviews and meetings with environmental staff of the contractors and soum administration to find out existing problems
- iv). check out restoration of borrow areas.

Each contractor employ on-site HSE staff who are responsible for implementation of EMP measures and occupational safety measures on daily basis. Contact information of the on-site environmental staffs employed by the contractors is provided in below table.

Table 2. On-site HSE staffs employed by the contractors

Construction packages	Name of on-site environmental staff	Phone number
Lot CW1-4	Mr. Ozat	99415161
Lots CW1 & CW3	Mr. Serikbol	99425545
Lot CW2	Ms. Ainur	99058625

3.3 AIR QUALITY MANAGEMENT

As specified in the EMP, following mitigation measures have been implemented by both contractors to minimize dust emission:

1. Asphalt plants and concrete batching plants is located at least 1000 m downwind from the nearest dwellings in order to reduce the impact of fumes on humans and to be fitted with necessary equipment such as bag house filters to reduce fugitive dust emissions.
2. The location of the stockpile is on downwind of sensitive receptors.
3. Dust monitoring is conducted at the monitoring spots on monthly basis to ensure dust level is within the maximum allowed level.
4. Earth material transporting vehicles started used blankets to prevent dust spread
5. Water is sprayed on construction sites and material handling routes where fugitive dust is generated. The Ulgyi bypass construction teams employ a total of 3 water spray trucks while the lot CW1-4 construction team employs 2 water spray trucks, respectively, that are used to sprinkle water along the temporary roads, embankment construction sites, borrow points and quarry sites to reduce dust generation.

3.4 NOISE AND VIBRATION CONTROL

As specified in the EMP, following mitigation measures have been implemented by both contractors to minimize noise and vibration:

As specified in the EMP, following measures are implemented to minimize noise impacts:

- ❖ Source control: Maintain all exhaust systems in good working order; undertake regular equipment maintenance;
- ❖ Locate sites for concrete-mixing and similar activities at least 500 m away from sensitive areas;
- ❖ Operate between 8am-8pm only and reach an agreement with nearby residents regarding the timing of heavy machinery work, to avoid any unnecessary disturbances;
- ❖ Provide advance warning to the community on timing of noisy activities.
- ❖ Noise monitoring regularly to ensure noise levels at construction sites are within the allowed limit



3.5 MANAGEMENT OF WATER RESOURCES

CW1-4:

The road alignment crosses Buraat river and passes nearby Bayan lake. The contractor will construct a new bridge on the river. Protection of the surface water resources from pollution is a critical task. Therefore, water protection zones are established around the Bayan lake and Buraat river within which activities that might cause pollution to surface water resources, such as vehicle washing, use of borrow and quarry, waste collection, vehicles maintenance and fuel recharging, are prohibited.

The contractor has not created any water well and is has been using water drawn from the Buraat river for construction purposes while drinking water for construction workforce is purchased from an existing well in Tsagaannuur village. The contractor has signed a Water Use Agreement with Nogoonnuur soum administration on 07 June, 2020.

In order ensure control over water quality, the contractors sub-contracted with local professional laboratories who send their professional staffs to conduct water quality monitoring is conducted on monthly basis. Water samples taken from the Buraat river is tested at the laboratory of the Institute of Meteorology of Bayan-Ulgii province.

CW1 and CW3:

The main surface water body in the project area is Khovd river which is crossed by the the road west of Ulgii city. Water protection zones are established around Khovd river within which activities that might cause pollution to surface water resources, such as vehicle washing, use of borrow and quarry, waste collection, vehicles maintenance and fuel recharging, are prohibited.

Drinking water for the construction workforce is purchased from the Fresh Water Factory in Ulgii city in 25-litres containers while construction use water is drawn from the Khovd river. The has signed an agreement on water use with the administration of Bayan-Ulgii province (document No.02) on 13 May 2021 which allows the contractor to draw water from Khovd river for construction purposes.

In order to ensure surface water quality is not affected by construction, the contractor is sub-contracted with local professional laboratory to conduct sampling and testing of water quality for Khovd river.

As a result of proper implementation of the water protection measures, no any complaints regarding water pollution is received from the local communities and monthly water quality monitoring results showed the water quality is not affected by the construction works (detailed results of water quality monitoring are provided in Section 4.

CW2:

A new bridge with length of 201 meters is being constructed over the Khovd river in about 4 km west of Ulgii city. Activities that might cause pollution to surface water resources, such as vehicle washing, use of borrow and quarry, waste collection, vehicles maintenance and fuel recharging, are prohibited within 150m distance to the Khovd river. Concrete mixing plant and culvert production facility operated by the contractor is located in 155 meters distance from the Khovd



river bank.

Drinking water for the construction workforce is purchased from the Fresh Water Factory in Ulgyi city in 25-litres containers while construction use water is drawn from the Khovd river. The contractor has obtained a Water Use Permission from the Khar Lake and Khovd River Basin Authority on 11 May, 2021.

3.6 MANAGEMENT OF SOIL RESOURCES AND INERT MATERIALS

Lot CW1-4

The construction team has obtained permission to use 6 borrow pits and 1 quarry from the Nogoonnur soum administration at the start of construction that are located at STA.12+000 (quarry site) and STA.2+050, STA5+500, STA5+500, STA.9+600, STA15+400 and STA.18+800. All borrow areas are located at least 500 meters away from surface water bodies and surrounded with soil stockpiles as access barriers to prevent from people or animal falling in the pits.

Contract Lots CW1 and CW3

Hotgor Zam LLC, the contractor operates 4 borrow pits that are located at STA.0+000, STA.6+240, STA.9+000 and STA.13+000 and 1 quarry site which is located at STA.0+000. All borrow and quarry site are located at least 280 meters distance from the Khovd river.

Permission on use of the borrow and quarry sites was granted to the contractor with Ulgyi soum Governor's Order No. A/78 on 19 May, 2021.

Contract Lot CW1-2

The contractor does not operate any borrow pit and quarry site, thus purchases the necessary aggregate materials from the borrow and quarry site operated by the neighboring Hotgor Zam LLC.

Soil protection measures

As specified in the EMP, both construction teams have implemented following measures in order to minimize potential impacts related to land use and soil erosion:

- ❖ All truck drivers were instructed to strictly follow the pre-determined road routes in order to avoid creating multiple dirt tracks
- ❖ Access road to camp sites, borrow points were planned to minimize length of the access road
- ❖ Borrow pits and quarry sites were chosen in at least 3-5km distance from herder settlements
- ❖ During earthworks, topsoil is stockpiled separately and will be used for future rehabilitation while remaining inert materials are used for embankment construction

3.7 WILDLIFE PROTECTION

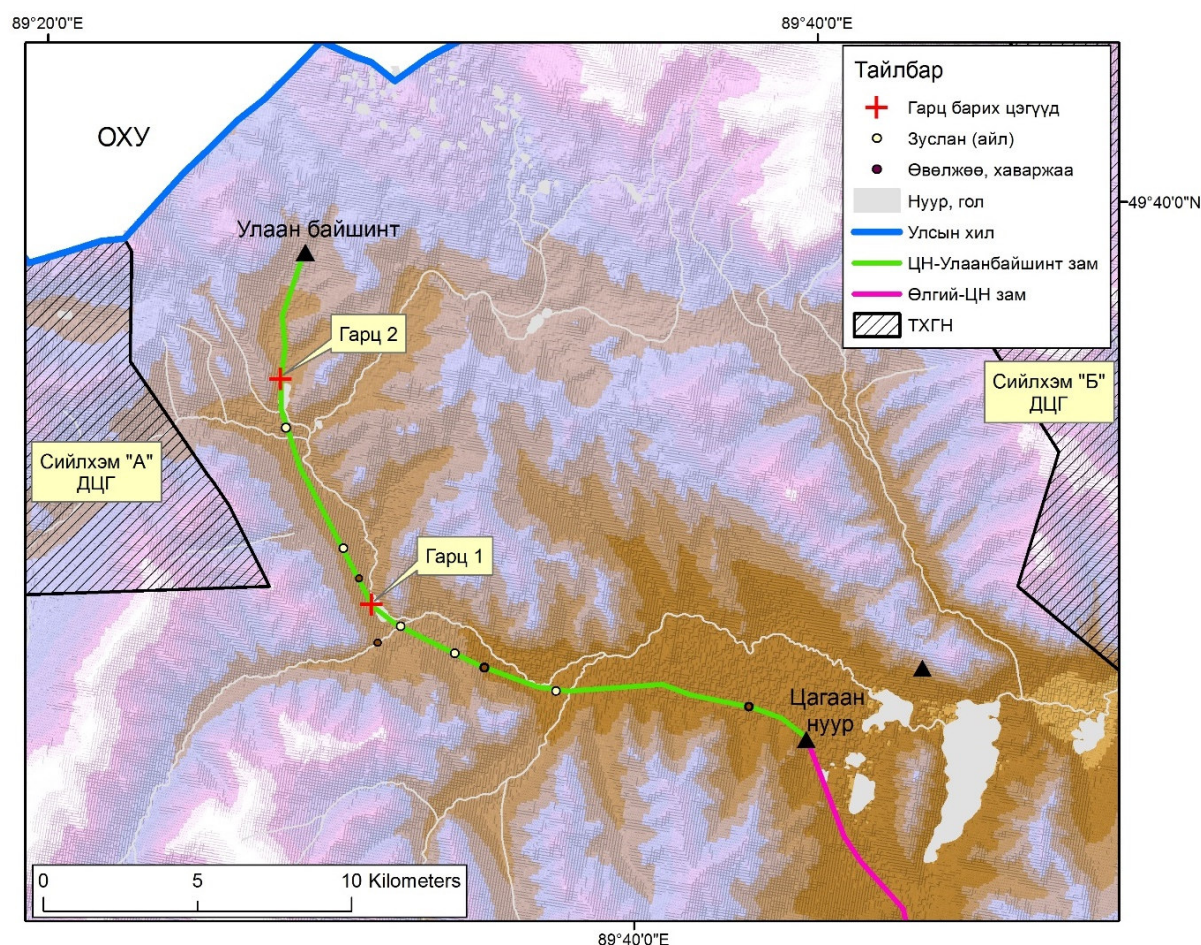
Ulgui bypass road:

Given its approximate location to the major settlement area Ulgui city, no wildlife species exist in the vicinity of the Ulgui bypass corridor (contract lots CW1, CW2 and CW3).

CW1-4:

A Wildlife Movement Survey conducted by the Wildlife Conservation Society (WCS) specialist Buuveibaatar in 2015 determined key migration routes for saiga, argali sheep, ibex and snow leopard determined along the AH-4 corridor. As proposed by the survey, wildlife crossings will be created at 2 locations in the Siilkhem Mountain range SPA towards the end of the road. Siilkhem Mountain Range SPA is known as a major habitat for argali sheep and ibex. Depending on the movement routes for the wildlife species that intersect with the road alignment, level crossings for wildlife is planned at STA.13 and STA.21.

Figure 3. The proposed site for wildlife crossings





Locations of the proposed wildlife crossings are shown in the table below.

Table 3. Location of the proposed wildlife crossing points

No.	Observed species	Latitude	Longitude	Elevation, m
Site 1	Argali sheep, ibex	49.50969	89.52537	2234
Site 2	Argali sheep, ibex	49.56787	89.46545	2267

The contractor will create level crossing for wildlife species at the proposed locations after the embankment construction is completed. In accordance with domestic standard, level crossing for wildlife comprises of ramps on both sides of road embankment, warning signs and 3 speed bumps with 150-meters distance from each other.

3.8 CAMP MANAGEMENT

The contract lots CW1, CW2 and CW3 each has 1 camp site for its construction workforce while the contract lot CW1-4 operates 3 camp sites: the main camp and sub-camps at crusher site and mixing plant. Location of the workers' camp sites are shown in the table below.

Table 4. Location of construction camp sites

No.	Construction lots	Location of workers campsite	Number of construction workers	Administrative division
1	CW1-4, 25.8km road to Ulaanbaishint border	STA.11+300	157 people	Nogoonnuur soum
2		STA.12+000		Nogoonnuur soum
3		STA.12+100		Nogoonnuur soum
2	CW 1, southern section of Ulgyi bypass road	STA.0+200	207 people	Ulgyi soum
4	CW 3, northern section of Ulgyi bypass road	STA.11+400		Ulgyi soum
5	CW 2 Bridge construction over Khovd river	STA.6+700	54 people	Ulgyi soum

Waste collection points, sanitation system, rest rooms, canteen, ventilator, dorms and office rooms are available at all camp sites. Necessary permits for all the camp sites were obtained from local administration.

3.9 WASTE MANAGEMENT

Lot CW1-2: The contractor has obtained a permission on waste water disposal from Khar nuur-Khovd lake water basin authority on May 14, 2021 which allows the contractor to dispose waste water to the waste water treatment plant of Ulgyi city. The Environmental Department of Bayan-Ulgyi province has issued waste disposal permission No.002 on May 11, 2021 which allows the contractors to dispose its solid waste to the central waste landfill site of Ulgyi city. A designated waste collection point is established at the workers' camp site.

Lots CW1-1 & CW1-3:

Permission on waste water disposal was granted to the contractor by the Khar nuur-Khovd lake water basin authority on 5 May, 2021 which allows the contractor to dispose waste water to the waste water treatment plant of Ulgyi city. Designated waste collection points are created at the main camp site, the crushers site and the mixing plant site. Domestic and construction waste



collected at the waste collection points are transported to the central landfill site of Ulgyi city which is located adjacent to the bypass road at around STA.6.

Lot CW1-4:

The following solid waste management procedures are implemented by the contractors:

- ❖ Domestic and waste construction materials are disposed to a designated waste collection points at each camp site.
- ❖ Garbage boxes are placed at each office and dormitory rooms and the construction staff are not allowed to throw any waste at or nearby the construction areas
- ❖ The contractors have signed "Agreement on waste handling" with the Nogoonnuur and Ulgyi soum administrations.
- ❖ Construction waste is delivered to the central landfill site of the relevant soum center.

3.10 HEALTH AND SAFETY

On-site HSE staffs employed by each construction team are responsible ensuring the contractors internal Health and Safety procedures and relevant national standards are obeyed at construction sites.

On-site EHS staffs carry out following works on daily basis:

- ❖ Checking up workplace arrangements and identify risks
- ❖ Checking up the health and safety principles, determine actions to be taken to improve the work place safety
- ❖ Dress inspection before the construction workers go out to workplace
- ❖ Checking the abnormal status and risk factors for the heavy machineries and equipment and determine preventive measures
- ❖ Clear signs placed at construction sites in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials and excavation and raising awareness on safety issues.
- ❖ If any risks are found, inform it to field supervisors and recommend appropriate mitigation measures

Following measures were implemented by the contractors' management toward prevention of COVID-19:

- Limit the number of persons in routine meetings – a chair spacing between workers.
- Use COVID-19 Self-Assessment tool questions to verify that workers are not feeling sick and so they are aware of what the symptoms are so they can self-monitor.
- Disinfect used pens, tables, chairs, etc., after each orientation.
- Following points were included discussed frequently:
 - social distancing of 2 meters
 - hygiene and location of hand washing and hand sanitization stations.
 - what the company is doing at the site to promote a safe workplace and remind them that their health is important to us.



- where the safety posters are located.
- the importance of reporting to their supervisor if they are feeling unwell and leaving the project.

Following hygiene practices were implemented among the construction workforce:

- Clean hands with soap and water before eat and at the end of the workday, during the work shift whenever possible, and when you get home from work.
- Do not shake hands; avoid physical contact.
- Do not share food, drinks, cigarettes, personal hand tools.
- Do not touch one's face, eyes, nose, mouth with unwashed hands (i.e., smoking, drinking water, eating, etc.)
- Follow good respiratory etiquette by covering one's mouth and nose with a disposable tissue or the crease of your elbow when you sneeze or cough.
- Regularly clean and disinfect commonly touched surfaces and tools

There were no COVID-19 cases occurred amongst the construction workforce during the reported period.

3.11. GRIEVANCE REDRESS MECHANISM

There are 3 main GRM entry points: local administration, EA and the contractors. The contractors' environmental staffs and Chinese-Mongolian translators are designated to take responsibility to receive and record complaints from local residents and pass it to managers and EA. There were no any complaints regarding environmental impact during the reporting period.



4 ENVIRONMENTAL MONITORING

4.1 MONITORING PARAMETERS

In accordance with the project EMP requirements, ADB standards and Mongolian regulations on environmental protection, the Contractor has chosen following parameters for environmental monitoring measurements:

- ❖ Dust concentration level PM10 (mg/m³)
- ❖ Nitrogen dioxide (NO₂) and Sulphur dioxide (SO₂)
- ❖ Noise emission level (decibel)
- ❖ Water chemical contents: turbidity, mineralization, hardness and contents of other chemicals
- ❖ Hygiene inspection: inspection on waste and sewage removal, physical condition of camp sites, hygiene condition of kitchen and canteen, drinking water standards.

4.2 MONITORING ACTIVITIES

The contractors have hired the Institute of Meteorology in Bayan-Ulgii province to carry out field sampling and laboratory test analysis for water quality in July, August and September. Naturalist - a local environmental monitoring agency was hired to conduct the air quality and noise measurement analysis in July and August.

4.3 MONITORING RESULTS

4.3.1 Air quality monitoring

The monitoring team specialists have measured levels of dust concentration, nitrogen dioxide and sulfur dioxide with average value of one-hour duration at the construction camp sites and the temporary roads nearby active construction sites.

Results of the air quality monitoring are shown in the tables below.

Table 5. Air quality measurement results, contract lot CW1-4

Monitoring spot	NO2, mg/m3		SO2, mg/m3		Dust, PM10, mg/m3	
	Measured level	Allowed level	Measured level	Allowed level	Measured level	Allowed level
06 July, 2021						
Main campsite	0.008	0.200	0.004	0.45	0.054	0.100
Temporary road nearby Bayan lake	0.006		0.003		0.050	
23 August, 2021						
Main camp site	0.007	0.200	0.003	0.45	0.050	0.100
Temporary road nearby Bayan lake	0.008		0.004		0.052	



Table 6. Air quality measurement results, contract lot CW2

Monitoring spot	NO2, mg/m3		SO2, mg/m3		Dust, PM10, mg/m3	
	Measured level	Allowed level	Measured level	Allowed level	Measured level	Allowed level
15 July, 2021						
Workers' camp site	0.009	0.200	0.003	0.450	0.059	0.100
Temporary road	0.014		0.007		0.097	
30 August, 2021						
Temporary road	0.002	0.200	0.001	0.450	0.083	0.100
Workers' camp site	0.004		0.006		0.065	

Table 7. Air quality measurement results, Contract lots CW1 and CW3

Monitoring spot	NO2, mg/m3		SO2, mg/m3		Dust concentration, mg/m³	
	Measured level	Allowed level	Measured level	Allowed level	Measured level	Allowed level
15 July, 2021						
Temporary road, CW1	0.008	0.200	0.002	0.450	0.100	0.100
Temporary road, CW3	0.006		0.005		0.094	
30 August, 2021						
Temporary road, CW1	0.008	0.200	0.003	0.450	0.088	0.100
Temporary road, CW3	0.007		0.002		0.071	

All measured parameters of air quality were within the standard levels required by the National Standard on Air quality MNS 4585:2016.

4.3.2 Noise monitoring

Daytime noise measurements were conducted at workers' camp sites and temporary roads nearby active construction sites with 1-hour duration. Maximum allowed level of noise during day time is 55 decibels according to Mongolian Standard on Noise.



Table 8. Measured daytime noise levels

Contract lots	Name of the monitoring spot	Measured noise level /dB/		Standard requirement
		15 July	30 August	
CW1-4	Temporary road, STA.1+000	52.9	47.1	55
	Main camp, STA.11+300	36.8	32.5	
	Temporary road, STA.23+900	35.0	43.7	
CW1	Temporary road, STA.4+200	47.1	52.0	
	Workers' camp, STA.0+200	44.3	35.8	
CW2	Workers' camp, STA.6+700	49.8	28.2	
CW3	Temporary road, STA.14+350	54.2	50.3	
	Workers' camp, STA.11+400	33.9	38.1	

At all monitoring spots, the measured noise levels were within the allowed level required in the National Standard MNS 4585:2016.

4.3.3 Water quality monitoring

Water quality monitoring was aimed to ensure surface water quality in the vicinity of the construction area are not affected. During the reported period, water samples were taken from the surface water bodies in the project areas: Bayan Lake at the construction lot CW1-4 and Khovd river at the Ulgyi bypass road. Laboratory test analysis is made at the laboratory of Bayan-Ulgii province Meteorology Institute and the results are compared against the Drinking Water Standard of Mongolia MNS 0900: 2018 in table below.

Table 9. Water quality analysis for Khovd river

Parameters	Khovd river water			Measuring unit	National Water Quality Standard MNS 0900:2018
	05 Jul	09 Aug	10 Sep		
pH	7.07	7.23	7.41	mg/l	6.5-8.5
Hardness:	2.0	2.1	1.9	mg/l	7
Cl ⁻	1.06	2.23	2.12	mg/l	350
SO ₄	13.7	12.4	14.1	mg/l	500
Ca	8.02	13.62	12.02	mg/l	100
Mg	0.97	4.38	3.89	mg/l	30
NH ₄	0.05	0.07	0.004	mg/l	1.5
NO ₂	0.003	0.001	0.001	mg/l	1
NO ₃	0.14	0.19	0.16	mg/l	50



Fe	0.10	0.008	0.07	mg/l	0.3
----	------	-------	------	------	-----

Table 10: Water Chemical analysis, Contract lot CW1-4

Parameters	Main camp		Bayan lake		Measuring unit	National Water Quality Standard MNS 0900:2018
	6-Jul	23-Aug	6-Jul	23-Aug		
pH	6.52	6.92	6.77	7.32	pH	6.5-8.5
Hardness:	3.92	2.4	3.48	6.08	mg/l	7
Cl ⁻	60.2	44.6	21.27	229.7	mg/l	350
Mg	6.44	4.4	17.99	16.54	mg/l	
SO ₄	28.0	27.6	10.5	12.2	mg/l	500
Ca	68.1	40.88	40.88	94.5	mg/l	100
NH ₄	1.3	1.2	1.2	1.2	mg/l	1.5
NO ₂	0.87	143.7	0.75	241.6	mg/l	1
NO ₃	5.5	5.1	2.5	2.7	mg/l	50
Fe	0.00	0.01	0.00	0.00	mg/l	0.3

Looking at the lab test results provided in above tables, level of turbidity, hardness and contents of other chemicals in water samples taken from the nearby rivers were all within the standard level, thus it can be concluded that the surface water quality in the project area is not affected.



5 CONCLUSION

5.1 SUMMARY OF ENVIRONMENTAL MANAGEMENT

The contractors implemented mitigation measures specified in the EMP properly during the reported period. Each construction package employed on-site environmental and safety staffs and hired local professional agencies to carry out field monitoring activities (sampling, measurements and lab test). There was no any major environmental issue and no any environment related complaints received during the reported period.

Overall, the Project has demonstrated a satisfactory level of environmental due diligence in the second half of 2021 construction season.

5.2 RECOMMENDATION ON NEXT CONSTRUCTION SEASON

1. All contractors need to ensure that their on-site EHS staffs continue to be employed for the next construction season in 2022.
2. Ensure that implementation of the EMP measures and environmental monitoring plan continue in the next construction season in 2022.
3. The contractor of the Lot CW1-4 shall create wildlife crossings at the 2 locations proposed by the Wildlife Movement Survey once the embankment construction activities completed in 2022.
4. The contractor of the Lot CW1-4 shall ensure that all mitigation measures required in EIA for environmentally sensitive areas of Bayan lake and Siilkhem Range SPA will be strictly followed during the 2022 construction season.
5. Public consultations shall be conducted during construction and post-construction in 2022 once the government ban on public gathering is lifted.
6. Ensure rehabilitation of borrow pits and quarry sites are executed properly and handed over to the local soum administrations at the end of construction period in 2022.
7. Ensure removal of facilities used for construction (crusher sites, camp sites and mixing plant etc) and post-construction site cleaning is conducted properly at the end of construction period in 2022.



APPENDIX 1. EMP COMPLIANCE CHECKLIST

No	Place	Concern issue	Recommended measures	Implementation status
1	Road Construction site	Use of Safety tools (goggles, gloves, dress, helmet, shoes, etc. by the Construction workers/ engineers.	Availability of safety tools at the camp and at the construction site.	Implemented
		Temporary Sign and Signals for construction works	Important signals like Line marker post, STA. post, Aerial markers, Intermediate aerial markers, Warning signs and Identification signs etc. should be made available along the road.	Implemented
2.	Construction camp	Water supply	<ul style="list-style-type: none"> Arrangement for elevated service reservoir / tank. Availability of taps in bathroom, toilet, kitchen and dining space Ensure drinking water quality through tests as per Mongolian standards 	Implemented
		Sanitation	<ul style="list-style-type: none"> Provision of water closet and flushing system in toilet and bathroom Effluent transportation arrangement into septic tank for treatment and disposal through soak pits. 	Implemented Implemented
		Kitchen and dining environment.	Provision of adequate ventilation, fixing of hand basins and cleanliness	Implemented
		Drainage at the camp	Provision of storm water drainage to nearby drain/stream outside the camp area.	Implemented



No	Place	Concern issue	Recommended measures	Implementation status
			Avoid stagnation of water inside the camp.	Implemented
		Solid waste	Placement of waste collection bins placed at every building and every campsite shall have designated waste collection point. Collected solid waste is disposed to the central landfill site of the relevant soum regularly.	Implemented
		First aid facilities,	First aid tool kits available at camp site	Implemented
		Workshop	<ul style="list-style-type: none"> Structure modification with raised impervious platform and shed/roof. Collection of drips on tray and storing in drum for re-use or safe disposal Soaking arrangement with dry sands in case of accidental spillage and disposal in deep pit away from water body 	Implemented. N/a N/a
		Stock pile	Maintenance of stockpile height at a maximum of 4 meter	Implemented
3.	Quarry/Borrow pits.	<ul style="list-style-type: none"> Material collection Compliance with Environmental Law, 2012. 	<ul style="list-style-type: none"> Preparation of a plan for required and available quantity supported by survey data and profiling of the river at the material collection point Collect permission from local authority. 	Implemented Implemented
4.	Unplanned Hill cutting,	Unplanned hill cutting and disposal of spoil earth and debris	<ul style="list-style-type: none"> Maintain necessary slope to the hill cutting area and staged disposal of 	Implemented



No	Place	Concern issue	Recommended measures	Implementation status
		materials will lead to erosion of the hill and will deposit the eroded soil on the road site.	spoil earth from hill cutting with adequate <ul style="list-style-type: none">• compaction and erosion protection measures to prevent all kinds of soil movement on the constructed road, valleys, agricultural lands, and river/stream courses.	
5.	Crusher Plant at site.	Dust pollution at the site resulting different diseases of the residence of the camp	<ul style="list-style-type: none">• Regular spray water at the dust area and the entire internal road, inside the camps.• Arrangement for water sprinkler throughout the crushing time, wearing of masks, goggles, etc., and regular health checking of the crusher equipment operators/workers at the site.	Implemented Implemented
6.	Camp, Offices	Firefighting equipment should be placed at the camp and office	Immediate placement of firefighting equipment so that it can visible and in case of any emergency, it can be utilized.	Implemented
7.	Transport and equipment movement at the camp.	Excessive dust polluting surrounding environment of the camp and sound pollution due to transport movement in the camp.	Equipment meeting environmental standard in respect of sound should be used in the camp and construction area.	Implemented
8.	Storage and use of chemicals, fuel and lubricant at the camp and at the offices.	Soil pollution for spilled out from the vehicles, bituminous drum etc. at the camp and at the offices.	Strict chemical and solid waste handling and storage practices should be followed.	Implemented



No	Place	Concern issue	Recommended measures	Implementation status
9.	Construction workers related Impact at the camp and at the construction sites.	<ul style="list-style-type: none">• Unhygienic and littered environment around the camp,• Exposure to hazards, transmission of diseases among workers, water-borne diseases to workers.	The local workers should be oriented to hygienic disposal of solid waste, hazardous materials, and proper handling methods. And also should be provided regular health inspections and vaccination among the workers.	Implemented
10.	Traffic Signal	Without traffic signal accident may be happened	Signal Man should be provided at the construction site.	Implemented
11.	Accommodation in the camp	According to size of the room accommodation of the workers should be provided.	Accommodation of the workers should have enough space and should be cleaned every day.	Implemented
12.	Environmental officer	In absence of environmental officer, contractors' activities may not going on as environment friendly.	Immediate placement of environmental officer.	Implemented



APPENDIX 2. PHOTOS LOT CW1-4.

The main camp



Sub-camp at crusher site



Water spray trucks drawing water at Buraat river





Crusher site



Concrete culvert plant



The quarry site



Workers' toilet



Lots CW1 and CW3. Asphalt pavement works at STA.4+000



Culvert construction site at STA.14+500



Borrow site at STA.6+240



Storage of bitumen box at the crusher site.



Contract Lot CW2.**Drilling works****Work of Abutment-1, Pier-1, Pier-2****Construction of bridge****Work of reinforcement cage for Pile cap. Pier-5**