

Environmental Monitoring Report

Semi-Annual Report
September 2017

MON: Western Regional Road Corridor Investment Program, Tranche 2

Prepared by Project Management Unit (Ministry of Road and Transport Development) for the Government of Mongolia, Ministry of Environment and Tourism, and the Asian Development Bank.

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2017

SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT, 2017



Western Regional Road Corridor
Development Program
Project Implementation Unit
8/17/2017

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ABBREVIATIONS

MRT – Ministry of Road and Transportation

ADB – Asian Development Bank

MET – Ministry of Environment and Tourism

EIA- Environmental Impact Assessment

DEIA- Detailed Environmental Impact Assessment

EMP- Environmental Management Plan

EPP- Environmental Protection Plan

EMR-Environmental Monitoring Report

PIU – Project Implementation Unit

COMO – Community Outreach Monitoring Officers

HSE – Health, safety and environment

1. INTRODUCTION

1.1 ABOUT THE REPORT

This quarterly Environmental Monitoring Report summarizes environmental works and activities carried out by the Project Implementation Unit, the Contractors, the Supervising consultant and their environmental staff and consultants. It also provides evaluation on implementation of the Environmental Management Plan for the Western Regional Road Corridor Development Project during the first half of 2017 construction season which lasted between May and July.

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

The report comprises of following sections:

1. Section 1 provides brief introductions to this EMR report and updates on construction progress.
2. Section 2 describes environmental requirements, EMP objectives, environmental personnel and trainings organized.
3. In Section 3, environmental management actions undertaken during first half of 2017 have been summarized.
4. In section 4, environmental monitoring activities carried out during first half of 2017 and the corresponding results have been analyzed.
5. Section 5 provides conclusion of environmental works and recommendations on further activities.

1.2 PROGRESS UPDATE

The Tranche-2 section, which connects Khovd provincial center to Ulaanbaishint border point, is divided into 4 lots. The contractor for the lots CW1-1, CW1-3 and CW 1-4 is Huashi Enterprises Co., Ltd while the contractor for lot CW1-2 is HKB International LLC. Inter Continental Technocrats (ICT) LLC has been serving as the supervising consultant for all four lots of the Tranche-2.

Table 1: Construction work progress rate as July 31, 2017

Lots	Start and end points	Length, km	Actual work progress rate as of July 31, 2017	Targeted work progress rate up to July 31, 2017
CW1-1	Shurga bridge to Khashaat pass	50 km	33.01%	37.19%
CW1-2	Khovd provincial center to Shurga bridge	53.9 km	34.34%	45.21%
CW1-3	Khashaat pass to Tolbo lake	60 km	11.31%	16.45%
CW1-4	Tsagaannuur village to Ulaanbaishint border town	25.8km	Has not started yet.	

Contract Package CW1-1: 2017 construction season has started relatively late, in June, due to contractors' visa issues. In the first half of the 2017 construction season, the Contractor has mobilized of workforce of 252 workers, of which 124 are Chinese workers and 128 are local workers. A total number of 128 equipment and machinery were mobilized. Construction works have been progressing well and embankment works are expected to be finalized later this year.

Contract Package CW1-2: 2017 construction season has started in May. The Contractor has mobilized a workforce of 242 laborers, of which 217 are Chinese workers and 25 are local workers. A total 118 of equipment and machinery were mobilized including asphalt mixing plant, Crushing plant and concrete mixing plant at the project site. The Contractor has three bridge construction teams at the site. Construction works have been progressing well and embankment works are expected to be finalized later part of 2017.

Contract Package CW1-3: 2017 construction season has started relatively late, in June, due to visa issues. In the first half of the 2017 construction season, the Contractor has mobilized total 229 laborers, of which 129 are Chinese workers and 100 are local workers. A total of 144 equipment and machinery were mobilized at the project site.

Figure 1: Project location



1.3. ENVIRONMENTALLY SENSITIVE AREAS FOR TRANCHE-2 SECTION.

A total of 5 environmentally sensitive areas were identified along Tranche-2 road corridor. The key criteria for identifying such areas were number and location of sensitive receptors such as local herders, grazing land, important water resources and wildlife habitat. A separate EMP was developed for environmentally sensitive areas within the domestic DEIA update works.

1. **Buraat river valley:** is located in the CW1-3 section between STA.74 and STA.80. Buraat is a tight river valley (less than 1 km wide at some points) with much of the valley is covered by grassland and marshes. There are 3 permanently dwelling households and a fodder field in the valley.

2. **Olon nuuruud:** is located at the end point of CW1-3 section nearby Khashaat pass between STA.98+500 and STA.101+500. This area has an important surface and ground water resources and a habitat to a number of migratory bird species during summer season. The road crosses the Hongor Ulun river and passes through northern part of the area.
3. **Buyant river delta:** is located at the lot CW1-2, between STA.82+900 and STA.88+200. Buyant river is the second largest river in the region and is one of the main tributaries to the Great Lakes. Buyant river valley is a home to agricultural planting and livestock pasture for the local people. There are about 1800 households of Buyant, Khovd and Jargalant soums plant watermelon down stream.
4. **Hongio river valley:** is located at the lot CW1-1 section between STA.2+800 and STA.21+600. This area has important historical remainings such as sculptures and tombs. The Hongio river is the main drinking water source for livestock during summer time. The river valley is tight (2-3 km wide at some points) with much of the valley is covered by grasses and marshes. Hongio river valley is one of the main pasture lands for herds people of Erdeneburen soum during summer time with 70-80 herder households residing there.

Figure 2: Buraat river valley, lot CW1-3.



2. ENVIRONMENTAL PROTECTION AND MANAGEMENT

2.1. ENVIRONMENTAL REQUIREMENTS

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.

DEIA and EMP for the Tranche-2 section is updated and approved by the Ministry of Environment and Tourism in November, 2016.

The Contractors are also responsible for obtaining necessary permission on quarry sites, borrow pits and drilling water wells from the local soum Governments. In addition, funding and expenses related to implementation of the Environmental Management Plan and report preparation are included in their contracts.

2.2 KEY OBJECTIVES OF EMP:

The updated EMP for Tranche-2 section defines mitigation and monitoring measures and describes the institutions and mechanisms to monitor and ensure compliance. It aims to ensure continuous improvement of environmental protection activities in order to prevent, reduce, or mitigate adverse impacts. The EMP draws on the domestic EIA and on discussions and agreements made with the relevant government agencies. This environmental management plan (EMP) was prepared in line with ADB's SPS 2009. 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.

The contractors have started implementation of the updated EMP for Tranche-2 in the first half of 2017. The on-site environmental staffs and key engineers were trained on implementation of the EMP. In order to fulfil their environmental duties, the contractors have contracted with local professionals and laboratories who carried out field environmental monitoring works.

2.3. ENVIRONMENTAL PERSONNELS

The PIU employs E.Hasar as the environmental monitoring consultant for the project who is responsible for implementing the EMP, training contractors' environmental staffs and handling environmental issues related with the project on daily basis. He started working at the PIU in January, 2014 and on April 01, 2016 his contract was extended through the 2018 construction season.

The environmental monitoring consultant has visited the Project area 2 times in the first half of 2017, during May 23-28, and July 20-25. The field trips were aimed to i). carry out to environmental monitoring works ii). visit environmentally sensitive 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. During the field trips, he had carried out following tasks:

1. Organized meetings with environmental officers of Khovd, Buyant, Erdeneburen and Tolbo soums
2. Organized meetings with Khar Lake Khovd River Water Basin Administration.
3. Visited active construction and environmental monitoring spots and environmentally sensitive areas.
4. Organized EMP trainings for contractor's environmental staffs.
5. Checked EMP implementation status and provide feedback.

The contractors employ on-site environmental staffs at their respective sites who are responsible for implementing the EMP and coordination of environmental monitoring. The CW1-1 construction team has employed Mr.Uyanzorig as a designated environmental personnel and Mr.Bayasgalanbat was appointed as Safety staff who is responsible for implementing Safe Operation Procedure and conducting daily safety check-ups. The CW1-3 construction team Mr.Jangiirkhan as on-site environmental staff beginning from May 2017.

Figure 3. Environmental staff and supervision engineer at the CW1-3 Team.



The CW1-2 construction team employs Mrs.Dungaamaa as its environmental staff since September 2015.

Construction packages	Name of on-site environmental staff	Phone number	Employed since
CW1-2	Ms.Dungaamaa	99806855	September, 2015

Cw1-1	Mr.Uyanzorig	95590306	April, 2016
CW1-3	Mr.Jangiirhan	99413777	May, 2017

2.4. ENVIRONMENTAL TRAININGS ORGANIZED

As part of his duties, the PIU environmental monitoring consultant has organized EMP trainings for the contractors and their key staffs. Following table shows EMP trainings conducted during the first half of 2017.

Table 2. Trainings

Training	Date	Attendants	Key topics presented
Implementation of the updated EMP	2017.May 23-25	Zhang Wang Guo - CW1-2 Team Leader Dungaamaa - Environmental staff of CW1-2 Cai Juhong - CW1-1 Team Leader Uyanzorig - Environmental staff of CW1-1 Jangiirkhan – Environmental staff of CW1-3 Khurts - Translator of CW1-3	Impact mitigation measures proposed in the updated EMP, timing, relevant standards to obey, monitoring spots, law requirements
Environmental Management actions	2017.July.21	Jangiirkhan – Environmental staff of CW1-3 Khurts - Translator of CW1-3 Enkhbold – Supervising engineer at CW1-3	Environmental requirements by the Professional Inspection Agency of Bayan-Ulgii province, correction measures, safety measures

2.5. GRIEVANCE REDRESS MECHANISM

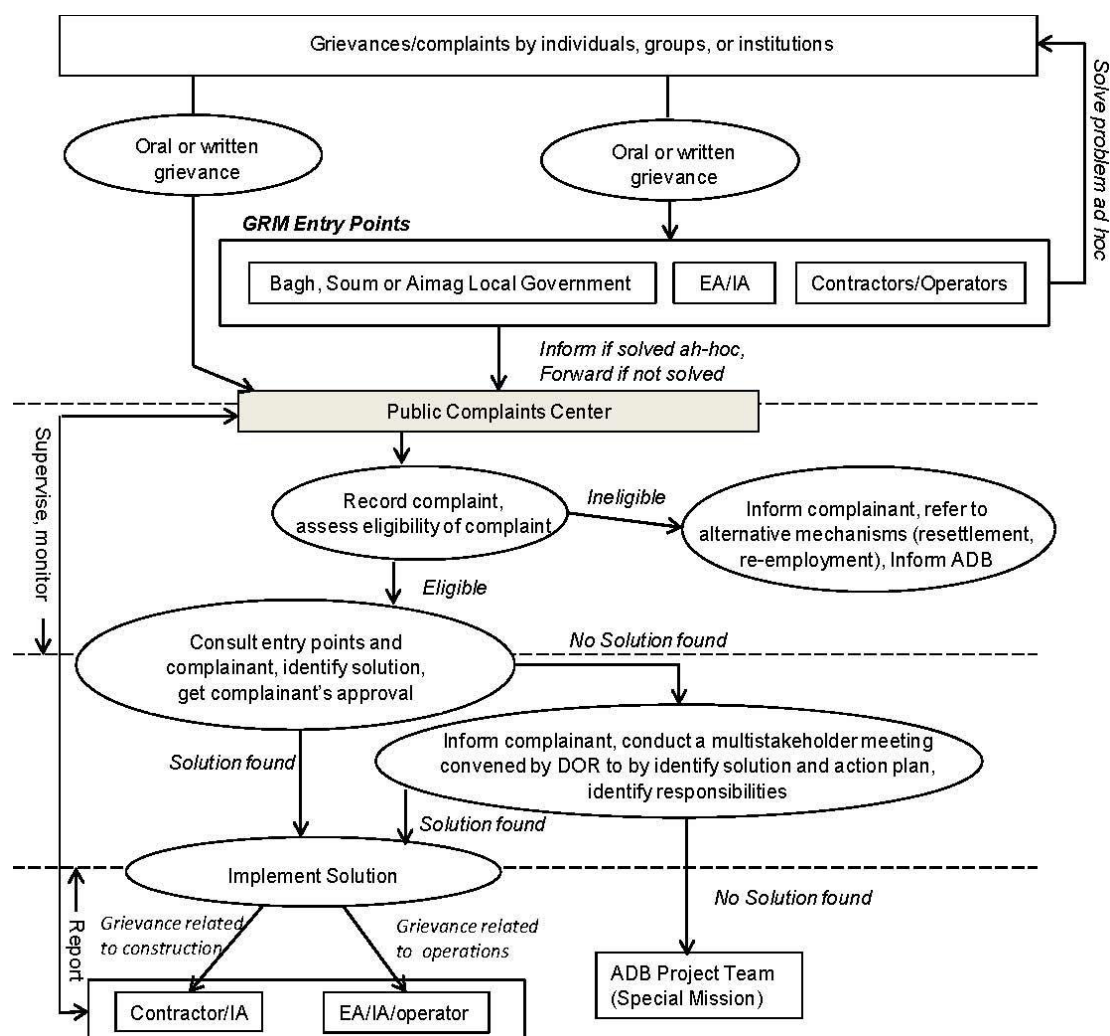
There are 3 main GRM entry points: local administration, EA and the contractors. The contractors' environmental staffs and Chinese-Mongolian translators are designated to take responsibility to receive and record complaints from local residents and pass it to managers and EA. The PIU environmental monitoring consultant has developed a good relationship with each soum and bag governors and organize monthly meetings with them to discuss complaints raised by local residents.

Aslo, the PIU hired community outreach monitoring officers at each lot to implement GRM measures: Ulzii Orshikh at CW1-2, Tsegmid and Kharul Majat at CW1-3 and Khishigtogtoh at CW1-1.

Name of COMO officer	Construction package	Contact phone
Ms. Hishigtogtoh	CW 1-1	88750511
Mr. Ulzii-Orshih	CW 1-2	95502499
Mr. Khairolmajat	Cw 1-3	99165438
Ms. Tsegmid	CW 1-3	99421778

Figure 4. GRM scheme for the Project.

3. MANAGEMENT OF ENVIRONMENTAL IMPACTS



3.1. AIR QUALITY MANAGEMENT

The contractors have employed water spray trucks to reduce dust generation. Each construction package is operating the 2 water spray trucks along the deviation road and construction sites and watering 4-5 times a day. However, dust generation has not been reduced to an expected level due to an extended drought and a dry weather this summer.

Figure 5. Water spray trucks



Figure 6. Earth material transporting vehicles use designated blanket to prevent from dust spread



Following mitigation measures to protect sensitive receptors from air quality issues have been implemented:

- ❖ Construction workers are provided with protection facial masks and goggles.
- ❖ **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.
- ❖ The location of the stockpile is on downwind of sensitive receptors.
- ❖ **Construction site management.** Water is sprayed on construction sites and material handling routes where fugitive dust is generated.
- ❖ **Air quality monitoring** is undertaken at the selected monitoring spots on monthly basis to ensure dust level is within the maximum allowed level.

3.2. NOISE PREVENTION

The potential noise impacts are mitigated through following measures as defined in the EMP:

- ❖ Source control: Maintain all exhaust systems in good working order; undertake regular equipment maintenance;
- ❖ Concrete-mixing and similar activities are located at least 500 m away from sensitive receptors;
- ❖ Noisy activities and operation of heavy machineries and equipments only between 9am-7pm
- ❖ Provide advance warning to the community on timing of noisy activities such as blasting at the quarry site

3.3. WATER RESOURCE MANAGEMENT

Lot CW1-1:

The CW1-1 road crosses Shurga and Hongio rivers and passes adjacent to the river in the Hongio valley. Protection of Hongio valley from potential pollution is important. There will be temporary limited access to pastureland for the herder families. The contractor will construct a new bridge on the crossing point of the Hongio river. At around STA.20, the space between the Hongio river and the mountain foot is very tiny, thus in order to allow a deviation road, the river bank shall be diverted. The contractor is planning to apply local administration for necessary permissions.

Figure 7: The point where Hongio river bank needs to be diverged



The contractor is using Shurga and Hongio river water for both drinking and construction purposes and has obtained a written approval from (Approval on Water Consumption) the Khar Lake and Khovd river basin administration.

In order to prevent from oil spills, the contractor has constructed a deviation road embankment with culverts under it at the Shurga river in July.

Figure 8. Deviation road embankment at the Shurga river



CW1-3:

The road alignment crosses Buraat and Hongor Ulun rivers and passes nearby Holboo lake (STA.101) which is a home to a number of bird species during summer time. The contractor will construct new bridges on both rivers. Protection of the surface water resources from pollution is a

critical task.

The contractor has obtained permission from the Tolbo soum administration on drilling of water wells at 1 spot: nearby the workers camp site (STA.65). The approval was given to well drilling at 3 spots, However only one water well has been drilled and used as water table at the other 2 spots were too deep. Drinking water for the main camp site is supplied from a well where the water table is about 60m. The water well at STA.65 is not affecting the bird area which is neaby STA.101.

The contractor uses surface water from Buraat, Hongor Ulun, Hongio and Hatuu rivers with a obtained written approval from the Tolbo soum administration, and Khar Lake and Khovd river basin administration office on annual basis. The Khar Lake and Khovd River Basin Administration concludes in the water use approval that there is no serious impact of drawing construction use water from the existing rivers.

CW1-3 team has constructed river crossing embankments for deviation roads at 3 points for Buraat and Hongor Ulun rivers, at STA.72+500, STA.75+800 and STA.100+700 respectively. Culverts are installed under the deviation which allows water flow.

Figure 9. Deviation road embankment over the Hongor Ulun river. STA.100+700



Figure 10: Water supply well at the main camp site, lot CW1-3



CW1-2:

The project road crosses 3 streams of the Buyant river in the delta. The deviation road embankments over 3 streams were already built in 2016. Two bridges with length of 150 will be built over the stream No.1 and 2. At the stream No.3, the culverts were installed under the road embankment. Preventing from pollution of Buyant river water is very important because there are about 1800 families are residing down the stream of Buyant river, as per Buyant soum governor. Also, around 30-40 herder households settle down in the delta temporarily in May.

The contractor is planning to use water from Buyant river and water wells for construction purpose and obtained a water use permission from the Khovd soum administration and Khar Lake and Khovd river basin administration bureau. To prevent from river pollution, the contractor has created a borehole on the eastern bank of the river from which the trucks draw water to be consumed for construction purposes. Approval for this borehole was included in the Water Use

Approval issued by Khar Lake and Khovd river basin administration.

In order to prevent oil spillage which could pollute Buyant river, the contractor has constructed a deviation road embankments over 3 streams of the Buyant river. A total of 146 culverts are being installed along the deviation road. It was a well planned mitigation measure that meets EMP requirements.

Figure 11: A deviation road embankment over the Buyant river



3.4. LANDSCAPE AND SOIL RESOURCES

Operation of a paved road will improve the environment as it provides an alternative to currently driving through multiple unimproved earth tracks, which has contributed to land degradation.

CW1-1:

The CW1-1 construction team has obtained permission on 14 borrow pits but only 13 was/is under exploitation. Currently 3 are in use. Ten borrow pits exploited already will be rehabilitated in 2018 before the construction closure.

The quarry site for the CW1-1 section is located nearby the main camp where the contractor produces aggregates for cement and asphalt concrete, graded crushed stone base course material located. All the necessary permissions and approvals were obtained for the quarry site. There is no herder households residing in 5 km radius of the quarry site, thus any noise and vibration impacts

were minimal.

CW1-3:

The construction team has obtained permission to use 22 borrow pits from the Tolbo soum government. At present, 5 out of 22 borrow pits are in use. . The main quarry site locates nearby the main workers' camp at STA.65. Another quarry site planned for the CW1-3 section locates at STA.93.

Figure 12. Borrow point at STA.96



CW1-2:

The contractor has obtained the permission from the local government for 20 borrow sites and exploited 4 borrow pits in May 2017 that are located at STA57+00, STA.87+660, STA.89+500 and STA.9+500. The quarry site is located in 4 km distance from the main camp at STA.81+300. The contractors's construction team has obtained permission on workers' camp sites from the Khovd soum administration. Besides the main camp, which locates at STA.77, there are 2 sub-camps for bridge construction and 2 more sub-camps for embankment construction.

Crusher at the quarry site: In order to increase gravel material production, the contractor hired 2 new crushers. Relevant permission were obtained from the local government and environmental monitoring activities cover the crusher sites.

Figure 13. Newly installed crushers at the quarry site.



Blasting works in July:

The contractor has hired Davkhar Tesrelt LLC to conduct blasting works at the quarry site (STA.81+300) on 3 July 2017. The blasting team consists of 4 professionals has conducted blasting works under supervision by ICT Sain LLC engineers, Khovd province police department, Professional Inspection Agency and Environmental Department. Environmental and safety staffs of the contractor met with the local administration and herdspeople to inform the upcoming blasting works 3 days prior to the blasting action. There are no any herder household is residing in the vicinity of the blasting site (in 10km radius).

Figure 14. Blasting at the quarry site. 2017.07.03



3.5. WASTE MANAGEMENT

Waste management procedure is defined as follows:

- ❖ Domestic and waste construction materials will be disposed to a designated waste collection points at each camp site.
- ❖ Prohibit construction workers throwing waste at or nearby the construction areas
- ❖ Sewage generated by camp sites are collected in septic tank or a designated pits.
- ❖ The contractors have signed "Agreement on waste handling" with the Tolbo, Jargalant and Erdeneburen soum administrations.
- ❖ Construction waste will be delivered to the central dumpsite of the soum center. In accordance with the "Agreement on waste handling", the contractor pays a waste disposal fee of 100,000 MNT per month to the soum administration for using the local dumpsite.

CW1-1:

PIU environmental monitoring specialist has visited workers camp site in July 2017 and instructed to collect ash waste from the main camp in a designated box/container.

Waste water or sewage from the workers' camp is collected at the installed septic tank. Once the septic tank is full, the wastewater will be collected and disposed to the wastewater treatment plant of Khovd city.

Figure 15. Waste collection point at the main camp site, CW1-1.



CW1-3:

The contractors have signed "Agreement on cooperation" with the Tolbo soum administrations.

Figure 16. Waste collection point at main camp, CW1-3



The contractor collects domestic waste generated from the camp site and waste ash in an open pit which could be taken to the surrounding environment with wind during windy days. PIU Environmental specialist has visited the camp site in July and instructed to have protection fence around the waste collection point and make some cleaning works. Also, the contractor was instructed to collect waste ash from the kitchen in a designated box.

The vehicle washing point at the camp site does have a concrete basis but lacks protection stages around it which would prevent waste water to run-off. The contractor is instructed to improve the condition.

Waste water of the main camp site is disposed to designated pit with concrete base. However, it might cause a bacterial pollution to surrounding soil cover, the contractor was instructed to choose one of the following 2 options to properly dispose its waste water:

- ❖ Add designated neutralizers into the waste water cumulated in the pit
- ❖ Or, draw the collected waste water once a week to dispose to the central dumpsite of the Tolbo soum

CW1-2:

The contractor has signed an "Agreement on waste handling" with the Khovd provincial government.

There are 3 main types of waste: municipal waste from workers' camp, solid waste from construction and liquid waste. Handling methods for each type of waste are:

- ❖ Domestic waste will be landfilled in 2 designated pits nearby camp site: one pit for recyclable waste items and another pit for waste food.
- ❖ Solid waste from construction will be removed to the central waste collection area of the provincial center.

Waste water or sewage from the workers' camp is collected in a designated septic tank and will be disposed to the Khovd city Waste Water Treatment Plant once it's full. CW1-2 construction team leader Mr.Zhang Wangguo has met with the WWTP staffs and had reached agreement on the waste water disposal.

3.6. WILDLIFE PROTECTION

Mr.Buuveibaatar, who is employed by the PIU as wildlife movement consultant, has conducted second phase wildlife movement survey in 2016.

Wildlife crossings the recommended for the Tranche-2 section are shown in below table:

Table 3. The proposed wildlife crossing point at the Buraat pass

No.	Wildlife species	Longitude*	Latitude*	Elevation, m
Lot CW1-1				
Crossing 1	Argali sheep, ibex, snow leopard	48.41935	90.93569	1867
Crossing 2	Argali sheep, ibex, snow leopard	48.40641	90.87063	1952
Crossing 3	Argali sheep, ibex, snow leopard	48.40230	90.85270	1977
Lot CW1-3				
Crossing 4	Argali sheep, ibex, snow leopard	48.46631	90.46074	2625

The PIU environmental monitoring consultant and ICT supervising engineer had a joint visit at the proposed wildlife crossing points to check implementation possibility. Depending on the height of the road embankment and landscape condition for wildlife movement, they propose to a slight change in the previously recommended locations for the wildlife crossing. Now, the agreed locations are at STA.6+520, STA.7+956 and STA.13+425 at CW1-1 and 85+040 at CW1-3, which are better for crossing as the road embankment is lower at the proposed spots..

Figure 17. Proposed wildlife crossing at 6+520, CW1-1.



Figure 18. Proposed wildlife crossing at STA.13+425, CW1-1.



Figure 19. Proposed wildlife crossing at STA.7+956, CW1-1.



Figure 20. The proposed wildlife crossing at Buraat pass, STA.85+040, CW1-3.



3.7. HEALTH AND SAFETY

Each construction team employs a permanent safety staff at its main camp site.

Name of safety staff	Construction package	Contact phone
Mr.Bayasgalanbat	CW 1-1	95590306
Mr.Tumenbayar	CW 1-2	99964855
Mr.Jangiirkhan	CW 1-3	99413777

Health and safety staffs carry our 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 equipments 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.
- ❖ Heavy machinery will not be used after day light and all such equipment will be returned to its overnight storage area/position before night.
- ❖ If any risks are found, inform it to field supervisors and recommend appropriate mitigation measures

Figure 21. All construction workers are provided with PPE.



Warning signages were place at deviation roads and active construction sites



Warning signages were placed at the jungles and nearby borrow pits



3.8. PROTECTION OF CULTURAL HERITAGES

CW1-1:

There are 23 ancient tombs existed within 20m distance of the road alignment in the Hongio river valley. Of which, 13 tombs were located under or very close to the road alignment, thus removed by professional organization in October 2016. The other 10 tombs that locate in 50-100m distance from the road alignment have been protected with visibility fencing.

Figure 22. An ancient tomb protected in Hongio river valley



CW1-3:

There are 4 ancient tombs and 1 ancient sculpture have been discovered along the CW1-3 road alignment. An ancient tomb are located at STA.86+400, was removed by Archeological Institute of Mongolia in October 2016.

CW1-2:

There is a definite need to make blasting works nearby the rock paintings at STA.68+950, which is considered as a cultural heritage. The rock painting is located in 6 meter distance from the planned blasting site, thus which could be affected. Thus, the contractor is closely having dialogues with and applied for a permission to Khovd province government for rescue excavation of the rock paintings.

Figure 23. The planned blasting



Figure 24. Nearby rock painting at STA.68+950



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 (m3/mg)
- ❖ Noise emission level (mega Hertz)
- ❖ Water chemical contents: turbidity, mineralization, hardness and contents of other chemicals
- ❖ Water contamination: contents of Pb, Zn, Cd, Cr and Ni.
- ❖ Soil chemical contents: sand, mud and contents of other chemical elements.
- ❖ Soil contamination: contents of Pb, Zn, Cd, Cr and Ni.
- ❖ 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 contracted local laboratories (Laboratory of the Meteorological Institute of Khovd province and Laboratory of Geographic Institute of Mongolia) sent a team of experts to carry out field monitoring works every month. The environmental monitoring team has conducted dust and noise

level measurements using devices Dust Trak and VoltCraft, taken soil and water samples. Test analysis for soil and water samples were conducted at the Laboratory of National Geographic Academy in Ulaanbaatar and at the Laboratory of Khovd province Institute of Meteorology.

Figure 25: Noise dust measurement devices used for monitoring



4.3.MONITORING FREQUENCY AND SCHEDULE

Considering the relatively short construction season in Mongolia due to climate condition, the Contractor has carries out the environmental monitoring activities on monthly basis between May and October, 6 times a year

Table 4: Environmental monitoring schedule

Monitoring parameters	2016		2017		2018
	Frequency	Months of monitoring	Frequency	Months of monitoring	
1. Air quality monitoring	Every month	May - October	Every month in the 1st half of the year, once a quarter in the 2d half of the year	May, June, July and October	Once a year if necessary
2. Water quality monitoring					
Chemical and heavy metals analysis					
3. Work place condition, safety & hygiene					

4. Soil quality monitoring Chemical and heavy metals analysis					
5. Plant monitoring	Once a year	September	Once a year	June	
6. Wildlife monitoring	Once a year	September	Once a year	June	

4.4. MONITORING RESULTS

4.4.1. Soil quality monitoring

Table 5: Heavy metals analysis for soil samples, June, 2017

Spot No.	Name of the monitoring spot	Depth sm	Content of heavy metals (mg/kg)					
			Ni	Cd	Pb	Zn	Cr	Cu
1	Nearby main camp CW1-1	0-30	20.2	0	3.2	36.9	3.84	59.9
2	Hongio valley	0-30	6.65	0	19.5	5.44	0	10.2
3	Nearby the quarry site CW1-1	0-30	23.1	0	10.4	55.2	7.05	47.6
4	Nearby Hongor Ulun river	0-30	6.91	0	27.3	2.09	0	17.4
5	Olon nuuruud valley	0-30	31.8	0	19.5	46.2	9.78	45.7
6	Buraat river valley	0-30	23.8	0	7.9	51.9	10.5	46.7
7	Main camp CW1-3	0-30	40.5	0	14.5	144	11.2	59
8	Nearby quarry CW1-3	0-30	1.16	0	32.2	1.43	0	9.78
9	Nearby waste water treatment plant of Khovd city	0-30	31.8	0	7.9	7.48	10.9	49.4
10	Nearby bridge No.1 at Buyant river	0-30	14.6	0	23.7	21.9	0	14.8
11	Ulaan Bogoch spring	0-30	4.19	0.00	19.1	9.99	0.00	15.6
12	Nearby quarry site CW1-2	0-30	20.5	0	4.3	7.96	8.71	331.8
13	Nearby main camp CW1-2	0-30	12.1	0	19.2	4.54	0	31.9
Mongolian Standard (MNS 5850 : 2008)			150	3	100	300	150	100

In the June monitoring analysis, heavy metals contents in the soil samples were within the standard levels. Based on the laboratory test analysis, it can be concluded that there is no soil contamination.

Table 6: Heavy metals analysis for soil samples, July, 2017

Spot No.	Name of the monitoring spot	Depth sm	Content of heavy metals (mg/kg)					
			Ni	Cd	Pb	Zn	Cr	Cu
1	Nearby main camp CW1-1	0-30	24.7	0	4.1	30.5	1.92	59.3
2	Hongio valley	0-30	9.96	0.1	13.0	5.83	0.8	8.26
3	Olon nuuruud valley	0-30	39.3	0.2	20.7	24.5	8.63	42.1
4	Nearby quarry CW1-3	0-30	1.84	0.1	27.1	2.81	0.91	10.06
5	Nearby bridge No.1 at Buyant river	0-30	24.9	9.6	0.069	15.0	29.7	0
6	Nearby quarry site CW1-2	0-30	37.1	8.5	0.048	21.8	19.3	0
Mongolian Standard (MNS 5850 : 2008)			150	3	100	300	150	100

In the July monitoring analysis, heavy metals contents in the soil samples were within the standard levels. Based on the laboratory test analysis, it can be concluded that there is no soil contamination.

4.4.2. Water quality monitoring

The monitoring team have taken water samples Holboo lake, Buraat river, Hongor Ulun, Hongio and Buyant rivers as well as from kitchens of 3 main camp sites in order to ensure workers' health.

Table 7: Water Chemical analysis, June, 2017. CW1-1 and CW1-3.

Parameters	Hongio river	CW1-1 main camp, kitchen	Buraat river	Hongor Ulun river	Kitchen of main camp	Measuring unit	Drinking Water Standard (MNS 9000:2005)
Turbidity	0	0	0	0	0	mg/l	1.5
Reaction	7.11	7.21	7.37	7.59	7.65	pH	6.5-8.5
EC:	104	181	301	230	197	dS/m	
Hardness:	1.72	1.61	1.96	1.8	1.92	mg/l	7
HCO ₃	80.5	78.1	86.8	86	80.6	mg/l	
Cl ⁻	9.2	8.5	9.9	10.6	12.1	mg/l	350
SO ₄	10.6	12.5	16.8	119.1	83.1	mg/l	500
Ca	29.9	27.4	36.9	31.4	33.9	mg/l	100
Mg	2.8	3.9	1.4	2.8	2.8	mg/l	30
NH ₄	0.12	0.16	0.24	0.22	0.18	mg/l	1.5

NO ₂	0.005	0.004	0.002	0.003	0.008	mg/l	1
NO ₃	0.29	0.27	0.18	0.24	0.22	mg/l	50
F	0.15	0.16	0.07	0.57	0.53	mg/l	0.7-1.5
Fe	0.13	0.07	0.04	0.12	0.17	mg/l	0.3
PO ₄	0.028	0.012	0.008	0.2	0.017	mg/l	0.1

Level of turbidity and content of other chemicals were all within the standard level.

Laboratory test results for the water samples from the camp kitchens show that all of the indicators are within the allowed level of Drinking Water Standard of Mongolia, thus could be used for human drinking.

Table 8: Water Chemical analysis, June 2017. CW1-2.

Parameters	Buyant river, stream No.1	Buyant river, stream No.2	Buyant river, stream No.10	Kitchen of the main camp	Ulaan Bogoch spring	Measuring unit	Drinking Water Standard (MNS 9000:2005)
Turbidity	1.5	1.5	1.5	0	0	mg/l	1.5
Reaction	7.32	7.56	7.71	7.44	7.27	pH	6.5-8.5
EC:	224.0	195.8	292	203	229.0	dS/m	
Hardness:	1.96	1.80	1.76	1.64	1.76	mg/l	7
HCO ₃	91.5	94.6	86.6	81.7	79.9	mg/l	
Cl	12.0	10.6	10.6	9.2	11.3	mg/l	350
SO ₄	17.3	19.7	20.7	11.0	102.8	mg/l	500
Ca	33.7	33.1	29.9	26.6	26.6	mg/l	100
Mg	3.4	1.8	3.3	3.8	5.2	mg/l	30
NH ⁴	0.18	0.21	0.13	0.10	0.45	mg/l	1.5
NO ²	0.003	0.002	0.009	0.001	0.006	mg/l	1
NO ³	0.23	0.28	0.23	0.19	0.15	mg/l	50
F	0.16	0.24	0.21	0.27	0.19	mg/l	0.7-1.5
Fe	0.04	0.07	0.08	0.12	0.04	mg/l	0.30
PO ⁴	0.015	0.01	0.016	0.01	0.011	mg/l	0.1

Level of turbidity and content of other chemicals were all within the standard level.

Laboratory test results for the water samples from the camp kitchens show that all of the indicators are within the allowed level of Drinking Water Standard of Mongolia, thus could be used for human drinking.

Table 9: Water Chemical analysis, July, 2017.CW1-1 and CW1-3.

Parameters	Hongio river	Hongor Ulun river	Buraat river	Hongor Ulun river	Kitchen of main camp	Buyant river,	Kitchen of the main camp	Measuring unit	Drinking Water Standard (MNS 9000:2005)
Turbidity	0	0	0	0	0	0	0	mg/l	1.5
Reaction	7.23	7.41	7.49	7.41	7.47	7.68	7.23	pH	6.5-8.5
EC:	201	210	278	210	173	217	217	dS/m	
Hardness:	1.89	1.79	2.04	1.79	1.76	2.23	2.17	mg/l	7
HCO ₃	90.9	90.1	89.2	90.1	86.3	96.2	87.1	mg/l	
Cl ⁻	9.1	11.6	10.6	11.6	14.3	9.2	10.6	mg/l	350
SO ₄	14.2	108.9	19.3	108.9	71.4	28.9	17.3	mg/l	500
Ca	31.2	30.6	34.5	30.6	32.8	38.1	30.4	mg/l	100
Mg	2.7	2.4	3.2	2.4	3.6	2.4	3.8	mg/l	30
NH ₄	0.28	0.36	0.32	0.36	0.26	0.39	0.48	mg/l	1.5
NO ₂	0.002	0.014	0.008	0.014	0.011	0.005	0.011	mg/l	1
NO ₃	0.22	0.41	0.28	0.41	0.2	0.29	0.36	mg/l	50
F	0.41	0.54	0.15	0.54	0.42	0.31	0.34	mg/l	0.7-1.5
Fe	0.09	0.16	0.07	0.16	0.14	0.03	0.07	mg/l	0.3
PO ₄	0.034	0.028	0.032	0.028	0.028	0.023	0.018	mg/l	0.1

Level of turbidity and content of other chemicals were all within the standard level.

Laboratory test results for the water samples from the camp kitchens show that all of the indicators are within the allowed level of Drinking Water Standard of Mongolia, thus could be used for human drinking.

4.4.3. DUST MEASUREMENT

Dust measurements were made nearby construction camps, borrow pits, active construction sites and deviation roads (access dirt roads) where there are relatively high traffic. The monitoring team specialists have measured dust concentration levels with average value of one hour duration. Average dust concentration level per hour is shown in the below table. The maximum allowed level of dust concentration is 0.1 mg/m³ according Mongolian Standard on Ambient Air Quality.

Measured dust concentration level was higher the standard level at the quarry site of CW1-2 and slightly exceeded the standard level at 2 active construction site in the Hongio river valley in June. The contractors were instructed to intensify watering at those sites and do site cleaning works at the CW1-2 quarry.

Table 10: Measured dust concentration levels, June, 2017.

Monitoring Spot No.	Name of the monitoring spot	Average dust concentration level /per hour/, mg/m ³	Standard level mg/m ³
1	Nearby construction camp CW1-1	0.093	0.1
2	Hongio bridge	0.049	
3	Hongio valley 1	0.479	
4	Hongio valley 2	0.611	
5	Nearby the quarry site CW1-1	0.122	
6	Olon nuur valley	0.236	
7	Buraat valley	0.083	
8	Nearby quarry site	0.126	
9	Nearby main camp CW1-3	0.039	
10	Nearby waste water treatment plant of Khovd	0.118	
11	Nearby bridge No.1 at Buyant river	0.23	
12	Nearby quarry site CW1-2	3.412	
13	Nearby main camp CW1-2	0.176	
14	Nearby Ulaan Bogoch spring	0.036	

Since measured dust levels exceeded the maximum allowed level at the active construction sites following measures are recommended to the contractor to reduce dust level:

- ❖ All trucks transporting earth materials shall be covered with tarpauling
- ❖ Fine particle stockpiles nearby the crusher need to be covered with tarpaulin.
- ❖ Intensify water spray along the deviation roads.

Figure 26. Dust measurement activity in July, CW1-1.



Measured dust concentration level exceeded the standard level all quarry sites and a couple of active construction spots in July. Each construction package is operating 2 water spray vehicles along the deviation road and construction sites on daily basis. However, due to an extended drought season and an unusually dry weather this year, the dry soil absorbs sprayed water in just a few minutes and dries up again quickly. Dust level was reduced with frequent water spraying, but not to an expected level. The contractors are planning to intensify watering along the deviation road and the borrow points. The workers are provided with protection masks and goggles. Herder households does not reside in close distance to active construction sites. Thus, there is no significant dust impacts to workers nor nearby communities.

Table 11: Measured dust concentration levels, July 2017.

Monitoring Spot No.	Name of the monitoring spot	Average dust concentration level /per hour/, mg/m3	Standard level mg/m3
1	Hongio valley	0.937	0.1
2	Nearby the quarry site CW1-1	1.235	

3	Olon nuur valley	0.802	
4	Buraat valley	0.095	
5	Nearby quarry site CW1-3	0.078	
6	Nearby waste water treatment plant of Khovd city	0.263	
7	Nearby bridge No.2 at Buyant river	0.087	
8	Nearby quarry site CW1-2	2.75	

4.4.4. NOISE MEASUREMENT

The monitoring spots chosen for noise measurement are same as the monitoring spots for dust measurement. Maximum allowed level of noise during day time is 90 decibels according to both ADB EIA for Tranche-2 and the Mongolian Standard on Noise. At all monitoring spots, the noise levels were within the allowed level.

Table 12: Measured noise levels, CW1-1

Monitoring Spot No.	Name of the monitoring spot	Measured noise level /dB/		Standard level dB (at construction site)
		June 2017	July 2017	
1	Nearby Shurga river bridge	18.2	26.7	90
2	Ontsiin Khutul	17.8	11.2	
3	Shar nuur	21	14.5	
4	Nearby construction camp	42.6	29.8	
5	Hongio bridge	33.1	68.6	
6	Hongio valley 1	72.5	76.1	
7	Hongio valley 2	71.7	78	
8	Hongio valley 3	46.4	74.9	
9	Bayan Enger	49.8	38	
10	Khashaat pass	29.6	63.5	

Table 13: Measured noise levels, CW1-3

Monitoring Spot No.	Name of the monitoring spot	Measured noise level /dB/		Standard level dB (at construction site)
		June	July	
1	Khashaat pass	52.1	48.3	90
2	Hongor Ulun river	77.3	55	
3	Holboo lake	41	12.5	
4	Nearby sub-camp	50.7	21.7	
5	Shar bulag	79.4	82.5	
6	Planned quarry site STA.96	71.3	78.1	
7	Buraat pass	39.6	26.2	
8	Buraat valley 1	33.5	69.9	
9	Buraat valley 2	33.3	67.5	
10	Nearby main camp and quarry site	84.5	88.2	

Table 14: Measured noise levels, CW1-2

Monitoring Spot No.	Name of the monitoring spot	Measured noise level /dB/		Standard level dB(at construction site)
		June	July	
1	Nearby waste water treatment plant	63.4	79.5	90
2	Nearby bridge No.1 at Buyant river	79.8	78.2	
3	Nearby bridge No.2 at Buyant river	85.6	67	
4	River crossing point at stream No.10	57.2	45.6	
5	Ulaan Bogoch spring	80.9	61.3	
6	Nearby quarry site	89.7	90	
7	Nearby main camp	34.5	29.9	
8	Nearby a herder's cattle yard	26.3	27	
9	Nearby a herder's spring shelter	36.9	33.2	
10	Nearby Shurga river bridge	22.3	13.8	

5. COMMUNITY CONSULTATION AND GRM RECORDS

Lot CW1-2:

PIU Community outreach monitoring officer Ms.Khishigtogtokh starts her work from May, 2017. She organizes monthly meetings with local soum administration and local residents and visit herder households for interview about the project and collect their opinion on the construction works.

COMO Ms.Khishigtogtokh visited 15 households in Nariin Gol bag of Buyant soum during on May 30 and 20 households in Norjinkhairkhan bag of Buyant soum during July 18-19. During the meetings with local households, she provided information on road construction progress, contractors and their staffs, number of equipment mobilized and environmental management actions.

Figure 27. COMO Khishigtogtokh visits a herder household in Buyant soum.



Ms.Khishigtogtokh organized a group discussion with local residents in Buyant soum center on June 06, 2017. 35 local residents attended the meeting. They were provided with information on road construction progress, contractors and their staffs, number of equipment mobilized and environmental management actions.

All people met with the COMO officer expressed positive opinion toward the project. There were no any negative opinions and complaints.

Figure 28. Group discussion meeting at Buyant soum.



Lot CW1-1:

PIU Community outreach monitoring officer Mr.Ulzii-Orshikh starts his work from May, 2017. He organizes monthly meetings with local soum administration and local residents and visit herder households for interview about the project and collect their opinion on the construction works.

He visited 12 local households of Shurga bag in May and 12 households of Hongio bag July respectively to present information on road construction progress, contractors and their staffs,

number of equipment mobilized and environmental management actions. Also, he visited local festival in Erdeneburen soum on June 04, 2017.

During the meetings, local residents expressed their pleasure toward the road development project and think the sealed road will help to enhance their livelihood.

There was one complaint recorded during the reporting period in Erdeneburen soum. The only concerns among the local people was that the timing of rehabilitation works. The contractor staffs provided construction progress information to them and pledged all borrow pits will be rehabilitated once exploitation is complete at the borrow points.

Figure 29. COMO Ulzii-Orshikh visits a local herder household for interview.



CW1-3:

PIU Community outreach monitoring officers at CW1-3 Mr.Khairolmajat and Ms.Tsegmid starts their work from May, 2017. They organize monthly meetings with local soum administration and

local residents and visit herder households for interview about the project and collect their opinion on the construction works.

He visited 43 local households of Tolbo soum during May, June and July and met with local soum and bag governors to collect their opinion and present information on road construction progress, contractors and their staffs, number of equipment mobilized and environmental management actions.

Figure 30. COMO Khairolmajat visits a local herder household for interview.



Local kazakh people of Tolbo soum are supportive of the road development project. They think the local economy, business and trade turnover will boost thanks to the sealed road. There were no complaints recorded during the reporting period.

6.CONCLUSION

The contractors started implementation of the updated EMP requirements from May when the construction activities started. On-site environmental staffs and construction engineers were trained on the EMP implementation. Each construction package employed on-site environmental

and safety staffs and hire local professionals laboratories to carry out field monitoring activities (sampling, measurements and lab test).

The construction works were commenced in May for the lot CW1-2 and in June for the lots CW1-1 and CW1-3. In general, the environmental protection measures specified in the EMP were implemented properly, except for the need of improvement at workers' camps. Most of the environmental management activities yielded good results. The key environmental issue during the first half of the 2017 construction season was that dust level has not been reduced to the standard level, despite efforts by the contractors and an enormous amount of water sprayed along the deviation roads and construction sites.

Overall, the Project has demonstrated a satisfactory level of environmental due diligence in the first half of 2017.

Important points for the next construction season:

For all contractors

- ❖ The contractor will continue its monthly monitoring activities to ensure the impacts are within control.

Lot CW1-1:

- ❖ Apply to Khar lake and Khovd river basin administration for permission on Hongio river diversion at STA.20.
- ❖ Create livestock crossings at the points that are recommended by Erdeneburen soum governor.
- ❖ Create wildlife crossings at 3 points in the Hongio river valley in accordance with the Mongolian standard MNS6515: 2015.

Lot CW1-3:

- ❖ Waste water facility at the main camp shall be renewed with a septic tank made of steel. In order to prevent from bacterial pollution to surrounding soil, the Contractor shall use designated neutralizer to put into the septic tank before disposing it.
- ❖ Create wildlife crossing at Buraat pass in accordance with the Mongolian standard MNS6515:2015.
- ❖ Identify location of livestock crossings through consultation with Tolbo soum administration.

Lot CW1-2:

1. Organize consultation with Jargalant, Khovd and Buyant soum administrations to identify locations of livestock crossings along the road.
2. Hire professional archeologists to have rescue excavation of the rock paintings at STA.68+950.

APPENDIX A.

Table 15: Compliance Report on Environmental Protection Measures

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

No	Place	Concern issue	Recommended measures	Implementation status
		Drainage at the camp	Provision of storm water drainage to nearby drain/stream outside the camp area.	Implemented
			Avoid stagnation of water inside the camp.	Implemented
		Solid waste	Placement of waste collection bins (one for two rooms), and Immediate modernization of waste disposal dig with cover and proper handling at the camp.	Implemented
		First aid facilities,	Physician 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 materials will lead to erosion of the hill and will deposit the	<ul style="list-style-type: none"> Maintain necessary slope to the hill cutting area and staged disposal of spoil earth from hill cutting with adequate compaction and erosion protection measures to prevent all kinds of soil movement on the constructed road, 	Implemented

No	Place	Concern issue	Recommended measures	Implementation status
		eroded soil on the road site.	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	Fire fighting equipment should be placed at the camp and office	Immediate placement of fire fighting 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.	Tree plantation at the road, camp and at the offices.	For the better environment it is required to plant tree along the road side, camp, offices etc.	Tree plantation along the road, at the camp and at the offices should be implemented immediately	N/a
9.	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
10.	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- 	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

No	Place	Concern issue	Recommended measures	Implementation status
		borne diseases to workers.		
11.	Traffic Signal	Without traffic signal accident may be happened	Signal Man should be provided at the construction site.	Implemented
12.	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 everyday.	Implemented
13.	Environmental officer	In absence of environmental officer contractors activities will may not going on as environment friendly.	Immediate placement of environmental officer.	Implemented