

Environmental Monitoring Report

Semi-Annual

Project number: 44458–013

Loan/Grant Number: 3025, 3026

March 2019

Period covered: July–December 2018

UZB: Amu Bukhara Irrigation System Rehabilitation Project

Prepared by Saban Cimen, JV Temelsu International Engineering Services Inc. Sheladia Associates Inc. for the Republic of Uzbekistan and the Asian Development Bank.

This semi-annual 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 judgments as to the legal or other status of any territory or area.

Semi-annual Environmental Monitoring Report

Project Number: 44458-013

Reporting period: July 2018 – December 2018

Uzbekistan: Amu Bukhara Irrigation System Rehabilitation Project

(Financed by the ADB Loan 3025-UZB/ 3025-UZB)

Prepared by: Saban Cimen, JV Temelsu International Engineering Services Inc. Sheladia Associates Inc Tashkent, Uzbekistan

For the: Ministry of Water Resources of Uzbekistan Republic Project Implementation Unit

Endorsed by: O. Mete Cilek

March, 2019

Table of Contents

| | | |
|----------|---|------------------------------|
| 1 | INTRODUCTION | 1 |
| 1.1 | Preamble..... | 1 |
| 1.2 | Headline Information | 1 |
| 2 | PROJECT DESCRIPTION AND CURRENT ACTIVITIES | 2 |
| 2.1 | Project Description | 2 |
| 2.2 | Project Contracts and Management | 2 |
| 2.3 | Project Activities During Current Reporting Period | 5 |
| 2.4 | Project Activities During Current Reporting Period | Error! Bookmark not defined. |
| 2.5 | Description of Any Changes to Agreed Construction methods..... | 7 |
| 3 | ENVIRONMENTAL SAFEGUARD ACTIVITIES..... | 8 |
| 3.1 | General Description of Environmental Safeguard Activities | 8 |
| 3.2 | Site Audits | 8 |
| 3.3 | Issues Tracking (Based on Non-Conformance Notices) | 11 |
| 3.4 | Trends..... | 15 |
| 3.5 | Unanticipated Environmental Impacts or Risks | 15 |
| 4 | RESULTS OF ENVIRONMENTAL MONITORING | 16 |
| 4.1 | Overview of Monitoring Conducted during Current Period..... | 16 |
| 4.1.1 | Air Emissions and Ambient Air Quality | 16 |
| 4.1.2 | Wastewater and Ambient Water Quality | 17 |
| 4.1.3 | Noise..... | 18 |
| 4.2 | Trends..... | 19 |
| 4.3 | Summary of Monitoring Outcomes | 19 |
| 4.4 | Material Resources Utilisation | 19 |
| 4.4.1 | Current Period | 19 |
| 4.4.2 | Cumulative Resource Utilisation | 19 |
| 4.5 | Waste Management | 19 |
| 4.5.1 | Current Period | 20 |
| 4.5.2 | Cumulative Waste Generation | 21 |
| 4.6 | Health and Safety | 22 |
| 4.6.1 | Community Health and Safety | 22 |
| 4.6.2 | Worker Health and Safety | 22 |
| 4.7 | Training..... | 22 |

| | | |
|------------|--|-----------|
| 5 | FUNCTIONING OF THE SEMP | 23 |
| 5.1 | SEMP Review | 23 |
| 6 | GOOD PRACTICE AND OPPORTUNITY FOR IMPROVEMENT | 24 |
| 6.1 | Good Practice | 24 |
| 6.2 | Opportunities for Improvement | 25 |
| 7 | SUMMARY AND RECOMMENDATIONS | 26 |
| 7.1 | Summary | 26 |
| 7.2 | Recommendations | 27 |

Annexes:

Annex I Performance Evaluation of Environmental Monitoring of ABISRP

Annex II- Photos

Annex III Environmental Monitoring Reports of The Contractors

Annex IV Acoustic Report

ABBREVIATIONS

| | |
|-----------------|--|
| ABIS | Amu Bukhara Irrigation System |
| ADB | Asian Development Bank |
| BISA | Basin Irrigation System Administration |
| EEC | Environmental Expert of Consultant |
| EIA | Environmental Impact Assessment |
| EHS | Environment, Health and Safety |
| EMP/ SSEMP | Environmental Management Plan/ Site-Specific Environmental |
| Management Plan | |
| EMMP | Environmental Management and Monitoring Plan |
| EMR | Environmental Monitoring Report |
| GoU | Government of Uzbekistan |
| HGME | Hydrogeological Meliorative Expedition |
| IA | Implementing Agency |
| IEE | Initial Environmental Examination |
| ISA | Irrigation System Administration |
| MAWR | Ministry of Agriculture and Water Resources |
| M&ES | Monitoring and Evaluation Specialist |
| NPC | Nature Protection Committee |
| PIU | Project Implementation Unit |
| SE | Site Engineer |
| SC | Supervision Consultant |
| SO | Safeguards Office |
| WCA | Water Consumers' Association |

1 INTRODUCTION

1.1 Preamble

1. This report represents the Semi - Annual Environmental Monitoring Review (SAEMR) for AMU BUKHARA IRRIGATION SYSTEM REHABILITATION PROJECT.
2. This report is the 7th EMR for the project.

1.2 Headline Information

3. In order to realize a sustainable and reliable water supply in ABIS, the Project is expected to achieve the following outputs:
 - a) Construction of one new pump station, and modernization and rehabilitation of four existing ones;
 - b) Increase in the conveyance efficiency of the main canal of ABIS;
 - c) Increase in the capacity of Basin Irrigation System Administration (BISA), Irrigation System Administrations (ISAs), water consumers' associations (WCAs), and farmers to adapt to climate change; and
 - d) Efficient management of project and ABIS
4. The Ministry of Agriculture and Water Resources (MAWR) has agreed to implement the Environmental Management Plan (EMP) and submit regular reports on its implementation. The Initial Environmental Examination Report (IEE) report, including the EMP, has been published on the Asian Development Bank (ADB) website. During project implementation, ADB and Japan International Cooperation Agency (JICA) will each be responsible for safeguard compliance in their respective project activities

2 PROJECT DESCRIPTION AND CURRENT ACTIVITIES

2.1 Project Description

5. The Amu Bukhara Irrigation System (ABIS) Rehabilitation Project is located in the central part of Uzbekistan on the right bank of Amu Darya River bordering to Turkmenistan. Bukhara is 563 km far from the capital Tashkent. The project covers lands of Bukhara and Navoi provinces. The ABIS is very important for the area and gives life as an oasis.
6. The ABIS supplies water to already irrigated lands, cities, settlements, and industries in Bukhara and Navoi provinces through a series of large cascading pump stations and thousands of kilometres of conveyance canals. It also drains the excess water through drainage system outside of the project area.
7. The ABIS, with a command area of 315,000 ha, serves the irrigated lands of the Bukhara Zarafshan and Karakul oases and the Karaul Bazar massif. The population in the ABIS command area is about 1,788,000 people, including 1,550,000 in Bukhara and 239,000 in two districts of Navoi, of which 68% live in rural areas and fully rely on irrigated agriculture. It is very important to supply reliable water to these people in the region. ABIS also supplies water for municipal and industrial purposes.
8. The aim of the Project is to improve the irrigated agriculture and water resources management in the ABIS, with the goal of promoting sustainable economic and social welfare of communities dependent upon ABIS. The Project objectives are
 - a) modernization and rehabilitation of obsolete pump stations;
 - b) increase of conveyance efficiency in ABIS main canal;
 - c) increase climate change adaptation capacity; and
 - d) increase efficiency of project management and irrigation system management.

2.2 Project Contracts and Management

9. A list or table of main organizations involved in the project and relating to Environmental Safeguards is Table 1 given below. It includes lender, borrower, PIU, Main Contractor/s and significant sub-contractors, environmental staff of various organizations with their names and contact details.

Table 2-1 Environmental Safeguards of ABISRP

| | |
|--|--|
| Lender | |
| Organization: | Asian Development Bank |
| Environmental Stuff: | Feruza Insavaliyeva |
| Email: | finsavaliyeva@adb.org |
| Tel: | - |
| Borrower/PIU | |
| | Ministry of Water Resources of Uzbekistan Republic |
| Organization: | Project Implementation Unit |
| Environmental Stuff: | Shakhlo Naimova |
| Email: | abisr@mail.ru |
| Tel: | +998903181037 |
| Supervision Consultant | |
| Organization: | JV Temelsu International Engineering Services Inc. Sheladia Associates Inc |
| Environment Specialist (International): | Saban Cimen |
| Email: | saban.cimen@temelsu.com.tr |
| Tel: | +998909663615 |
| Environment Specialist (local): | Jakhongir Gadayev |
| Email: | jakhongir.gadaev@yahoo.com |
| Tel: | +998901745142 |
| Contractors | |
| Modernization and Rehabilitation of Amu Bukhara Main Canal Regulating Structure (ABISRP 02) | |
| Consortium LLC "Kogon Suv Qurilish" and JSC "Amubukhorokanalkurilish" | |
| Environmental Stuff: | - |
| Email: | - |
| Tel: | - |
| Modernization and Rehabilitation of Kuyu Mazar and Kizil Tapa Pump Stations (ABISRP 03) | |
| Modernization & Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.01) | |
| Hebei Construction Group Co., Ltd, Hebei Province, China | |
| Environmental Stuff: | Zhang Wenjin / Miao Guowang |
| Email: | 383087759@qq.com / 66326632@qq.com |
| Tel: | +998972812666 |
| Modernization & Rehabilitation of Kizil Tapa Pump Station (ABISRP 03.02) | |
| Hebei Construction Group Co., Ltd, Hebei Province, China | |
| Environmental Stuff: | Hao Zhe / Miao Guowang |
| Email: | 369048009@qq.com / 66326632@qq.com |
| Tel: | +998936575393 |
| Rehabilitation of inter-farm and on-farm pilot irrigation network (ABISRP 04) | |
| Kogon Suv Qurilish LLC | |
| Environmental Stuff: | Izomov Amin Ashurovic |
| Email: | - |
| Tel: | - |

10. The following organizations and/or staff will be responsible for environmental monitoring:
 - Basin Irrigation System Authority of Regions
 - Contractor of any Subcomponent
 - Civil Engineer of Consultant
 - Climate Change Mitigation Specialist
 - Environmental Expert of Consultant
 - Electrical Engineer of Consultant
 - Ministry of Health
 - Project Manager of Consultant
 - Project Implementation Unit
 - Water Consumer Associations

11. The key staff for the environmental management and monitoring activities Mrs. Shakhlo Naimova is the PIU's Monitoring and Evaluation Specialist (M&ES). Mrs. Naimova has all responsibilities and tasks related to environment, land, social (including involuntary resettlement and indigenous people), and poverty and gender aspects in accordance with the environment and social safeguard documents and Summary Poverty Reduction and Social Strategy, all of which are project linked documents. Specifically, PIU Monitoring and Evaluation Specialist:
 - takes responsibility for monitoring and evaluating performance targets and indicators with baselines indicated in the Design and Monitoring Framework of the project document for all dimensions with support from the implementation consultant;
 - provides necessary guidance to the Poverty, Social and Gender Officer in the PIU of Bukhara to collect relevant information on poverty, gender, and social aspects in relation to the Design and Monitoring Framework of the project document and Summary Poverty Reduction and Social Strategy;

12. Additionally, in relation to the environmental aspects, with the support from the international consultant the environmental specialist will:
 - ensure that Environmental Management Plan (EMP) is updated during detailed design completed,
 - ensure that bidding documents include all requirement to implement IEE and its EMP;

- ensure that the bidder selected will have adequate resources to implement and update EMP;
 - undertake safeguards monitoring activities and prepare safeguard reports to be submitted to ADB;
 - ensure that all construction works will be taken place in the permanent land possession of ABISA;
 - if additional land required for construction works, ensure that land acquisition and resettlement plan is prepared in accordance to ADB SPS 2009 as well as the Government law and regulation related with land acquisition; and
 - Ensure that other project-related tasks are complied with ADB SPS 2009 and Government requirement.
 - To review and approve Site-Specific and Topic Specific Management Plans prepared by Construction Contractor.
13. PIU as responsible IA for the project recruited a Supervision Consultant (SC) – consortium: «Temelsu International Engineering Services Inc» and «Sheladia Associates Inc». The International environmental expert (Saban Cimen) and national environmental specialist of Supervision Consultant (EEC) – Jakhongir Gadaev assist M&ES of PIU in the supervision of the construction activities under the Project.
14. The part of the work of the Environmental Experts of the Consultant is to develop a capacity building training program for Contractor's Environmental Officers in order to increase the implementation efficiency of environmental monitoring. The timing of this program will be just before the commencement of civil works. Environmental Experts of the Consultant will develop the content of training.

2.3 Project Activities During Current Reporting Period

15. The activities about the Amu Bukhara 1 New Pump Station (ABISR/ICB/01) during the reporting period was announcement of the bid on 10th of September 2018, arrangement of the pre-bid meeting on 3rd and 4th of October 2018. The bids were submitted on 25th of October 2018. The tender evaluation phase of the project has not been completed yet.
16. During the reporting period, the construction activities were implemented for the Contracts ABISRP-02 the intended completion date of contract is 12/04/2019.

17. Contracts for Kuyu Mazar Pump Station (ABISRP 03.1) and Kizil Tepa Pump Station (ABISRP 03.2) were signed and became effective by September 2017; the contractor of both contracts is the same company named Hebei Construction Group Co.Ltd. The contractor has mobilized to both sites design, site establishment and rehabilitation and construction works goes on.
18. The main project activities carried out in the reporting period include the following:

Table 2-2 Construction Activities Carried out During Reporting Period (January 2018-June 2018)

| Site | Construction Activity | Number of Workers | |
|--|---|-------------------|---------|
| | | Maximum | Minimum |
| <u>Modernization and Rehabilitation of Amu Bukhara Main Canal Regulating Structure (ABISRP 02)</u> | | | |
| Agitma Regulator (Tashrabad) | Construction of Temporary By-pass Canal | 15 | 2 |
| | Construction of Regulating Structure | | |
| Dvoynik Regulator (Alat) | ABMK 1 Regulating Structure | 15 | 2 |
| Rostguy | Shafirkan Regulating Structure | 25 | 2 |
| | Kalkanrut Regulating Structure | | |
| | Rostguy Regulating Structure | | |
| | Abumuslim Regulating Structure | | |
| Djilvan Regulator (Djilvan) | Construction of Regulating Structure | 60 | 2 |
| <u>Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1)</u> | | 10 | 5 |
| <u>Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2)</u> | | 12 | 5 |

19. Photos of construction works is given in Annex II.
20. A map of construction sites during the report period are given at the Figure 2-1.

21. The construction work Dvoynik Regulator area, Kuyu Mazar and Kizil Tepa Pump stations have been started during previous reporting period and has not been fully completed yet.

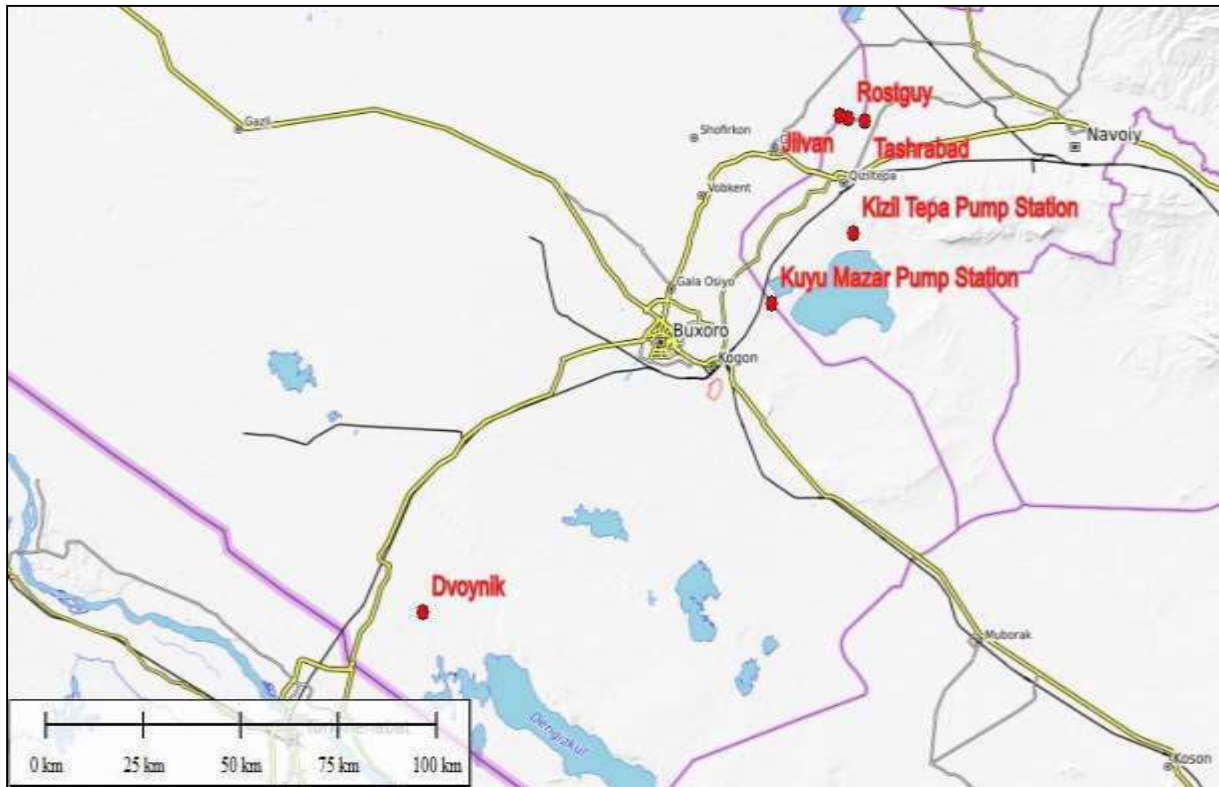


Figure 2-1 Map of Construction Sites Where Construction Activities Carried out During Reporting Period (July 2018-December 2018)

22. The Contract ABISRP 04, with “Kogon Suv Qurilish” LLC was signed on 30th of June 2016. The Works had been substantially completed as of 22nd of October 2017. The as-built drawings were completed by the Contractor and the payment certificate on completion was issued.
23. No changes happened during the reporting period of the project design from that which was assessed in the Impact Assessment phase of the project and is set out in the Initial Environmental Examination/Environmental Impact Assessment.

2.4 Description of Any Changes to Agreed Construction methods

24. No changes to any construction processes have been observed during the construction period

3 ENVIRONMENTAL SAFEGUARD ACTIVITIES

3.1 General Description of Environmental Safeguard Activities

25. The activities carried out by each of contractor's environmental manager during the reporting period have been summarized at the following table.

Table 3-1 Environmental Safeguard Activities Carried out During Reporting Period (June 2018-December 2018)

| Environmental Safeguard Activities |
|--|
| The International environmental expert (Saban Cimen) and national environmental specialist of Supervision Consultant (EEC) – Jakhongir Gadaev - Training of Supervision Staff about implementation of Environmental Responsibilities of Contractors (July – December 2018) |
| Modernization and Rehabilitation of Amu Bukhara Main Canal Regulating Structure (ABISRP 02) (Responsible Environmental Manager: Not designated) - Preparation of environmental monitoring reports (July, August, September) |
| Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) (Responsible Environmental Manager: Hao Zhe / Miao Guowang) - Preparation of environmental monitoring reports (July 2018) - Training of Working Staff on Environmental Issues |
| Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) (Responsible Environmental Manager: Zhang Wenjin / Miao Guowang) - Preparation of environmental monitoring reports (July 2018) - Training of Working Staff on Environmental Issues |

3.2 Site Audits

26. Regular site monitoring visits were carried out during the reporting period by PIU, and Environmental Specialist to check up realization of environmental protection measures parallel to civil works inspection as indicated below:

Table 3-2: Environmental Audits Carried out During Reporting Period (July 2018-December 2018)

| Date | Conducted by | Purpose | Findings | Corrective Actions |
|---------------------|--|--------------------------------|--|-----------------------|
| 12.07.2018 | Saban Cimen (SC) | Environmental Audit | Site environmental and health and safety conditions of the Contractor ABISRP 03.01 and 02 sites under development GRM log books have been created in both sites. | See paragraph 38 |
| 16.07.2018 | Saban Cimen (SC) | Environmental Audit | The contractor has discharged the Environmental Manager, the Environmental Responsibilities poorly implemented. | See paragraph 38 |
| 17.12.2018 | Saban Cimen (SC) | Environmental Audit | Site environmental and health and safety conditions of the Contractor ABISRP 03.01 & 02 sites are not good in condition need to be further developed for both sites. Information about the shifting of environmental manager has not been submitted yet. | See paragraph 39 |
| Routine site visits | Supervision Consultant Site Engineers (SC) | General, Environmental and OHS | Site environment, health and safety at the site of the contractor ABISRP 02 is unsatisfactory due to the financial problems and qualification of the employee's necessary of development. Thus, in this situation, the contractor cannot be expected to take action on these issues. | See paragraph 38 & 39 |

27. It has been requested from the contractors to send monthly environmental monitoring activities, which could be integrated into the monthly progress report.

During the reporting period the environmental monitoring reports (EMR) which have been received from the contractors have been indicated in the Table 3-1 and presented in Annex III.

28. Modernization and Rehabilitation of Amu Bukhara Main Canal Regulating Structure (ABISRP 02) Contractor issues EMR each month however October, November and December 2018 reports have not submitted yet. The environmental report format and content need to be further developed by the Contractor. The reporting period should be followed monthly as indicated in SEMP. The Contractor has been provided with a template of EMR.
29. Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) contractor has not issued the EMR for August, September, October, November and December. The EMR should be presented on time. The Contractor has been provided with a template of EMR.
30. Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) contractor has not issued the EMR for August, September, October, November and December. The EMR should be presented on time.
31. Zhang Wenjin who is the Environmental Manager of Kuyu Mazar Pump Station (ABISRP 03.1) contractor has been replaced by Miao Guowang. About this shift the PIU/SC has not been informed yet.
32. Hao Zhe who is the Environmental Manager of Kizil Tepa Pump Station (ABISRP 03.2) contractor has been replaced by Miao Guowang. About this shift the PIU/SC has not been informed yet
33. Environmental progress of the Modernization and Rehabilitation of Amu Bukhara Main Canal Regulating Structure (ABISRP 02) Contractor considered to be minor. Environmental protection measures applied by the contractor however has not been documented well. See performance evaluation form at the Annex I.
34. Environmental progress of the Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) contractor is moderate. The environmental record keeping system has been formed. Health and safety conditions, social leisure areas have been formed for the workers. Environmental and health and safety labelling partly done which needs observation. Dust formation is observed at unpaved roads. Oil spill has not been cleaned at site. See performance evaluation form at the Annex I.

35. Environmental progress of the Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) contractor is under progress. The environmental record keeping system has been formed. Health and safety conditions, social leisure areas have been formed for the workers. Environmental and health and safety labelling partly done which needs observation. Hazardous waste material observed at site. See performance evaluation form at the Annex I.
36. The dredged material excavated at the forebay area of the Kuyu Mazar Pump station has been disposed to a site. A permission from the local government offices should be obtained by the Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) contractor for disposal of the dredged material
37. The dredged material excavated at the forebay area of the Kizil Tepa Pump station has been disposed to a site. A permission from the local government offices should be obtained by the Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) contractor for disposal of the dredged material

3.3 Issues Tracking (Based on Non-Conformance Notices)

38. The observed Non-Conformance issues revealed related to the construction activities of Amu Bukhara Main Canal Regulating Structure (ABISRP 02) during the previous reporting period (January 1st, 2018- June 30st, 2018) remain open during the current reporting period as of Jul-Dec 2018 (**Table 3-3**). The main reason of that the contractor under the ABISRP 02 contract is not able to perform their contractual works, caused by financial problems and the employee qualifications. Therefore, there was no consistent progress in the past 8 months to fulfill environmental responsibilities and to make the necessary corrections. During the same period Non-Conformance issues of Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) and Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) have been closed and reported in previous EMR. The following **Table 3-4** gives the present situation on the tracked non-conformance notices, which are open.

Table 3-3: Non-conformance issues observed during July December 2018 period (ABISRP 02)

| Non-Conformances | Corrective measures | Implementation deadline |
|--|--|-------------------------|
| ABISRP – 02 | | |
| Semi-annual EMR, R.05, P.36 - The toilet facilities for Contract ABISRP 02 in the site camping area are poor in conditions and hasn't been stored in hygienic conditions or disposed after treatment or transferred to a | The Contractor of ABISRP 02 has been informed to comply with the national legislation and contract requirements. | 31 March 2018 (Open) |

Amu Bukhara Irrigation System Rehabilitation Project
Environmental Monitoring Report (July 2018 – December 2018)

| Non-Conformances | Corrective measures | Implementation deadline |
|---|--|----------------------------|
| ABISRP – 02 | | |
| treatment facility. The domestic sewage effluent hasn't been observed in the construction site. | | |
| Semi-annual EMR, R.05, P. 40 - The old tires and consumed accumulators directly transferred for final disposal without any record. | The contractor has been informed provide the necessary data. | 01 March 2018 (Open) |
| Semi-annual EMR, R.05, P.41 - Contractors pay no attention to the storage of oil in nearby water courses which needs corrective actions to be taken by the Contractors. No sign or signboards exist for fuel storage areas. | The Contractor of ABISRP 02 has been informed to comply with the national legislation and contract requirements. | 01 March 2018 (Open) |
| Semi-annual EMR, R.05, P. 42 - The solid waste has not been separated in the working site. All kind of solid waste has been stored and transferred to the Municipal Solid Waste Disposal areas by means of municipal solid waste collection vehicles within the service area of Municipality or in any other case by means of Contractors tractors. | The contractor has been informed to sort solid waste separately. | 12 February 2018 (Open) |
| Semi-annual EMR, R.05, P.50 - Surfaces and facilities in site camps of the Contractors are not clean and kept in hygienic conditions. Facilities are not safe adequately and don't provide protection against climatological conditions, don't have acceptable light conditions. | The Contractor of ABISRP 02 has been informed to comply with contract requirements. | 12 February 2018 (Open) |
| Semi-annual EMR, R.05, P. 51 - Site camps of the Contractors don't have any fire-fighting equipment or fire extinguisher. | The Contractor of ABISRP 02 has been informed to comply with contract requirements. | 12 February 2018 (Open) |
| Semi-annual EMR R.06, P. 26 – EMR has not been submitted regularly. | The Contractor of ABISRP 02 has been informed to comply with contract requirements. | 10 July 2018 (Open) |
| Third revised version of SEMP for Amu Bukhara Main Canal Regulating Structure (ABISRP 02) was submitted by the Contractor on 24 January 2017. However, Contractor does not follow properly the requirements set up under the SEMP. Therefore, close follow-up Contractor's construction activities is advised. | The Contractor of ABISRP 02 has been informed to comply with SEMP requirements. | 10 July 2018 (Open) |

39. During the reporting period (July 1st, 2018 – December 31st, 2018) the observed Non-Conformance issues have been recorded given in below **Table 3-4** related to the construction activities of Modernization and Rehabilitation of Kuyu Mazar

**Table 3-4: Non-conformance issues observed during July December 2018
period (ABISRP 03.1 & ABISRP 03.2)**

| Non-Conformances | Corrective measures | Implementation deadline |
|---|---|-------------------------|
| ABISRP – 03 | | |
| Semi-annual EMR R.06 P. 35 at ABISRP 03.01 Kuyu Mazar | The Contractor of ABISRP 03.01 has been informed to follow the rules stated in | 30/06/2019 (Open) |
| Construction Site hazardous wastes observed in site. | Hazardous Waste Management Plan, regularly check the site | 30/06/2019 (Open) |
| Semi-annual EMR R.06 P. 34 at ABISRP 03.02 Kizil Tepa Construction Site oil spills observed in site. | The Contractor of ABISRP 03.02 has been informed to clean and regularly check the site | 30/06/2019 (Open) |
| Semi-annual EMR R.06 P. 34 at ABISRP 03.02 Kizil Tepa Construction Site dust formation at unpaved roads observed in site. | The Contractor of ABISRP 03.02 has been informed to spray the unpaved roads with water and regularly check the site | 30/06/2019 (Open) |
| Semi-annual EMR R.06 P. 29 at ABISRP 03.01 Kuyu Mazar Contractor has not been submitted regularly. | The Contractor of ABISRP 03.01 has been informed to comply with contract requirements. | 01/02/2019 (Open) |
| Semi-annual EMR R.06 P. 30 at ABISRP 03.02 Kizil Tepa Contractor has not been submitted regularly. | The Contractor of ABISRP 03.02 has been informed to comply with contract requirements. | 01/02/2019 (Open) |
| Semi-annual EMR R.06 P. 31 at ABISRP 03.01 Kuyu Mazar Contractor has not been informed PIU/SC about the replacement of Environmental Manager. | The Contractor of ABISRP 03.01 has been informed to declare the replacement. | 01/02/2019 (Open) |
| Semi-annual EMR R.06 P. 32 at ABISRP 03.02 Kizil Tepa Contractor has not been informed PIU/SC about the replacement of Environmental Manager. | The Contractor of ABISRP 03.02 has been informed to declare the replacement. | 01/02/2019 (Open) |
| Semi-annual EMR R.06 P. 36 at ABISRP 03.01 Kuyu Mazar Contractor has not obtained permission for the disposal of the dredged material | The Contractor of ABISRP 03.01 has been informed to obtain the necessary permission. | 01/02/2019 (Open) |
| Semi-annual EMR R.06 P. 37 at ABISRP 03.02 Kizil Tepa Contractor has not obtained permission for the disposal of the dredged material | The Contractor of ABISRP 03.02 has been informed to obtain the necessary permission. | 01/02/2019 (Open) |

40. During the reporting period (1st July 2018 – 31st December 2018) the observed Non-Conformance issues have been recorded is 10 in total which none of them have been closed. Total number of Non-Conformance issues observed is 26 which 38% has been closed (Table 3-5).

Table 3-5: Summary of Issues Tracking Activity for Current Period

| | |
|--|-----|
| Total Number of Issues for Project | 26 |
| Number of Open Issues | 16 |
| Number of Closed Issues | 10 |
| Percentage Closed | 38% |
| Issues Opened This Reporting Period | 10 |
| Issues Closed This Reporting Period | 0 |

41. The distribution of Non-Conformance issues based on priority is shown at the Figure 3-1 and non-conformance level at the Figure 3-2.

Figure 3-1 Summary of Issues by Priority

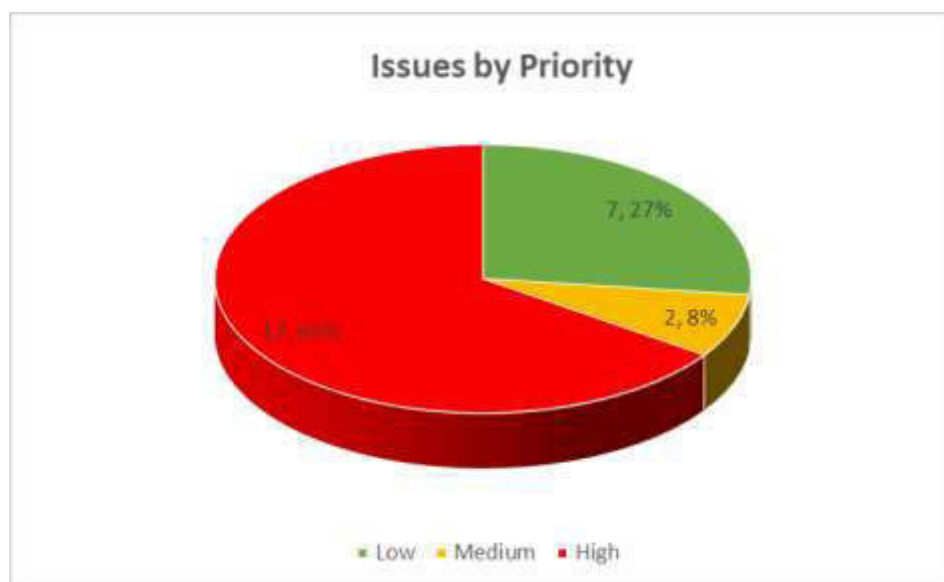
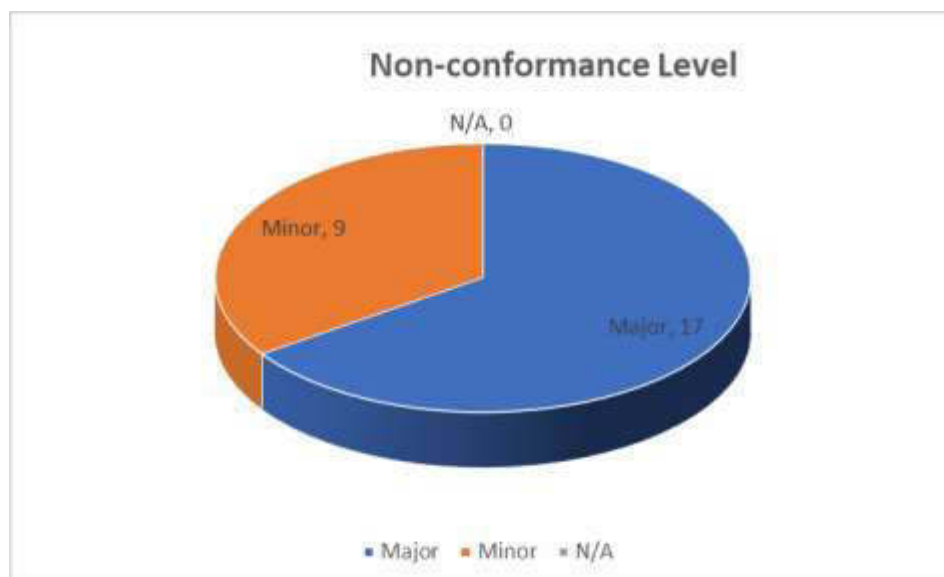
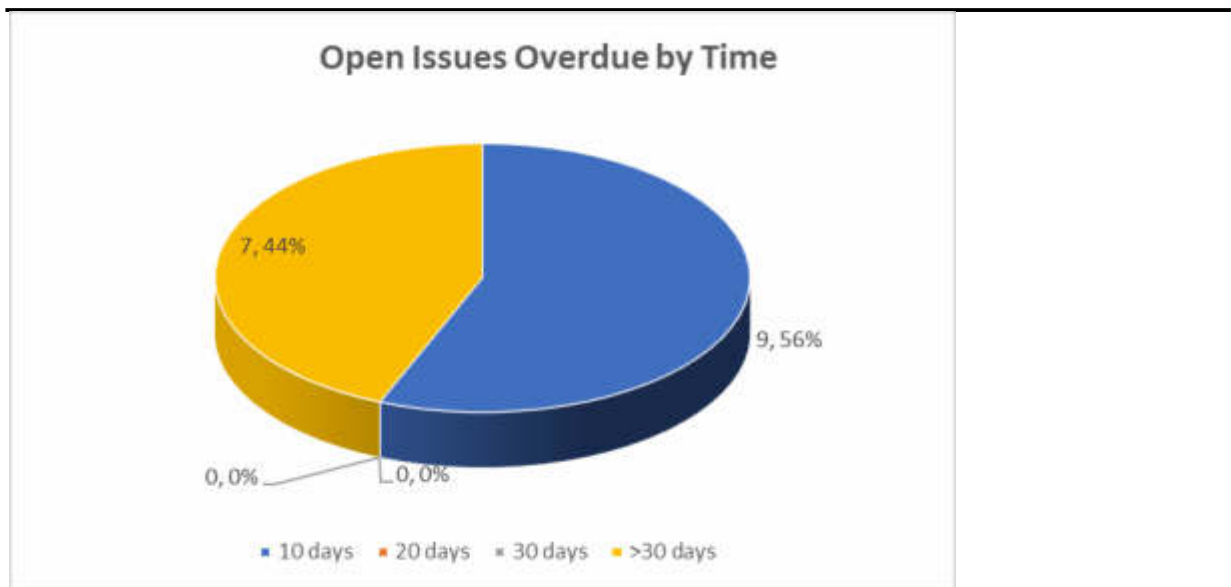


Figure 3-2 Summary of Issues by Non-Conformance



42. Duration to close any issue takes approximately 4 months. The distribution of days required to close any issue has been shown in Figure 3-3.

Figure 3-3 Open Issues Overdue by Time



3.4 Trends

43. Based on the record time, the trends of issues closed has been given at the following.

| Semi-annual Report No | Total Number of Issues | % of issues closed on time | % of issues closed late |
|-----------------------|------------------------|----------------------------|-------------------------|
| 6 | 6 | 60% | 40% |
| 7 | 6 | 60% | 40% |

44. All of the issues, which are open, belong to Amu Bukhara Main Canal Regulating Structure (ABISRP 02) Contractor. That shows the Contractors involvement in environmental documentation is in low level.
45. New issues have been opened due to the intensified construction activities have been started on Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1), Modernization, and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) areas. Both Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) and Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) contractors suffer from the implementation of environmental measures.

3.5 Unanticipated Environmental Impacts or Risks

46. During the reporting period (1st July 2018 – 31st December 2018) any unanticipated environmental impacts and risks has not been observed.

4 RESULTS OF ENVIRONMENTAL MONITORING

4.1 Overview of Monitoring Conducted during Current Period

47. The Environmental Monitoring study has been based upon the collection of existing background environmental data from the relevant government authorities. The requested information covers quality of irrigation water and soil quality. Until the end of reporting period, the water quality (2015-2016) and water flow amounts (2015-2018) have been received from the relevant government agencies and given as Annex to the Semi-annual EMR R.06. The soil quality data has been re-requested from the relevant government authorities for the next reporting period.
48. According to EMP requirements, Contractors are responsible for conduction visual monitoring of above indicated parameters. There are no more requirements on environmental monitoring included in EMP and as following in SEMP. Submitted EMR of contractor include the environmental activities. The Contractors shall be informed to submit EMR on timely manner.
49. During the reporting period no complaints were received from people living in nearby residential areas for any construction site. In case of receiving such complains, further elaboration in environmental monitoring activities and solving and or settling the problematic issues needed.

4.1.1 Air Emissions and Ambient Air Quality

50. Except the Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) construction site appropriate measures were taken to prevent the pollution of atmospheric air, to limit the dust level from working vehicles and enforce strict observance of safety rules at main road crossing, along main roads, the mahalla streets and near sub-project construction sites. In the Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) construction site dust formation at unpaved roads have been observed visually (Annex II).
51. While excavation and transportation of excavating materials, additional environmental requirements were followed: Schedule transportation activities by avoiding peak traffic periods; Use tarpaulins to cover loose material that is a transported to and from the site by truck.

52. Inspection of exhaust emissions of vehicles and machinery used has been controlled in Uzbekistan with a regulation named “Implementation of Mandatory Technical Inspection of Vehicles the Machinery” and numbered 54, which is in force since January 31st, 2003. Each Contractor should hold a valid permission for the vehicles and machineries used in the construction activities. Therefore, the vehicles and machineries used in construction activities do not exceed limits as far as they hold a valid permission from relevant Government authorities.
53. According to the IEE the nature of the project activities, will not generate significant quantities of emissions, therefore visual monitoring of dust has been envisaged at the Environmental Management Plan of the project. Since there isn't any change in the main project activities, no need for monitoring of air quality except the method stated in Environmental Management Plan given at IEE:

4.1.2 Wastewater and Ambient Water Quality

54. The toilet facilities for Contract ABISRP 02 in the site camping area are poor in conditions and has not been stored in hygienic conditions, disposed after treatment, or transferred to a treatment facility. The domestic sewage effluent has not been observed in the construction site. This might be due to few numbers of working staff or the filtration of sewerage to groundwater. It should be reported that no ground water usage either for drinking or irrigational purposes has been observed in the nearby vicinity of working sites.
55. Canal cleaning involved excavation of large amounts of sediment. This was disposed of to the locations agreed with the Engineer. Where there was insufficient space along the side of the canal embankment to deposit the excavated materials, they were transported and deposited in disposal areas further away from the canal. On the site visit 16 07 2018 the dumping area observed at the outflow canal of Rostguy. This site has been levelled and cleaned according to the observation made on 12 10 2017 (See Annex II).
56. During the canal cleaning works, it is unavoidable to form temporary turbidity and sediment problems. Existing water quality of the irrigation water turbid and high in sediment amount, therefore this temporary effect could not be differentiated, unless the sediment amount is measured before and during the cleaning activity.

4.1.3 Noise

57. The contractors have fit the daily regular working hours. It has been reported on EMR of Contractors using new equipment and vehicle, which is appropriate for the Occupational Health and Safety Noise levels.
58. The Uzbek national construction noise norms that are relevant to all stages of the construction phase are provided by law KMK 2.01.08-96 —Protection from noise and detailed in Table 1 at Annex IV.
59. The —Sanitarian Rules and Norms on providing allowed noise level into the living building, public building and territory of living areall (SanR&N No.0267-09) establish the maximum admissible noise level into the living areas, both inside and outside buildings, given at Table 2, Annex IV.
60. The World Banks “Environmental, Health and Safety General Directives, 2007 (EHS)” is functional instead of PPAH. EHS stipulates that noise at any activity shall not exceed the levels given in the Table 3, Annex IV below for given receptors, nor shall they result in a greater increase of ambient noise than 3 dB at the nearest receiving area outside the site.
61. At the Annex IV an acoustic analysis report has been given. In the report the Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) construction site Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) construction site have been analysed at for the maximum vehicle and equipment conditions. The national and international legislative requirements for the working conditions have been stated at the report. After prediction of sound level at the nearest locations results which are given at Table 4-1 have been summarized.

Table 4-1. Comparison of Equivalent Sound Levels with the National and International Standards.

| Site | Equivalent Sound Level in dBA | Standard Type for Specified Receptor in dBA | |
|---|-------------------------------|---|---------------|
| | | National | International |
| Kuyu Mazar Pump Station Construction Site | 48 | 55 | 55 |
| Kizil Tepa Pump Station Construction Site | 53 | 55 | 55 |

4.2 Trends

62. Based on the visual inspection and EMR reports the air, noise and water quality conditions has not considerably changed during the project construction span. The existing performance of the Contractors has been evaluated based on the Environmental Management Plan (EMP) of the overall project and attached to Annex I.

4.3 Material Resources Utilization

4.3.1 Current Period

63. The electricity is used from the grid, water for construction is used from the canal. Water for working personnel for consumption and for washing is brought by water tank trucks.

4.3.2 Cumulative Resource Utilization

64. As indicated in paragraph 64 material records have not been kept. Therefore, cumulative progress not included into the EMR.

4.4 Waste Management

65. Amu Bukhara Main Canal Regulating Structure (ABISRP 02) Contractor has not signed any contract related to the waste disposal. The waste originated from their construction and workers daily activities has been verbally reported that disposed to the municipal solid waste disposal areas by their own trucks/tractors.
66. The Contractor of Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) has submitted a Waste Management Plan on 11th May 2018 and Hazardous Materials Management Plan on 10th May 2018 (Semi-annual EMR R.06).
67. The solid waste disposal area of Contractor of Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) has been declared as Kuyu Mazar Solid Waste Disposal area, which is approximately 3 km away from the Kuyu Mazar Pumping Station.
68. The Contractor of Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) has signed a protocol with Toza-Khudud firm for collection, transfer, and disposal of the domestic solid waste. The protocol is valid until the 31st December 2018. This protocol will be revised at the next reporting period.

-
69. The Contractor of Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) has submitted a Waste Management Plan on 11th May 2018 and Hazardous Materials Management Plan on 10th May 2018 (Semi-annual EMR R.06).
70. The solid waste disposal area of Contractor of Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) has been declared a local Solid Waste Disposal area which is approximately 6 km away from the Kizil Tepa Pumping Station.
71. The Contractor of Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) has signed a protocol with Toza-Khudud firm for collection, transfer, and disposal of the domestic solid waste. The protocol is valid until the 31st December 2018. This protocol will be revised at the next reporting period.

4.5.1 Current Period

72. Amu Bukhara Main Canal Regulating Structure (ABISRP 02) Contractor has no record about the type, quantity of waste produced and disposed. Due to suspended construction activities no domestic solid waste has been observed at the construction and or camping sites.
73. During the reporting period (1st July 2018 – 31st December 2018) the Contractor of Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) has dumped four times once domestic solid waste to the site defined at Paragraph 68. Toza-Khudud firm has realized the transfer and disposal of solid waste.

| Date of Solid Waste Transfer | Amount of Solid Waste (m ³) |
|------------------------------|---|
| 05.July.2018 | 36.0 |
| 17.August.2018 | 2.66 |
| 26.September.2018 | 1.32 |
| 28.December.2018 | 2.64 |

74. During the reporting period (1st July 2018 – 31st December 2018) the Contractor of Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) has dumped four times domestic solid waste to the site defined at Paragraph 71. The aluminium sheets and demolished concrete have been restored at the ABMK storage areas for reuse and/or recycle purposes. The recorded disposals are given in the following. Toza-Khudud firm has realized the transfer and disposal of domestic solid waste; the other type of waste has been transferred by the Contractor.

| Date of Solid Waste Transfer | Amount of Solid Waste (m ³) | | | | | Storage Area |
|------------------------------|---|----------------------|---------------------------|-------------------------------|----------------------------|-------------------|
| | Type I Very Hazardous | Type II Hazardous | Type III Medium Hazard | Type IV Slightly Hazardous | Type V Nearly No Hazard | |
| 18.July.2018 | | | 4.5 | | | ABMK Storage Area |
| 19.July.2018 | | | | 3 | | ABMK Storage Area |
| 20.July.2018 | | | | | 3 | Toza-Khudud |
| 20.July.2018 | | | | 3 | | ABMK Storage Area |
| 23.July.2018 | | | | 1 | | ABMK Storage Area |
| 24.July.2018 | | | | | 2 | ABMK Storage Area |
| 25.July.2018 | | | | | 5.5 | ABMK Storage Area |
| 26.July.2018 | | | 4.5 | | | ABMK Storage Area |
| 27.July.2018 | | | | 7 | | ABMK Storage Area |
| 28.July.2018 | | | | 1.5 | | ABMK Storage Area |
| 29.July.2018 | | | | 5 | | ABMK Storage Area |
| 01.August.2018 | | | | | 5 | ABMK Storage Area |
| 19.Auguts.2018 | | | | | 3 | Toza-Khudud |
| 18.September.2018 | | | | | 3 | Toza-Khudud |
| 21.November.2018 | | | | | 3 | Toza-Khudud |
| Total | - | - | 9 | 20.5 | 24.5 | |

75. The dredged material excavated at the forebay area of the Kuyu Mazar Pump station was removed and buried at the authorized site with approval of local authorities.
76. The dredged material excavated at the forebay area of the Kizil Tepa Pump station was removed and buried at the authorized site with approval of local authorities.

4.5.2 Cumulative Waste Generation

77. During reporting period (1st July 2018 – 31st December 2018) totally 96.2 m³ of solid waste has been originated within the scope of Amu Bukhara Irrigation System Rehabilitation Project. Approximately 43% of this waste amount has been restored for reuse and recycle purposes at the premises of ABMK Kizil Tepa storage areas. The progress in solid waste disposal has been shown below table.

| EMR Report Number | Kuyu Mazar | | Kizil Tepa | | Total | |
|-------------------|------------|-------------------|------------|-------------------|----------|-------------------|
| | Disposed | Recyled or Reused | Disposed | Recyled or Reused | Disposed | Recyled or Reused |
| 6 | 3 | 0 | 3.9 | 0 | 6.9 | 0 |
| 7 | 42.62 | 0 | 12 | 42.00 | 54.62 | 42 |
| Total | 45.62 | 0 | 15.9 | 42 | 61.52 | 42 |

4.6 Health and Safety

4.6.1 Community Health and Safety

78. During reporting period (1st July 2018 – 31st december 2018) no incidents occurred resulted in Community Health and Safety issues, including the traffic accidents.

4.6.2 Worker Health and Safety

79. During reporting period (1st July 2018 – 31st December 2018) no incidents occurred resulted in the working and camp site area.
80. It has been verbally reported that Kuyu Mazar Pump Station (ABISRP 03.1) and Kizil Tapa Pump Station (ABISRP 03.2) technical staff had a general health scan.
81. During the site visit it has been observed that the health and safety instruction posters have been attached to a board in the working site.
82. Miao Guowang has been assigned as the Health and Safety Specialist of Kuyu Mazar Pump Station (ABISRP 03.2) contract.
83. Miao Guowang has been assigned as the Health and Safety Specialist of Kizil Tapa Pump Station (ABISRP 03.2) contract.

4.7 Training

84. The training was conducted by Ketu Dgebuadze (RETA/ADB International-Regional Environmental Safeguards Consultant) for PIU, SC and CC staff related to new Manual for Monitoring of Environmental Safeguards Implementation conducted on 2 July 2018.
85. Training of the field Supervision Engineers of the Consultant by SC about the implementation of environmental monitoring and how to develop it on 18th December 2018 in Bukhara.

5 FUNCTIONING OF THE SEMP

5.1 SEMP Review

86. Third revised version of SEMP for Amu Bukhara Main Canal Regulating Structure (ABISRP 02) was submitted by the Contractor on 24 January 2017. However, Contractor does not follow properly the requirements set up under the SEMP. Therefore, close follow-up Contractor's construction activities is advised.
87. Currently SEMP of Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) (14 February 2018 is submission date of third revision and 20 February 2018 no objection date) and Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) (14 February 2018 is submission date of third revision and 20 February 2018 no objection date) considered to fit the environmental requirements of the construction activities.

6 GOOD PRACTICE AND OPPORTUNITY FOR IMPROVEMENT

6.1 Good Practice

88. Bilingual (English and Russian) access database formed by Supervision Consultant to monitor environmental, social, and financial and physical progress evaluation of project. This will accumulate all the project relevant data for evaluation purposes.



Figure 6-1 Amu Bukhara Irrigation System Rehabilitation Project Monitoring Database

89. In the working camp of Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) sporting area has been established for the workers as illustrated below. The sporting activities in these areas can help for developing friendships centred on healthy, safe, and enjoyable activities. This will contribute to the improvement of social environment of the workers.



Basketball Field



Ping Pong Hall

6.2 Opportunities for Improvement

90. In the working areas of the modernization and rehabilitation of the Kuyu Mazar pumping station (ABISCH 03.1) and the modernization and rehabilitation of the Kyzyl-Tepa pumping station (ABISRP 03.2), the operation of pumps was not sustainable due to low quality of health and safety of technical and administrative personnel working at the pumping stations. The contractor's occupational health and safety specialist must strictly monitor/control the occupational health and safety of personnel for ensuring effective working process.

7 SUMMARY AND RECOMMENDATIONS

7.1 Summary

91. Before the reporting period (before 1 July 2018) the following environmental safeguard activities have been performed.
- The review and update of the Initial Environmental Examination (IEE) Report have been realized and approval received by PIU from the national authorities.
 - The Contractor of Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) has submitted a Waste Management Plan on 11 May 2018 and Hazardous Materials Management Plan on 10 May 2018.
 - The Contractor of Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) has submitted a Waste Management Plan on 11 May 2018 and Hazardous Materials Management Plan on 10 May 2018.
 - Environmental Monitoring Reports submitted by all contractors to PIU (not regular).
 - Semi-annual Environmental Monitoring Reports have been submitted regularly.
 - Kuyu Mazar Pump Station (ABISRP 03.1) contractor obtained State Ecological Expertise permission from the Bukhara Province Ecology and Environmental Protection Agency on 30 April 2018.
 - Kizil Tepa Pump Station (ABISRP 03.2) contractor obtained State Ecological Expertise permission of the project from the Navoi Province Ecology and Environmental Protection Agency on 26 April 2018.
92. During the reporting period (1st July 2018- 31st December 2018) the following environmental safeguard activities have been performed
- The training by Ketil Dgebuadze RETA/ADB International-Regional Environmental Safeguards Consultant) for PIU, SC and CC staff related to new Manual for Monitoring of Environmental Safeguards Implementation conducted on 2 July 2018.
 - Training of the field Supervision Engineers of the Consultant by SC about the implementation of environmental monitoring and how to develop it on 18 December 2018 in Bukhara.
 - Environmental Audit by SC on Site environmental and health and safety conditions of the Contractor ABISRP 03.01 and 02 sites on 12 July 2018.
 - Environmental Audit by SC on Site environmental and health and safety conditions of the Contractor ABISRP 02 sites on 16 July 2018.
 - Environmental Audit by SC on Site environmental and health and safety conditions of the Contractor ABISRP 02, ABISRP 03.01 and 02 sites on 12 July 2018.
 - SEMP of Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1) has been approved on 14 December 2018.
 - SEMP of Modernization and Rehabilitation of Kizil Tepa Pump Station (ABISRP 03.2) has been approved on 14 December 2018.

7.2 Recommendations

93. In the ADB's Manual named "Manual for Monitoring of Environmental Safeguards Implementation- The Role of Project Implementation Unit (PIU)" subheading number 4.3 describes the GRM tracking. However, the Semi-annual Environmental Report format doesn't include any part about the GRM tracking results and observations, etc. It has been proposed to add to the existing EMR format GRM tracking chapter or heading. It has been suggested to add sub-chapter 4.8 – "Grievance Redress Mechanism and Complaints" after 4.7 Sub-chapter – "Trainings".
94. Conduct environmental Audit by SC on Site environmental and health and safety conditions of the Contractor ABISRP 02, ABISRP 03.01 and 02 sites on until the end of next reporting period.
95. The Contractor of Modernization and Rehabilitation of Kuyu Mazar (ABISRP 03.1) shall revise the protocol with Toza-Khudud firm for collection, transfer, and disposal of the domestic solid waste, which will be valid after 1 January 2019.
96. The Contractor of Modernization and Rehabilitation of Kizil Tepa (ABISRP 03.2) shall revise the protocol with Toza-Khudud firm for collection, transfer, and disposal of the domestic solid waste, which will be valid after 1st January 2019.
97. The Contractor of Modernization and Rehabilitation of Kuyu Mazar (ABISRP 03.1) shall obtain permission for the disposal site of the dredged material until 1 February 2019.
98. The Contractor of Modernization and Rehabilitation of Kuyu Mazar (ABISRP 03.1) shall submit the all previous EMR reports until 1st February 2019.
99. The Contractor of Modernization and Rehabilitation of Kizil Tepa (ABISRP 03.2) shall submit the all previous EMR reports until 1st February 2019.
100. Amu Bukhara Main Canal Regulating Structure (ABISRP 02) Contractor shall submit the all previous EMR reports until 1st February 2019.

ANNEX I PERFORMANCE EVALUATION OF ENVIRONMENTAL MONITORING OF ABISRP

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|--|--|--|----------------------|--|-----------|-----------|-------|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| PRE-CONSTRUCTION PHASE | | | | | | Lot 1 | Lot 2 | |
| Has the Consultant reviewed IEE? | By the activities of PIU Technical Assistance Team | Once in the initial phase of project. | EEC | Y | N/A | N/A | N/A | N/A |
| If the IEE has been updated has it been sent to the ADB for approval? | By the activities of PIU Technical Assistance Team | Once in the initial phase of project. | EEC | Y | N/A | N/A | N/A | N/A |
| Has the PIU submitted IEE assessment report for approval to the National Authorities? | By the activities of PIU Technical Assistance Team | Once in the initial phase of project. | PIU | Y | N/A | N/A | N/A | N/A |
| Has the Consultant included the EMP as a special Condition in the Bid Document? | By the activities of PIU Technical Assistance Team | Once in the initial phase of project. | PEC | Y | N/A | N/A | N/A | N/A |
| Has the Contractor designed adequate staff facilities in the pump house redesigns (water-seal toilets, furnished rest rooms, dining rooms, etc.) | By technical review | Once in the review of design documents | CEC | N/A | N/A | Y | Y | N/A |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|--|--------------------------|--|----------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Does the Contractor's design include raised walking ways? | By technical review | Once in the review of design documents | CEC | N/A | N/A | Y | Y | N/A |
| Does the Contractor's design provide safety guards on the areas exposed to the machinery? | By technical review | Once in the review of design documents | MEC | N/A | N/A | Y | Y | N/A |
| Does the Contractor's design have any drainage facility to lower ground water? | By technical review | Once in the review of design documents | CEC | N/A | Y | Y | Y | Y |
| Does the design meet the internationally acceptable safety standards of electricity for wet working areas? | By technical review | Once in the review of design documents | EIEC | N/A | Y | Y | Y | Y |
| Does the design consider critical periods for biological life and adhere any avoidance plan? | By technical review | Once in the review of design documents | EEC | N/A | N/A | N/A | N/A | N/A |
| Does the Contractor have proper survey equipment? | By technical review | Once in the review of design documents | CEC | N/A | Y | Y | Y | Y |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|---|--------------------------|--|----------------------|--|-----------|-----------|---|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Does the design ensure free access to the facilities and availability of roads to them for O&M? | By technical review | Once in the review of design documents | CEC | N/A | Y | Y | Y | Y |
| Does the design take care the placement of building and facilities considering fire breaks? | By technical review | Once in the review of design documents | MEC | N/A | N/A | Y | Y | N/A |
| Does the design consider Corrosion protection of buildings by groundwater? | By technical review | Once in the review of design documents | CEC | N/A | Y | Y | Y | Y |
| Does the design care the fire proof materials where necessary? | By technical review | Once in the review of design documents | CEC | N/A | N/A | Y | Y | N/A |
| Has the Contractor checked the desilting efficiency of inlet canal design and desilting basins? | By technical review | Once in the review of design documents | CEC | N/A | Y | Y | Y | Y |
| Has the Contractor developed inlet having sand trap and/or other alternative devices? | By technical review | Once in the review of design documents | CEC/MEC | N/A | Y | Y | Y | Y |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|---|--------------------------|--|----------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Does the design consider oil separators to have oil concentration less than 0.3 mg/l? | By technical review | Once in the review of design documents | CEC/MEC | N/A | N/A | Y | Y | N/A |
| Does the Contractor develop a Worker Safety Plan in compliance with Uzbekistan Labour Code? | By technical review | Once in the review of design documents | EEC | N/A | Y | Y | Y | Y |
| Does the design consider protection measures for pipes laid in saline areas? | By technical review | Once in the review of design documents | MEC | N/A | N/A | N/A | N/A | N/A |
| Does the design consider safety conditions of crossing, bridges that will be used for transportation of vehicles, equipment, and staff? | By technical review | Once in the review of design documents | CEC | N/A | Y | Y | Y | Y |
| Does the design consider landscaping convenient to the prevailing natural conditions? | By technical review | Once in the review of design documents | EEC | N/A | Y | N/A | N/A | Y |
| Does the design consider training of O&M staff on mechanical and electrical equipment? | By technical review | Once in the review of design documents | EIEC | N/A | N/A | Y | Y | Y |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|--|--------------------------|--|----------------------|--|-----------|-----------|---|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Does the design consider supplying transformers free of PCB? | By technical review | Once in the review of design documents | EIEC | N/A | N/A | Y | Y | N/A |
| Is the EMP attached to the Contract to form a part of Contract Documents? | By technical review | Once in the review of design documents | PEC | Y | Y | Y | Y | Y |
| Does the design consider the irrigational and drinking water requirements? | By technical review | Once in the review of design documents | MEC | N/A | Y | Y | Y | Y |
| Has PIU evaluated the bidder by checking EMP requirements? | By technical review | Once in the review of design documents | PEC | N/A | Y | Y | Y | Y |
| Has the Contractor prepared an acceptable EMP based on the Approved IEE? | By technical review | Once in the review of design documents | CEC | Y | Y | Y | Y | Y |
| Has the Contractor developed Contingency Plan for accidents including spill of fuel? | By technical review | Once in the review of design documents | EEC | N/A | Y | Y | Y | Y |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|---|--|---|----------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Has the Contractor submitted the Site Environmental Management Plan? | By technical review | Once in the review of design documents | EEC | N/A | Y | Y | Y | Y |
| Does the Contractor publish a public notice regarding the nature and location of the project? | Questionnaires | Once in the initial phase of construction project. | C | N/A | N | N/A | N/A | N |
| Has the Consultant conducted training program for WCA? | By the activities of PIU Technical Assistance Team | Once according to the time schedule of the training program | EEC | Y | N/A | N/A | N/A | N/A |
| Has the Consultant conducted training program for BISA? | By the activities of PIU Technical Assistance Team | Once according to the time schedule of the training program | EEC/MEC | N | N/A | N/A | N/A | N/A |
| Has the EMP been explained to the Contractor before the commencement of works? | By the activities of PIU Technical Assistance Team | Once before the commencement of construction project. | PMC/EEC/PIU | N/A | Y | Y | Y | Y |

Amu Bukhara Irrigation System Rehabilitation Project
Environmental Monitoring Report (July 2018 – December 2018)

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|---|--------------------------|--------------------------------|----------------------|--|-----------|-----------|---|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Has the Contractor defined Environmental Management Officer? | Biding Documents | Once in bid evaluation phase | C | N/A | Y | Y | Y | Y |
| Has the Contractor defined Safety Officer? | Biding Documents | Once in bid evaluation phase | C | N/A | N | Y | Y | N |
| Does the Contractor handle the protected plant species, trees taking care of environmental concerns and/or permissions? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Does the Contractor excavate and preserve the top soil? | Questionnaires | monthly | C | N/A | N | | | N |
| Does the Contractor maximize the use of excavated material for construction works? | Questionnaires | monthly | C | N/A | Y | | | Y |
| Has the Contractor defined the licensed or got permissions borrow area for usage of construction material? | Questionnaires | monthly | C | N/A | Y | | | Y |
| Has the Contractor caused any landslide or erosion? | Questionnaires | monthly | C | N/A | N | | | N |
| Has the Contractor stockpiles of excavated material for backfilling? | Questionnaires | monthly | C | N/A | Y | | | Y |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|--|--------------------------|--------------------------------|----------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Has the Contractor realized the work activities during non-cropping periods? | Questionnaires | monthly | C | N/A | Y | N/A | N/A | Y |
| Has the Contractor take measures for providing water continuously during construction work? | Questionnaires | monthly | C | N/A | Y | N/A | N/A | Y |
| Has the Contractor defined spoil disposal site with the local authorities? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Does the Contractor disposed/recycled the waste material from the construction area? | Questionnaires | monthly | C | N/A | Y | | | Y |
| Has PCB containing electrical equipment disposed according to the requirements of Gozecoexpertisa? | Questionnaires | monthly | C | N/A | N/A | | | N/A |
| Has the Contractor defined material storage area? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Has the Contractor defined fuel storage area 20 m away from watercourse? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Is the noise level in working area below the defined limit 80 dB(A)? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Has the Contractor taken noise prevention measures for staff using noisy equipment, vehicles? | Questionnaires | monthly | C | N/A | N | N | N | N |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|---|--------------------------|--------------------------------|----------------------|--|-----------|-----------|---|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Is the nearest residential area affected by the noise level? | Questionnaires | monthly | C | N/A | N | N | N | N |
| Has the working activities limited by daylight hours? | Questionnaires | monthly | C | N/A | Y | N | N | Y |
| Does the Contractor have a water tanker for spraying water to roads? | Questionnaires | monthly | C | N/A | N | N | N | Y |
| Does the Contractor suppress the dust by watering? | Questionnaires | monthly | C | N/A | Y | N | N | Y |
| Has the Contractor trained the staff on personnel health and sanitation procedures at the working camp, how to interact with the host communities, subprojects environmental protection measures? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Has the Contractor trained the staff on contingency plan? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Has the Contractor trained the personnel for fuel handling procedure? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Does the Contractor train any person for the first-aid? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Does the Contractor apply any simple training measure for the visitors? | Questionnaires | monthly | C | N/A | N | N | N | N |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|--|--------------------------|--------------------------------|----------------------|--|-----------|-----------|---|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Does the Contractor keep the records for all kind of training? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Number of accidents occurred during report period? | Questionnaires | monthly | C | N/A | 0 | 0 | 0 | 0 |
| Does the Contractor supply clean drinking water to the staff? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Does the Contractor provide the staff hygienic living and working conditions? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Does the Contractor have toilets, baths, sleeping quarter, dining hall for the staff? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Does the Contractor have any social facilities like sporting area, canteen, shuttle vehicles to the local centres, etc.? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Does the Contractor check the health of the staff regularly? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Does the Contractor keep the health record of the staff? | Questionnaires | monthly | C | N/A | N | N | N | N |
| Does the Contractor have adequate fire protection measures? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Has the Contractor made available the first aid kit to the staff? | Questionnaires | monthly | C | N/A | N | Y | Y | N |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|--|--------------------------|--------------------------------|----------------------|--|-----------|-----------|---|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Has the Contractor provided safe floor and hand rails, stairs, lifts where necessary? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Has the Contractor provided the enough ventilation and lightening in the specific areas? | Questionnaires | monthly | C | N/A | N | Y | Y | Y |
| Has the Contractor provided the safety equipment, material to the staff? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Does security staff exist in the working area? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Does the working area have fencing in order to protect intrusion? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Has the Contractor defined solid waste storage area? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Has the Contractor defined the area for used material storage? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Does the Contractor apply solid waste separation for recyclable solid waste? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Does the Contractor keep any record for the waste recycled? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Does the Contractor keep any record for the solid waste disposed? | Questionnaires | monthly | C | N/A | N | Y | Y | N |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|---|--------------------------|--------------------------------|----------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Does the Contractor keep any record for the hazardous waste disposed? | Questionnaires | monthly | C | N/A | N | N | Y | N |
| Does the Contractor use the local public roads even the avoidance from these road(s) possible? | Questionnaires | monthly | C | N/A | Y | Y | N/A | Y |
| Has the Contractor collected and disposed the solid waste regularly? | Questionnaires | monthly | C | N/A | Y | N | Y | Y |
| Does the Contractor discharge the sewerage after treatment? | Questionnaires | monthly | C | N/A | N | N/A | N/A | N |
| Does the Contractor avoid the peak hours of local traffic in case of use of local public roads? | Questionnaires | monthly | C | N/A | Y | N/A | N/A | Y |
| Does the material carried on public roads covered? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Does the Contractor use the vehicles having the controlled exhaust emissions? | Questionnaires | monthly | C | N/A | N | Y | Y | N |
| Does the Roads selected by the Contractor effect the protected areas? | Questionnaires | monthly | C | N/A | N | N | N | N |
| Does the public informed with adequate signs about the working area and vehicles? | Questionnaires | monthly | C | N/A | N | N | N | N |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|--|---|--------------------------------|----------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Do the Vehicles of the Contractor fit in to the speed limits? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Does the Contractor repair all infrastructure/roads when damage given by them? | Questionnaires | monthly | C | N/A | Y | Y | Y | Y |
| Has the Contractor removed the soil if they contaminated? | Questionnaires | monthly | C | N/A | Y | N/A | N/A | Y |
| Has the Contractor left the working area as defined in Landscape section of the Bidding Documents? | Questionnaires | monthly | C | N/A | Y | | | Y |
| Has the Operating Personnel signed and accepted all work sites, labour camps, storage areas and temporary dumping areas? | Questionnaires | monthly | C | N/A | N | N | N | N |
| Number of grievances about the Contractor? | Interview with the relevant authorities | monthly | BISA | N/A | 0 | 0 | 0 | 0 |
| Number of grievances solved by the Contractor? | Interview with the relevant authorities | monthly | BISA | N/A | 0 | 0 | 0 | 0 |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|--|--------------------------|--|----------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Has the Contractor provided the training on the safe use of electricity and pumps for operational staff? | Questionnaires | Once when the project activities completed | EEC | N/A | N/A | Y | Y | N/A |
| Has the Contractor evaluated the trained O&M staff? | Questionnaires | Once when the project activities completed | MEC/EIEC | N/A | N/A | | | N/A |
| Has the Consultant trained the WCA, BISA staff for irrigation canal and drainage canal management? | Questionnaires | Once when the project activities completed | EEC | Y | N/A | | | N/A |
| Has the Consultant evaluated the trained WCA, BISA staff? | Questionnaires | Once when the project activities completed | EEC | Y | N/A | N/A | N/A | N/A |
| Has the Oil Separator regularly checked and properly maintained? | Questionnaires | Once when the project activities completed | EEC | N/A | N/A | N/A | N/A | N/A |
| Has the relevant organizations observed the irrigation water quality? | Questionnaires | Once when the project activities completed | EEC | N | N/A | N/A | N/A | N/A |

Amu Bukhara Irrigation System Rehabilitation Project
Environmental Monitoring Report (July 2018 – December 2018)

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|---|--------------------------|--|----------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Has the relevant organizations observed the ground water level in the irrigation area? | Questionnaires | Once when the project activities completed | EEC | N | N/A | N/A | N/A | N/A |
| Have the farmers applied crop rotation? | Questionnaires | Once when the project activities completed | BISA | N | N/A | N/A | N/A | N/A |
| Have the farmers applied environmentally friendly agricultural production techniques? | Questionnaires | Once when the project activities completed | BISA | N | N/A | N/A | N/A | N/A |
| Has the fertility and productivity been enhanced? | Questionnaires | Once when the project activities completed | BISA | N | N/A | N/A | N/A | N/A |
| Has the O&M staff applies the national Worker Safety Plan? | Questionnaires | Once when the project activities completed | C | N/A | N | Y | Y | N |
| Has the Contractor made facilities available in the operational building with the clean drinking water? | Questionnaires | Once when the project activities completed | C | N/A | Y | Y | Y | Y |

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|--|--------------------------|--|----------------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Has the Contractor made facilities available in the operational building with sewerage disposal/handling? | Questionnaires | Once when the project activities completed | C | N/A | N | Y | Y | N |
| Has the international agreements about the water abstraction been fitted? | Questionnaires | Once when the project activities completed | EEC | | N/A | N/A | N/A | N/A |
| GENERAL ENVIRONMENTAL IMPACTS OF THE PROJECT ON THE ENVIRONMENT | | | | | | | | |
| Flow amount of water in channels? | Measurement | Monthly | BISA/WCA | N | N/A | N/A | N/A | N/A |
| Irrigated Area (ha) | Measurement | Monthly | BISA/WCA | N | N/A | N/A | N/A | N/A |
| Amount of water used for irrigation purposes. | Measurement | Monthly | BISA/WCA | N | N/A | N/A | N/A | N/A |
| Water quality of irrigation water (pH, salinity, hardness, BOD, COD, Nitrate, Nitrite, Ammonium, Phosphate, Pesticides, Oil products, phenol) in the project area. | Measurement | Bi-annual | PIU, HGMEs, Uzhydromet | N | N/A | N/A | N/A | N/A |
| Soil quality/pollution (SOM) (humus), soil carbon, mobile and gross NPK, nitrates, nitrites, ammonium, phosphate, pesticides) | Measurement | Bi-annual | PIU, BISA, HGMEs, and WCAs | N | N/A | N/A | N/A | N/A |

Amu Bukhara Irrigation System Rehabilitation Project
Environmental Monitoring Report (July 2018 – December 2018)

| INDICATORS | Data Source | Frequency | Responsibility | Achievement from Commencement of Project Till end of Reporting Period (Yes(Y)/No(N)/Not Applicable(N/A)) | | | | |
|---|--|---|------------------------|--|-----------|-----------|-----|-----------|
| | How it will be measured? | How often it will be measured? | Who will measure it? | General | ABISRP 02 | ABISRP 03 | | ABISRP 04 |
| Water levels of wells in the irrigated areas? (specify wells) | Measurement | Monthly | BISA/WCA | N | N/A | N/A | N/A | N/A |
| Amount of water used for irrigation purposes. | Health Statistics of Local Authorities | Yearly | PIU from local MoH | N | N/A | N/A | N/A | N/A |
| Electricity Consumed before the project by pumping? | Electricity Meter Records | Monthly Consumed, yearly total | BISA | N | N/A | N/A | N/A | N/A |
| Electricity Consumed after the project by pumping? | Electricity Meter Records | Monthly Consumed, yearly total | BISA | N | N/A | N/A | N/A | N/A |
| Water quantity pumped before rehabilitation/reconstruction? | Flow Measurement | Monthly, average flow | BISA | N | N/A | N/A | N/A | N/A |
| Water quantity pumped after rehabilitation/reconstruction? | Flow Measurement | Monthly, average flow | BISA | N | N/A | N/A | N/A | N/A |
| Reduction in % of GHG by implementation of project? | Calculations | Once based on yearly energy consumption amounts | Calculated by PIU CCMS | | N/A | N/A | N/A | N/A |

BISA : Basin Irrigation System Authority of Regions
C: Contractor of any Subcomponent
CEC: Civil Engineer of Consultant
CCMS: Climate Change Mitigation Specialist

Amu Bukhara Irrigation System Rehabilitation Project
Environmental Monitoring Report (July 2018 – December 2018)

EEC: Environmental Expert of Consultant

EIEC: Electrical Engineer of Consultant

EMR: Environmental Monitoring Report

MEC: Mechanical Engineer of Consultant

MoH : Ministry of Health

MRoC: Monthly Report of the Contractor about the Implementation of EMP PEC:

Procurement Expert of Consultant

PMC: Project Manager of Consultant

PIU: Project Implementation Unit

WCA: Water Consumer Associations

ANNEX II- PHOTOS

Modernization & Rehabilitation of Amu Bukhara Main Canal Regulation Structures
(ABISRP 02)

Construction Works at Agitma



16 July 2018



September 2018

Construction Works at Djilvan Regulator



16 July 2018



August 2018

Rostguy Regulator



16 July 2018



17 December 2018

Land Levelling at Rostguy



16 July 2018



17 December 2018

Modernization and Rehabilitation of Kuyu Mazar Pump Station (ABISRP 03.1)

Kuyu Mazar Working Site



17 December 2018



17 December 2018

Kuyu Mazar Pump Station



17 December 2018



17 December 2018

Modernization and Rehabilitation of Kizil Tapa Pump Station (ABISRP 03.2)

Kizil Tapa Pump Station



17 December 2018



17 December 2018

Kizil Tapa Pump Station



17 December 2018



17 December 2018

ANNEX III ENVIRONMENTAL MONITORING REPORTS OF THE CONTRACTORS

Information Report

On the implementation of the Environmental Monitoring Plan during

Works under Contract: **ABISRP-02 « Modernization and rehabilitation of regulation structures of Amu-Bukhara main canal»**

for July 2018 y

Completion of the scope of work for the Outflow 1 at ABMC 1 (emergency reset) on the PC 310 + 43 continues.

Works on installation of equipment are performed. The primary test is performed. The stone outline along the channel slopes and the bottom of the channel is completed. Water is passed through a new channel channel.





Stone outline along the slopes of the canal and at the bottom of the channel is completed.







(Disassembly) The jumpers on the upper and lower channels of the channel have been removed.



The movement of water along the old channel of the channel was restored. Temporary working and bypass line, as in the channel a lot of water (vegetation period).

Work is underway on the installation and installation of electrical cable lines and installation of a transformer.





During the month, 15 workers and employees worked at the facility. Operated: 2 units. excavators, 1 unit. bulldozer, 2 units. truck cranes, 5 units. dump trucks.

During the construction work guided SNIP "Safety in construction", technical regulations, passports for the use of mechanization, as well as instructions for the safe conduct of work.

Work was allowed for persons who had undergone in the prescribed manner a safety briefing. Persons working on mechanisms have documents for the right to manage them.

On the object of the "Jilvan" the installation of handrails.

The area of the facility is cleared of construction debris and from all types of waste. Recovery will be applied to all affected locations, including storage sites, except for permanently occupied lands. The contractor will restore the disturbed territories to their original or better state, as far as practicable.



Welding works are carried out by a mobile welding unit.



During the month, 5 workers and employees worked at the Zhilvan facility. Operated 1 unit. Tractor Belarus MTZ, 1 unit. dump truck.

Information Report

On the implementation of the Environmental Monitoring Plan during

Works under Contract: **ABISRP-02 « Modernization and rehabilitation of regulation structures of Amu-Bukhara main canal»**

for August 2018 y

At the Agitma facility, work is under way in the lower pool. During the reporting period, the contractor installed a mounting beam in the amount of 305 pieces. and a stone outline. The facility employs 14 people, 4 units of equipment and electrical equipment.

Access roads have been constructed for the transportation of building materials. Electric lines are connected and the channel slopes are being strengthened.



Round-the-clock duty for the subsoil water pumping facility was organized.



A special place for storage of quartz stone is allocated.

There are open areas for acceptance and storage of incoming materials.



The area for the construction site is clean and leveled. On this site there were no trees and various plantations.



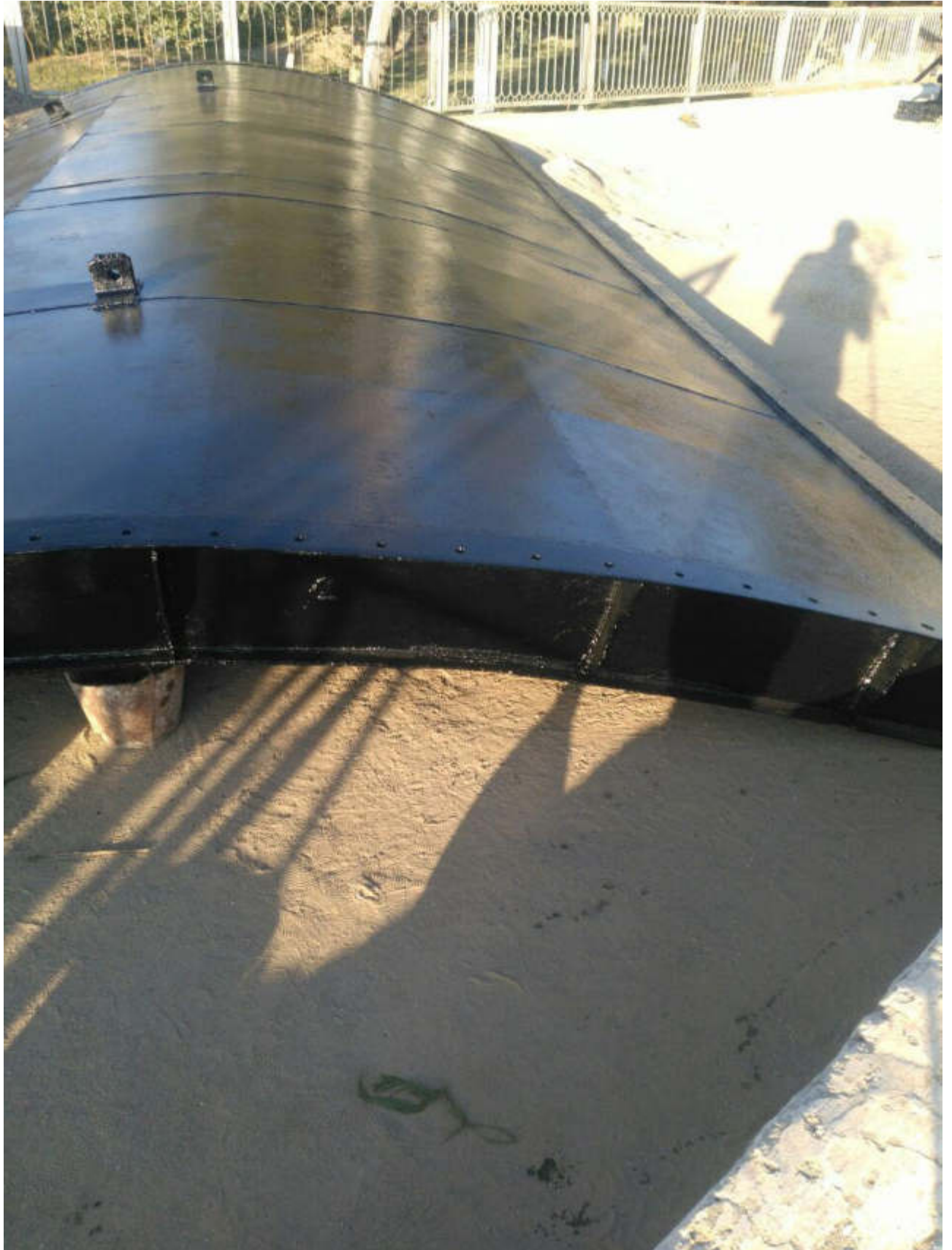


After completion of all works on the spillway project "Agitma", the facility's parameter will be restored and erosion control measures will be taken. Some places will be planted with vegetation in accordance with requirements to avoid soil erosion. The area will be cleared of construction debris and all types of waste.

To repair the hydrounit Tashrabad structure Shafirkan, work is underway on sand blasting and painting of the gates. For the installation and repair of the corresponding closures work 5 people, 3 units of equipment. This month 1 item was repaired. gate. In addition, another 5 pcs. The donors were brought to the contractor's base for repair.







For the construction of the "Jilvan" facility, the contractor completed the installation of asphalt 30 tons in the reporting period.

An object is being prepared for the delivery of the ABMK operational organization.





All employees who work at the facility are locals. A bus is organized, which daily delivers workers.

Information Report

On the implementation of the Environmental Monitoring Plan during

Works under Contract: **ABISRP-02 « Modernization and rehabilitation of regulation structures of Amu-Bukhara main canal»**

for September 2018 y

Work is underway to clean the emergency waste channel "Agitma"



Over the course of 500m, work has been developed to clean the channel that has been filled in, to hold it at its original condition and according to the design mark.

Cleaning and removal of sediment from the supply and discharge channels is planned at a distance of 500m.



The excavation of the developed soil with a bulldozer is regularly conducted and space is allocated for placement.

Created front of work on both sides of the channel for rehabilitation. The advancement and operation of the technology did not fade into the atmospheric air, on water resources and on land resources. Provides for the protection of vegetation and wildlife. Respected preservation of existing trees in the canal valley. The canal was cleaned by an excavator. Strictly observed measures to prevent the leakage of oil products when working with an excavator. It is not allowed to burn dry branches and herbs at the construction sites. The water protection zone of the channel has been determined and sanitary protection zones have been established. Provided sanitary and epidemiological reliability of the area. After completion of the change of work all the equipment mobilized on a specially organized car wash.

For cleaning works used:

- Excavator Hyundai - 1 pc
- Excavator Liu Gong 925 LL - 3 pcs
- Bulldozer Shantui S16 - 1 pc
- Bulldozer with ripper Liu Gong CLGB 160 - 1 pc
- Jackhammer - 1 pc

Removed the existing concrete threshold by the method of hydraulic splitting of rocks.





Organized sites for unloading building materials, concrete products.



After dismantling, the rejected concrete slopes were collected at a certain place and loaded onto motor vehicles and transported to the base of the operating organization ABMK for recycling and reuse in preparatory work in the access roads.

B In the current month, installation of ladders, cable channels, plates, gates, lifts and electrical equipment was carried out at the “Agitma” facility.





During the reporting period, 15 people, 7 units of equipment and electrical equipment worked at the facility.

In addition, the contractor created its own paint crew at the base consisting of 10 employees, and the relevant team performed sandblasting, priming and painting the shutters delivered to the contractor's warehouse.







In the process of building an emergency, a dangerous incident, victims and injured did not happen.

Claims and complaints during the reporting period are not received.

Approved by
JV Hebei Construction Group Co.LTD.
& Hebei Water Conservancy Engineering Bureau
Contractor's Representative
王超超 **Wang Chaochao**
15, August 2018

Monthly Environmental Monitoring Report
July of 2018 Rehabilitation and Modernization of Kuyu Mazar Pump Station

| IMPACT MITIGATION | | | | IMPACT MONITORING | | |
|--|-----------------------------------|---|------------------------------------|---|-----------------------------------|--|
| Project Activity | Potential Environmental Impact(s) | Proposed Mitigation Measures | Implementing Responsibility | Parameter to be monitored | Frequency and means of monitoring | Monitoring Responsibility |
| A. Main Conclusions: Contract ABISRP/NCB/03: | | | | | | |
| The mission advised to cover municipal waste containers. Establish hazardous waste area with concrete ground, roofing, and with secondary container/drip tray. | | Cover the municipal waste containers. Establish hazardous waste area with concrete ground, roofing, and with secondary container/drip tray. | Construction Manager Li Changku | Add a cover to the waste containers, and put it on the concrete ground | Completed/ Permanent | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KM) Zhang Wenjin <u>See picture 1</u> |
| B. Agreed Actions: | | | | | | |
| 4)Environmental recording system to be established with separate folder for environmental documents kept at the camp site by the end of March, 2018. | | Set (hereinafter referred to as establish) HSE folders | Construction Manager Li Changku | Environmental recording system has already been established, and a separated folder for environmental documents has been set and kept at HSE office | Completed/ Permanent | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KM) Zhang Wenjin |

| | | | | | | |
|---|---|--|------------------------------------|---|---|---|
| | | | | at camp site. | | <u>See picture 2</u> |
| 5) GRM logbooks and grievance box to be available at the camp site before commencement of construction works. | | | Construction Manager Li Changku | GRM logbooks and grievance box have already been set at the camp site. | Completed | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KM) Zhang Wenjin <u>See picture 3</u> |
| Construction Stage | | | | | | |
| Removal of trees in construction sites | N/A | N/A | N/A | N/A | N/A | N/A |
| Site preparation | N/A | N/A | N/A | N/A | N/A | N/A |
| Excavation of sites and opening of borrow pits | N/A | N/A | N/A | N/A | N/A | N/A |
| Rehabilitation activities during cropping season | N/A | N/A | N/A | N/A | N/A | N/A |
| Removal and transportation of wastes | Complying with the requirements for storage of production and household waste, and placing separate waste containers (dustbin) (4 pieces) | Signed contract with a professional company designated by the local authority, ie ДУК «Тоза-Худуд» (Kogon city Bukhara Oblast) | Construction Manager Li Changku | Perform daily HSE monitoring and register in the primary monitoring daily record (HSE daily monitoring record) to keep the data of the formation and transportation of waste and register it in the daily record. | The quantity of the collected wastes in 4 containers transported from April 9th, 2018 to June 18th, 2018 is 3.9m ³ . | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KM) Zhang Wenjin <u>See picture 4</u> |
| Storage and Handling of construction materials, fuel and lubricants | N/A | N/A | N/A | N/A | N/A | N/A |
| Noise from construction equipment; e.g. air Compressors | N/A | N/A | N/A | N/A | N/A | N/A |
| Dust | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | |
|---|---|---|------------------------------------|---|---|--|
| Worker Health and Safety | Accident and incapacity | Contractors must make safety plans to ensure the safety of workplace. Workers should be provided with safety equipment and directed to use it. | Construction Manager Li Changku | Make No.1 plan, and guide the workers at site, provide personal protection equipment to the workers, and guide them according to No. 1 plan(instruction). | Every season | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KM) Zhang Wenjin <u>See picture 5,6,7,8,9</u> |
| Solid and liquid waste management | Complying with the requirements for storage of production and household waste, and placing separate waste containers (dustbin) (4 pieces) | Signed contract with a professional company designated by the local authority, ie ДУК «Тоза-Худуд» (Kogon city Bukhara Oblast) | Construction Manager Li Changku | Perform daily HSE monitoring and register in the primary monitoring daily record (HSE daily monitoring record) to keep the data of the formation and transportation of waste and register it in the daily record. | Every day Clean up the waste container before the volume of the garbage is less than 2/3 of the container's volume | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KM) Zhang Wenjin <u>See picture 4</u> |
| Transport of equipment and material in existing roads | N/A | N/A | N/A | N/A | N/A | N/A |
| Rehabilitation and closing of construction sites | N/A | N/A | N/A | N/A | N/A | N/A |
| Inspection and acceptance of construction works before handing over | N/A | N/A | N/A | N/A | N/A | N/A |

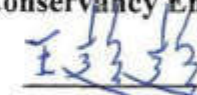
Prepared by:

HSE Officer

Б.А. Тиллабоев

«УТВЕРЖДАЮ»

Представитель подрядчика
СП «HEBEI Construction Group Co., Ltd &
HEBEI Water Conservancy Engineering Bureau»

 Wang Chaochao
15 августа 2018 г.

Ежемесячный отчёт по экологическому мониторингу
за ИЮЛЬ месяц 2018 г.
по объекту «Реабилитация и модернизация насосной станции Куин-Мазар»

| Снижение воздействия на окружающую среду | | | | Мониторинг воздействия | | |
|---|---|--|--|--|---------------------------|---|
| Проектная деятельность | Возможное воздействие на окружающую среду | Предлагаемые меры по снижению воздействия | Ответственные лица за проведение мероприятий | Параметры, по которым проводится мониторинг | Частота и методы проверки | Ответственные лица за мониторинг |
| А. Основные выводы: Контракт ABISRP/NCB/03: | | | | | | |
| Миссия рекомендовала покрывать контейнеры для муниципальных отходов и создавать зону опасных отходов с бетонным грунтом, кровлей и вторичным контейнером/поддоном для сбора капель. | | Покрывать контейнеры для муниципальных отходов и создавать зону опасных отходов с бетонным грунтом, кровлей и вторичным контейнером/поддоном для сбора капель. | Менеджер по строительству Li Changku | Установлены крышки для мусорных контейнеров и контейнеры установлены на бетонном покрове. | Выполнено/ Постоянно | Специалист по ОТ, ТБ и ООС (местный) Баходир Тиллабоев и Международный специалист по экологии Zhang Wenjin <u>См. рисунок 1</u> |
| В. Согласованные мероприятия: | | | | | | |
| 4) Система экологической регистрации будет создана с отдельной папкой для экологических документов, хранящихся на территории лагеря, к концу марта 2018 года. | | Компоновки (далее – создать) документации по охране труда, техники безопасности и охраны окружающей среды в папки. | Менеджер по строительству Li Changku | Система экологической регистрации создана с отдельной папкой для экологических документов на территории лагеря в кабинете ОТ, ТБ и | Выполнено/ Постоянно | Специалист по ОТ, ТБ и ООС (местный) Баходир Тиллабоев и Международный специалист по экологии Zhang Wenjin <u>См. рисунок 2</u> |

| | | | | | | |
|---|---|--|---|--|---|---|
| | | | | ООС. | | |
| 5) Книги и ящик для жалоб должны быть доступны в лагере до начала строительных работ. | | Завести журнал регистрации жалоб и установить ящик для жалоб. | Менеджер по строительству Li Changku | В лагере заведена книга жалоб и установлен ящик для жалоб. | Выполнено | Специалист по ОТ, ТБ и ООС (местный) БаходирТиллабоев и Международный специалист по экологии ZhangWenjin <u>См.рисунок 3</u> |
| ФАЗА СТРОИТЕЛЬСТВА | | | | | | |
| Вырубка деревьев в участках строительства | N/A | N/A | N/A | N/A | N/A | N/A |
| Подготовка участка | N/A | N/A | N/A | N/A | N/A | N/A |
| Земельные работы и открытие котлована | N/A | N/A | N/A | N/A | N/A | N/A |
| Работы по реконструкции ввегетационный период | N/A | N/A | N/A | N/A | N/A | N/A |
| Уборка ивывозмусора | Соблюдаются требования раздельного хранения отходов производства и потребления, установлены раздельные контейнера (4 ед.) | Заключен договор со специализированными организациями санкционированными местными органами,а именно с ДУК «Тоза-Худуд» города Когона, Бухарской области. | Менеджер по строительству Li Changku | Ведется ежедневный мониторинг по ООС, ОТ и ТБ с регистрацией в журнале первой ступени контроля (RegistrationLog-BookofDailyHSEmonitring), учет образования и движения отходов с регистрацией в журнале. | с 09.04-по 18.06.2018 г. количество (вывоз) убранный контейнеров 4 ед./3,9 м3 | Специалист по ОТ, ТБ и ООС (местный) БаходирТиллабоев и Международный специалист по экологии ZhangWenjin <u>См.рисунок4</u> |
| Хранение и обращение состроительными и горяче смазочными материалами | N/A | N/A | N/A | N/A | N/A | N/A |
| Шум от строительного оборудования, например, от воздушных компрессоров | N/A | N/A | N/A | N/A | N/A | N/A |
| Пыль | N/A | N/A | N/A | N/A | N/A | N/A |
| Безопасность и здоровье рабочих | Несчастные случаи и потеря трудо- | Подрядчик должен проводить программу по обеспечению | Менеджер по строительству Li Changku | Разработана программа №1 по проведению | Ежеквартально | Специалист по ОТ, ТБ и ООС (местный) БаходирТиллабоев и |



| | | | | | | |
|--|---|---|---|---|--|--|
| | способности | безопасности рабочего места. Рабочие должны быть обеспечены оборудованием по безопасности труда и проинструктированы о его использовании. | | инструктажа на рабочем месте для разнорабочего. Рабочие обеспечены средствами индивидуальной защиты и проведен (проинструктированы) инструктаж согласно программе №1. | | Международный специалист по экологии ZhangWenjin <u>См.рисунок 5,6,7,8,9</u> |
| Управление твердыми и жидкими отходами | Соблюдаются требования раздельного хранения отходов производства и потребления, установлены раздельные контейнера (4 ед.) | Заключен договор со специализированными организациями санкционированными местными органами, а именно с ДУК «Тоза-Худуд» города Когона, Бухарской области. | Менеджер по строительству Li Changku | Ведется ежедневный мониторинг по ООС, ОТ и ТБ с регистрацией в журнале первой ступени контроля (RegistrationLog-BookofDailyHSEmonitoring), учет образования и движения отходов с регистрацией в журнале. | Мусорные контейнерыочищаются при заполнении не более чем на 2/3 их объема. | Специалист по ОТ, ТБ и ООС (местный) БаходирТиллабоев и Международный специалист по экологии ZhangWenjin <u>См.рисунок4</u> |
| Транспортировка оборудования иматериалов по существующим дорогам | N/A | N/A | N/A | N/A | N/A | N/A |
| Реабилитация и закрытие строительных участков | N/A | N/A | N/A | N/A | N/A | N/A |
| Обследование и принятие строительных работ до передачи объекта. | N/A | N/A | N/A | N/A | N/A | N/A |

Составил:

Специалист по ОТ, ТБ и ООС

Б.А. Тиллабоев



Picture/РИСУНОК 1



Picture/ РИСУНОК 2



Picture/ РИСУНОК 3



| № п/п | Дата обращения за отходами | Класс отходов, код по классу | Класс опасности | Наименование организации, осуществляющей обращение с отходами | Решение комиссии по отходам (протокол) | Ф.И.О. ответственного лица | Ф.И.О. должностное лицо (подпись) | Подпись ответственного лица |
|-------|----------------------------|------------------------------|-----------------|---|---|----------------------------|-----------------------------------|-----------------------------|
| 1 | 10.01.2018 | 1.3.1 | V-S | Общество с ограниченной ответственностью 'Белгородский завод строительных материалов' | Решение комиссии по отходам от 10.01.2018 | Иванов И.И. | Иванов И.И. | Иванов И.И. |
| 2 | 10.01.2018 | 1.3.1 | V-S | Общество с ограниченной ответственностью 'Белгородский завод строительных материалов' | Решение комиссии по отходам от 10.01.2018 | Иванов И.И. | Иванов И.И. | Иванов И.И. |
| 3 | 10.01.2018 | 1.3.1 | V-S | Общество с ограниченной ответственностью 'Белгородский завод строительных материалов' | Решение комиссии по отходам от 10.01.2018 | Иванов И.И. | Иванов И.И. | Иванов И.И. |



Picture/РИСУНОК 4

«ПРЕДВАР»
Механизм по строительству
ПУ «HBCG Construction Group Co., Ltd»
по объекту «Ремонтные и монтажные
работы здания «Куб-Мастер»
г. Стамбул
15.05.2018 г.

Программа №1
проведения инструктажа на рабочем месте для РАБОТНИКОВ

| № п/п | Номер инструкции на объекте | Наименование инструкции по охране труда | Количество часов Время проведения инструктажа по инструкции | Примечание |
|----------|--------------------------------|---|--|------------|
| 1. | ОТ-КМ-019-2018 | Инструкция по охране труда для рабочих (исполнителей работ) | 20 мин. | |
| 2. | ОТ-КМ-03-2018 | Инструкция для работников по эксплуатации | 15 мин. | |
| 3. | ОТ-КМ-04-2018 | Инструкция по технике пожарной безопасности | 15 мин. | |
| 4. | ОТ-КМ-05-2018 | Инструкция по пожарной безопасности | 15 мин. | |
| 5. | ОТ-КМ-09-2018 | Инструкция по охране труда при работе с ручными электроинструментами | 15 мин. | |
| 6. | ОТ-КМ-015-2018 | Инструкция по охране труда при производстве работ на высоте | 10 мин. | |

Итого: 90 мин.

Разработал:
Специалист ОТ, ТБ и ОД (HSE)
Б.Талибов

Компания HBCG Construction Group Co., Ltd

**ЖУРНАЛ
РЕГИСТРАЦИИ ИНСТРУКТАЖЕЙ
НА РАБОЧЕМ МЕСТЕ/
REGISTRATION
LOG BOOK OF INSTRUCTIONS AT THE
WORKPLACE**

«HBCG Construction Group Co., Ltd»

Итого: 90 мин.

Picture /ПИСУНОК5

1. *Quercus*
 2. *Pinus*
 3. *Abies*
 4. *Larix*
 5. *Thuja*
 6. *Juniper*
 7. *Podocarpus*
 8. *Taxus*
 9. *Yew*
 10. *Cedrus*
 11. *Juniper*
 12. *Thuja*
 13. *Podocarpus*
 14. *Taxus*
 15. *Yew*
 16. *Cedrus*
 17. *Juniper*
 18. *Thuja*
 19. *Podocarpus*
 20. *Taxus*
 21. *Yew*
 22. *Cedrus*
 23. *Juniper*
 24. *Thuja*
 25. *Podocarpus*
 26. *Taxus*
 27. *Yew*
 28. *Cedrus*
 29. *Juniper*
 30. *Thuja*
 31. *Podocarpus*
 32. *Taxus*
 33. *Yew*
 34. *Cedrus*
 35. *Juniper*
 36. *Thuja*
 37. *Podocarpus*
 38. *Taxus*
 39. *Yew*
 40. *Cedrus*
 41. *Juniper*
 42. *Thuja*
 43. *Podocarpus*
 44. *Taxus*
 45. *Yew*
 46. *Cedrus*
 47. *Juniper*
 48. *Thuja*
 49. *Podocarpus*
 50. *Taxus*
 51. *Yew*
 52. *Cedrus*
 53. *Juniper*
 54. *Thuja*
 55. *Podocarpus*
 56. *Taxus*
 57. *Yew*
 58. *Cedrus*
 59. *Juniper*
 60. *Thuja*
 61. *Podocarpus*
 62. *Taxus*
 63. *Yew*
 64. *Cedrus*
 65. *Juniper*
 66. *Thuja*
 67. *Podocarpus*
 68. *Taxus*
 69. *Yew*
 70. *Cedrus*
 71. *Juniper*
 72. *Thuja*
 73. *Podocarpus*
 74. *Taxus*
 75. *Yew*
 76. *Cedrus*
 77. *Juniper*
 78. *Thuja*
 79. *Podocarpus*
 80. *Taxus*
 81. *Yew*
 82. *Cedrus*
 83. *Juniper*
 84. *Thuja*
 85. *Podocarpus*
 86. *Taxus*
 87. *Yew*
 88. *Cedrus*
 89. *Juniper*
 90. *Thuja*
 91. *Podocarpus*
 92. *Taxus*
 93. *Yew*
 94. *Cedrus*
 95. *Juniper*
 96. *Thuja*
 97. *Podocarpus*
 98. *Taxus*
 99. *Yew*
 100. *Cedrus*

Handwritten signature

Picture/ПИСУНОК 6

Handwritten: *Відомості про виконавців*
 (Information about executors)

| Дата виконання, або справа виконана (Date of execution, or case completed) | Відомості про виконавця (Information about the executor) | Відомості про виконавця (Information about the executor) | |
|---|---|---|---|
| | | Відомості про виконавця (Information about the executor) | Відомості про виконавця (Information about the executor) |
| 10/10/2017 | Виконавці: <i>Виконавці: [illegible]</i> [illegible] | 10 | [illegible] |
| 10/10/2017 | Виконавці: <i>Виконавці: [illegible]</i> [illegible] | 10 | [illegible] |
| 10/10/2017 | Виконавці: <i>Виконавці: [illegible]</i> [illegible] | 10 | [illegible] |

Handwritten: *Відомості про виконавців*
 (Information about executors)

| Дата виконання, або справа виконана (Date of execution, or case completed) | Відомості про виконавця (Information about the executor) | Відомості про виконавця (Information about the executor) | |
|---|---|---|---|
| | | Відомості про виконавця (Information about the executor) | Відомості про виконавця (Information about the executor) |
| 10/10/2017 | Виконавці: <i>Виконавці: [illegible]</i> [illegible] | 10 | [illegible] |
| 10/10/2017 | Виконавці: <i>Виконавці: [illegible]</i> [illegible] | 10 | [illegible] |
| 10/10/2017 | Виконавці: <i>Виконавці: [illegible]</i> [illegible] | 10 | [illegible] |

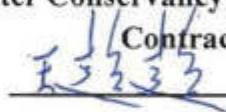
Picture/РИСУНОК 7

| Инструкция (Instruction) Full name | | Инструкция (Instruction) Trade (position) | |
|--|--|---|--|
| Дата подписания, или дата окончания действия документа (Signature date, date of expiration of instruction) | Тема инструкции (содержит наименование инструкции, на которую выдается подпись, на которой осуществляется подпись) | Подпись инструктора (Signature) | Подпись инструктируемого (Signature) |
| 06/05/2017 | Содержит сведения о выполнении инструкции на листе | Li Huan, Dan | Li Huan, Dan |
| 06/05/2017 | Содержит сведения о выполнении инструкции на листе | Li Huan, Dan | Li Huan, Dan |

Picture /ПИСУНОК 8

[illegible]

Picture /ПИСУНОК 9

Approved by
JV Hebei Construction Group Co.LTD.
& Hebei Water Conservancy Engineering Bureau

Contractor's Representative
Wang Chaochao
15, August 2018

Rehabilitation and Modernization of Kizil Tepa Pump Station
July of 2018 Monthly Environmental Monitoring Report

| IMPACT MITIGATION | | | | IMPACT MONITORING | | |
|--|-----------------------------------|---|--------------------------------------|---|-----------------------------------|---|
| Project Activity | Potential Environmental Impact(s) | Proposed Mitigation Measures | Implementing Responsibility | Parameter to be monitored | Frequency and means of monitoring | Monitoring Responsibility |
| A. Main Conclusions: Contract ABISRP/NCB/03: | | | | | | |
| The mission advised to cover municipal waste containers. Establish hazardous waste area with concrete ground, roofing, and with secondary container/drip tray. | | Cover the municipal waste containers. Establish hazardous waste area with concrete ground, roofing, and with secondary container/drip tray. | Construction Manager Zheng Suchen | Add a cover to the waste containers, and put it on the concrete ground | Completed/ Permanent | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KT) Hao Zhe <u>See picture 1</u> |
| B. Agreed Actions: | | | | | | |
| 4) Environmental recording system to be established with separate folder for environmental documents kept at the camp site by the end of March, 2018. | | Set (hereinafter referred to as establish) HSE folders | Construction Manager Zheng Suchen | Environmental recording system has already been established, and a separated folder for environmental documents has been set and kept at HSE office at camp site. | Completed/ Permanent | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KT) Hao Zhe <u>See picture 1</u> |
| 5) GRM logbooks and | | | Construction | GRM logbooks and | Completed | HSE Officer (Local) |

| | | | | | | |
|---|---|--|--------------------------------------|---|---|--|
| grievance box to be available at the camp site before commencement of construction works. | | | Manager Zheng Suchen | grievance box have already been set at the camp site. | | БаходирТиллабоев , International HSE Officer (KT) Hao Zhe <u><i>See picture 2</i></u> |
| Construction Stage | | | | | | |
| Removal of trees in construction sites | N/A | N/A | N/A | N/A | N/A | N/A |
| Site preparation | N/A | N/A | N/A | N/A | N/A | N/A |
| Excavation of sites and opening of borrow pits | N/A | N/A | N/A | N/A | N/A | N/A |
| Rehabilitation activities during cropping season | N/A | N/A | N/A | N/A | N/A | N/A |
| Removal and transportation of debris | Complying with the requirements for storage of production and household waste, and placing separate waste containers (dustbin) (4 pieces) | Signed contract with a professional company designated by the local authority, ie ДУК «Тоза-Худуд» (Kizil Tepa city, Navoi oblast), Contract No. 2/27, February 26, 2018 | Construction Manager Zheng Suchen | Perform daily HSE monitoring and register in the primary monitoring daily record (HSE daily monitoring record) to keep the data of the formation and transportation of waste and register it in the daily record. | The quantity of the collected wastes in the containers transported from June 11th, 2018 to July 20th, 2018 is 6m ³ . The construction wastes are transported 15 times. | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KT) Hao Zhe <u><i>See picture 3</i></u> |
| Storage and Handling of construction materials, fuel and lubricants | N/A | N/A | N/A | N/A | N/A | N/A |
| Noise from construction equipment; e.g. air Compressors | N/A | N/A | N/A | N/A | N/A | N/A |
| Dust | N/A | N/A | N/A | N/A | N/A | N/A |
| Worker Health and Safety | N/A | N/A | N/A | N/A | N/A | N/A |

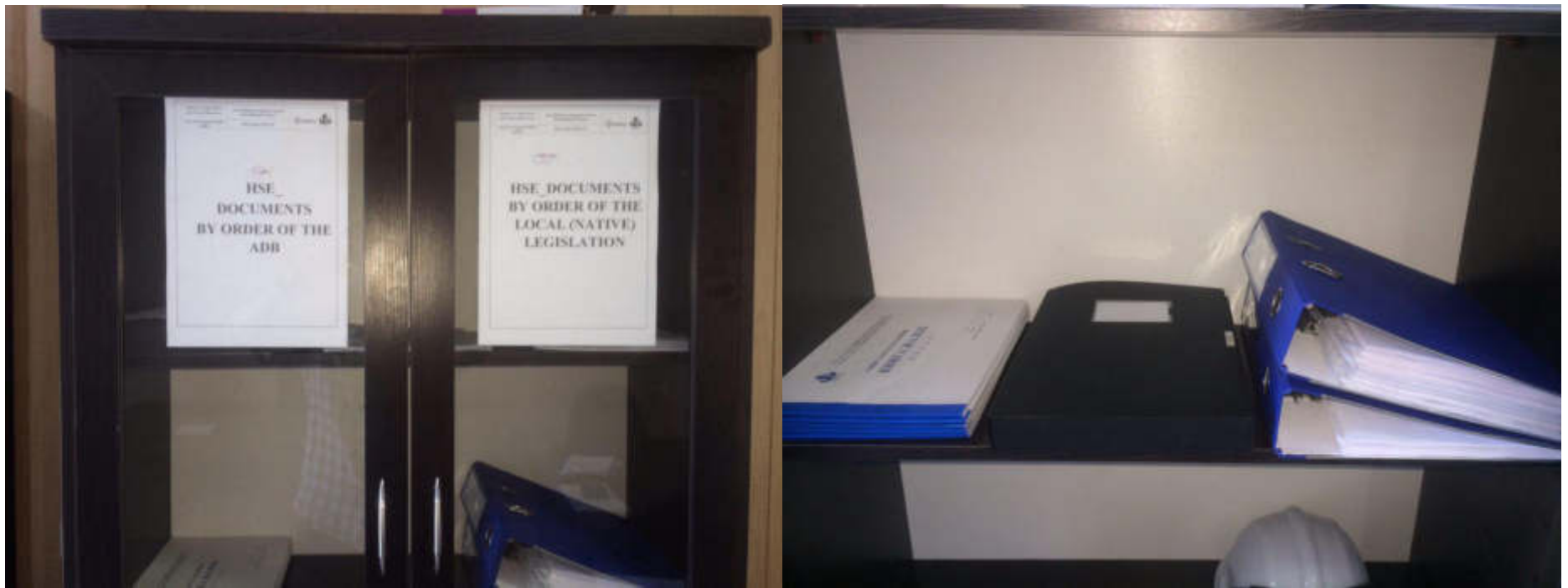


| | | | | | | |
|---|---|--|--------------------------------------|---|--|---|
| Solid and liquid waste management | Complying with the requirements for storage of production and household waste, and placing separate waste containers (dustbin) (4 pieces) | Signed contract with a professional company designated by the local authority, ie ДУК «Тоза-Худуд» (Kizil Tepa city, Navoi oblast), Contract No. 2/27, February 26, 2018 | Construction Manager Zheng Suchen | Perform daily HSE monitoring and register in the primary monitoring daily record (HSE daily monitoring record) to keep the data of the formation and transportation of waste and register it in the daily record. | Clean up the waste container before the volume of the garbage is less than 2/3 of the container's volume | HSE Officer (Local) БаходирТиллабоев , International HSE Officer (KT) Hao Zhe <u>See picture 4</u> |
| Transport of equipment and material in existing roads | N/A | N/A | N/A | N/A | N/A | N/A |
| Rehabilitation and closing of construction sites | N/A | N/A | N/A | N/A | N/A | N/A |
| Inspection and acceptance of construction works before handing over | N/A | N/A | N/A | N/A | N/A | N/A |

Prepared by:

HSE Officer

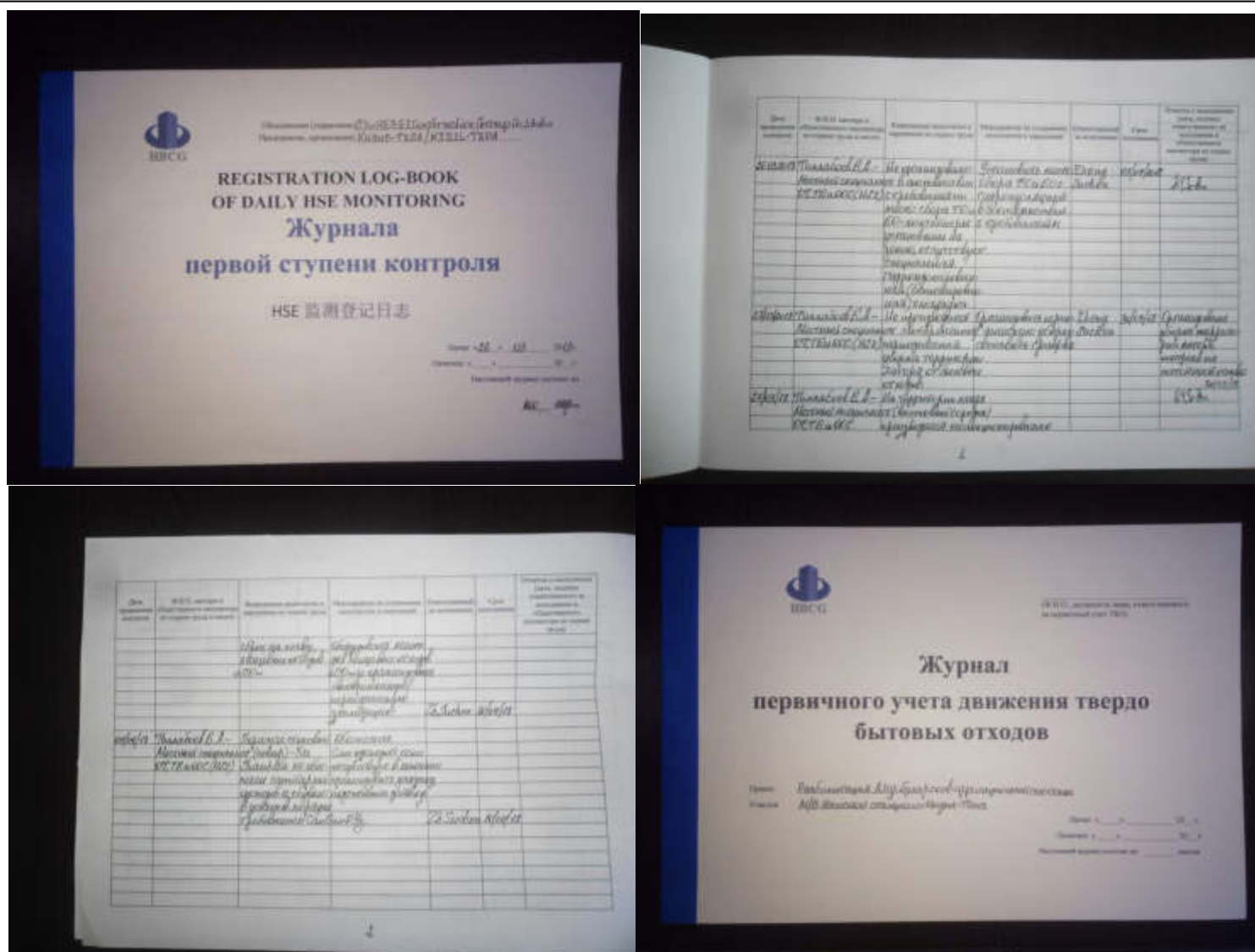
Б.А. Тиллабоев



Picture 1



Picture 2



Picture 3

[illegible]

1. Species Name AI
 2. Year 1981 June 11-12, 1981
 3. Location W.C. 434
 4. Time 10:00 AM
 5. Observer W.C. 434
 6. Notes AI
 7. Remarks AI
 8. Signature W.C. 434
 9. Date 1981

7

«УТВЕРЖДАЮ»

Представитель подрядчика
СП «HEBEI Construction Group Co., Ltd &
HEBEI Water Conservancy Engineering Bureau»

 Wang Chaochao
15 августа 2018 г.

Ежемесячный отчёт по экологическому мониторингу
за ИЮЛЬ месяц 2018 г.
по объекту «Реабилитация и модернизация насосной станции Кизил-Тепе»

| Снижение воздействия на окружающую среду | | | | Мониторинг воздействия | | |
|---|---|--|--|--|---------------------------|--|
| Проектная деятельность | Возможное воздействие на окружающую среду | Предлагаемые меры по снижению воздействия | Ответственные лица за проведение мероприятий | Параметры, по которым проводится мониторинг | Частота и методы проверки | Ответственные лица за мониторинг |
| А. Основные выводы: Контракт ABISRP/NCB/03: | | | | | | |
| Миссия рекомендовала покрывать контейнеры для муниципальных отходов и создавать зону опасных отходов с бетонным грунтом, кровлей и вторичным контейнером/поддоном для сбора капель. | | Покрывать контейнеры для муниципальных отходов и создавать зону опасных отходов с бетонным грунтом, кровлей и вторичным контейнером/поддоном для сбора капель. | Менеджер по строительству Zheng Suchen | Установлены крышки для мусорных контейнеров и контейнеры установлены на бетонном покрове с отбортовкой. | Выполнено/ Постоянно | Специалист по ОТ, ТБ и ООС (местный) Баходир Тиллабоев и Международный специалист по экологии Hao Zhe |
| В. Согласованные мероприятия: | | | | | | |
| 4) Система экологической регистрации будет создана с отдельной папкой для экологических документов, хранящихся на территории лагеря, к концу марта 2018 года. | | Компоновки (далее – создать) документации по охране труда, техники безопасности и охраны окружающей среды в папки. | Менеджер по строительству Zheng Suchen | Система экологической регистрации создана с отдельной папкой для экологических документов на территории лагеря в кабинете ОТ, ТБ и | Выполнено/ Постоянно | Специалист по ОТ, ТБ и ООС (местный) Баходир Тиллабоев и Международный специалист по экологии Hao Zhe <u>См. рисунок 1</u> |

| | | | | | | |
|---|---|---|---|--|---|---|
| | | | | ООС. | | |
| 5) Книги и ящик для жалоб должны быть доступны в лагере до начала строительных работ. | | Завести журнал регистрации жалоб и установить ящик для жалоб. | Менеджер по строительству Zheng Suchen | В лагере заведена книга жалоб и установлен ящик для жалоб. | Выполнено | Специалист по ОТ, ТБ и ООС (местный) Баходир Тиллабоев и Международный специалист по экологии Hao Zhe <u>См.рисунок 2</u> |
| ФАЗА СТРОИТЕЛЬСТВА | | | | | | |
| Вырубка деревьев в участках строительства | N/A | N/A | N/A | N/A | N/A | N/A |
| Подготовка участка | N/A | N/A | N/A | N/A | N/A | N/A |
| Земельные работы и открытие котлована | N/A | N/A | N/A | N/A | N/A | N/A |
| Работы по реконструкции в вегетационный период | N/A | N/A | N/A | N/A | N/A | N/A |
| Уборка и вывоз мусора | Соблюдаются требования раздельного хранения отходов производства и потребления, установлены раздельные контейнера (3 ед.) | Заключен договор со специализированными организациями санкционированными местными органами, а именно с ДУК «Тоза-Худуд» города Кызыл-Тепа, Навоийской области. Договор №2/27 от 26.02.2018 г. | Менеджер по строительству Zheng Suchen | 1. Ведется ежедневный мониторинг по ООС, ОТ и ТБ с регистрацией в журнале первой степени контроля (Registration Log-Book of Daily HSE monitoring) , учет образования и движения отходов с регистрацией в журнале. | с 11.06-по 20.07.2018 г. количество (вывоз) убранный контейнеров 6 м3 и 15 рейсов строительных отходов. | Специалист по ОТ, ТБ и ООС (местный) Баходир Тиллабоев и Международный специалист по экологии Hao Zhe <u>См.рисунок 3</u> |
| Хранение и обращение со строительными и горюче-смазочными материалами | N/A | N/A | N/A | N/A | N/A | N/A |
| Шум от строительного оборудования, например, от воздушных компрессоров | N/A | N/A | N/A | N/A | N/A | N/A |
| Пыль | N/A | N/A | N/A | N/A | N/A | N/A |
| Безопасность и здоровье рабочих | N/A | N/A | N/A | N/A | N/A | N/A |



| | | | | | | |
|---|---|---|---|---|---|--|
| Управление твердыми и жидкими отходами | Соблюдаются требования раздельного хранения отходов производства и потребления, установлены раздельные контейнера (3 ед.) | Заключен договор со специализированными организациями санкционированными местными органами, а именно с ДУК «Тоза-Худуд» города Кызыл-Тепе, Навоийской области. Договор №2/27 от 26.02.2018 г. | Менеджер по строительству Zheng Suchen | Ведется ежедневный мониторинг по ООС, ОТ и ТБ с регистрацией в журнале первой ступени контроля (Registration Log-Book of Daily HSE monitoring) , учет образования и движения отходов с регистрацией в журнале. | Мусорные контейнеры очищаются при заполнении не более чем на 2/3 их объема. | Специалист по ОТ, ТБ и ООС (местный) Баходир Тиллабоев и Международный специалист по экологии Hao Zhe <u>См.рисунок 4</u> |
| Транспортировка оборудования и материалов по существующим дорогам | N/A | N/A | N/A | N/A | N/A | N/A |
| Реабилитация и закрытие строительных участков | N/A | N/A | N/A | N/A | N/A | N/A |
| Обследование и принятие строительных работ до передачи объекта. | N/A | N/A | N/A | N/A | N/A | N/A |

Составил:

Специалист по ОТ, ТБ и ООС

Б.А. Тиллабоев

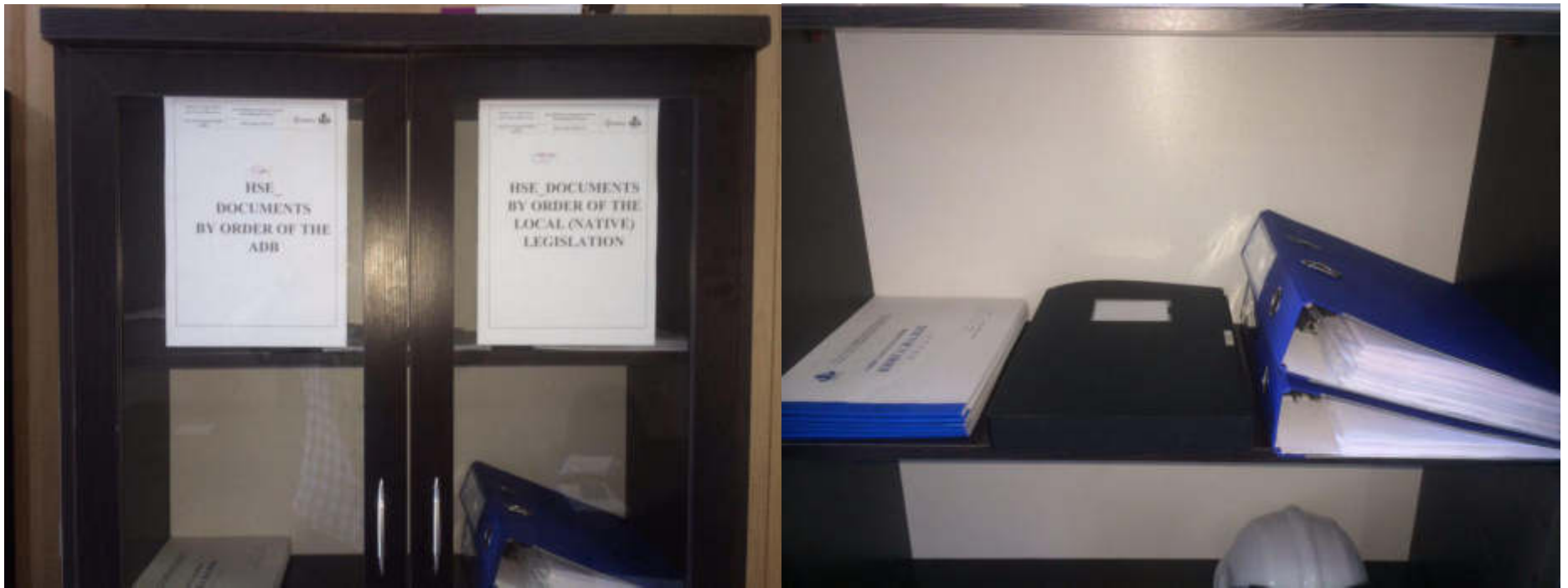


РИСУНОК 1



РИСУНОК 2

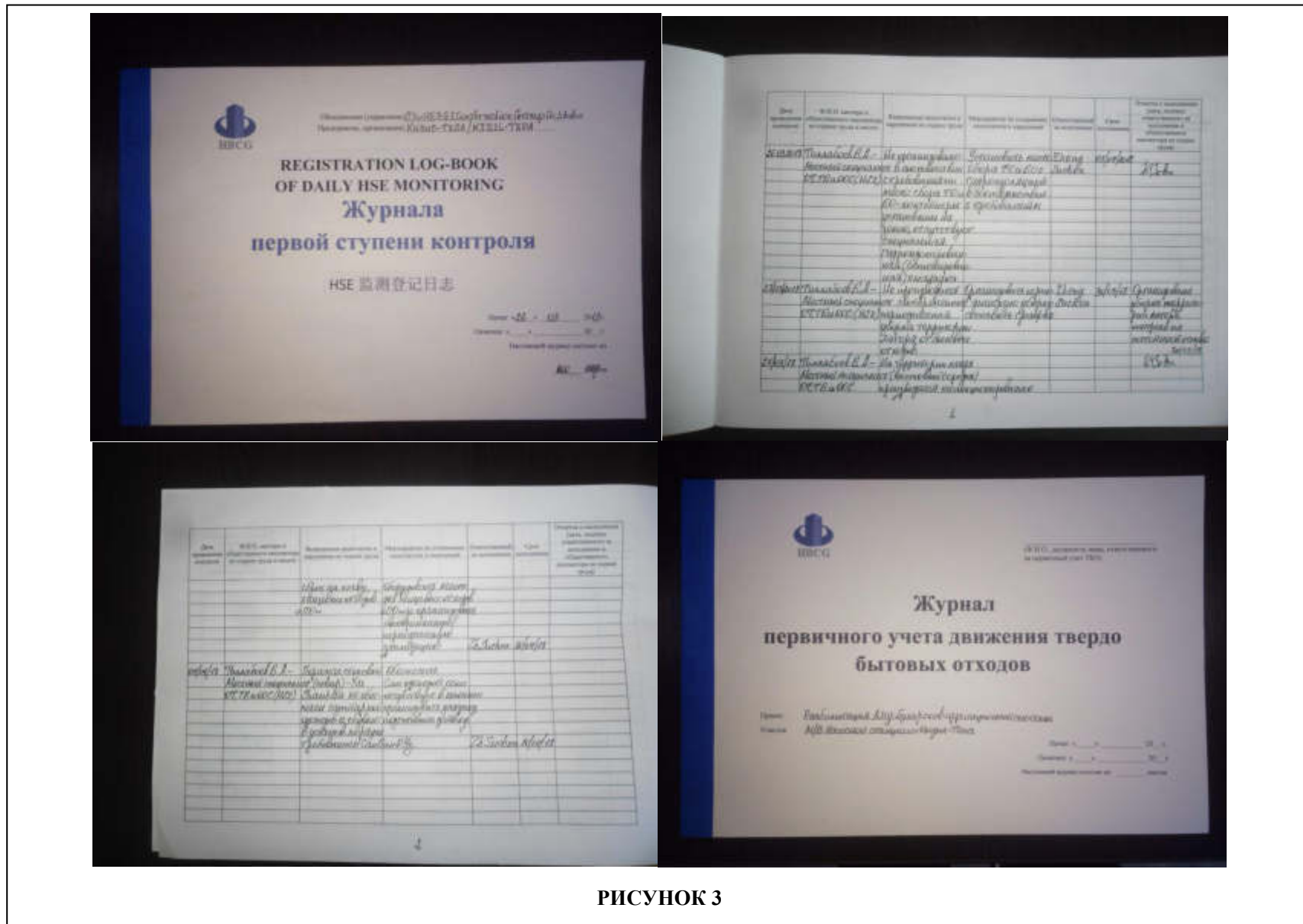
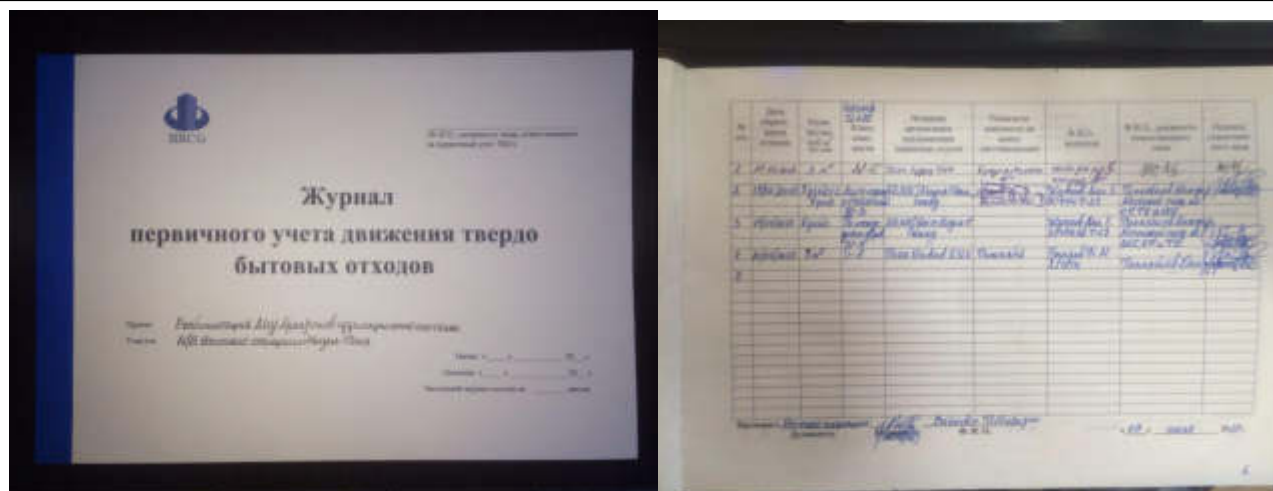
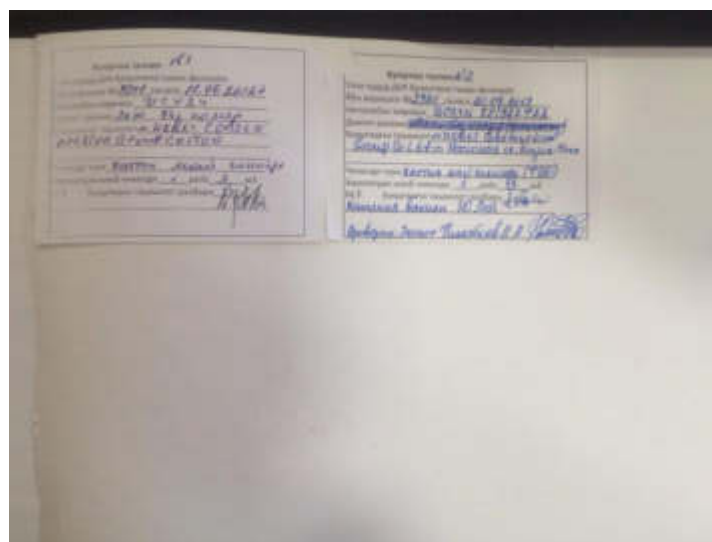


РИСУНОК 3



The image shows the cover and the first page of a waste movement journal. The cover is white with a blue HBCG logo at the top left. The title is "Журнал первичного учета движения твердо бытовых отходов" (Journal of primary accounting of the movement of solid household waste). Below the title, there are fields for "Имя" (Name) and "Фамилия" (Surname), both filled with handwritten text. The first page is a table with columns for "Дата" (Date), "Время" (Time), "Место" (Place), "Вид отходов" (Type of waste), "Количество" (Quantity), "Подпись" (Signature), and "Подпись" (Signature). The table contains several rows of handwritten data.

| Дата | Время | Место | Вид отходов | Количество | Подпись | Подпись |
|--------------|-------|-------|-------------|------------|---------|---------|
| 1. 10.10.10 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| 2. 10.10.10 | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 |
| 3. 10.10.10 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| 4. 10.10.10 | 13.00 | 13.00 | 13.00 | 13.00 | 13.00 | 13.00 |
| 5. 10.10.10 | 14.00 | 14.00 | 14.00 | 14.00 | 14.00 | 14.00 |
| 6. 10.10.10 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 |
| 7. 10.10.10 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 |
| 8. 10.10.10 | 17.00 | 17.00 | 17.00 | 17.00 | 17.00 | 17.00 |
| 9. 10.10.10 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 |
| 10. 10.10.10 | 19.00 | 19.00 | 19.00 | 19.00 | 19.00 | 19.00 |



The image shows two pages of a waste movement journal. The left page is titled "Журнал первичного учета движения твердо бытовых отходов" (Journal of primary accounting of the movement of solid household waste) and contains handwritten data. The right page is titled "Журнал первичного учета движения твердо бытовых отходов" (Journal of primary accounting of the movement of solid household waste) and contains handwritten data. Both pages have columns for "Дата" (Date), "Время" (Time), "Место" (Place), "Вид отходов" (Type of waste), "Количество" (Quantity), "Подпись" (Signature), and "Подпись" (Signature).

| Дата | Время | Место | Вид отходов | Количество | Подпись | Подпись |
|--------------|-------|-------|-------------|------------|---------|---------|
| 1. 10.10.10 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| 2. 10.10.10 | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 | 11.00 |
| 3. 10.10.10 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| 4. 10.10.10 | 13.00 | 13.00 | 13.00 | 13.00 | 13.00 | 13.00 |
| 5. 10.10.10 | 14.00 | 14.00 | 14.00 | 14.00 | 14.00 | 14.00 |
| 6. 10.10.10 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 |
| 7. 10.10.10 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 |
| 8. 10.10.10 | 17.00 | 17.00 | 17.00 | 17.00 | 17.00 | 17.00 |
| 9. 10.10.10 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 | 18.00 |
| 10. 10.10.10 | 19.00 | 19.00 | 19.00 | 19.00 | 19.00 | 19.00 |

РИСУНОК 4

**ANNEX IV ACOUSTIC REPORT FOR KUYU MAZAR PUMP STATION (ABISRP 03.1)
AND KIZIL TEPA PUMP STATION (ABISRP 03.2) CONSTRUCTION SITES**

ANNEX IV

ACOUSTIC REPORT

FOR

KUYU MAZAR PUMP STATION (ABISRP 03.1)

AND

KIZIL TEPA PUMP STATION (ABISRP 03.2)

CONSTRUCTION SITES

CONTENTS

| | |
|---|----|
| A- GENERAL KNOWLEDGE..... | 1 |
| 1. Location of Sites | 1 |
| 2. Regulations Applied for Noise Control..... | 1 |
| a) National Noise Legislation of Republic of Uzbekistan | 1 |
| b) International Standards..... | 3 |
| 3. Nearest Receptor to the Working Areas | 4 |
| 4. Climatological Propertis at Construction Site..... | 4 |
| 5. Workind Period | 4 |
| B- NOISE EMISSIONS DURING THE CONSTRUCTION WORKS | 5 |
| 1. Sound Level of Equipments Used | 5 |
| 2. Sources of Noise..... | 8 |
| 3. Calculation of Equivalent Sound Level | 9 |
| a) Kuyu Mazar Pumping Station Construction Site..... | 9 |
| b) Kizil Tepa Pumping Station Construction Site | 15 |
| 4. Comparision of Results with Existing Legislation | 20 |
| a) Kuyu Mazar Pumping Station Construction Site..... | 20 |
| b) Kizil Tepa Pumping Station Construction Site | 20 |

LIST OF TABLES

| | |
|---|----|
| Table 1. Uzbek construction noise norms (KMK 2.01.08 96 —Protection from noise) | 1 |
| Table 2. Admissible noise level into the living area, both inside and outside the buldings (SanR&N No.0267-09) | 3 |
| Table 3. Noise Level Guideline (EHS) | 3 |
| Table 4. Permissible Sound Power Level of Equipments..... | 5 |
| Table 5. The Number of Vehicles and Equipments and their Sound Levels at Kuyu Mazar Pumping Station Construction Site | 8 |
| Table 6. The Number of Vehicles and Equipments and their Sound Levels at Kizil Tepa Pumping Station Construction Site | 9 |
| Table 7. Sound Pressure Level at all Directions Originated from Kuyu Mazar Pumping Station Construction Site | 9 |
| Table 8. Sound Pressure Level at all Directions Originated from Kuyu Mazar Pumping Station Construction Site | 10 |
| Table 9. Correction Factors for db(A) for the Frequencies between 500 Hz and 4000 H | 11 |
| Table 10. Corrected Sound Power Level at Kuyu Mazar Pumping Station Construction Site | 11 |
| Table 11. Atmospheric Absorption Value for Different Frequencies | 12 |
| Table 12. Total Sound Level at Kuyu Mazar Pumping Station Construction Site | 13 |
| Table 13. Equivalent Sound Levels at Kizil Tepa Pumping Station Construction Site | 14 |
| Table 14. Sound Pressure Level at all Directions Originated from Kizil Tepa Pumping Station Construction Site | 15 |
| Table 15. Sound Pressure Level at all Directions Originated from Kizil Tepa Pumping Station Construction Site | 16 |
| Table 16. Corrected Sound Power Level at Kizil Tepa Pumping Station Construction Site | 17 |
| Table 17. Total Sound Level at Kizil Tepa Pumping Station Construction Site | 18 |
| Table 18. Equivalent Sound Levels at Kizil Tepa Pumping Station Construction Site | 19 |
| Table 19. Comparison of Equivalent Sound Levels with the National and International Standards..... | 20 |

LIST OF FIGURES

| | |
|---|----|
| Figure 1. Equivalent Sound Level (L_{eq}) Variation Versus Distance at Kuyu Mazar Pumping Station Construction Site | 14 |
| Figure 2. Equivalent Sound Level (L_{eq}) Variation Versus Distance at Kizil Tepa Pumping Station Construction Site | 19 |

A- GENERAL KNOWLEDGE

1. Location of Sites

Kuyu Mazar Pump Station (ABISRP 03.1) Construction site has been located approximately 4.5 km away from southwest corner of Tudakul Lake.

Kizil Tepa Pump Station (ABISRP 03.2) Construction site has been located approximately 4 km away from Tudakul Lake.

2. Regulations Applied for Noise Control

a) National Noise Legislation of Republic of Uzbekistan

To ensure acceptable levels of sound pressure and sound levels in rooms, workplaces, industrial sites, in residential and public buildings, living areas of cities and other settlements the project must comply with a couple of Uzbek legislations

The Uzbek national construction noise norms that are relevant to all stages of the construction phase are provided by law KMK 2.01.08-96 —Protection from noise and detailed in Table 1 below.

Table 1. Uzbek construction noise norms (KMK 2.01.08 96 —Protection from noise)

| Premises and territories | Equivalent sound pressure levels, L_{eq} (dB) | | | | | | | | | Level of Sound, (dBA) |
|---|---|----|-----|-----|-----|------|------|------|------|-----------------------|
| | 31,5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 1. Hospital and sanatorium wards, operating hospitals | 68 | 51 | 39 | 31 | 24 | 20 | 17 | 14 | 13 | 25 |
| 2. Living rooms in apartments, living premises in rest/care homes, sleeping rooms in children boardingschools | 72 | 55 | 44 | 35 | 29 | 25 | 22 | 20 | 18 | 30 |
| 3. Doctor's offices in hospitals, sanatoriums, polyclinics, audience halls of concert-halls, rooms in hotel, living rooms in campus | 78 | 59 | 48 | 40 | 34 | 30 | 27 | 25 | 23 | 35 |
| 4. Hospital and sanatorium territories adjacent to the buildings | 78 | 59 | 48 | 40 | 34 | 30 | 27 | 25 | 23 | 35 |

| Premises and territories | Equivalent sound pressure levels, L_{eq} (dB) | | | | | | | | | Level of Sound, (dBA) |
|--|---|----|-----|-----|-----|------|------|------|------|-----------------------|
| | 31,5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 5. Territories adjacent to living houses (in 2 m from cladding structures), residential areas of neighbourhoods and housing estates, grounds of schools and preschool institutions, school territories | 84 | 67 | 57 | 49 | 44 | 40 | 37 | 35 | 33 | 45 |
| 6. Class premises, exercise rooms, auditoriums of schools and other educational facilities, conference halls, audience halls of theatres, clubs, cinemas, halls for court sessions and meetings. | 82 | 63 | 52 | 45 | 39 | 35 | 32 | 30 | 28 | 40 |
| 7. Administration working premises, working premises of design and engineering organisations, scientific and research institutes | 86 | 71 | 61 | 54 | 49 | 45 | 42 | 40 | 38 | 50 |
| 8. Café, restaurant, canteen halls, lobby of theatres and cinemas | 89 | 75 | 66 | 59 | 54 | 50 | 47 | 45 | 43 | 55 |
| 9. Trading halls of shops, sport halls, waiting halls of airports and transport stations, reception centers of housekeeping/ municipal services | 93 | 79 | 70 | 63 | 58 | 55 | 52 | 50 | 49 | 60 |

The —Sanitarian Rules and Norms on providing allowed noise level into the living building, public building and territory of living areall (SanR&N No.0267-09) establish the maximum admissible noise level into the living areas, both inside and outside buildings, given at Table 2. In this Norm daytime is defined as time span between 07:00 and 23:00, whereas nighttime is defined as time span between 23:00 and 07:00.

Table 2. Admissible noise level into the living area, both inside and outside the buildings (SanR&N No.0267-09)

| Name of Location | | Level of sound pressure, octave bands with average geometric mean frequencies (dB) | | | | | | | | Level of Sound, (dBA) |
|--|-----------------------|--|-----|-----|-----|------|------|------|------|-----------------------|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| Living room of flats, bedrooms of resorts (inside) | Daytime 07:00-23:00 | 63 | 52 | 45 | 39 | 35 | 32 | 30 | 28 | 40 |
| | Nighttime 23:00-07:00 | 55 | 44 | 35 | 29 | 25 | 22 | 20 | 18 | 30 |
| Territories adjacent to living houses (outside) | Daytime 07:00-23:00 | 75 | 66 | 59 | 54 | 50 | 47 | 45 | 43 | 55 |
| | Nighttime 23:00-07:00 | 67 | 57 | 49 | 44 | 40 | 37 | 35 | 33 | 45 |

b) International Standards

Amu Bukhara Irrigation System Rehabilitation Project shall comply with Environmental Assessment Guidelines of Asian Development Bank. It has been stated in the Environmental Assessment Guidelines that “determining appropriate environmental standards for ADB projects, ADB will follow the standards and approaches laid out in the World Bank’s Pollution Prevention and Abatement Handbook (PPAH)”. Presently, PPAH is used as reference document. The World Bank’s “Environmental, Health and Safety General Directives, 2007 (EHS)” is functional instead of PPAH. EHS stipulates that noise at any activity shall not exceed the levels given in the table below for given receptors, nor shall they result in a greater increase of ambient noise than 3 dB at the nearest receiving area outside the site.

Table 3. Noise Level Guideline (EHS)

| Receptor | One Hour L_{Aeq} , (dBA) | |
|---|----------------------------|-----------------------|
| | Daytime 07:00-22:00 | Nighttime 22:00-07:00 |
| Residential; institutional; educational | 55 | 45 |
| Industrial; commercial | 70 | 70 |

3. Nearest Receptor to the Working Areas

The nearest receptors to the construction sites are listed below:

The nearest location to the Kuyu Mazar Pump Station (ABISRP 03.1) construction site is settlement area (houses) which has been located approximately 750 m southwest.

Kizil Tepa Pump Station (ABISRP 03.2) construction site is settlement area (houses) which has been located approximately 500 m west.

4. Climatological Propertis at Construction Site

The desert and steppe landforms that comprise the region influence the sharply continental, arid character of the climate. This continental climate is characterized by cold winters and hot, dry summers. During the summers there are strong winds that carry sand and dust.

Average air temperature in January is 8°C in the north, and 2°C in the south. Summer is long, hot and dry; average air temperature in July of 28°C. The annual average air temperature is 16.0°C. The average monthly minimum temperature of the coldest month is -3.0°C, and the average monthly maximum temperature of the hottest month is 37.2°C.

There is high solar radiation up to 150 kcal and more is characteristic of this region. The average number of sunny days per year is 300.

There are 217 frost-free days per year. The annual precipitation is 125 mm to 175 mm.

Winds from the north and north northwest (23.6% and 19.8% respectively) predominate in the city of Bukhara. Usually there are winds with the speed of 2-3 m/s and 4-5 m/s, their probability of occurrence is 37.6% and 33.1%. The probability that light breezes (0-1 m/s) occur is 11.5% of the time. The low probability of light breezes occurring is beneficial for stronger winds promote the dispersion of air pollutants.

The relative humidity data according to the closest available data measured was in Samarkand meteorological station. Based on the observations made between 1961-1990 the relative average humidity value is 58,58%.

5. Workind Period

The daily working hours of the project is defined as daytime 07:00-23:00.

B- NOISE EMISSIONS DURING THE CONSTRUCTION WORKS

1. Sound Level of Equipments Used

Table 4. Permissible Sound Power Level of Equipments

| Type of equipment | Net installed power P (in kW) Electric power $P_{el}^{(1)}$ in kW Mass of appliance m in kg Cutting width L in cm | Permissible sound power | |
|--|---|---|--|
| | | Stage I as from 3 January 2002 | Stage II as from 3 January 2006 |
| Compaction machines (vibrating rollers, vibratory plates, vibratory rammers) | $P \leq 8$ | 108 | $105^{(2)}$ |
| | $8 < P \leq 70$ | 109 | $106^{(2)}$ |
| | $P > 70$ | $89 + 11 \log P$ | $86 + 11 \log P^{(2)}$ |
| Tracked dozers, tracked loaders, tracked excavator-loaders | $P \leq 55$ | 106 | $103^{(2)}$ |
| | $P > 55$ | $87 + 11 \log P$ | $84 + 11 \log P^{(2)}$ |
| Wheeled dozers, wheeled loaders, wheeled excavator-loaders, dumpers, graders, loader-type landfill compactors, combustion-engine driven counter balanced lift trucks, mobile cranes, compaction machines (non-vibrating rollers), paver-finishers, hydraulic power packs | $P \leq 55$ | 104 | $101^{(2)}(^{(3)})$ |
| | $P > 55$ | $85 + 11 \log P$ | $82 + 11 \log P^{(2)}(^{(3)})$ |
| Excavators, builders' hoists for the transport of goods, construction winches, motor hoes | $P \leq 15$ | 96 | 93 |
| | $P > 15$ | $83 + 11 \log P$ | $80 + 11 \log P$ |
| Hand-held concrete-breakers and picks | $m \leq 15$ | 107 | 105 |
| | $15 < m < 30$ | $94 + 11 \log m$ | $92 + 11 \log m^{(2)}$ |
| | $m \geq 30$ | $96 + 11 \log m$ | $94 + 11 \log m$ |
| Tower cranes | | $98 + \log P$ | $96 + \log P$ |
| Welding and power generators | $P_{el} \leq 2$ | $97 + \log P_{el}$ | $95 + \log P_{el}$ |
| | $2 < P_{el} \leq 10$ | $98 + \log P_{el}$ | $96 + \log P_{el}$ |
| | $P_{el} > 10$ | $97 + \log P_{el}$ | $95 + \log P_{el}$ |
| Compressors | $P \leq 15$ | 99 | 97 |
| | $P > 15$ | $97 + 2 \log P$ | $95 + 2 \log P$ |
| Lawnmowers, lawn trimmers/lawn-edge trimmers | $L \leq 50$ | 96 | $94^{(2)}$ |
| | $50 < L \leq 70$ | 100 | 98 |
| | $70 < L \leq 120$ | 100 | $98^{(2)}$ |
| | $L > 120$ | 105 | $103^{(2)}$ |
| ⁽¹⁾ P_{el} for welding generators: conventional welding current multiplied by the conventional load voltage for the lowest | | | |
| P_{el} for power generators: prime power according to ISO 8528-1:1993, clause 13.3.2 | | | |
| ⁽²⁾ The figures for stage II are merely indicative for the following types of equipment: | | | |
| - walk-behind vibrating rollers; | | | |
| - vibratory plates (> 3kW); | | | |
| - vibratory rammers; | | | |
| - dozers (steel tracked); | | | |
| - loaders (steel tracked > 55 kW); | | | |
| - combustion-engine driven counterbalanced lift trucks; | | | |
| - compacting screed paver-finishers; | | | |
| - hand-held internal combustion-engine concrete-breakers and picks ($15 < m < 30$) | | | |
| - lawnmowers, lawn trimmers/lawn-edge trimmers., | | | |
| Definitive figures will depend on amendment of the Directive following the report required in Article 20(1). In the absence | | | |
| ⁽³⁾ For single-engine mobile cranes, the figures for stage I shall continue to apply until 3 January 2008. After that date, The permissible sound power level shall be rounded up or down to the nearest integer number (less than 0,5, use lower | | | |

The sound levels of equipments have been calculated according to table given at the Directive 2005/88/EC of The European Parliament and of the Council of 14 December 2005 Amending Directive 2000/14/EC on The Approximation of the Laws of The Member States Relating to the Noise Emission in the Environment by Equipment for Use Outdoors. This table is provided Table 4.

The sound level of the equipments that will be used in the construction have been calculated as shown below.

Trucked Excavator: The power of the engine that will be used in both of the project areas has been considered as 350 HP. This engine power makes approximately $P=261$ kW. Based on the information provided Table 4 since $P = 261 \text{ kW} > 55 \text{ kW}$ the permissible sound level of the trucked excavators used in site calculated by using the formula below.

$$L_w = 84 + 11 \log P;$$

$$L_w = 84 + 11 \log 261 \approx 111 \text{ dB}$$

Truck: The power of the engine that will be used in both of the project areas has been considered as 250 HP. This engine power makes approximately $P=186$ kW. Based on the information provided Table 4 since $P = 186 \text{ kW} > 55 \text{ kW}$ the permissible sound level of the trucks used in site calculated by using the formula below.

$$L_w = 82 + 11 \log P;$$

$$L_w = 82 + 11 \log 186 \approx 107 \text{ dB}$$

Wheeled Loader: The power of the engine that will be used in both of the project areas has been considered as 200 HP. This engine power makes approximately $P=149$ kW. Based on the information provided Table 4 since $P = 149 \text{ kW} > 55 \text{ kW}$ the permissible sound level of the wheeled loaders used in site calculated by using the formula below.

$$L_w = 82 + 11 \log P;$$

$$L_w = 82 + 11 \log 149 \approx 106 \text{ dB}$$

Vibrating Roller: The power of the engine that will be used in both of the project areas has been considered as 110 HP. This engine power makes approximately $P=82$ kW. Based on the information provided Table 4 since $P = 82$ kW > 70 kW the permissible sound level of the vibrating rollers used in site calculated by using the formula below.

$$L_w = 86 + 11 \log P;$$

$$L_w = 86 + 11 \log 82 \approx 108 \text{ dB}$$

Truck Mixer: The power of the engine that will be used in both of the project areas has been considered as 350 HP. This engine power makes approximately $P=261$ kW. Based on the information provided Table 4 since $P = 261$ kW > 55 kW the permissible sound level of the truck mixers used in site calculated by using the formula below.

$$L_w = 82 + 11 \log P;$$

$$L_w = 82 + 11 \log 261 \approx 109 \text{ dB}$$

Concrete Pumps: The power of the engine that will be used in both of the project areas has been considered as 215 HP. This engine power makes approximately $P=160$ kW. Based on the information provided Table 4 since $P = 160$ kW > 55 kW the permissible sound level of the concrete pumps used in site calculated by using the formula below.

$$L_w = 82 + 11 \log P;$$

$$L_w = 82 + 11 \log 160 \approx 107 \text{ dB}$$

Hand Held Concrete Breakers: The weight of the equipment that will be used in both of the project areas has been considered as 11 kg. Based on the information provided Table 4 since $m < 15$ kg the permissible sound level of handheld concrete breakers used in site is 105 dB.

Street Sprinkler Truck: The power of the engine that will be used in both of the project areas has been considered as 120 HP. This engine power makes approximately $P=89$ kW. Based on the information provided Table 4 since $P = 89$ kW > 55 kW the permissible sound level of the Street Sprinkler Trucks used in site calculated by using the formula below.

$$L_w = 82 + 11 \log P;$$

$$L_w = 82 + 11 \log 89 \approx 104 \text{ dB}$$

2. Sources of Noise

The type and number of the construction site the vehicles and equipments that create sound have been listed at the following together with their sound characteristics. All of the equipments listed here will be used at open areas.

The difference in the sound power level of any equipment by the number of the same equipments used has been calculated by the following formula.

$$\Delta L = 10 \log n$$

ΔL : Difference in sound level, (dB)

n : number of the same equipment/vehicle

Table 5. The Number of Vehicles and Equipments and their Sound Levels at Kuyu Mazar Pumping Station Construction Site

| Vehicle/ Equipment Type | Number | Sound Power Level, dB | Sound Power Level Difference for the Designated Number of Vehicle/ Equipment, ΔL , (dB) | Total Power Level, dB |
|------------------------------------|---------------|--------------------------------------|---|--------------------------------------|
| Trucked Excavator | 3 | 111 | 5 | 116 |
| Truck | 3 | 107 | 5 | 112 |
| Wheeled Loader | 1 | 106 | 0 | 106 |
| Vibrating Roller | 1 | 108 | 0 | 108 |
| Compressor | 1 | 99 | 0 | 99 |
| Concrete Pump | 1 | 107 | 0 | 107 |

Table 6. The Number of Vehicles and Equipments and their Sound Levels at Kizil Tepa Pumping Station Construction Site

| Vehicle/ Equipment Type | Number | Sound Power Level, dB | Sound Power Level Difference for the Designated Number of Vehicle/ Equipment, ΔL, (dB) | Total Power Level, dB |
|------------------------------------|---------------|--------------------------------------|--|--------------------------------------|
| Trucked Excavator | 4 | 111 | 6 | 117 |
| Truck | 4 | 107 | 6 | 113 |
| Hand Held concrete-breakers | 10 | 94 | 10 | 104 |
| Street Sprinkler Truck | 1 | 104 | 0 | 104 |
| Compressor | 1 | 99 | 0 | 99 |
| Concrete Pump | 1 | 107 | 0 | 107 |

3. Calculation of Equivalent Sound Level

a) Kuyu Mazar Pumping Station Construction Site

Based on the information provided the information above the Table 5 the sound level difference the sound level of the equipments are given four (4) octave at Table 7.

Table 7. Sound Pressure Level at all Directions Originated from Kuyu Mazar Pumping Station Construction Site

| Vehicle/ Equipment Type | Sound Power Level (dB) | | | | |
|------------------------------------|-------------------------------|---------------|----------------|----------------|----------------|
| | Toplam | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |
| Trucked Excavator | 116 | 110 | 110 | 110 | 110 |
| Truck | 112 | 106 | 106 | 106 | 106 |
| Wheeled Loader | 106 | 100 | 100 | 100 | 100 |
| Vibrating Roller | 108 | 102 | 102 | 102 | 102 |
| Truck Mixer | 112 | 106 | 106 | 106 | 106 |
| Concrete Pump | 107 | 101 | 101 | 101 | 101 |

Sound level at a specified “r” distance calculated by the formula and given at Table 8.

Sound Level : $L_{pi} = L_w + 10 \log \left(\frac{Q}{4\pi r^2} \right)$. where

| | | |
|------------------------------|----------|-----|
| r, sound level at a distance | L_{pi} | dBA |
| Sound level | L_w | dBA |
| Distance from source | r | m |
| Directivity factor | Q | - |

Q : Directivity factor is considered to be equal to “1” since both of the project area which is a free field and have no ceilings.

Table 8. Sound Pressure Level at all Directions Originated from Kuyu Mazar Pumping Station Construction Site

| Vehicle/ Equipment Type | Distance (m) | Sound Pressure Level (dB) | | | |
|----------------------------|--------------|---------------------------|---------|---------|---------|
| | | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |
| Trucked Excavator | 50 | 65 | 65 | 65 | 65 |
| | 100 | 59 | 59 | 59 | 59 |
| | 250 | 51 | 51 | 51 | 51 |
| | 500 | 45 | 45 | 45 | 45 |
| | 1000 | 39 | 39 | 39 | 39 |
| | 2000 | 33 | 33 | 33 | 33 |
| Truck | 50 | 61 | 61 | 61 | 61 |
| | 100 | 55 | 55 | 55 | 55 |
| | 250 | 47 | 47 | 47 | 47 |
| | 500 | 41 | 41 | 41 | 41 |
| | 1000 | 35 | 35 | 35 | 35 |
| | 2000 | 29 | 29 | 29 | 29 |
| Wheeled Loader | 50 | 55 | 55 | 55 | 55 |
| | 100 | 49 | 49 | 49 | 49 |
| | 250 | 41 | 41 | 41 | 41 |
| | 500 | 35 | 35 | 35 | 35 |
| | 1000 | 29 | 29 | 29 | 29 |
| | 2000 | 23 | 23 | 23 | 23 |
| Vibrating Roller | 50 | 57 | 57 | 57 | 57 |
| | 100 | 51 | 51 | 51 | 51 |
| | 250 | 43 | 43 | 43 | 43 |
| | 500 | 37 | 37 | 37 | 37 |
| | 1000 | 31 | 31 | 31 | 31 |
| | 2000 | 25 | 25 | 25 | 25 |
| Truck Mixer | 50 | 61 | 61 | 61 | 61 |
| | 100 | 55 | 55 | 55 | 55 |
| | 250 | 47 | 47 | 47 | 47 |
| | 500 | 41 | 41 | 41 | 41 |
| | 1000 | 35 | 35 | 35 | 35 |
| | 2000 | 29 | 29 | 29 | 29 |
| Concrete Pump | 50 | 56 | 56 | 56 | 56 |
| | 100 | 50 | 50 | 50 | 50 |
| | 250 | 42 | 42 | 42 | 42 |
| | 500 | 36 | 36 | 36 | 36 |
| | 1000 | 30 | 30 | 30 | 30 |
| | 2000 | 24 | 24 | 24 | 24 |

Sound Pressure Levels which are in dB calculated has been corrected by using the correction factors provided at Table 9 and corrected sound pressure levels have been listed at Table 10.

Table 9. Correction Factors for db(A) for the Frequencies between 500 Hz and 4000 H

| Frequency | Correction Factor |
|-----------|-------------------|
| 500 Hz | -3,2 |
| 1000 Hz | 0,0 |
| 2000 Hz | 1,2 |
| 4000 Hz | 1,0 |

Table 10. Corrected Sound Power Level at Kuyu Mazar Pumping Station Construction Site

| Vehicle/Equipment Type | Distance (m) | Corrected Sound Level (dBA) | | | |
|------------------------|--------------|-----------------------------|---------|---------|---------|
| | | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |
| Trucked Excavator | 50 | 61,8 | 65 | 66,2 | 66 |
| | 100 | 55,8 | 59 | 60,2 | 60 |
| | 250 | 47,8 | 51 | 52,2 | 52 |
| | 500 | 41,8 | 45 | 46,2 | 46 |
| | 1000 | 35,8 | 39 | 40,2 | 40 |
| | 2000 | 29,8 | 33 | 34,2 | 34 |
| Truck | 50 | 57,8 | 61 | 62,2 | 62 |
| | 100 | 51,8 | 55 | 56,2 | 56 |
| | 250 | 43,8 | 47 | 48,2 | 48 |
| | 500 | 37,8 | 41 | 42,2 | 42 |
| | 1000 | 31,8 | 35 | 36,2 | 36 |
| | 2000 | 25,8 | 29 | 30,2 | 30 |
| Wheeled Loader | 50 | 51,8 | 55 | 56,2 | 56 |
| | 100 | 45,8 | 49 | 50,2 | 50 |
| | 250 | 37,8 | 41 | 42,2 | 42 |
| | 500 | 31,8 | 35 | 36,2 | 36 |
| | 1000 | 25,8 | 29 | 30,2 | 30 |
| | 2000 | 19,8 | 23 | 24,2 | 24 |
| Vibrating Roller | 50 | 53,8 | 57 | 58,2 | 58 |
| | 100 | 47,8 | 51 | 52,2 | 52 |
| | 250 | 39,8 | 43 | 44,2 | 44 |
| | 500 | 33,8 | 37 | 38,2 | 38 |
| | 1000 | 27,8 | 31 | 32,2 | 32 |
| | 2000 | 21,8 | 25 | 26,2 | 26 |
| Truck Mixer | 50 | 57,8 | 61 | 62,2 | 62 |
| | 100 | 51,8 | 55 | 56,2 | 56 |
| | 250 | 43,8 | 47 | 48,2 | 48 |
| | 500 | 37,8 | 41 | 42,2 | 42 |
| | 1000 | 31,8 | 35 | 36,2 | 36 |
| | 2000 | 25,8 | 29 | 30,2 | 30 |
| Concrete Pump | 50 | 52,8 | 56 | 57,2 | 57 |
| | 100 | 46,8 | 50 | 51,2 | 51 |
| | 250 | 38,8 | 42 | 43,2 | 43 |
| | 500 | 32,8 | 36 | 37,2 | 37 |
| | 1000 | 26,8 | 30 | 31,2 | 31 |
| | 2000 | 20,8 | 24 | 25,2 | 25 |

Atmospheric absorption values have been calculated by the use of following formula.

$$\alpha_{atm} = 7,4 \cdot 10^{-8} \left(f^2 \cdot r / \phi \right)$$

| | | |
|-----------------------------|----------------|-----|
| Atmospheric absorption | α_{atm} | dBA |
| Frequency of sound pressure | f | Hz |
| Distance | r | m |
| Relative Humidity | Φ | % |

The atmospheric absorption values for 4 (four) octaves have been calculated and given at Table 11.

Table 11. Atmospheric Absorption Value for Different Frequencies

| Distance (m) | Atmospheric Absorption (dBA) | | | |
|--------------|------------------------------|---------|---------|---------|
| | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |
| 50 | 0,02 | 0,06 | 0,25 | 1,01 |
| 100 | 0,03 | 0,13 | 0,51 | 2,02 |
| 250 | 0,08 | 0,32 | 1,26 | 5,05 |
| 500 | 0,16 | 0,63 | 2,53 | 10,11 |
| 1000 | 0,32 | 1,26 | 5,05 | 20,21 |
| 2000 | 0,63 | 2,53 | 10,11 | 40,42 |

The atmospheric absorption values have been subtracted from the Corrected Sound Power Levels given at Table 10 and corrected results are given Table 12.

The total sound levels given at the Table 12 have been calculated by the following formula.

$$L_T = 10 \log_{10} \sum 10^{L_i/10}$$

Where:

| | | |
|----------------------------------|-------|-----|
| Total Sound Level | L_T | dBA |
| Sound Level at a given Frequency | L_i | dBA |

Table 12. Total Sound Level at Kuyu Mazar Pumping Station Construction Site

| Vehicle/Equipment Type | Distance (m) | Sound Level (dBA) | | | | |
|------------------------|--------------|-------------------|---------|---------|---------|-------|
| | | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | Total |
| Trucked Excavator | 50 | 61,78 | 64,94 | 65,95 | 64,99 | 71 |
| | 100 | 55,77 | 58,87 | 59,69 | 57,98 | 64 |
| | 250 | 47,72 | 50,68 | 50,94 | 46,95 | 55 |
| | 500 | 41,64 | 44,37 | 43,67 | 35,89 | 48 |
| | 1000 | 35,48 | 37,74 | 35,15 | 19,79 | 41 |
| | 2000 | 29,17 | 30,47 | 24,09 | -6,42 | 33 |
| | | | | | | |
| Truck | 50 | 57,78 | 60,94 | 61,95 | 60,99 | 67 |
| | 100 | 51,77 | 54,87 | 55,69 | 53,98 | 60 |
| | 250 | 43,72 | 46,68 | 46,94 | 42,95 | 51 |
| | 500 | 37,64 | 40,37 | 39,67 | 31,89 | 44 |
| | 1000 | 31,48 | 33,74 | 31,15 | 15,79 | 37 |
| | 2000 | 25,17 | 26,47 | 20,09 | -10,42 | 29 |
| | | | | | | |
| Wheeled Loader | 50 | 51,78 | 54,94 | 55,95 | 54,99 | 61 |
| | 100 | 45,77 | 48,87 | 49,69 | 47,98 | 54 |
| | 250 | 37,72 | 40,68 | 40,94 | 36,95 | 45 |
| | 500 | 31,64 | 34,37 | 33,67 | 25,89 | 38 |
| | 1000 | 25,48 | 27,74 | 25,15 | 9,79 | 31 |
| | 2000 | 19,17 | 20,47 | 14,09 | -16,42 | 23 |
| | | | | | | |
| Vibrating Roller | 50 | 53,78 | 56,94 | 57,95 | 56,99 | 63 |
| | 100 | 47,77 | 50,87 | 51,69 | 49,98 | 56 |
| | 250 | 39,72 | 42,68 | 42,94 | 38,95 | 47 |
| | 500 | 33,64 | 36,37 | 35,67 | 27,89 | 40 |
| | 1000 | 27,48 | 29,74 | 27,15 | 11,79 | 33 |
| | 2000 | 21,17 | 22,47 | 16,09 | -14,42 | 25 |
| | | | | | | |
| Truck Mixer | 50 | 57,78 | 60,94 | 61,95 | 60,99 | 67 |
| | 100 | 51,77 | 54,87 | 55,69 | 53,98 | 60 |
| | 250 | 43,72 | 46,68 | 46,94 | 42,95 | 51 |
| | 500 | 37,64 | 40,37 | 39,67 | 31,89 | 44 |
| | 1000 | 31,48 | 33,74 | 31,15 | 15,79 | 37 |
| | 2000 | 25,17 | 26,47 | 20,09 | -10,42 | 29 |
| | | | | | | |
| Concrete Pump | 50 | 52,78 | 55,94 | 56,95 | 55,99 | 62 |
| | 100 | 46,77 | 49,87 | 50,69 | 48,98 | 55 |
| | 250 | 38,72 | 41,68 | 41,94 | 37,95 | 46 |
| | 500 | 32,64 | 35,37 | 34,67 | 26,89 | 39 |
| | 1000 | 26,48 | 28,74 | 26,15 | 10,79 | 32 |
| | 2000 | 20,17 | 21,47 | 15,09 | -15,42 | 24 |
| | | | | | | |

After that all equivalent sound levels which combines all the equipments and vehicle sounds have been calculated by using formula for a given distance.

$$L_{eq} = 10 \log_{10} \sum 10^{L_T/10}$$

Where:

| | | |
|---------------------------------|----------|-----|
| Sound Level at a given distance | L_{eq} | dBA |
| Total Sound Level | L_T | dBA |

The results of calculation for equivalent Sound Level data is given at Table 13 and graphically shown at Figure 1.

Table 13. Equivalent Sound Levels at Kizil Tapa Pumping Station Construction Site

| Distance (m) | L_{eq} (dBA) |
|--------------|----------------|
| 50 | 74 |
| 100 | 67 |
| 250 | 58 |
| 500 | 51 |
| 1000 | 44 |
| 2000 | 36 |

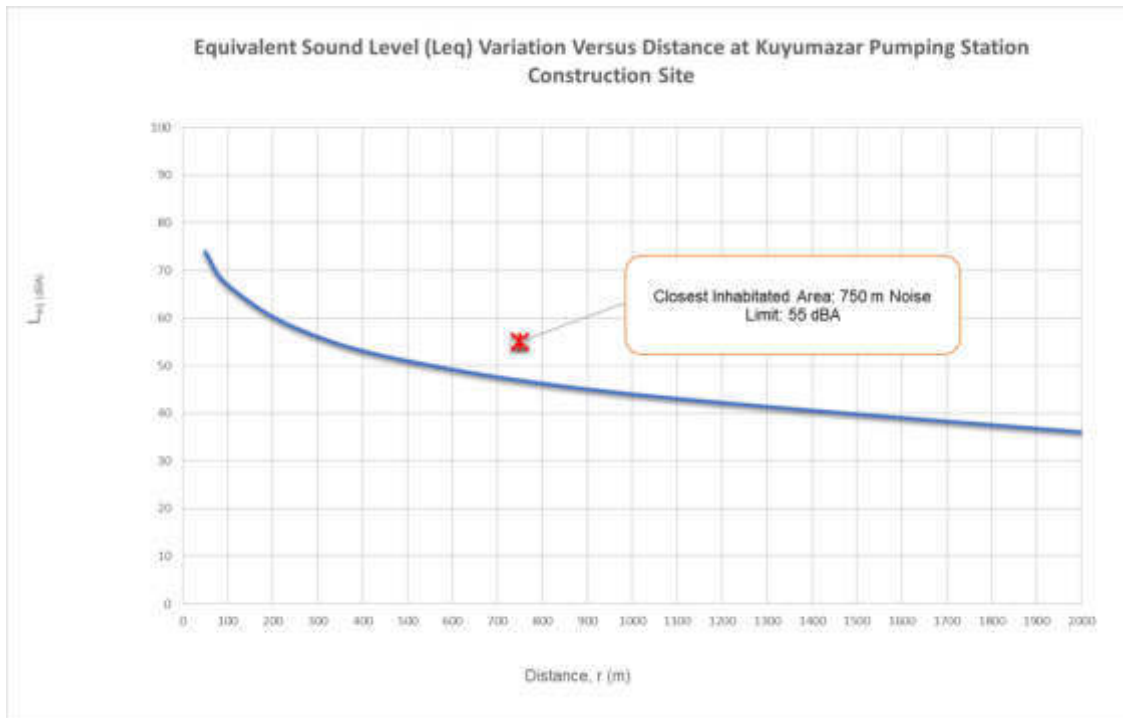


Figure 1. Equivalent Sound Level (L_{eq}) Variation Versus Distance at Kuyu Mazar Pumping Station Construction Site

b) Kizil Tepa Pumping Station Construction Site

Based on the information provided the information above the Table 6 the sound level difference the sound level of the equipments are given four (4) octave at Table 14.

Table 14. Sound Pressure Level at all Directions Originated from Kizil Tepa Pumping Station Construction Site

| Vehicle/ Equipment Type | Sound Power Level (dB) | | | | |
|------------------------------------|------------------------|--------|---------|---------|---------|
| | Toplam | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |
| Trucked Excavator | 117 | 111 | 111 | 111 | 111 |
| Truck | 113 | 107 | 107 | 107 | 107 |
| Hand Held concrete- breakers | 115 | 109 | 109 | 109 | 109 |
| Street Sprinkler Truck | 104 | 98 | 98 | 98 | 98 |
| Truck Mixer | 112 | 106 | 106 | 106 | 106 |
| Concrete Pump | 107 | 101 | 101 | 101 | 101 |

Sound level at a specified “r” distance calculated by the formula:

$$\text{Sound Level} : L_{pi} = L_w + 10 \log \left(\frac{Q}{4\pi r^2} \right) . \text{where}$$

| | | |
|------------------------------|----------|-----|
| r, sound level at a distance | L_{pi} | dBA |
| Sound level | L_w | dBA |
| Distance from source | r | m |
| Directivity factor | Q | - |

Q : Directivity factor is considered to be equal to “1” since both of the project area which is a free field and have no ceilings.

Th results of sound level calculations are given at Table 15.

Table 15. Sound Pressure Level at all Directions Originated from Kizil Tepa Pumping Station Construction Site

| Vehicle/ Equipment Type | Distance (m) | Sound Pressure Level (dB) | | | |
|--------------------------------|--------------|---------------------------|---------|---------|---------|
| | | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |
| Trucked Excavator | 50 | 66 | 66 | 66 | 66 |
| | 100 | 60 | 60 | 60 | 60 |
| | 250 | 52 | 52 | 52 | 52 |
| | 500 | 46 | 46 | 46 | 46 |
| | 1000 | 40 | 40 | 40 | 40 |
| | 2000 | 34 | 34 | 34 | 34 |
| Truck | 50 | 62 | 62 | 62 | 62 |
| | 100 | 56 | 56 | 56 | 56 |
| | 250 | 48 | 48 | 48 | 48 |
| | 500 | 42 | 42 | 42 | 42 |
| | 1000 | 36 | 36 | 36 | 36 |
| | 2000 | 30 | 30 | 30 | 30 |
| Hand Held concrete-breakers | 50 | 64 | 64 | 64 | 64 |
| | 100 | 58 | 58 | 58 | 58 |
| | 250 | 50 | 50 | 50 | 50 |
| | 500 | 44 | 44 | 44 | 44 |
| | 1000 | 38 | 38 | 38 | 38 |
| | 2000 | 32 | 32 | 32 | 32 |
| Street Sprinkler Truck | 50 | 53 | 53 | 53 | 53 |
| | 100 | 47 | 47 | 47 | 47 |
| | 250 | 39 | 39 | 39 | 39 |
| | 500 | 33 | 33 | 33 | 33 |
| | 1000 | 27 | 27 | 27 | 27 |
| | 2000 | 21 | 21 | 21 | 21 |
| Truck Mixer | 50 | 61 | 61 | 61 | 61 |
| | 100 | 55 | 55 | 55 | 55 |
| | 250 | 47 | 47 | 47 | 47 |
| | 500 | 41 | 41 | 41 | 41 |
| | 1000 | 35 | 35 | 35 | 35 |
| | 2000 | 29 | 29 | 29 | 29 |
| Concrete Pump | 50 | 56 | 56 | 56 | 56 |
| | 100 | 50 | 50 | 50 | 50 |
| | 250 | 42 | 42 | 42 | 42 |
| | 500 | 36 | 36 | 36 | 36 |
| | 1000 | 30 | 30 | 30 | 30 |
| | 2000 | 24 | 24 | 24 | 24 |

Sound Pressure Levels which are in dB calculated has been corrected by using the correction factors provided at Table 9 and corrected sound pressure levels have been listed at Table 16.

Table 16. Corrected Sound Power Level at Kizil Tepa Pumping Station Construction Site

| Vehicle/Equipment Type | Distance (m) | Corrected Sound Level (dBA) | | | |
|-----------------------------|--------------|-----------------------------|---------|---------|---------|
| | | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |
| Trucked Excavator | 50 | 62,8 | 66 | 67,2 | 67 |
| | 100 | 56,8 | 60 | 61,2 | 61 |
| | 250 | 48,8 | 52 | 53,2 | 53 |
| | 500 | 42,8 | 46 | 47,2 | 47 |
| | 1000 | 36,8 | 40 | 41,2 | 41 |
| | 2000 | 30,8 | 34 | 35,2 | 35 |
| Truck | 50 | 58,8 | 62 | 63,2 | 63 |
| | 100 | 52,8 | 56 | 57,2 | 57 |
| | 250 | 44,8 | 48 | 49,2 | 49 |
| | 500 | 38,8 | 42 | 43,2 | 43 |
| | 1000 | 32,8 | 36 | 37,2 | 37 |
| | 2000 | 26,8 | 30 | 31,2 | 31 |
| Hand Held concrete-breakers | 50 | 60,8 | 64 | 65,2 | 65 |
| | 100 | 54,8 | 58 | 59,2 | 59 |
| | 250 | 46,8 | 50 | 51,2 | 51 |
| | 500 | 40,8 | 44 | 45,2 | 45 |
| | 1000 | 34,8 | 38 | 39,2 | 39 |
| | 2000 | 28,8 | 32 | 33,2 | 33 |
| Street Sprinkler Truck | 50 | 49,8 | 53 | 54,2 | 54 |
| | 100 | 43,8 | 47 | 48,2 | 48 |
| | 250 | 35,8 | 39 | 40,2 | 40 |
| | 500 | 29,8 | 33 | 34,2 | 34 |
| | 1000 | 23,8 | 27 | 28,2 | 28 |
| | 2000 | 17,8 | 21 | 22,2 | 22 |
| Truck Mixer | 50 | 57,8 | 61 | 62,2 | 62 |
| | 100 | 51,8 | 55 | 56,2 | 56 |
| | 250 | 43,8 | 47 | 48,2 | 48 |
| | 500 | 37,8 | 41 | 42,2 | 42 |
| | 1000 | 31,8 | 35 | 36,2 | 36 |
| | 2000 | 25,8 | 29 | 30,2 | 30 |
| Concrete Pump | 50 | 52,8 | 56 | 57,2 | 57 |
| | 100 | 46,8 | 50 | 51,2 | 51 |
| | 250 | 38,8 | 42 | 43,2 | 43 |
| | 500 | 32,8 | 36 | 37,2 | 37 |
| | 1000 | 26,8 | 30 | 31,2 | 31 |
| | 2000 | 20,8 | 24 | 25,2 | 25 |

Atmospheric absorption values have been calculated by the use of following formula.

$$\alpha_{atm} = 7,4 \cdot 10^{-8} \left(f^2 \cdot r / \phi \right)$$

| | | |
|-----------------------------|----------------|-----|
| Atmospheric absorption | α_{atm} | dBA |
| Frequency of sound pressure | f | Hz |
| Distance | r | m |
| Relative Humidity | Φ | % |

The atmospheric absorption values for 4 (four) octaves have been calculated and given at Table 11.

The atmospheric absorption values have been subtracted from the Corrected Sound Power Levels given at Table 16 and corrected results are given Table 17.

The total sound levels given at the Table 17 have been calculated by the following formula.

$$L_T = 10 \log_{10} \sum 10^{L_i/10}$$

Where:

Total Sound Level L_T dBA
 Sound Level at a given Frequency L_i dBA

Table 17. Total Sound Level at Kizil Tepa Pumping Station Construction Site

| Vehicle/Equipment Type | Distance (m) | Sound Level (dBA) | | | | |
|-----------------------------|--------------|-------------------|---------|---------|---------|-------|
| | | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | Total |
| Trucked Excavator | 50 | 62,78 | 65,94 | 66,95 | 65,99 | 72 |
| | 100 | 56,77 | 59,87 | 60,69 | 58,98 | 65 |
| | 250 | 48,72 | 51,68 | 51,94 | 47,95 | 56 |
| | 500 | 42,64 | 45,37 | 44,67 | 36,89 | 49 |
| | 1000 | 36,48 | 38,74 | 36,15 | 20,79 | 42 |
| | 2000 | 30,17 | 31,47 | 25,09 | -5,42 | 34 |
| Truck | 50 | 58,78 | 61,94 | 62,95 | 61,99 | 68 |
| | 100 | 52,77 | 55,87 | 56,69 | 54,98 | 61 |
| | 250 | 44,72 | 47,68 | 47,94 | 43,95 | 52 |
| | 500 | 38,64 | 41,37 | 40,67 | 32,89 | 45 |
| | 1000 | 32,48 | 34,74 | 32,15 | 16,79 | 38 |
| | 2000 | 26,17 | 27,47 | 21,09 | -9,42 | 30 |
| Hand Held concrete-breakers | 50 | 60,78 | 63,94 | 64,95 | 63,99 | 70 |
| | 100 | 54,77 | 57,87 | 58,69 | 56,98 | 63 |
| | 250 | 46,72 | 49,68 | 49,94 | 45,95 | 54 |
| | 500 | 40,64 | 43,37 | 42,67 | 34,89 | 47 |
| | 1000 | 34,48 | 36,74 | 34,15 | 18,79 | 40 |
| | 2000 | 28,17 | 29,47 | 23,09 | -7,42 | 32 |
| Street Sprinkler Truck | 50 | 49,78 | 52,94 | 53,95 | 52,99 | 59 |
| | 100 | 43,77 | 46,87 | 47,69 | 45,98 | 52 |
| | 250 | 35,72 | 38,68 | 38,94 | 34,95 | 43 |
| | 500 | 29,64 | 32,37 | 31,67 | 23,89 | 36 |
| | 1000 | 23,48 | 25,74 | 23,15 | 7,79 | 29 |
| | 2000 | 17,17 | 18,47 | 12,09 | -18,42 | 21 |
| Truck Mixer | 50 | 57,78 | 60,94 | 61,95 | 60,99 | 67 |
| | 100 | 51,77 | 54,87 | 55,69 | 53,98 | 60 |
| | 250 | 43,72 | 46,68 | 46,94 | 42,95 | 51 |
| | 500 | 37,64 | 40,37 | 39,67 | 31,89 | 44 |
| | 1000 | 31,48 | 33,74 | 31,15 | 15,79 | 37 |
| | 2000 | 25,17 | 26,47 | 20,09 | -10,42 | 29 |
| Concrete Pump | 50 | 52,78 | 55,94 | 56,95 | 55,99 | 62 |
| | 100 | 46,77 | 49,87 | 50,69 | 48,98 | 55 |
| | 250 | 38,72 | 41,68 | 41,94 | 37,95 | 46 |
| | 500 | 32,64 | 35,37 | 34,67 | 26,89 | 39 |
| | 1000 | 26,48 | 28,74 | 26,15 | 10,79 | 32 |
| | 2000 | 20,17 | 21,47 | 15,09 | -15,42 | 24 |

After that all equivalent sound levels which combines all the equipments and vehicle sounds have been calculated by using formula for a given distance.

$$L_{eq} = 10 \log_{10} \sum 10^{L_T/10}$$

Where:

| | | |
|---------------------------------|----------|-----|
| Sound Level at a given distance | L_{eq} | dBA |
| Total Sound Level | L_T | dBA |

The results of calculation for equivalent Sound Level data is given at Table 18 and graphically shown at Figure 2.

Table 18. Equivalent Sound Levels at Kizil Tepa Pumping Station Construction Site

| Distance (m) | L_{eq} (dBA) |
|--------------|----------------|
| 50 | 76 |
| 100 | 69 |
| 250 | 60 |
| 500 | 53 |
| 1000 | 46 |
| 2000 | 38 |

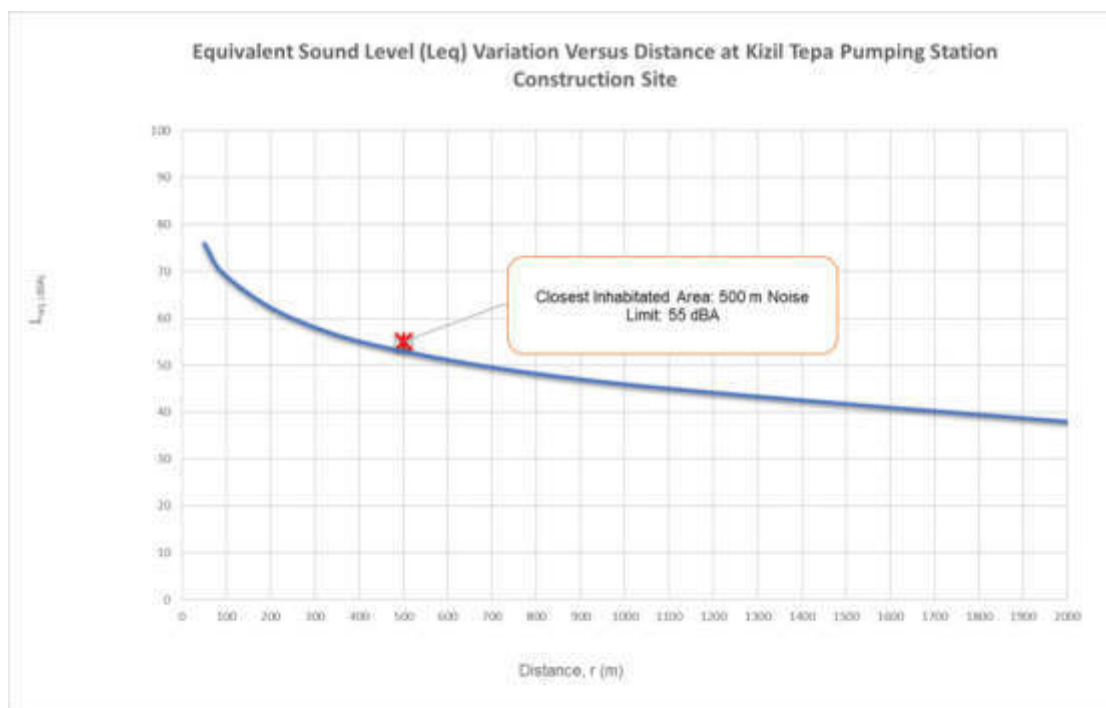


Figure 2. Equivalent Sound Level (L_{eq}) Variation Versus Distance at Kizil Tepa Pumping Station Construction Site

4. Comparison of Results with Existing Legislation

a) Kuyu Mazar Pumping Station Construction Site

As indicated the nearest location to the Kuyu Mazar Pump Station (ABISRP 03.1) construction site is settlement area (houses) which has been located approximately 750 m southwest.

The equivalent sound level at this location has been calculated as 48 dBA. This value is already below according to the national and international standards.

b) Kizil Tepa Pumping Station Construction Site

As indicated the nearest location to the Kizil Tepa Pump Station (ABISRP 03.2) construction site is settlement area (houses) which has been located approximately 500 m west.

The equivalent sound level at this location has been calculated as 53 dBA. This value is already below according to the national and international standards.

Table 19. Comparison of Equivalent Sound Levels with the National and International Standards.

| Site | Equivalent Sound Level in dBA | Standard Type for Specified Receptor in dBA | |
|---|-------------------------------|---|---------------|
| | | National | International |
| Kuyu Mazar Pump Station Construction Site | 48 | 55 | 55 |
| Kizil Tepa Pump Station Construction Site | 53 | 55 | 55 |