

OJSC “Rogun HPP”

State Enterprise “Directorate for Flooding Zone of Rogun HPP”

Project Management Group for Energy Facilities Construction under the President of the Republic of Tajikistan

ROGUN HYDROPOWER PROJECT - UPDATED ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Volume 3

This part of Volume 3 of this ESMP includes the following chapters:

1. Air Quality Management Plan Framework
2. Asbestos Management Plan Framework
3. Blasting and Explosives Management Plan Framework
4. Erosion Management Plan Framework
5. Excavation Spoil and Fill Storage Management Plan Framework
6. Hazardous Materials Management Plan Framework
7. Noise and Vibration Management Plan Framework
8. Retrenchment Management Plan Framework
9. Site Management Plan Framework
10. Wastewater Management Plan Framework
11. Worker Accommodation Management Plan Framework



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Table of Abbreviations

ACM	Asbestos Containing Material
AMP	Asbestos Management Plan
AQMP	Air Quality Management Plan
BEMP	Blasting and Explosives Management Plan
BMP	Biodiversity Management Plan
DFZ	State Directorate of the Flooding Zone
EBRD	European Bank for Reconstruction and Development
EHS	Environmental, Health and Safety
EMP	Erosion Management Plan
ER	Employer's Representative
ESF	World Bank Environmental and Social Framework
ESFMP	Excavation Spoil and Fill Management Plan
ESS	Environmental and Social Standard
GIIP	Good International Industry Practice
HMMP	Hazardous Materials Management Plan
HPP	Hydropower Plant
HSE	Health, Safety and Environment
IFC	International Finance Corporation
ILO	International Labour Organization
LMP	Labor Management Procedures
MAC	Maximum Allowable Concentration
MPC	Maximum Permissible Concentration
NVMP	Noise and Vibration Management Plan
OHS	Occupational Health and Safety
OJSC	Open Joint Stock Company
PMC	Project Management Consultant
PMG	Project Management Group
PPE	Personal Protective Equipment
SDS	Safety Data Sheet
SEP	Stakeholder Engagement Plan
SRMP	Site Rehabilitation Management Plan
TMP	Traffic Management Plan
WAMP	Worker Accommodation Management Plan
WBG	World Bank Group
WWMP	Wastewater Management Plan

Air Quality Management Plan Framework

A. Purpose and Scope

1. Each Contractor employed at the Rogun Hydropower Project (Rogun HPP, or the Project) will prepare and implement an Air Quality Management Plan (AQMP, or Plan) that is consistent with this Framework. The Plan will be reviewed and approved by the Employer's Representative (ER) and/or the Project Management Consultant (ER/PMC) and once approved must be diligently implemented.
2. New Contractors must have an approved Plan before mobilizing at the site, while existing Contractors must have an approved Plan within six months of the date that World Bank financing is provided to the Project.

B. Applicable Standards

3. The Plan must include requirements that will ensure the Project meets the requirements of the:
 - Legislative requirements of the Republic of Tajikistan
 - Standards promulgated by International Financial Institutions
 - International obligations of the Republic of Tajikistan
 - Good International Industry Practice (GIIP).
4. Such requirements will include, at a minimum, the requirements listed in this framework. In all cases, site-specific engineering and scientific judgment will be used to confirm that standards are sufficient to prevent unacceptable impacts on the people and environment. If there are inconsistencies among or between requirements, the Plan must adopt the more stringent..

C. National Air Quality Legislation

5. Article 7 of the Law of the Republic of Tajikistan on the Protection of Atmospheric Air (2012) mandates the Government to establish, among other, standards for maximum permissible concentrations for ambient pollutants. The maximum permissible concentration is also known as Maximum Allowable Concentration (MAC).

D. International Financial Institutions' Requirements

6. World Bank Environmental and Social Standards (ESS) that are applicable to air quality management include:
 - World Bank ESS1: Assessment and Management of Environmental and Social Risks and Impacts - with the objective to identify, evaluate and manage the environment and social risks and impacts of the project
 - World Bank ESS2: Labor and Working Conditions – with the objective to promote safety and health at work
 - World Bank ESS3: Resource Efficiency and Pollution Prevention – with the objective to avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities
 - World Bank ESS4: Community Health and Safety – with the objective to anticipate and avoid adverse impacts on the health and safety of project-affected communities.

E. Good International Industry Practice

7. In addition to the above, examples of general and industry-specific Good International Industry Practice (GIIP) are provided in the World Bank Group (WBG) General Environmental Health and Safety Guidelines. The General Guidelines provide guidance for management of emission limits and ambient air quality to ensure that relevant ambient quality guidelines and standards are not exceeded. This is done by applying national standards, or in their absence, the current WHO Air Quality Guidelines or other internationally recognized sources.

F. World Health Organization

8. The WBG General EHS Guidelines make specific reference to the World Health Organization (WHO) Air Quality Guidelines¹ recommended levels and interim targets for common air pollutants in ambient air: particulate matter (PM), Ozone (O₃), Carbon monoxide (CO), Nitrogen dioxide (NO₂), and Sulfur dioxide (SO₂).

G. Standards that Apply to the Project

9. The Project air quality standards are set out in Table 1 and apply to all locations on the Rogun HPP site and at other locations affected by the Project. These constitute the more stringent of the Tajikistan MAC and the WHO Interim Target 3 ambient air quality standards. These standards apply to ambient and occupational exposure as follows:

- The annual standards serve as ambient air quality standards
- The short-duration limits, when measured over an 8-hour period, provide an exposure limit for site workers in indoor areas, including underground locations and buildings
- Rogun city
- Pasi Muhraho Village located next to Construction Site 2.
- Rogun HPP and Contractor offices and buildings

H. Table 1. Ambient and Occupational Air Quality Standards that Apply to the Project

Pollutant	Units	Duration	Tajikistan MAC (Annual)	Construction Phase		Operational Phase	
				WHO AQ Guidelines			
				Interim Target 3		Interim Target 4	
PM _{2.5}	(µg/m ³)	Annual	35 – 25	15		10	
		24-hour ^a	-	-	37.5	-	25
PM ₁₀	(µg/m ³)	Annual	60 – 40	30		20	
		24-hour ^a	-	-	75	-	50
O ₃	(µg/m ³)	peak season ^b	30	-	-	-	-
		8-hour ^a	-	-	-	-	100 ^c
NO ₂	(µg/m ³)	Annual	40	20	-	-	-

¹ World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile

		24-hour ^a	-	-	-	-	-
		1-hour ^a	-	-	-	-	200^c
SO ₂	(µg/m ³)	24-hour ^a	50	-	-	-	40^d
		10-minute					500
CO (24-hour)	(mg/m ³)	24-hour ^a					4
		8-hour	3	-	-	-	10
		1-hour					35
		15-minute					100
a. 99th percentile (i.e., exceedance days per year) b. Average of daily maximum 8-hour mean O ₃ concentration in the six consecutive months with the highest six-month running-average O ₃ concentration c. Unchanged from WHO 2005 AQ Guidelines d. WHO 2021 limit							

I. Baseline Air Quality

10. The main pollutants of concern include:

- Airborne particulate matter, including specifically total PM as well as PM with diameters under 10 microns and 2.5 microns.
- Nitrogen oxides (NOx) and carbon monoxide (CO) from fuel combustion, particularly vehicles and plant within enclosed spaces.
- Ozone (O₃) in the transformer and powerhouse caverns and adjacent tunnels.
- The Air Quality Management Plans prepared by Contractors must include a program to characterize and manage the air quality at all locations for which they are responsible. In order to do this, the Contractor must:
- Baseline air quality and pollutant concentrations. Contractors must monitor the pollutants of concern and include in the AQMP the existing air quality conditions in their above- and below-ground locations. This includes collecting data on pollutants through consistent monitoring, meteorological conditions, and the identification of sensitive receptors
- Emissions inventory: The AQMP must identify and quantify the key sources of emissions from construction operations. This includes both fixed sources (e.g., generators which operate for extended periods) and mobile sources (e.g., construction vehicles)
- Mitigation Measures: The AQMP must identify measures to reduce or eliminate sources of pollution that cause exceedances of the applicable standards defined in Section 2 above. Such measures may include operational changes such as traffic regulation, dust control, or implementing speed limits or design measures, such as improved ventilation in confined spaces such as tunnels or the powerhouse
- Monitoring and Reporting: the AQMP will continue to monitor air quality during construction in order to evaluate the effectiveness of mitigation measures and consider whether impacts that remain after mitigation has been implemented require further mitigation, and require that results be reported to the ER/PMC

J. Mitigation Measures

11. Contractors will identify mitigation measures that will be implemented in order to avoid exceedances of air quality standards and in response to the exceedance of standards. Annex A presents a non-exhaustive list of candidate measures for control of air pollution at large HPPs during construction and operation.
12. Conditions that may require Contractors to enact mitigation measures include the following:
 - Complaints: The receipt of complaints from workers or communities about dust, odors, or other air quality issues may require enhanced mitigation efforts
 - Changes in weather: Adverse weather conditions, such as high winds, can increase the dispersion of dust and other pollutants over an area wider than usual, which may result in impacts to more or different receptors.
 - Repeated and/or extended exceedances of applicable standards, as determined by monitoring results or observations of visible dust
 - High-risk activities: Certain construction activities, such as demolition, excavation, or the handling of dusty materials, may require mitigation to minimize air emissions and quality impacts.
13. The AQMP must specify the measures that will be implemented, generally and in specific locations, to minimize air quality impacts from construction activities. Annex A provides examples of potential mitigation measures that have been found effective in various situations to avoid or reduce air pollution and air quality impacts and that should be considered by the Contractor in identifying required mitigations.
14. The AQMP must include requirements for training and awareness, which will include at least the following:
 - Inclusion in induction training information on the importance of managing air quality, including the risks to workers and communities
 - Training for all personnel who have responsibilities related for air quality management, both in general the importance of reducing emissions. This includes managers, drivers, HSE personnel, supervisors, and others with relevant responsibilities.
 - Maintenance of the Grievance Mechanisms for workers and community members that allow them to provide complaints and suggestions regarding air emissions and air quality.
15. Contractors may not rely on PPE as a routine measure to protect workers. The AQMP may include PPE as a mitigation measure to prevent or reduce impacts from air pollution only as a last resort and for short-term exposure, and only as approved by the ER/PMC. In such cases, the relevant PPE must be functional and in good condition and must be provided at no cost to workers.

K. Monitoring and Inspections

16. The AQMP must include a detailed monitoring program that meets the relevant time periods for air quality standards so that any exceedances of standards can be identified. The monitoring program must be accompanied by a robust inspection program, carried out by competent and defined individuals employed by each Contractor.

17. In all indoor and underground areas under the Contractor's control, the program will require monitoring at all workplaces where workers may be exposed to dust and exhaust emissions.
18. In outdoor areas, monitoring of ambient air quality must be undertaken at locations where activities result in airborne particulates, where fixed plant and equipment is operated, and at quarries and borrow pits. Air quality monitoring times, frequencies and methods will be set out in the AQMP so that the monitoring results can be compared to applicable standards.
19. The schedule shall be developed and updated after each monitoring period and adjusted as needed in response to violations of standards or to ambient conditions that may affect air quality (high winds, heavy traffic, wet weather, etc.).
20. The Plan will identify instrumentation that will be used to monitor air quality. The types of instruments that may be used for the various pollutants are summarized in **Table 2**.

Table 2. Examples of Air Quality Monitoring Instrumentation

Pollutant/substance	Example instrument and justification
Dust (Suspended Particulates)	Optical Particle Counters (OPC): OPCs offer real-time monitoring and measures particle size distribution and concentration, which aids in quickly identifying dust level exceedances
PM ₁₀	OPC
PM _{2.5}	OPC
O ₃	Photometric Ozone Monitors (POM): POMs measure ozone concentration and are useful for continuous monitoring and provide real-time data.
Nox (NO and NO ₂)	UV Absorption Analyzers (UVAA): UVAAAs can detect NO _x concentrations in indoor and outdoor spaces. They are reliable and provide continuous, real-time data.
SO ₂	Non-Dispersive Infrared (NDIR) Analyzers: These devices measure SO ₂ concentration by detecting the absorption of infrared light by SO ₂ molecules. They are useful for continuous monitoring and can provide real-time data
CO	NDIR

21. All instrumentation must be well-maintained and regularly calibrated to ensure that they continue to deliver accurate readings. Equipment must be calibrated as recommended by manufacturers and adhere to best practice standards such as ISO 21501-4.
22. Where PPE is authorized for use, the use will be monitored and enforced by supervisors, HSE personnel, and managers. Repeated failure to use PPE properly may result in removal from the site.
23. Managers and supervisors must be continually aware of air quality and call any perceived issues (e.g., haze in tunnels, visible dust in outdoor locations) to the attention of HSE personnel, who will investigate and monitor if needed and will take prompt action to address the issue.

24. The AQMP will require that qualified personnel conduct air quality inspections and instrument monitoring at all locations at least monthly and, if needed, in response to issues raised by managers or supervisors or complaints by workers or community members. Locations of particular concern include unpaved roads used by construction traffic and construction activities in locations where dust may affect communities, including dwellings, schools, hospitals, etc. It also includes underground locations distant from tunnel portals or other openings.
25. In addition to the routine observations and the monthly monitoring, the AQMP will require unscheduled monitoring checks to be undertaken on varying days each week and at different times of day/night, to capture monitoring information in a range of scenarios. These site reviews will be logged, and any remedial actions recorded. Such checks will include (not limited to):
 - Presence and effectiveness of required mitigation measures (e.g., dust suppression, forced-air ventilation)
 - Compliance with agreed working methods
 - Compliance with any other requirements of the AQMP.
 - In addition to other inspections, incidental monitoring should also be carried out conditions that include, but are not limited to:
 - Where a non-conformance to applicable standards has been identified.
 - When a complaint about air quality from a worker or community member has been received.
 - In the case of an exceedance being reported and subsequently investigated and verified, the AQMP will require that the investigation consider the following:
 - Weather conditions, including wind direction and strength
 - Operations and the location at the time of exceedance
 - Any abnormal operations being undertaken the Contractor or other parties that could affect air quality
 - Air quality controls and other mitigation measures being applied
 - Identification of additional controls required.
26. The AQMP will require that work be suspended at locations where confirmatory sampling continues to show an exceedance of standards. Only when additional sampling shows that air quality is within standards may the suspension be ended, and this may be approved only by HSE personnel. Following resumption of work, air quality will be monitored on a daily basis to identify any further excursions and the need for further action.

L. Recording and Reporting

27. All monitoring and remedial actions, including responses to complaints and reports of issues, must be documented in an Air Quality Monitoring Register. This is to be a live document that is continually updated (see example in Annex B). Records must be maintained until the completion of works by the Contractor.
28. The Contractor will maintain a record of calibration for all instruments used for air quality monitoring and will take photographs of visible dust or haze when conducting inspections of making casual observations.
29. The Contractor will include a summary of the implementation of the AQMP as part of the monthly progress report that is submitted to the ER/PMC. This will include (but not limited to):

- A summary of the monitoring and inspection program e.g., number of inspections, number of samples, etc.) and of any deviations from the AQMP in the methods and instruments used
- A summary of the results of monitoring, including details of any violations of applicable standards, the actions taken to return to compliance, and the effectiveness of such actions.
- Changes to the AQMP.

M. Roles and Responsibilities

30. The AQMP must identify the responsible individuals for the implementation of the Plan, including mitigation and monitoring activities, recording and reporting, and supervision.

N. Training

31. Contractors must include in the AQMP a description of comprehensive training that will be provided to ensure that personnel understand and can effectively manage air emissions and air quality. Key subjects on which relevant personnel should be trained include, but are not limited to:
- Air Quality Standards: Training on project standards
 - Monitoring Techniques: Instruction on how to calibrate and use air quality monitoring equipment, interpret data, and report findings accurately
 - Health and Safety Protocols: Education on the health impacts of poor air quality and the importance of using PPE correctly
 - Pollution Control Measures: Training on best practices for minimizing emissions and controlling dust and other pollutants and on the proper operation of mitigation equipment
 - Emergency Response: Procedures for responding to air quality incidents
 - Environmental Awareness: General awareness training to develop a shared culture of environmental responsibility and sustainability.

O. Relationship to Other Management Plans

32. Other management plans that are or may be related to the Air Quality Management Plan and whose requirements may affect air quality include:
- Blasting and Explosives Management Plan
 - Community Health and Safety Management Plan
 - Construction Emergency Preparedness and Response Plan
 - Hazardous Materials Management Plan
 - Labor Management Plan (including worker grievance mechanism)
 - Occupational Health and Safety Plan and Plan
 - Spoil and Fill Management Plan
 - Stakeholder Engagement Plan (including external stakeholder grievance mechanism)
 - Traffic Management Plan (off-site and on-site).

P. Revision

33. The AQMP and relevant supporting documents will be reviewed and updated at least semi-annually (twice yearly) to ensure that it includes up to date information about the measures and monitoring which are required to be implemented. The AQMP will also be reviewed, and updated if necessary, following repeated violations of air quality standards.

34. The AQMP and relevant supporting documents will also be updated to include any additional mitigation measures or guidelines identified as being required to comply with the relevant AAQs. Where necessary, this will be completed prior to commencement of new construction activities.
35. Following every scheduled and unscheduled review, the Contractor will prepare and submit to the ER/PMC a summary of the review and a rationale for whether the AQMP requires updating. If the AQMP is updated, the updated Plan must be submitted to the ER/PMC for review and approval prior to implementation.

Annex A

Candidate Measures for Reducing Air Pollution and/or Controlling Exposure to Air Pollutants

Q. 1. Construction Phase

- Operations and storage/rest areas designed and laid out to reduce detours
- Use of low-emission vehicles, equipment, and machinery
- Timely and regular maintenance of vehicles and equipment
- Implement anti-idling policies to reduce emissions from stationary vehicles (shut off engines when not in use)
- Reduction of speeds on unpaved roads
- Suspension of dust-generating operations under windy or other unfavorable conditions
- Blasting scheduled during low wind periods; reduce during high-wind periods
- Use of dust control arrangements at quarries, such as wind-breaking walls / greenbelt.
- Control emissions from batching plants by using filters/cyclones
- Provision of covers for conveyor belts for all material susceptible to flying away
- Provision of covers for vehicles carrying dry earthen materials
- Dust suppression (e.g., water spraying, covering stockpiles).
- Personal protective equipment (PPE) for pollutant of concern (provided and used in accordance with the Occupational Health and Safety Plan). PPE is only for short-term use when other methods are not available or not effective, and to be approved by HSE Manager any time this method is used
- Monitor air quality in and near traffic tunnels and roads and in confined work areas
- Ventilation of tunnels with extended distances between portals
- Suspension of works when standards are repeatedly exceeded

R. 2.2. Operation and Maintenance Phase

- Use of low-emission vehicles, equipment, and machinery
- Monitor air quality near roads and in confined work areas
- Provision of masks and other PPE for activities close to emission sources—short-term use approved by HSE Manager each time this method is used.

Annex B

AIR QUALITY MONITORING REGISTER

Section 1: General Information

Field	Entry
Monitoring Location Name/ID	
GPS Coordinates (Lat, Long)	
Date of Monitoring (DD/MM/YYYY)	
Start Time (HH:MM)	
End Time (HH:MM)	
Field Staff Name(s)	
Project/Activity Reference	
Instrument Type	
Instrument Serial Number	
Calibration Status (Date & Method)	

Section 2: Pollutant Measurements

Pollutant	Unit	Averaging Period	Concentration	Measured Value	Comment
PM2.5	$\mu\text{g}/\text{m}^3$	Annual	5		
		24-hour ^(a)	15		
		One-time exceedance	160		
PM10	$\mu\text{g}/\text{m}^3$	Annual	15		
		24-hour	45		
		One-time exceedance	300		
O3	$\mu\text{g}/\text{m}^3$	peak season ^(b)	60		
		24-hour	30		
		8-hour	100		
		One-time exceedance	160		
NO2	$\mu\text{g}/\text{m}^3$	Annual	10		
		24-hour ^(a)	25		
		1-hour	200		
		One-time exceedance	85		
SO2	$\mu\text{g}/\text{m}^3$	24-hour ^(a)	40		
		10-minute	500		
		One-time exceedance	500		
CO	mg/m^3	24-hour ^(a)	3		
		8-hour	10		
		1-hour	35		
		15-minute	100		
		One-time exceedance	5		
Dust including silicon dioxide (SiO ₂) (20% < SiO ₂ < 70%)	mg/m^3	24-hour	100		
		One-time exceedance	300		

Notes:

e. 99th percentile (i.e., exceedance days per year)

- f. Average of daily maximum 8-hour mean O₃ concentration in the six consecutive months with the highest six-month running-average O₃ concentration

Section 3: Weather Conditions

Parameter	Unit	Start	End
Temperature	°C		
Humidity	%		
Wind Speed	m/s or km/h		
Wind Direction	Compass Bearing		
Cloud Cover	In eighths of the sky (octas) or percentage		
Rainfall	Yes/No + Intensity		
Visibility	Description or meters		

Section 4: Observations & Notes**1. Unusual Events (e.g., traffic, construction):****2. Instrument Issues or Anomalies:****3. Field Staff Comments:****Section 5: Verification**

Field	Entry
Field Staff Signature	
Supervisor Review Signature	
Date of Completion	
Photo Documentation Attached (Yes/No)	

✔ Guidance for Field Staff

- All fields **must be completed**. Use "N/A" only with justification.
- Use **calibrated instruments** only. Attach calibration certificates if required.
- Record **weather conditions at both start and end** of sampling.
- Ensure **timestamps are accurate** and consistent.
- Attach **supporting documents** (e.g., photos, calibration logs) as needed

Asbestos Management Plan Framework

A. Purpose and Applicability

1. Contractors employed at Rogun Hydropower Project (Rogun HPP or “the Project”) who are responsible for the demolition of buildings and other structures to clear a site will prepare and implement an Asbestos Management Plan (AMP) that is consistent with this Framework.
2. The Plan will be reviewed and approved by the Employer’s Representative (ER) and/or the Project Management Consultant (PMC) and, once approved, it must be diligently implemented by the Contractor. New Contractors must have an approved Plan prior to the start of demolition works; and existing Contractors must prepare and submit such a Plan within six months of the date that World Bank financing is provided to the Project or earlier, if required by their contract.

B. Applicable Standards

3. The Plan must include such requirements that will ensure the project meets the requirements of relevant regulations in Tajikistan and its international obligations, standards and requirements of International Financial Institutions, and good international industry practice (GIIP).
4. Such requirements will include, at a minimum, the requirements described in this Management Plan Framework.
5. In all cases, site-specific engineering and scientific judgment will be used to confirm that standards are sufficient to prevent unacceptable impacts on the people and environment. If there are inconsistencies among or between requirements, the AMP must adopt the more stringent of all these requirements.

C. Tajikistan Legislation

6. Tajikistan has ratified the International Labor Organization (ILO) Convention concerning Safety in the Use of Asbestos (entry into force: 16 Jun 1989) – the Asbestos Convention, 1989 (No. 162) has transposed the commitments into the Law of the Republic of Tajikistan “About Production Wastes and Consumption” (Decree 44, 2002, as amended).

D. International Financial Institutions’ Standards

7. Various international financial institutions are providing financing for the construction and operation of Rogun HPP. Each of these institutions requires that projects comply with not only national legislation but also the institution’s own standards. The various standards that are relevant to waste management are exemplified by World Bank ESS3.
8. Paragraphs 17 and 18 of ESS 3 (Resource Efficiency and Pollution Prevention and Management) outline the following principles for managing hazardous waste:
 - Minimize waste generation to the extent feasible.
 - Reuse, recycle and recover waste to the extent possible, in a manner that is safe for human health and the environment. Where waste cannot be reused, recycled, or recovered, it must be treated, destroyed, and/or disposed of it in an environmentally sound and safe manner.
 - Where hazardous waste is generated, it must be managed in compliance with national waste laws and applicable international conventions, including those relating to transboundary movement of waste. Where such requirements are absent,

the Project must adopt Good International Industry Practice (GIIP) alternatives for its environmentally sound and safe management and disposal.

- Verify that third parties involved in hazardous waste management are reputable and legitimate companies licensed by the government, with chain of custody records maintained for transportation and disposal.
- Ensure that disposal sites are properly licensed and are being operated to acceptable standards.

E. Good International Industry Practice

9. World Bank Group Environmental, Health and Safety (EHS) General Guidelines: Environmental, sections 1.6 “Waste Management”
10. WBG EHS Guidelines for Occupation Health and Safety (OHS) Section 2.4 “Chemical Hazards – Asbestos Containing Materials (ACM)”
11. Asian Development Bank. Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks. March 2022
12. European Bank for Reconstruction and Development Briefing Note: Working Safely Around Asbestos Pipes. Version 1. July 2021.

F. Asbestos Survey

13. In consultation with Rogun JSC, the Project Management Group for Energy Facilities Construction Under the President of the Republic of Tajikistan (PMG) will arrange for an asbestos survey by appropriately qualified personnel or Contractors to identify where asbestos is or may be present. If suitably qualified asbestos survey specialists cannot be found within Tajikistan, international contractors must be used.
14. The asbestos survey will cover, but not be limited to, the following locations:
 - Rogun HPP construction site:
 - All buildings that will be demolished
 - Areas of the construction site that will be inundated as the reservoir is filled
 - All locations where wastes are known or suspected to have been dumped or otherwise disposed.
 - Resettlement villages:
 - Buildings that have been abandoned in advance of inundation by the reservoir that are known or suspected to contain asbestos.
15. Where surveys will be conducted for resettlement villages, State Enterprise “Directorate of the Rogun HPP Flooding Zone (DFZ) will liaise with PMG and the ER/PMC to identify and use personnel with requisite qualifications to manage asbestos risk during the resettlement process.
16. Once the survey has been completed, an Asbestos Register must be developed by the party undertaking the survey. The Asbestos Register must include (but is not limited to):
 - All known and presumed ACM in all buildings or other locations
 - Type of ACM present
 - Quantity of asbestos and its condition

- Risk assessment of the potential for each ACM to release fibers and the likelihood of disturbance during the demolition or removal, process. The risk assessment should include the following aspects, as a minimum:
 - The information gathered on the location, amount and condition of the ACM
 - Whether there is easy access to the ACM
 - Whether the demolition process will release asbestos fibers to which workers or others could be exposed.
 - The numbers of people who could be exposed to the asbestos
 - Photographs to confirm location and for routine condition monitoring
 - Specific actions that need to be taken to manage or remove identified ACM and due dates and responsibility for these actions
 - Personal protective equipment (PPE) and safety equipment that are required to be provided to workers involved in the demolition effort and the management of asbestos
 - Evidence of actions being completed, and corresponding update of the Asbestos Register. The Asbestos Register shall inform the development of a site-wide Asbestos Management Plan (AMP) stating how ACM on the Project site will be managed. The AMP will include controls to prevent disturbance of ACM, in accordance with the management approach and activities described below.

G. Management Approach and Activities

17. Using the Asbestos Register and the risk assessment, the relevant Contractor must prepare a detailed AMP for the demolition of identified sites and structures and the removal of other ACM. The purpose of the AMP will be to ensure the safety of site personnel, the community, and other potentially affected persons and to ensure that asbestos management minimizes exposure to asbestos fibers and prevent the release of asbestos to the environment in the future. The AMP will become part of the Contractor's program for managing environmental and social risks and impacts.
18. The AMP must describe the GIIP and additional mitigation measures for management of ACM, which must be consistent with requirements of the Waste Management Plan and the applicable standards and must, as a minimum, include:
 - The location of buildings/structures to be demolished
 - The location of known and potential ACM
 - A method statement that describes how asbestos will be managed, *in situ* and loose in a way that prevents the release of fibers into the air, during removal, handling and containerization, and transport.
 - The location and description of the location to which asbestos will be removed for disposal, which must be compliance with Tajikistan legal requirements
 - The procedures to be followed in case of accidents or emergencies

- A procedure that describes the process to be followed if unexpected ACM is identified during the course of works, including a requirement to stop work until the materials have been adequately characterized
 - Training and qualification requirements for personnel engaged in work that may expose them to ACM.
 - Specifications for, labelling containers that may hold ACM and warning signs in the work area
 - Details of how ACMs will be secured for removal, such as double-bagging, using heavy-duty plastic sheeting and sealing with tape, placing rubble into specifically designed builders' bags, and/or other practices.
19. The AMP must describe the process by which the disposal site was selected and identify by name and location of the approved facility that will accept the asbestos waste. The Plan will also describe the describe and commit to following the specific processes and requirements of the site operator. The ER/PMC will confirm the disposal site is suitable and accepts asbestos as part of the AMP review and approval.
20. The AMP must describe what actions will be taken, and by whom, if inspection results show that management practices do not meet applicable requirements.
21. The AMP must also identify the means by which, and the level within the Contractor and the ER/PMG to which, violations of requirements and/or adverse effects due to improper management of ACMs will be reported.

H. Health and Safety

22. The Contractor(s) employed by PMG to conduct the asbestos survey will prepare an Occupational Health and Safety Plan² that defines the work practices that will be implemented to protect workers from exposure to asbestos fibers and other risks that may be faced in the survey. Contractors responsible for demolition and asbestos management will include in their AMPs will also define their programs of safe work practices³. These plans must be submitted for review and approval by the ER/PMC prior to implementation.
23. The plans must include, at a minimum:
- Minimum personal protective equipment (PPE) that will be required, which will include, but not be limited to, safety boots, hard hats, high-visibility clothing, disposable coveralls and respirators or other respiratory protection
 - Requirements that workers who may be exposed to asbestos fibers be trained in the risks, in the safe handling of asbestos and ACM, and in the proper use of PPE and equipment

² Or include in the main OHS Plan requirements that are specific to the risks presented by asbestos and the actions needed to manage those risks.

³ Requirements relevant to asbestos may be included in the Contractors' Occupational Health and Safety Plans or may be included in a OHS Plan prepared specifically for the asbestos management program.

- Requirements for the enforcement of PPE use by supervisors, HSE personnel, and management, including immediate removal from sites of personnel without proper PPE
- Requirements for hygiene and cleanup, including:
 - Strict hygiene practices, including not smoking or eating in potential exposure zones and showering after work
 - Thorough cleanup procedures to remove any dust or debris using HEPA vacuums and wet wiping
 - Designated and contained areas with specialized cleaning facilities (e.g., three-stage decontamination units) for workers on higher-risk jobs.

I. Monitoring, Recordkeeping, and Reporting

24. The OHS requirements in the ACM and/or the OHS program for asbestos management will include monitoring of air in and at the perimeters of work locations. The program will require:
- That concentrations be measured for shorter (30-minute) and longer (8-hour) periods. Results must be available in a timely manner--more than one or a very few days would make the results too late for a meaningful response.
 - That monitoring be at removal locations and at site perimeters
 - That work be suspended if concentrations are found to exceed 1.0 fibers per cubic centimeter of air during a 30-minute period or 0.1 fibers per cubic centimeter over an 8-hour period. Work may not be resumed until additional measures are implemented to reduce concentrations or limit exposure. Resumption may be authorized only by the ER/PMC HSE Manager.
 - Repeated monitoring following any exceedance of the limits above.
 - That workers be informed if concentrations exceed the limits above.
25. The Contractor will include in the monthly progress report submitted to the ER/PMC a summary of the asbestos removal and management program for the previous period. This will include a summary of activities and how asbestos has been managed, including locations and quantities. The report will also describe any deviations from the approved AMP.
26. Through all activities involving demolition and asbestos management, the Asbestos Register will be updated to reflect the progress of identification and removal.

J. Implementation

27. The AMP must identify and describe the organizational positions and responsibilities of all parties who will implement, supervise, or otherwise have a role in implementing the requirements of the AMP. This should be shown in organograms that include as much detail as possible, down to the individual position or person and their titles. The Contractor's AMP must cover the Contractor and all subcontractors.
28. Only personnel qualified in the identification and removal of ACM shall undertake pre-demolition works, surveys, and be authorized to update the Asbestos Register.

K. Training

29. The AMP must identify the training that will be provided to all staff and managers who will be involved in the identification and management of asbestos. Training must be sufficient to allow them to perform their responsibilities at minimum risk to themselves, other workers, the Project, and the environment. It must identify who will be responsible for conducting the training and who will be trained in what skills. Training will focus on the assigned responsibilities of the trainees and will cover technical and administrative skills needed to perform assigned responsibilities related to demolition management, the actions required in case of incidents, and topics related to occupational health and safety, including PPE required to conduct assigned activities.
30. The AMP will require training in the recognition of ACM and in the prevention of unnecessary disturbance of ACM for all staff involved in conducting surveys, and in recognizing and handling asbestos for those involved in demolition and in transporting asbestos.

L. Relationship to Other Plans

31. Other plans that are or may be related to this AMP include:

- Community Health and Safety Plan
- Emergency Preparedness and Response Plan
- Occupational Health and Safety Plan
- Waste Management Plan
- Spill Prevention and Response Plan
- Stakeholder Engagement Plan
- On- Site and Off-Site Traffic Management Plans.

M. Revision

32. The Contractor must review the AMP at least semi-annually (that is, twice per year) during the period during which demolition activities take place, and revise the Plan as needed to reflect changes in standards, conditions, or activities.
33. If a review determines that revisions are required, the updated Plan must be reviewed and approved by the ER/PMC before changes are made to ongoing asbestos management. If no changes are needed, the Contractor must notify the ER/PMC that the review has concluded no changes are needed, a conclusion to which the ER/PMC must concur.

Blasting and Explosives Management Plan Framework

A. Purpose and Applicability

1. The purpose of this Framework is to identify the minimum requirements for explosives management and blasting operations at the Rogun Hydropower Project (HPP) construction site and to define the requirements of Contractor Blasting and Explosives Management Plans (BEMPs).
2. Each Contractor employed at Rogun Hydropower Project (the Project) that transports, stores, uses, or otherwise manages explosives must have a BEMP that is consistent with Tajikistan law and this Framework, and that has been approved by the Contractor's Project Manager and by the Employer's Representative (ER) and/or the Project Management Consultant (PMC). If an existing Contractor has a BEMP that has been approved by the ER, a new plan is not needed if the ER/PMC verifies the existing plan is equivalent to what is required by this Framework, or if the Contractor makes sufficient changes to the existing plan that the ER determines it is equivalent. Once approved by the ER/PMC, it shall be diligently implemented by the Contractor.
3. New Contractors must have a Plan approved by the ER/PMC before they transport explosives to the construction site or manage explosives on the site. Existing Contractors that manage explosives or are involved in blasting operations must have an approved Plan within six months of the date that World Bank financing is provided to the Project or as otherwise required by their contract.
4. Contractors must consider alternatives to blasting (for example chemical rock braking, jackhammer, etc.) and other possible methods of minimizing the quantities of explosives transported, stored, and used on site.

B. Definitions

Approved Storage Facility: A facility for the storage of explosive materials conforming to the requirements covered by license or permit issued under authority of Tajikistan laws and regulations.⁴

Blast Area: The areas in which explosives are loaded and blasting operations are being conducted.

Blaster: The person qualified and authorized to use explosives for blasting purposes as specified by applicable laws and regulations and the blasting license holder.

Blasting Agent: Any material or mixture consisting of a fuel and oxidizer used for blasting that is blasting and is not classified an explosive, in which none of the ingredients is classified as an explosive, provided the furnished (mixed) product cannot be detonated with a No. 8 test

⁴ Selection of this/these site(s) will be based on a thorough assessment of accident scenarios considering, among other factors, the maximum quantity and type of explosives to be stored on site, the potential radius of damage and injuries in the event of an accidental explosion and the location of receptors, such as communities, infrastructure and environmentally sensitive areas.

blasting cap when confined. A common blasting agent presently in use is a mixture of ammonium nitrate (NH_4NO_3) and carbonaceous combustibles, such as fuel oil or coal, and may either be procured, premixed, and packaged from explosives companies or mixed in the field.

Blasting Cap: A metallic tube closed at one end, containing a charge of one or more detonating compounds, and designed for and capable of detonation from the sparks or flame from a safety fuse inserted and crimped into the open end.

Block Holing: The breaking of boulders by firing a charge of explosives that has been loaded in a drill hole.

Transportation: The movement of explosives or blasting agents from one location to another in a mobile vehicle or machine of any sort, including but not limited to trucks, trailers, rail cars, barges, and vessels.

Detonating Cord: A flexible cord containing a center core of high explosives which, when detonated, will have sufficient strength to detonate other cap-sensitive explosives with which it is in contact.

Detonator: Blasting caps, electric blasting caps, delay electric blasting caps, and non-electric delay blasting caps.

Electric Blasting Cap: A blasting cap designed for and capable of detonation by means of an electric current.

Electric Blasting Circuitry:

Bus wire. An expendable wire, used in parallel or series, in parallel circuits, to which are the leg wires of electric blasting caps connected.

- **Connecting wire.** An insulated expendable wire used between electric blasting caps and the leading wires or between the bus wire and the leading wires.
- **Leading wire.** An insulated wire used between the electric power source and the electric blasting cap circuit.
- **Permanent blasting wire.** A permanently mounted insulated wire used between the electric power source and the electric blasting cap circuit.

Electric Delay Blasting Caps: Caps designed to detonate at a predetermined period of time after energy is applied to the ignition system.

Explosive:

- A substance, or a mixture of substances, in a solid or liquid state, which is capable of producing an explosion
- A pyrotechnic substance in a solid or liquid state, or a mixture of such substances, designed to produce an effect by heat, light, sound, gas or smoke, or a combination of these, as the result of non-detonative self-sustaining exothermic chemical reaction, including pyrotechnic substance which do not evolve gases
- Any article or device containing one or more substances contemplated in paragraph above
- Any plastic explosive

- Any other substance or articles which is classified as an explosive by the Main State Department on Control of Safe Works in Industry and Mines Inspectorate or other relevant Government agency

Magazine: Any building or structure, other than an explosive manufacturing building, used for the storage of explosives.

Misfire: An explosive charge which failed to detonate.

Primary Blasting: The blasting operation by which the formation or material is dislodged from its location.

Secondary Blasting: The reduction of oversize material by the use of explosives to the dimension required for handling, including mud-capping and block-holing.

C. Roles and Responsibilities

5. The BEMP will define the roles and responsibilities for transporting, using, and disposing of explosives and for managing blasting operations. While the titles and specific responsibilities may vary, the following is an example of common practice:

- *Blasting Manager/Blaster.* Overall management of blasting operations, whose responsibilities will include, but not be limited to:
- Implementation of the approved Blasting Plan and supervision of blasting operations in accordance with the requirements of the Blasting Plan and the BEMP
- Ensuring good communication / liaison with relevant Contractor / Client representatives.
- Planning and acquisition of the labor resources
- Ensuring all activities are carried out to schedule, and in accordance with quality, safety, health and environmental requirements
- Ensuring all personnel involved in field operations are qualified to carry out the tasks they are required to perform
- Blasting Foreman
- Executing blasting works as directed by the Blasting Manager in accordance with Tajikistan law and this Framework
- Maintaining all blasting records and reporting to the Blasting Manager as required
- Tunnelling Site Agent or Engineer
- Ensuring that assigned Supervisors and other personnel carry out blasting works correctly and in a safe and environmentally friendly manner

D. Sequence of Activities

6. The BEMP will require that all blasting operations covered by a Blasting Plan be conducted in accordance with requirements at least equivalent to those in this section. Appendix 1 provides examples of several forms that could be used to record required information for blasting records.

D.1. General Provisions:

- Only authorized and qualified persons shall be allowed to handle and use explosives.
- Smoking, firearms, matches, lighters, open flame lamps, and other fires, flame or heat or sparks producing devices shall be prohibited in or near explosive magazines or while explosives are being handled, transported, or used.
 - All explosives shall be accounted for at all times.
 - Explosives not being used shall be kept in a locked magazine, unavailable to persons not authorized to handle them.
 - The Contractor shall maintain an inventory and use record of all explosives.
- Appropriate authorities shall be notified of any loss, theft, or unauthorized entry into a magazine.
- No explosives or blasting agents shall be abandoned.
- Fires shall be dealt with when safe to do so. However, fires in the vicinity of explosives shall not be considered “safe” and therefore shall not be tackled. In this case all workers and visitors shall be moved to a safe area and the fire area contained and guarded against intruders.
- Original containers or magazines shall be used for taking detonators and other explosives from storage magazines to the blasting area.
- When blasting is done in congested areas or in proximity to a structure, road, or any other installation that may be damaged, the blaster shall take special precautions in the loading, delaying, initiation, and confinement of each blast with mats or other methods so as to control the throw of fragments, and thus prevent bodily injury to employees.
- Employees authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution to ensure personnel safety, including but not limited to visual and audible warning signals, flags, or barricades.
- Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, lightning, adjacent power lines, dust storms, or other sources of extraneous electricity. These precautions must include:
 - Short-circuiting of detonators in holes that have been primed, and shunted until wired into the blasting circuit
 - Suspension of all blasting operations and removal of persons from the blasting area during the approach and progress of an electric storm
 - Ensuring that mobile radio transmitters are de-energized and effectively locked if they are less than 30 meters away from electric blasting caps that are in other than original containers
 - Adherence to the recommendations of The Institute of the Makers of Explosives with regard to blasting in the vicinity of radio transmitters, as stipulated in “Radio Frequency Energy - A Potential Hazard in the Use of Electric Blasting Caps” (IME Publication No. 20, March 1971)

- Empty boxes and paper and fiber packing materials that have previously contained explosives shall be defined as “Old Explosives”. They may not be used again for any purpose but will be destroyed by burning at an approved location⁵.
- Explosives, blasting agents, and blasting supplies that are obviously deteriorated or damaged must not be used, and any part of any explosives found during the post-blast inspection must be treated as old explosives and destroyed as per an “Old Explosives” procedure.
- Delivery and issue of explosives may only be made by and to authorized persons and placed in authorized magazines or approved temporary storage or handling areas.
- Blasting operations in the proximity of overhead power lines, communication lines, utility services, or other services and building structures may not be carried out until measures for safe control have been taken and the Employer’s Representative has reviewed and approved.
- All loading and firing must be directed and supervised by competent qualified persons thoroughly experienced in this field.
- All blasts must be fired electrically with an electric blasting machine or properly designed electric power source.

D.2. Blaster Qualifications

7. The BEMP will establish minimum criteria in order for a person to be qualified as a blaster. These must be equivalent to or equal to the following:
- In possession of a blasting certificate
 - In good physical condition and not be addicted to alcohol, narcotics, intoxicants, or similar types of drugs
 - Qualified, by reason of training, knowledge, or experience, in the field of transporting, storing, handling, and use of explosives, and have a working knowledge of Tajikistan laws and regulations that pertain to explosives
 - Required to furnish satisfactory evidence of competency in handling explosives and performing in a safe manner the type of blasting that will be required.
 - Knowledgeable and competent in the use of each type of blasting method used.

D.3. Explosives Transport

8. The BEMP must establish requirements for transporting explosives, on and off the construction site, at least equivalent to the following paragraphs:
- Motor vehicles or other conveyances transporting explosives may only be driven by, and be in the charge of, a licensed driver who is physically fit and familiar with the Tajikistan legal requirements governing the transportation of explosives.

⁵ All Sites will be approved by the Service on the State Supervision of Safe Operation in Industry and Mountain Supervision of the Government of Tajikistan

- Neither the driver, passenger, or any other person may smoke or carry matches or any other flame-producing device, or carry firearms or loaded cartridges, while in or near a motor vehicle or conveyance transporting explosives.
- Explosives, blasting agents, and blasting supplies may not be transported with other materials or cargoes. Blasting caps (including electric) may not be transported in the same vehicle with other explosives.
- Vehicles used for transporting explosives must be strong enough to carry the load without difficulty and must be in good mechanical condition.
- All vehicles used for the transportation of explosives must have tight floors and any exposed spark-producing metal on the inside of the body must be covered with wood or other non-sparking material in order to prevent contact with containers of explosives.
- Each vehicle used for transportation of explosives must be equipped with a fully charged approved fire extinguisher of not less than 10-ABC rating. The driver must be trained in the use of the extinguisher on/in his/her vehicle.
- Motor vehicles or conveyances carrying explosives, blasting agents, or blasting supplies, may not be taken inside a garage or shop for repairs or servicing.
- Vehicles used for transporting explosives must be clearly marked on the rear, front and on both sides with required hazardous safety signs and marked "EXPLOSIVES".
- No motor vehicle transporting explosives may be left unattended.
- As required by the Traffic and Transport Management Plan, Pre-start checks must be conducted by the driver and blaster before any explosives transport vehicle may be used using a checklist and recording the results. Results of checks must be maintained.
- When loading explosives transport vehicles with explosives, no other vehicle or employees other than those loading the vehicle are allowed within 30 meters. If necessary, the area to be barricaded off.
- The driver of a vehicle transporting explosives must not stop on route unnecessarily. If a stop is necessary, the driver must:
 - Stop for no longer than required under the circumstances.
 - Park the vehicle away from any place where there is an open flame, match or any other thing that could increase the likelihood of an ignition.
 - Park the vehicle away from any place where there are flammable substances, including but not limited to gasoline pumps, propane tanks, or above-ground storage tanks for flammable liquid or flammable gas, are stored
 - Park the vehicle away from any place where people are likely to gather.
- In a vehicle transporting explosives breaks down or is otherwise unable to proceed for mechanical reasons, the driver must ensure that repairs to the vehicle are done at the location of the breakdown only if the person doing the repair work will not increase the likelihood of an ignition, understands the hazards to which they could be exposed, and who is competent to carry out their duties in a manner that is safe, lawful, and ensures the security of the vehicle.
- The driver of an explosives transport vehicle must ensure that the portion of the vehicle that contains the explosives is kept locked except when the explosives are being loaded or unloaded.

D.4. Storage of Explosives and Blasting Agents

- The Blaster shall keep detailed and comprehensive records of all explosives received and used. Any deviation (shortage) must be immediately reported to the relevant authorities and Site Management as well as security authorities in accordance with the Security Management Plan.
- Explosives and related materials must be stored in approved facilities required under the applicable provisions of Tajikistan law and regulations. Appropriate access control measures (to inter alia prevent theft/improper use) at the storage and handling sites would have to be verified before the facilities are put to use.
- Blasting caps, electric blasting caps, detonating primers, and primed cartridges may not be stored in the same magazine with other explosives or blasting agents.
- Smoking and open flames shall not be permitted within 15 meters of an explosives and detonator storage magazine.
- Explosive stores must be inspected weekly by the Blaster, with records kept of the results.
- All lights and electrical switches must be of the flameproof type, and switches must be located outside the store.
- Magazines must be kept clean and dry, and kept free of grit, paper, empty packages and containers, and rubbish.
- Brooms and other utensils used in the cleaning and maintenance of magazines must have no spark-producing metal parts.
- Safety signs shall be clearly displayed at all explosive storage sites as per legal requirements, and in the language of the people who enter or use the sites, or universally understood pictograms. The following signs must be displayed:
 - Unauthorized Entry Prohibited
 - No mobile phones allowed
 - No smoking, cigarettes or lighters allowed.
 - No open flames allowed.
 - Danger: Explosives
- All unused or redundant explosive magazines or other areas used where explosives were handled, shall be inspected by the relevant blaster / responsible person to ensure no residue is left behind. The store/area shall be cleaned and washed with water and all material that was in contact with explosives removed and treated as "Old Explosives" and destroyed accordingly. After such removal and disposal, normal procedure as per the SMPF should be followed on decommissioning measures.

D.5. Loading of Explosives or Blasting Agents

- All drill holes must be sufficiently large to admit freely the insertion of the cartridges of explosives.
- Tamping must be done only with wood rods or plastic tamping poles without exposed metal parts, although non-sparking metal connectors may be used for jointed poles. There must be no violent tamping and the primer must never be tamped.
- No holes are to be loaded except those to be fired in the next round of blasting. After loading, all remaining explosives and detonators must be returned immediately to an authorized magazine.

- Drilling may not be started until all remaining butts of old holes are examined for unexploded charges, and if any are found, they must be refired before work proceeds.
- No person is to be allowed to deepen drill holes that have contained explosives or blasting agents.
- No explosives or blasting agents may be left unattended at the blast site.
- Machines and all tools not used for loading explosives into bore holes must be removed from the immediate location of holes before explosives are delivered. Equipment may not be operated within 20 meters of loaded holes.
- No activity of any nature other than that which is required for loading holes with explosives is to be allowed in a blast area.
- Power lines and portable electric cables for equipment being used must be kept a safe distance from explosives or blasting agents that are being loaded into drill holes. Cables in the proximity of the blast area must be de-energized and locked out by the blaster.
- Holes must be checked prior to loading to determine depth and conditions. Where a hole has been loaded with explosives, but the explosives have failed to detonate, there may be no drilling within 30 meters of the hole.
- When loading a long line of holes with more than one loading crew, the crews must be separated by practical distance consistent with efficient operation and supervision of crews.
- All blast holes in open work must be stemmed to the collar or to a point which will confine the charge.
- No loaded holes may be left unattended or unprotected.
- The blaster must keep an accurate, up-to-date record of explosives, blasting agents, and blasting supplies used in a blast and must keep an accurate running inventory of all explosives and blasting agents stored on the operation.

D.6. Initiation of Explosive Charges – Electrical Blasting

- Before blasting, the Blaster must complete a pre-blast checklist. An example checklist is provided as Appendix 2.
- Electric blasting caps may not be used where sources of extraneous electricity could make the use of electric blasting caps dangerous. Before adopting any system of electrical firing, the blaster must conduct a thorough survey for extraneous currents and eliminate all dangerous currents any holes are loaded.
- Blasting cap leg wires must be kept short-circuited (shunted) until they are connected into the circuit for firing.
- In any single blast using electric blasting caps, all caps must be of the same style or function, and of the same manufacture.
- Electric blasting must be carried out using blasting circuits or power circuits in accordance with the electric blasting cap manufacturer's recommendations.
- When firing a circuit of electric blasting caps, care must be exercised to ensure that an adequate quantity, in accordance with the manufacturer's recommendations, of delivered current is available.
- Connecting wires and lead wires must be insulated single solid wires of sufficient current-carrying capacity.
- Bus wires must be solid single wires of sufficient current-carrying capacity.
- When firing electrically, the insulation on all firing lines must be adequate and in good condition.
- A power circuit used for firing electric blasting caps must not be grounded.

- When firing from a power circuit, the firing switch must be locked in the open or "Off" position at all times, except when firing. It must be designed so that the firing lines to the cap circuit are automatically short-circuited when the switch is in the "Off" position. Keys to this switch must be entrusted only to the blaster.
- Blasting machines must be in good condition and the efficiency of the machine tested periodically to make certain that it can deliver power at its rated capacity.
- When firing with blasting machines, the connections must be made as recommended by the manufacturer of the electric blasting caps used.
- The number of electric blasting caps connected to a blasting machine may not be in excess of its rated capacity. Further, in primary blasting, a series circuit may contain no more caps than the limits recommended by the manufacturer of the electric blasting caps in use.
- The blaster must be in charge of the blasting machines, and no other person may connect the leading wires to the machine.
- Whenever the possibility exists that a leading line or blasting wire might be thrown over a live power line by the force of an explosion, care has to be taken to see that the total length of wires is too short to hit the lines, or that the wires are securely anchored to the ground. If neither of these requirements can be satisfied, a non-electric system must be used.
- After firing an electric blast from a blasting machine, the leading wires must be immediately disconnected from the machine and short-circuited.

D.7. Use of Detonating Cord

- Care must be taken to select a detonating cord consistent with the type and physical condition of the bore hole and stemming and the type of explosives used.
- Detonating cord must be handled and used with the same respect and care given other explosives.
- The line of detonating cord extending out of a bore hole or from a charge must be cut from the supply spool before loading the remainder of the bore hole or placing additional charges.
- Detonating cord must be handled and used with care to avoid damaging or severing the cord during and after loading and hooking-up.
- Detonating cord connections must be competent and positive in accordance with approved and recommended methods. Knot-type or other cord-to-cord connections may be made only with detonating cord in which the explosive core is dry.
- All detonating cord trunk lines and branch lines must be free of loops, sharp kinks or angles that direct the cord back toward the oncoming line of detonation.
- All detonating cord connections must be inspected before firing the blast.
- When detonating cord milli-second-delay connectors or short-interval-delay electric blasting caps are used with detonating cord, the practice must conform strictly to the manufacturer's recommendations.
- When connecting a blasting cap or an electric blasting cap to detonating cord, the cap must be taped or otherwise attached securely along the side or the end of the detonating cord, with the end of the cap containing the explosive charge pointed in the direction in which the detonation is to proceed.
- Detonators for firing the trunk-line must not be brought to the loading area nor attached to the detonating cord until everything else is in readiness for the blast.

D.8. Firing the Blast

- Before a blast is fired, a loud warning signal must be given by the blaster in charge, who has made certain that all surplus explosives are in a safe place, all employees are in a safe place, and all vehicles and equipment are at a safe distance or under sufficient cover. Temporary barriers and continual monitoring must be used to ensure employees are kept outside of the danger zone.
- Flaggers must be stationed in safe places on roads that pass through the danger zone and must be trained to stop traffic during blasting operations.
- It is the duty of the blaster to fix the time of blasting.

D.9. Inspection after Blasting

- Immediately after the blast has been fired, the firing line must be disconnected from the blasting machine, or where power switches are used, they must be locked open or in the off position.
- A fan must be installed prior to any work being conducted in a tunnel. The fan must be operative for at least 15 minutes after the blast in order for the smoke and fumes to leave the blasted area before anyone may return to the blasted area. The blaster must inspect the area and the surrounding rubble to determine if all charges have been exploded before employees are allowed to return to the operation. In tunnels, the muck pile must have been wetted down.
- Before access to the areas is allowed, inspections of all roads, utilities, and structures must confirm they are safe and that rubble has been removed.
- All explosives, blasting agents, blasting caps (including electric), detonators, ignitor cord and other blasting supplies found in the blasted area "old explosives" and destroyed as per the appropriate procedure.
- The Blaster must complete a post-blast checklist on completion of inspection. An example is provided Appendix 2.

D.10. Misfires and Sockets/Butts

- If a misfire is found, the blaster must provide proper safeguards to exclude all employees from the danger zone.
- No other work may be done in the danger zone except what is necessary to remove the hazard of the misfire. Only workers necessary to do the work may remain in the danger zone.
- No attempt may be made to extract explosives from any charged or misfired hole. Instead, a new primer shall be put in and the hole re-blasted. If re-firing of the misfired hole presents a hazard, the explosives may be removed by washing out with water.
- If there are any misfires while using cap and fuse, all persons, including blasting employees, shall remain away from the charge for at least one (1) hour. Misfires must be handled under the direction of the person in charge of the blasting. All wires must be carefully traced and a search made for unexploded charges.
- No drilling, digging, or picking may be permitted until all missed holes have been detonated or the authorized representative has approved that work can proceed.
- Sockets must be cleaned using water and a scraper made of non-sparking material (e.g., copper scraper). No drilling shall be allowed in or within 15 centimeters of a socket or butt.

D.11. Blasting Methodology for Tunnels

- If a Permit-to-Work Procedure applies the BEMP must require compliance before any pre-blast or blasting activities may commence.
- The BEMP will include additional requirements for blasting in tunnels, including requirements at least equivalent to the following.

D.12 Responsibilities of the Blaster

9. Before drilling and blasting, the Blaster is responsible for the following:

- Ensure all relevant permit / approvals required by law and from the Employer are in place and adhered to
- Inspect the area to be blasted prior to the commencement of any drilling operations
- Ensure that only workers under his direct supervision are in the area to be drilled and that no unauthorized entry to the working area is allowed
- Ensure that the working area is safe prior to drilling, including the hanging wall, foot wall, and the side walls
- Ensure that there are no misfires from any previous blasting operations
- If there are any misfires then the holes are to be pumped out and made safe in a manner approved by the relevant authority
- Mark the designated area to be drilled
- In the case of any misfires the holes are to be marked as per the regulations to ensure that there is no possibility of drilling into a misfired hole
- Supervise all drilling operations inclusive of trimming
- Check that all drilled holes are clean and drilled to the correct length and direction
- Inform the relevant authorities prior to charging up
- Charge up the blast with the explosives delivered to site, using the pattern supplied.
- Ensure that guards are sent out to stop any entry to the blasting area and surroundings
- Sound the siren to warn of imminent blast
- If the blast is on or near a roadway, ensure that all traffic has been stopped in all directions
- Ensure that the area is safe to blast
- Complete a pre-blast checklist. An example is provided in Appendix 2
- Fire the blast from a safe distance
- Wait at least 15 minutes prior to re-entry

D.13 Closure and Post-Blast Procedure

10. Following the blast, the Blaster must:

- Ensure that there are no misfires indicated by the “witness lines”
- If there are misfires, either retake the blast or stop and pump out the explosives in accordance with legal requirements
- Once satisfied that the blast and safety aspects are in order, inform the Engineer that the blast is complete to allow inspection
- Once the area has been declared safe, notify and recall the guards
- Ensure that air is pumped into the blasted area for at least five minutes to ensure displacement of any blasting fumes
- Ensure that water is sprayed on the muck pile to dampen any fumes that may be trapped
- Complete a post-blast checklist. An example is provided in Appendix 2.

- Grant permission to re-enter once this is completed
- Supervise and help during the make-safe operation prior to re-entry (this includes all initial barring and supporting of the working area)
- Supervise lashing, and cleaning operations to ensure that there are no misfired explosives in the rock removal phase
- Ensure all safety regulations are adhered to in the cleaning phase, inclusive of checking of all safety equipment to be worn by working personnel

E. Health and Safety

11. An ammonium nitrate explosion produces massive amounts of nitrogen oxides. Nitrogen dioxide (NO_2) is a red, bad-smelling gas above 21 °C. Images from Beirut reveal a distinct reddish color to the plume of gases from the blast. Nitrogen oxides are commonly present in urban air pollution, and can irritate the respiratory system. Elevated levels of these pollutants are particularly concerning for people with respiratory conditions.
12. Blasting must be carried out in accordance with the Blasting Plan. All blasting operations shall be carried out in a safe and practical manner, with due consideration being given to employees' health and safety.
13. The Blaster and supervisors are responsible for ensuring that all workers adhere to requirements of the Contractor's Occupational Health and Safety Plan at all times, with emphasis on wearing the correct safety clothing and using equipment appropriate to the blasting operation. PPE and equipment will be defined in the Blasting Plan. For Blasters and helpers, this will include respiratory equipment (masks), eye protection, fire retardant clothing, non-static high-visibility reflective or coats, safety boots/shoes, etc. See the table below for mandatory and blast-specific PPE that may be required. PPE requirements should be posted at the perimeter(s) of the blasting zones, with no one allowed in the zone without proper PPE, and must be covered in the safety meeting that precedes each blast.

Required Personal Protective Equipment:	 HARD HAT AREA	 PROTECTIVE CLOTHING MUST BE WORN	 FOOT PROTECTION MUST BE WORN	 EYE PROTECTION MUST BE WORN	 HEARING PROTECTION MUST BE WORN	 HAND PROTECTION MUST BE WORN
Required?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
Additional Personal Protective Equipment:	 SAFETY HARNESS MUST BE WORN	 FACE SHIELD MUST BE WORN	 BREATHING APPARATUS MUST BE WORN	 FULL FACE RESPIRATOR MUST BE WORN	 DUST MASK MUST BE WORN	 SAFETY VEST MUST BE WORN
Required?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No

14. The Blasting Plan will also identify the locations of first aid facilities and medical facilities, and contact information for First Aiders and the relevant Emergency Team(s).

	First Aid Facilities:	First Aider:	No:
		First Aid Box Location:	
		Nearest Medical Facilities:	No:
		Emergency Team:	No:

15. The Blaster must perform a Job Safety Analysis on a daily basis. All such Analyses must be properly documented and filed.
16. All helpers and nearby persons must be made aware through appropriate safety training (toolbox talks, safety workshops, etc.) of the hazards associated with blasting, including any particular hazards associated with a specific blast.
17. A Safety Observation System shall be implemented on the blasting site.
18. Members of the blasting crew must receive basic training for the hazards of the operation. Several activities represent special hazards particular to this type of work, as described in following subsections.
19. Before every blast, all workers must receive training on the evacuation route(s) to use and the emergency evacuation point.

E.1. Emergency Evacuation

20. For blasting locations, before blasting in any location, the Blaster or designated person will identify evacuation route(s) in the event of an emergency. This will include the turns that will need to be made in order to reach a tunnel entrances, in those situations.
 - The Blaster or members of the blasting crew should evacuate the people present, to an area upwind from the explosion site and move them at least 150 feet away from the effected locations.
 - Keep roadways and walkways clear for emergency vehicles.
 - Nobody should move closer to the explosion site without instruction from the Blaster or blasting crew or any available emergency personnel.
 - Fires shall be dealt with when safe to do so. However, fires in the vicinity of explosives shall not be considered “safe” and therefore shall not be tackled. In this case all workers and visitors shall be moved to a safe area and the fire area contained and guarded against intruders.
 - If an emergency requires emergency evacuation, the Blaster (or a designated person if the Blaster is incapacitated or otherwise unable) will cause the alarm to be sounded continuously for at least three minutes. All workers in the evacuation zone must gather at the emergency evacuation point, where a supervisor will hold a roll call.
 - The Contractor’s HSE Manager, the relevant Emergency Team, and the Employer’s Representative’s HSE Manager must be informed immediately as per the Contractor’s Emergency Preparedness and Response Management Plan.

- The Blaster (or his designate) will prevent any persons from entering the danger zone until he/they determine the area to be safe to enter.

21. For Storage Locations, A focused Emergency Plan (fEP) should be prepared with, at least, the following details:

- Prominent placement of signage (containing emergency contact numbers);
- an evacuation map of the premises and perimeter with locations of assembly points (upwind of most commonly observed wind direction);
- appropriate fire risk management plans, including contact details for fire services;
- Procedures that address the loss of normal communication system
- List of appropriately trained persons expected to assist in an emergency
- Evacuation guidelines: In the event of an uncontrolled fire (with a substantial source of fuel) evacuation shall take place. Evacuation distances shall be based on worst case explosion. It is recommended that emergency evacuation points should be at least 50 m away from the perimeter.
- The fEP shall be reviewed (and updated as appropriate) as required, e.g. after an incident or when improvements are identified, or at least annually. The review shall demonstrate the effectiveness of actions taken at the premises and all associated communications, but physical evacuation, and actual operation of equipment (such as fire extinguishers) are not required. The results of the review must be documented.

F. Relationship to Other Plans

22. The BEMP must reference or incorporate by reference relevant requirements of other Contractor environmental and social management plans, including:

- Emergency Preparedness and Response Plan
- Materials and Waste Management Plan (also see subsection 6.1)
- Noise and Vibration Management Plan, including acceptable noise and vibrations levels (also see subsection 6.2 below)
- Occupational Health and Safety Plan
- Traffic and Transport Management Plan (also see subsection 4.3 above)

F.1. Additional Requirements for Waste Management

23. As described in paragraph 34 above, empty boxes and paper and fiber packing materials that have previously contained explosives must be managed as required in an “Old Explosives” procedure. They may not be used again for any purpose but will be destroyed by burning at an approved location or otherwise managed as a flammable hazardous waste.

24. Unless prohibited or otherwise required by Tajikistan law, the Old Explosives Procedure must include a burning methodology at least equivalent to the following:

- Only the Blaster and other trained personnel may handle empty boxes and packaging that contained explosives.

- All empty explosives boxes and packaging must be collected and placed in a stack and loaded onto a vehicle authorized to transport explosives (but no vehicle not so authorized).
- Boxes and packaging must be secured with heavy objects or other measures to ensure they are not blown away by the wind.
 - All empty boxes and packages are to be taken to a site designated for burning and all boxes and packages are to be burnt immediately.
 - A qualified and designated Blaster must be present at all times when burning is taking place. Only after all boxes and packages are completely burnt may the Blaster leave the site.
 - All burnt residue to be collected and placed in a bag or container and disposed of as per the HSE Manager's instructions.

F.2. Additional Requirements for Noise and Vibration

- Vibration levels resulting from blasting must not exceed levels specified in the Blasting Plan/Specification.
- The size of explosives charges used must be optimized so as to balance breaking capability, vibration impact, and fly rock.
- The Blaster must determine in advance if any buildings, structures, or other features could be affected by vibrations from a blast; this is to be accomplished by an inspection to identify particular features that may be subject to damage. If they could be, the Blaster will cause Vibro-recorders to be placed at such buildings or structures in order to record vibration levels,. Following each blast, the Blaster or other qualified person will review the records and inspect the structure to determine if there has been damage. Pre- and post-blast inspections must be documented and all Vibro recordings are to be kept on file.
- All relevant authorities and any persons or other entities that may be affected must be notified and approval obtained prior to blasting, as required by applicable law.

F.3 Requirements of Decommissioning plan (to be included in the SMPF) for unused explosives

- **Storage:** Unused explosives must be returned to the secure magazine at the end of a shift, and never left unattended or stored overnight outside a magazine.
- **Transportation:** Explosives must be transported in a timely manner in proper vehicles with appropriate signage and fire extinguishers. Detonators must be physically separated from other explosives during transport and storage.
- **Deteriorated Material:** Deteriorated or unstable explosives are extremely dangerous and must not be used. The manufacturer and Service on the State Supervision of Safe Operation in Industry and Mountain Supervision, of the Government of Tajikistan must be contacted immediately for handling and disposal instructions.
- **Disposal:** Disposal of high explosives may only be done by qualified persons at approved locations under supervision.

G. Management of Change

25. The Contractor's Management of Change procedure will be initiated when there is a material change to the EPRP. This would include new emergencies or other changes that require

immediate modification of emergency response—changes in planning may await the next regular review.

26. Trigger the formal Management -of-Change procedure ensures that all relevant authorities/persons are informed, all relevant management plans, procedures, and method statements are reviewed, revised/revised/updated and approved and all relevant persons are trained.
27. The EPRP Plan will be reviewed and updated, in its entirety or in part, in the following instances:
 - At a minimum and in its entirety, semi-annually (that is, twice per year)
 - Following drills, as recommended by the Emergency Drill Report
 - When major equipment goes out of service and when major new equipment becomes available
 - Following all emergencies
28. It is noted that some changes may occur without triggering an immediate revision to the EPRP. Such changes could include modifications to the contact list, changes in the Emergency Teams, changes to contact numbers, etc. These changes will be implemented immediately and changed in the EPRP in the next scheduled update.

- | Drill and Blast Return (Staggered) | | | | | | | | | |
|---|--|---|--|--|--|----------------------------|------------------------|--|--|
| DATE OF BLAST | | DRILLED BY | | NUMBER OF HOLES | | | TOTAL EXPL. USED | | |
| TIME BLASTED | | MATERIAL BLASTED | | AVERAGE DEPTH | | | INST. VOLUME | | |
| CONTRACT NAME | | HOLE DIAMETER | | AVERAGE STEM DEPTH | | | POWDER FACTOR | | |
| CONTRACT NUMBER | | BURDEN | | SPACINGS | | AVERAGE CHARGE DEPTH | | | |
| BLASTING ACCESSORIES USED
10M PRINADETS | | | | | | | | | |
| 10M EZDETS | | | | | | | | | |
| 12M EZDETS | | | | | | | | | |
| 15M EZDETS | | | | | | | | | |
| 20M EZDETS | | | | | | | | | |
| 25M EZDETS | | | | | | | | | |
| 30M EZDETS | | | | | | | | | |
| 35M EZDETS | | | | | | | | | |
| 40M EZDETS | | | | | | | | | |
| 45M EZDETS | | | | | | | | | |
| 50M EZDETS | | | | | | | | | |
| 6M EZTRUNKLINES | | | | | | | | | |
| 8M EZTRUNKLINES | | | | | | | | | |
| 10M EZTRUNKLINES | | | | | | | | | |
| 12M EZTRUNKLINES | | | | | | | | | |
| DETONAT. NO. CORD (m) | | REMARKS
WEATHER CONDITION | | SIGNATORIES
BLASTER NAME | | | | | |
| CARTRIDGES (Size) | | WIND DIRECTION | | SITE MANAGER NAME | | | | | |
| 8000 BOOSTERS | | ESTIMATED DISTANCE FLYROCK | | CONTACTS MANAGER NAME | | | | | |
| 4000 BOOSTERS | | NEAREST SURFACE OBJECT | | CLIENT NAME | | | | | |
| 1500 BOOSTERS | | DISTANCE NEAREST SURFACE OBJECT | | CONSULTANT NAME | | | | | |
| JED'S | | ACTUAL PPV (mm/s) R..... V..... T..... | | | | | | | |

Example Drilling Summary Report

<i>Hole type</i>	<i>Hole diameter (mm,)</i>	<i>Hole length</i>	<i>Number of holes</i>	<i>Meters drilled</i>
Grid	30mm	1.5m	12	18
Open	38mm	1.5m	1	1.5
Total			13	19.5

Example Explosive Consumption Report

<i>Explosive name</i>	<i>Explosive mass (g)</i>	<i>Explosive unit size (mm)</i>	<i>Number of units</i>
Powergel pipe	8.55	25	0.34
Total	8.55		0.34

Tunnel 2000 Report (example)

Hole Diameter	38.00 mm
Hole Length	1.50 m
Uncharged Length(Grid)	0.50m
Number of holes	13
Vert.Hole Spacing	0.53 mm
Horiz. Hole Spacing	0.80 mm
Grid Power Factor	1.67 m
Overall Power factor	2.47 m
Primary Explosive	Powergel pipe
Initiation system	
Rock type	
Rock Density	2.30
Tunnel Height	1.60
Tunnel Width	1.60
Tunnel area	2.56
Advance per Blast	1.35
Volume Blasted	3.46
Tons per Blast	11.18

Example Initiation System Summary

<i>Initiator Type</i>	<i>Uni-Delay-Shock Fuse</i>
Product Name	
In-hole delay (ms)	100m/s
Ex-hole delay (ms)	100m/s
Unit Cost	0
Total Number of Units	12
Total Cost	0

Example Maximum Permissible Charge per Delay or Shot (based on vibration limit)

<i>Distance to Nearest Structure (m)</i>	<i>Maximum Charge (Mass/Delay) (kg)</i>
1	0.05
1.1	0.06
1.2	0.07
1.3	0.08
1.4	0.09
1.5	0.1
1.6	0.12
1.7	0.14
1.8	0.16
1.9	0.18
2.	0.2
3	0.4
4	0.6
5	0.9
6	1.2
7	1.5
8	1.9
9	2.2
10	2.5
15	4.5
20	7
25	10
30	13
35	17
40	21
45	25
50	30
60	36
70	49
80	60
90	71
100	83
125	116

<i>Distance to Nearest Structure (m)</i>	<i>Maximum Charge (Mass/Delay) (kg)</i>
150	150
175	190
200	240
250	330
300	430
400	670
500	930

Example Mass of Explosives Per Cartridge

Cordtex 10	= 10 gram/ 1 meter
Powercord 8	=8 gram/ 1 meter
Energex 22/100	=48 gram/ 1 stick
Energex 25/200	=125 gram/1 stick
Energex 25/300	=180 gram / 1 stick
Energex 25/300	=360 gram / 2 stick
Energex 25/300	=540 gram / 3 stick
Energex 25/300	=720 gram /4 stick
Energex 25/300	=900 gram/ 5 stick
Energex 25/300	=1.1 kilogram /6 stick
Energex 25/300	=1.3 kilogram/ 7 stick
Energex 25/300	=1.4 kilogram/ 8 stick
Energex 25/300	=1.6 kilogram/ 9 stick
Energex 25/300	=1.8 kilogram/10 stick
Energex 25/300	=2 kilogram / 11 stick
Energex 25/300	=2.2 kilogram /12 stick

Example Vibration Limit (mm/s)

Structure	Vibration limits	Where (in all cases on the blast-side)
Powerlines and telecommunications	75	At the closest pylon to blasting
Sub-stations	10	At the substation perimeter fence or enclosure
Road and railways	100	under road or railway
Residential areas	7	In the ground 5m from nearest wall
Brick and mortar buildings	12	In the ground 5m from nearest wall
Steel structures	50	
Nearby buildings containing sensitive electronic equipment	10	
Nearby existing pipelines	25	1 meter from the pipeline
Close to concrete structures	100	5 meter from structure
Close to earth-walled dams and slimes dams	25	5 meter from structure
Towers	25	5 meter from structure

Example Pre-Blast Briefing Record

Briefing delivered by: _____ Job title: _____

Workplace: _____ Date/Time: _____

By signing this record, you confirm you have been briefed and understood the Blasting and Explosives Management Plan and this Blast Plan and will comply with the specified requirements and control measures. If the work activity changes or deviates from the originally foreseen methods, you are required to seek further advice and request an amended Blast Plan

[illegible]

[illegible]

Appendix 2

Example Blaster Checklist

Date of blasting:	
Chainages & Exact location of area to be blasted:	

Day before the blast

<u>Criteria</u>	<u>YES</u>	<u>NO</u>
SHC representative in agreement with Blaster on chainages and area to be blasted		
Blast sketch showing distances to services/structures and places of interest.		
Blasting notification boards updated with next blast date and time		
Local communities informed of blasting taking place – inspection of surrounding structures.		
Local traffic department notified if required - Traffic stoppage plan approved.		
Notification to shareholders of services		
Drilling plan showing all holes to be blasted		
Inspection of blast access areas completed		
Applied for blasting permit and approved from SHC		
Supervisor checked holes for blast		

Morning of Blast – BEFORE DRAWING EXPLOSIVES FROM THE MAGAZINE

Supervisor checked holes and ready for blast		
Has blast area changed due to change in conditions or any other reason?		
Will changes result in any additional risks associated with the blast?		
Have any changes been communicated with ALL parties, and agreed to be acceptable?		

After drawing explosives for the magazine

Notify the blasting inspector of blasting activity		
Procedures in transporting explosives to site followed		
Warning signs up and visible		
Blast area changed due to conditions		

Before Blast

Prevent unauthorised people of entering blast area		
Handle and use explosives in accordance with the safety standard and regulations		
Charging holes as per blasting plan		

Post-Blast Check

Inspection completed of blast area		
Number of misfires and treated as per the procedure		
Old explosives identified, collected, recorded, and removed as per procedure		
Blast area safe for cleaning, fumes removed, waiting time exceeded		
Incidents reported		
Destroy excess explosives – refer to procedures for destroying excess explosives		

Date: _____	<i>Time checklist completed</i>
Criteria completed	
Morning of blast	
After drawing explosives	
Immediately before blast	
Post-blast	

Erosion Management Plan Framework

A. Purpose and Applicability

1. Each Contractor employed at Rogun Hydropower Project (the Project) will prepare and implement an Erosion Management Plan (EMP, or Plan) that is consistent with this Framework. The purpose of the Plan will be to minimize the movement of soil or other material from one location to another, including to surface water bodies, by water or wind. The Plan will be reviewed by the Employer's Representative (ER) and/or the Project Management Consultant (PMC) and once approved it must be diligently implemented.
2. New Contractors will have an approved Plan before mobilizing to site and beginning earthworks or any works that include ground disturbance. Existing Contractors must have an approved EMP within six months of the date that World Bank financing is provided to the Project.

B. Applicable Standards

3. The Plan must include such requirements that will ensure the Project meets the requirements of Tajikistan law, standards promulgated by International Financial Institutions that are supporting the Project, the international obligations of Tajikistan, and good international industry practice (GIIP).
4. Such requirements will include, at a minimum, the requirements listed in this Framework.
5. In all cases, site-specific engineering and scientific judgment will be used to confirm that standards are sufficient to prevent unacceptable impacts on the people and environment. If there are inconsistencies among or between requirements, the Plan must adopt the more stringent.

C. Tajikistan Legislation

6. Article 52 of the Land Code of the Republic of Tajikistan (Law 327 of 1996 as amended on 19-07-2022) sets out requirements to:
 - Ensure an appropriate site layout to avoid or reduce potential land degradation
 - Protect land from water and wind erosion, mudflows, waterlogging, swamping, compaction,... and other degradation
 - Plan and implement appropriate stripping, storage and preservation of topsoil during construction
 - Restore and/or rehabilitate soil fertility and properties of the land.

D. International Financial Institutions Standards

- World Bank Environmental and Social Standard 1 (ESS1--Assessment and Management of Environmental and Social Risks and Impacts) sets out the steps responsibilities for assessing, managing, and monitoring environmental and social risks and impacts in order to achieve outcomes consistent with the Environmental and Social Framework and GIIP.
- World Bank Environmental and Social Standard 3 (ESS3--Resource Efficiency and Pollution Prevention) encourages projects to implement sustainable land use practices that prevent erosion, especially in agricultural or construction-related projects. This could involve

reforestation, protection of topsoil, and the restoration of degraded lands to avoid further erosion.

E. Good International Industry Practice

7. World Bank Group Environmental, Health, Safety General Guidelines and the Guidelines for Construction Materials and Extraction each describe GIIP to avoid or control erosion. Relevant GIIP measures are cited below.

F. Management Approach

8. The EMP will require that the Contractor demarcate and map all areas that are or will be under the Contractor's control or otherwise could be affected by the Contractor's works and require that all works be confined to these areas. Within these areas, the EMP will map the areas that may be susceptible to erosion of earthen materials by wind or water.
9. The EMP will describe the good practice measures, ways of working, and measures to be implemented by the Contractor to avoid or control erosion.. This will include clearly establishing which mitigation actions are intended to prevent erosion and offsite sedimentation and the locations and time periods in which they will be implemented.
10. The EMP will identify the specific controls to be used, which may range from physical/structural measures to vegetative and mechanical measures. The Plan will also describe how each intervention will be conducted/ installed and maintained throughout the works.
11. The EMP must cover all construction activities that have the potential to cause erosion. The activities and construction facilities that require erosion control may include, but are not limited to:
 - Removal or disturbance of soil in new or previously disturbed
 - Compaction rollers
 - Installation and use of temporary or permanent access roads
 - Material laydown areas and construction areas
 - Stockpiles of soils and other earthen materials
 - Temporary areas of hardstanding
 - Wastewater and measures used to control drainage
 - In general, any bare ground under the control of the Contractor, including the workers' camps and administrative buildings.
12. All of these must be included in the EMP for the areas to which they apply. The Plan should state the reason why measures are not specified for any of these areas.
13. The EMP will require that the implementation of measures to control erosion take account of the construction schedule so that the exposure of soil can be minimized. This can be achieved by including the erosion control measures (drainage measures, berms, silt fences, etc.) in the method statement of the construction activity (ground-breaking, excavation, spoil storage, etc.) that would cause erosion.

G. Principles of Erosion Control

14. Erosion management measures to minimize the risk of erosion and to prevent sediment and material eroding from the construction area should be based on the following principles and include:
- Minimizing the area to be disturbed
 - Identifying areas vulnerable to erosion
 - Planning and designing activities within the natural constraints of the site
 - Mapping out and geo-referencing of areas where soil disturbance will occur and the timing of those activities.

H. Mitigation Measures

15. The mitigation measures must combine engineering and nature-based solutions, including the use of hard structures (dikes, check dams, retention ponds, rip-raps chute structure, and other complementary structural and water flow management works), flexible structures (gabions, geotextile fabrics /mattresses, terraces) and bioremediation (afforestation, replanting, regrassing) as well as awareness creation regarding erosion prevention and management actions.
16. The EMP must set out the good practice measures and ways of working to minimize erosion and must include how the mitigation measures will be implemented and managed throughout the construction stage to prevent or reduce soil erosion and sediment runoff.
17. The Plan must require that, before the Contractor mobilizes into areas not previously used for construction, they will develop construction method statements for review and approval by the Contractor's HSE Manager and the ER/PMC prior to any commencement of work. These will include how procedures and designs will be consistent with the requirements of the EMP.
18. The following mitigation measures are examples of the construction activities that must be incorporated into EMPs as needed to control erosion.

I. Earthmoving

19. Developing Method Statements for earthmoving activities to create temporary laydown areas for construction materials and construction site infrastructure (e.g., temporary offices, worker accommodation, etc.). Methods must describe how the Contractor will mitigate the risk of runoff and erosion on sloping sites.
20. As required by the Air Quality Management Plan, applying water (including sprays) to roads/tracks and construction areas to reduce the potential for wind erosion.

J. Excavation and Stripping

- Stripping of each layer or topsoil and subsoils to maintain structural integrity.
- Retaining as much vegetation as possible to maintain slope stability.
- Once topsoil or other surface material has been stripped, using a vibratory roller to compact the soils in defined areas as required.

K. Stockpiles

21. As required by the Excavation Spoil and Fill Storage Management Plan:

- Storing soils in separate stockpiles according to type so that when land is reinstated, the different layers are not mixed, which could generate erosion
- Stabilizing stockpiles that are in place for over four months including using technical or vegetative means to prevent erosion and degradation of the resource
- Designing topsoil and other stockpiles to be stable, with slopes of not more than two meters high with 45-degree slopes, and where practicable locating stockpiles farther than 10 meters from waterbodies if
- Locating and designing stockpiles so as not to impede general runoff and flow within drainage lines
- Monitoring stockpiles monitored to ensure that they remain viable and are not subject to excessive erosion
- Developing a management plan for stockpiles being stored for over four months, with the plan describing the long-term stabilization and management requirements, as well as detailed monitoring and remediation measures.

L. Drainage/Stormwater Runoff

- Including in construction method Statements measures to control stormwater drainage in a way that avoids erosion
- Constructing ditches or other drainageways to divert water from running onto disturbed areas.

M. Sediment

- Installing sediment barriers or silt fences to trap sediment and silt runoff
- Constructing sediment basins and traps to collect and store sediment runoff until it can be removed and discharged appropriately
- Establishing channels or ditches to divert runoff away from vulnerable sites, slopes, or sensitive environments.

N. Stabilization of Exposed Areas

- Minimizing removal of vegetation, reseeding or replanting as soon as practicable
- Mulching and seeding exposed areas
- Minimizing the amount of time ground is exposed by phased reinstatement and/or restoring slopes and stripped areas while further construction continues
- Phased grading to minimize the area of bare soil exposed at one time
- Applying geotextile fabrics or natural materials to prevent soil movement
- Using terracing or other methods to prevent landslides or slope-slippage.

O. Monitoring and Inspection

22. Each Contractor's EMP will set out a program of monitoring and inspection to be undertaken by the Contractor's HSE specialists. Implementation and performance of the Plan will be monitored against key parameters for the applicable erosion control measures selected, including those specified in this framework.

23. The Plan will require regular inspections of erosion and sediment control measures, in order to evaluate their effectiveness. These will include checking at least the following:

- Effectiveness of methods used for soil and site stabilization
- Growth of root systems and Density of vegetative covers and health of planted areas to ensure that vegetation is establishing and thriving. A density of over 60-70% is often recommended for effective coverage.
- Control of run-on and run-off from bare ground
- Visual signs of erosion on the soil surface such as rills (small channels), gullies (larger channels), and pedestals (small columns of soil that indicate surrounding soil has been washed away).
- Functionality of installed barriers and traps.
- Effectiveness and integrity of silt fences (check for holes, tears, undercutting, etc.) and that the fabric is securely anchored and prevents water from flowing underneath.
- Excessive sediment buildup on the upslope side of barriers such as silt fences, straw bales, and sediment basins, which indicates the barrier is working but needs to be cleaned out to maintain capacity.
- Signs that temporary earthworks such as berms and diversions are maintaining their shape and not showing signs of washouts or scouring.
- Sediment accumulation in sediment retention and detention ponds to ensure they retain their intended storage capacity.

24. The Plan will also require regular inspections and monitoring of water quality, including as required by the Water and Wastewater Management Plan. The following areas are key requirements:

- Turbidity-Observation and measurement of the cloudiness of water in the reservoir or other water body that receives runoff from the project area. Any instances of increased turbidity shall be noted as a direct indicator of suspended soil particles, a result of uncontrolled erosion and due measures to counter should be undertaken. Include the applicable standards and a threshold for action.
- Discharge points- points where stormwater or wastewater leaves the site must be inspected for signs of sediment-laden discharge
- Pollutant control-areas around locations where hazardous materials are stored or used or wastes are managed must be inspected to verify that drainage and runoff are not being contaminated.
- Inspections of erosion control measures should include photographic evidence of their condition and their effectiveness, including any evidence of erosion. Images from successive inspections should be compared to verify any changes in their effectiveness and the need to modify or refine erosion control measures.
- Inspections should include the status of the banks of drainageways, ditches, streams, and other water bodies (including the Rogun reservoir) identify changes in the bank's profile over time, revealing areas of retreat or deposition and the need for intervention.

25. The Plan must require daily site observations as well as erosion-specific inspections/checks/audits at least monthly and after major rainfall and snowmelt events. These will include:

- Visual inspections of earthworks and ground disturbance practices that may cause erosion for evidence of accidental erosion or practices that have caused an erosion risk
- Checking the slopes of construction roads, areas of cut or embankment
- Observation of any discoloration of the Rogun reservoir or other water bodies that is caused by erosion from the construction site

26. The Plan must include protocols for the following circumstances:

- Reviewing the results of erosion control monitoring shall be established.
- Responding to complaints relating to erosion or sediment events, including monitoring the issue documenting the actions taken

27. The Plan will describe what should be observed and recorded, which will include:

- Assessing the degree of erosion
- Taking photographs and notes of erosion control measures and any soil degradation or erosion that is occurring
- Determining and documenting the cause or drivers of soil erosion
- Reporting the incident.

28. The Plan must require that work that is contributing to erosion be suspended if monitoring determines that significant or shortcomings of GIIP have occurred. The only works that may continue during such a suspension are actions to stabilize the site and correct the deficiencies. Work may be resumed when the HSE Manager and Site Manager determine that erosion control meets the requirements of the Plan and GIIP.

P. Recording and Reporting

29. Findings of inspections and observations must be documented. All site inspections and relevant observations will be logged and any required remedial actions recorded.

30. The Plan will identify how, and the level within the Contractor and the ER/PMC to which violations/infractions of requirements and/or adverse effects due to erosion will be reported.

31. The Plan will stipulate the procedure to inform the ER/PMC about any incidents or major problems observed and the process for implementing in a timely manner any required mitigation measures for further prevention or rehabilitation.

32. The Contractor's monthly progress report to the ER/PMC will include a summary of erosion management measures, including a summary of the results of the monthly dedicated inspection and issues identified during daily or post-precipitation monitoring observations. The report will also describe actions taken to correct or improve mitigation measures.

33. If there is any potential for construction activities to affect communities, the Plan will require that local authorities and communities be consulted before activities begin.

Q. Roles and Responsibilities

34. The Plan must identify and describe the organizational positions and responsibilities of all parties who will implement, supervise, or otherwise have a role in implementing the requirements of the EMP. This should be shown in organograms that include as much detail as possible, down to the individual position/person and their titles. The Contractor's EMP must cover its own activities that have the potential to cause erosion and that of all subcontractors.

R. Training

35. The Plan must identify the training that will be provided to all workers, supervisors and managers who will be involved in erosion control so they can perform their responsibilities at minimum risk to themselves, other workers, the Project, and the environment.
36. It must identify who will be responsible for conducting the training and who will be trained. Training will focus on the assigned responsibilities of the trainees and will cover technical and administrative skills needed to perform assigned responsibilities related to materials and waste management, the actions required in the case of incidents and topics related to occupational health and safety, including PPE required to conduct assigned activities.
37. At a minimum, the following personnel should be trained in their roles and responsibilities for erosion prevention and management:
- Site managers, HSE specialists, and supervisors on the principles of erosion control
 - HSE Manager and specialists in erosion control measures, inspection and monitoring, responding to excessive erosion, and in recording and reporting
 - Supervisors in the erosion control measures at their work sites and the responsibilities of all personnel under their supervision
 - Workers whose tasks involve land-clearing or other ground disturbance in the measures required to control erosion.

S. Relationship to Other Plans

38. The EMP should be read in conjunction with, and in accordance with the requirements of:
- Excavation Spoil and Fill Storage Management Plan
 - Hazardous Materials Management Plan
 - Site Rehabilitation Plan
 - Water and Wastewater Management Plan
 - Waste Management Plan

T. Revision

39. The Plan will require the HSE Manager to review the EMP at least semi-annually (twice per year) and updated when:
- There is a significant change in project or site conditions or activities and significant additional control measures are required
 - One or more mitigation measures is determined to be insufficient to achieve its purpose

40. At any time the Plan is updated, the Contractor will submit it to the ER/PMC for review and approval. If any semi-annual or other review determines that no update is required, the Contractor will provide an explanation to the ER/PMC, which will either concur with the rationale or require an update.

Excavation Spoil and Fill Storage Management Plan Framework

A. Purpose and Applicability

1. Each Contractor employed at Rogun Hydropower Project (the Project) that conducts activities that involve excavation or the generation and management of spoil will prepare and implement an Excavation Spoil and Fill Management Plan (ESFMP, or Plan) that is consistent with this Framework. The Plan will be reviewed by the Employer's Representative (ER) and/or the Project Management Consultant (PMC) and, once approved, must be diligently implemented.
2. New Contractors must have an approved Plan, based on this Framework, before conducting excavations and/or generating and/or managing spoil. Existing Contractors must have an approved Plan in place within six months of the date that World Bank financing is provided to the Project.

B. Applicable Standards

3. The ESFMP will include such requirements that will ensure the Project meets the requirements of Tajikistan law, standards set by International Financial Institutions, the international obligations of Tajikistan, and good international industry practice (GIIP).
4. Such requirements will include, at a minimum, the requirements described in this Framework.
5. In all cases, site-specific engineering, scientific and professional judgment will be used to confirm that standards are sufficient and consistent with Tajikistan law, standards set by International Financial Institutions, the international obligations of Tajikistan, and good international Industry Practices (GIIP) to prevent unacceptable impacts on people or the environment. If there are inconsistencies among or between requirements, the Plan must adopt the more stringent.

C. Tajikistan Legislation

6. Chapter 8 of the Land Code of the Republic of Tajikistan (327 of 1996), as amended on 19-07-2022, requires the conservation and restoration of soil, the prevention of degradation, and that land conservation measures meet ecological, sanitary, hygienic, and other special requirements, including norms, rules, and standards.

D. International Financial Institutions Standards

7. Various international financial institutions are providing financing for construction and operation of Rogun HPP. Each of these institutions requires the Project to comply not only with national legislation but also the institution's own standards. Standard most relevant to excavation spoil and fill storage management are exemplified by World Bank Environmental and Social Standards 1 (Assessment and Management of Environmental and Social Risks and Impacts), 3 (Resource Efficiency and Pollution Prevention and Management, and 4 (Community Health and Safety).

E. Good International Industry Practice

8. World Bank Group Environmental, Health and Safety Guidelines for Mining (2007) provides guidelines on waste rock dump management for quarries and other areas where waste rock is generated and managed.
9. World Bank Group Environmental, Health, and Safety Guidelines for Construction Materials Extraction (2007) provides guidelines for managing and restoring borrow pit areas for extracting gravels, clay and other construction materials and for managing spoil.

F. Management Approach and Activities

10. The Plan will be based on a detailed evaluation of ongoing activities and will be informed by and based upon the best judgment of qualified professionals. The Plan will become part of the Contractor's program for managing environmental and social risks and impacts.
11. The Plan will be designed to accomplish the following objectives:
 - Assure compliance with the standards cited above
 - Ensure the safe and environmentally responsible handling, storage, and disposal of spoil materials
 - Maximize the reuse of suitable excavated materials as fill, thereby reducing the demand for imported fill and minimizing waste generation
 - To minimize disturbances to natural habitats and prevent adverse impacts on water and air quality as well as public health.
12. The areas where spoil and fill require management include but are not limited to:
 - Quarry and borrow pit locations, including stockpiles of aggregate at crusher plants
 - Establishment of new settlement areas due to the resettlement of households from inundation zones
 - Reinstatement of the left bank road.
13. The Plan will identify all activities within their works that will generate spoil and estimate the quantities that will be generated and that will be used for any purpose. The Plan will require the Contractor to develop method statements for managing spoil and fill that include measures to minimize potential impacts on workers, communities, and the environment, including measures specified in this framework.
14. The Plan will require the Contractor to minimize the amount of material sent to spoil stockpiles by testing a representative sample of material for compliance with geotechnical specifications for material being used. Only out-of-specification material will be disposed as spoil.
15. Blasting spoil that complies with the geotechnical specification will be used in the dam core; with the residual materials sent to the spoil stockpile.
16. The Plan will detail the long-term stabilization and management requirements for stockpiles that are to be retained for longer than four months.
17. The Plan will detail the rehabilitation of areas where temporary stockpiles have been established, including the revegetation of areas, as appropriate.
18. The Plan must include a description of the method for the identification of a location that is geotechnically suitable for the establishment of a stockpile, the operation of the stockpile in terms of the sequence of dumping of spoil and the method to analyze the stability of spoil in stockpiles that could represent a reservoir landslide hazard.
19. The Plan will provide a description of the procedure to assess the potential risks and impacts of reservoir landslides from stockpiles on downstream infrastructure and the environment.
20. The plan will describe and illustrate on maps/drawings the locations of spoil storage and management sites and whether they have been approved by the ER/PMC and/or the relevant authority. The layout of each disposal site must be shown on project drawings (at scale), showing the site boundary/extent of any vegetation clearance, cross-sections and slopes of the disposed

spoil, site access points, and the layout of temporary and permanent controls (retaining walls, benching, topsoil and vegetation stockpiles, etc.)

G. Principles for Spoil Management

21. The Plan will require:

- **Classification of Spoil Material:** Before being removed, stored, reused, or disposed, spoil must be tested and classified as (i) clean spoil, including natural soil, sand, gravel, or rock free from contaminants and suitable for reuse or compliant disposal, or (ii) contaminated spoil that contains oil, chemicals, or other hazardous substances, necessitating specialized handling and disposal protocols. Both categories will be subjected to testing and classification prior to removal, storage, reuse, or disposal.
- **Spoil Minimization:** Measures to minimize spoil generation include optimizing project design to balance cut and fill volumes, maximizing reuse of spoil in embankments, landscaping, or for other construction requirements, and scheduling excavations to coordinate spoil generation and utilization with overall project timelines.
- **Spoil Handling, Storage, and Transportation:** The process of handling spoil will include the establishment of designated temporary stockpile areas equipped with appropriate sediment and erosion controls, siting spoil heaps at least 50 meters from watercourses, wetlands, and sensitive habitats, selecting material handling equipment and haul routes to minimize dust, spillage, and environmental or community disturbance, and transporting Transport spoil in covered vehicles to prevent dust emissions and material loss.
- **Spoil Disposal:** Permanent spoil disposal sites must be selected based on geotechnical integrity, environmental suitability, stakeholder consultation and Government approval, and must have engineered slopes, proper drainage, and vegetation coverage to control erosion, leachate, and visual impact. Contaminated spoil must be tracked, contained, and transferred to approved hazardous waste facilities.

H. Principles for Fill Management

22. The Plan will describe:

- **Material Selection and Testing:** Prior to use, fill material from on- and off-site borrow sources must be assessed for material suitability, environmental sensitivity, and regulatory compliance; (ii) Verified to conform to engineering specifications for grading, compaction, and required strength, and (iii) tested for contaminants prior to use.
- **Placement and Compaction of Fill:** The placement of fill materials must (i) be in engineered layers, maintaining proper moisture content and achieving required compaction standards; (ii) avoid contamination of water resources and minimize alteration of natural drainage systems during fill placement; and (iii) coordinated with construction schedules to avoid unnecessary stockpiling or double-handling.
- **Excess Fill Management:** The reuse of surplus fill must be maximized, with unsuitable fill managed in accordance with spoil management procedures.
- **Records Management:** There must be comprehensive inventories maintained of sources, transportation and use of material used as fill.

I. Principles of Topsoil Management

23. For areas to be disturbed by excavation, spoil storage or disposal, or other construction has topsoil, the Plan will require:
- Beneficial reuse of topsoil and spoil
 - Topsoil must be stripped and stockpiled separately for later reuse in rehabilitation of disturbed areas
 - Spoil should be used for productive purposes wherever possible, wherever close in locations close to where the spoil is generated—such uses could include as aggregate, fill for final project landforms, community use, etc.
 - Productive uses of spoil must be reviewed and approved by the ER/PMC prior to use, to ensure that the use is genuine and to avoid unauthorized dumping.
 - Topsoil management (stripping and stockpiling)
 - Topsoil must be stripped separately from spoil (subsoil, gravel, and other materials) and conserved for use in project site revegetation or for other productive uses
 - Topsoil stockpile areas must be located as close as possible to where the topsoil will be used
 - When possible, topsoil should be handled only one time from the point of generation to the point of reuse in order to minimize the potential impacts of temporary stockpiling
 - In order to maintain soil biota, topsoil stockpiles should not exceed 2.5 meters in height, except where site limitations exist and deviations are approved by the ER/PMC
 - Stockpile slopes will generally be no steeper than 2:1 (H:V).
24. Topsoil stockpiles that are to be retained for greater than three months must be covered with mulch or other material in order to stabilize them and minimize erosion.

J. Potential Mitigation Measures

25. The Plan must describe the measures to be implemented for the management of spoil and fill, which may include but not limited to:
- Review of the environmental and social impacts of topsoil storage and spoil disposal options in the selection of final sites. Site locations must:
 - Be located on land under the control of the Contractor and as approved by the ER/PMC
 - Avoid community water sources, pastoral areas and other culturally significant sites
 - Be located on lower slope land (for example <15°) where possible, so that stable landforms can be created
 - Be located on degraded or lower value land (e.g. eroded areas, previously altered sites etc.) wherever possible
 - Avoid clearing areas of forest or shrub and other high value habitats).

- Be located at least 20 meters from drainage lines or streams, and outside the designated flood zone, except approved areas within the future reservoir footprint
- The site boundary for spoil management and disposal areas, including truck, and machinery access point(s), retaining structures, temporary and permanent stockpiles, drains/diversion banks and sediment basin(s), must be surveyed and clearly demarcated prior to the commencement of related spoil generation.
- All supervisors and workers involved in spoil handling and disposal must be walked through the demarcated disposal sites and instructed on strict adherence to spoil handling and disposal at the site, including confining all works and disturbance to the demarcated area.
- Stockpiles must be protected from impacts to air quality due to dust and particulates blowing from the stockpile. This may require the use of sprayers to wet the surface of the stockpile, chemical binders that adhere to the soil to create a crust, or vegetation for long-term piles. Dust must be controlled as required by the approved Air Quality Management Plan.
- Runoff from the stockpile must be contained and treated (e.g., by settling) prior to discharge to a surface water body or reuse for dust suppression.
- Ingress and egress from the stockpile areas must be managed to minimize congestion and maintain road safety.
- Unpaved road surfaces must be watered or otherwise treated to minimize dust from movement of vehicles and equipment
- Silt fences, check dams, sediment basins must be installed to intercept, slow, or store runoff from disturbed ground and stockpiled materials
- Stockpiles and disposal sites must be located away from water bodies, equipped with drainage controls that are monitored regularly, and with surface water monitored as needed to evaluate sediment, turbidity, and potential contaminants
- Vegetation removal is to be avoided as much as possible
- Disturbed areas that are to be revegetated must use indigenous species.
- All staff will be provided with and required to use personal protective equipment (PPE) as defined in the Occupational Health and Safety Plan, including gloves, boots, high-visibility clothing. Masks or other devices will be provided as needed to minimize exposure to dust. PPE use will be enforced by the Contractor's supervisors, HSE personnel, and managers.

K. Recordkeeping and Reporting

26. The Plan will require the HSE Manager to maintain records of spoil volumes, classifications, and disposal locations, and of fill sources, volumes, and use.
27. The Plan will require the monthly progress report submitted to the ER/PMC to include a summary of spoil and fill management, including locations affected, changes in management, and volumes.

L. Site Closure and Rehabilitation

28. The Plan will include the following actions for responsible closure of borrow pits:

- Removal of all spoil and fill stockpiles upon project completion and restoration of sites to pre-construction conditions, except stockpiles that will remain in the reservoir footprint or that are designated for other uses.
- Stabilization, grading, and revegetation of all disposal and borrow sites as needed to prevent erosion and promote long-term stability and ecological restoration.
- Implementation of long-term monitoring and reporting of rehabilitated sites to ensure the success of rehabilitation and restoration measures.

M. Implementation

29. The Plan will identify and describe the institutional arrangements and responsibilities of all parties who will develop, implement, supervise, or otherwise have a role in implementing the requirements of the ESFSMP. This is to be shown in organograms that include as much detail as possible, down to the individual position/person and their titles and their specific responsibilities with relation to spoil and fill management. The Plan must include a program to supervise subcontractors who will be involved in any aspects of spoil and fill management.

N. Training

30. The ESFSMP will identify the training that will be provided to all staff and managers who will be involved in any way in management of spoil and fill so they can perform their responsibilities at minimum risk to themselves, other workers, the Project, and the environment.
31. The Plan will identify who will be responsible for conducting the training and who will be trained in what skills. Training will focus on the assigned responsibilities of the trainees and will cover technical and administrative skills needed to perform assigned responsibilities related to spoil and fill storage management, the actions required in case of incidents, and topics related to occupational health and safety, including PPE required to carry out assigned activities.

O. Relationship to Other Plans

32. Other plans that are or may be related to the Excavation Spoil and Fill Storage Management Plan include:
- Biodiversity Management Plan
 - Blasting and Explosives Management Plan
 - Community Health and Safety Management Plan
 - Emergency Response Plan and
 - Erosion Management Plan
 - Occupational Health and Safety Plan.
 - Site Rehabilitation Management Plan
 - Stakeholder Engagement Plan
 - Waste Management Plan
 - Wastewater Management Plan

P. Revision

33. The ESFSMP will be reviewed at least semi-annually (that is, twice per year) and updated when:

- There is a significant change in Project or site conditions, including the establishment of a new stockpile or the closure of an existing one
- Any mitigation measure is determined to be insufficient to mitigate the corresponding and relevant risks and impacts
- There is a major landslide or other incident that interferes with requirement spoil or fill generation or management

34. It is necessary to improve management of spoil or fill storage in order to ensure compliance with applicable standards.

35. If a review determines the Plan does not need to be updated, this will be communicated to the ER/PMC for concurrence or further consideration as needed. When the Plan is updated, the revised Plan must be submitted to the ER/PMC for review and approval prior to implementation of the changes.

Hazardous Materials Management Plan Framework

A. Purpose and Applicability

1. Each Contractor employed at Rogun Hydropower Project (the Project) will prepare and implement a Hazardous Materials Management Plan (HMMP, or Plan) that is consistent with this Framework.
2. The Plan will be reviewed by the Employer's Representative (ER) and/or the Project Management Consultant (PMC) and, once approved, must be diligently implemented. New Contractors must have an approved Plan, based on this Framework, before mobilizing to the Site and using hazardous materials. Existing Contractors must have an approved Plan in place within six months of the date that World Bank financing is provided to the Project.

B. Applicable Standards

3. The Plan must include such requirements that will ensure the Project meets the requirements of Tajikistan law, standards set by International Financial Institutions, the international obligations of Tajikistan, and good international industry practice (GIIP).
4. Such requirements will include, at a minimum, the requirements described in this Framework.
5. In all cases, site-specific engineering and scientific judgment will be used to confirm that standards are sufficient to prevent unacceptable impacts on the people and environment. If there are inconsistencies among or between requirements, the Plan must adopt the more stringent.

C. Tajikistan Legislation

6. Relevant legislation includes:
 - The Law of the Republic of Tajikistan of May 10, 2002 No. 44 "Industrial and Consumer Waste", as amended
 - Law of the Republic of Tajikistan "About Production Wastes and Consumption" (Decree 44, 2002, as amended).

D. International Financial Institutions Standards

7. Various International Financial Institutions are providing financing for construction and operation of Rogun HPP. Each of these institutions requires that projects comply with not only national legislation but also the institution's own standards. The various standards that are relevant to hazardous materials management are exemplified by World Bank ESS3.
8. The key requirements for the management of hazardous materials in ESS3 are:
 - Para. 19 - Avoid the use of chemicals and hazardous materials subject to international bans, restrictions or phaseouts
 - Para. 20.1 - Minimize and control the release and use of hazardous materials
 - Para. 20.3 - Consider less hazardous substitutes where hazardous materials are intended to be used in operations.

E. International Obligations

9. International Conventions and Protocols that apply include, but are not limited to:
 - Stockholm Convention on Persistent Organic Pollutants

- Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal protocol), reflected in Order No. 477 of the Government of the Republic of Tajikistan (December 3, 2002), “About measures for accomplishment of the Vienna convention on protection of ozone layer and the Montreal Protocol for the substances destroying ozone layer.”
- Vienna Convention for the Protection of the Ozone Layer – ratified by Tajikistan in 1996
- Convention on International Prior Informed Consent Procedure for Certain Trade in Hazardous Chemicals and Pesticides in International Trade Rotterdam (PIC)—not in force in Tajikistan, which has signed but not ratified the Convention
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal—ratified by Tajikistan in 2016.

F. Good International Industry Practice

10. GIIP for hazardous materials management is exemplified by the World Bank Group Environmental Health and Safety (EHS) General Guidelines. Key measures relating to hazardous materials management are:

- Section 1.5 provides measures for managing hazardous materials for the prevention of pollution to soils, including appropriate handling and storage of solid and liquid materials (e.g., chemicals, fuels, oils), and the incorporation of secondary containment (e.g., use of bunded double skinned tanks etc.).
- Section 2.4 provides measures for managing occupational health and safety risks related to chemical hazards, with emphasis on prevention through:
 - Replacement of the hazardous substance with a less hazardous substitute
 - Implementation of engineering and administrative control measures to avoid or minimize the release of hazardous substances into the work environment
 - Keeping the number of employees exposed, or potentially exposed, to a minimum
 - Communicating chemical hazards to workers through labeling and marking in an understandable language, including International Chemical Safety Cards (ICSC), Materials Safety Data Sheets (MSDS) or equivalent
 - Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE.

G. Management Approach and Activities

11. The Plan will be based on a detailed evaluation of ongoing and planned operations. The Plan will be informed by and based upon the best judgment of qualified professionals. The Plan will become part of the Contractor’s overall system of managing environmental and social risks.
12. The Plan will cover hazardous materials management by the Contractor and subcontractors. The Contractor will be responsible for the subcontractor’s management of hazardous materials.

H. Hazardous Materials Management

13. The Plan must prepare and include an accurate inventory that describes the characteristics and quantities of each hazardous material that is, or will be, used or produced. The Plan should also include a definitive determination that there is no technically and economically feasible alternative that would avoid or reduce the use of the hazardous material.
14. The inventory must describe and identify all hazardous materials that will be transported, stored, and/or used, their uses or purposes, the amounts to be managed, and the locations of storage or

use. All hazardous materials must be identified and classified based on the United Nation scheme for the classification of dangerous goods (derived from Globally Harmonized System of Classification and Labeling of Chemicals.⁶).

15. The inventory must include photographic evidence of their management, their location coordinates, and documented information that is sufficient to illustrate and characterize the materials and their management.
16. It is expected that the most common hazardous materials that are and will be managed and used by Contractors may include any or all of the following:
 - Diesel, petrol/gasoline, fuel oil, and special fuel mixtures
 - Machinery/engine/turbine lubricants and coolants
 - Hydraulic oil, brake fluid, and transmission fluid
 - Paints and solvents
 - Cleaning compounds and sanitizing chemicals
 - Cement mixes
 - Asbestos in building materials
 - Pesticides for managing vegetation, insects, rodents, or other nuisance flora and fauna, with special attention to pesticides that are considered persistent organic pollutants
 - Insulating oils and gases
 - Sanitary wastewater and potable water treatment reagents and residues
 - Lead-acid and other types of batteries
 - Fluorescent light bulbs
 - Electronic waste
 - Contaminated soil at spill sites and associated cleanup media.
17. The Plan must include a hazardous material site layout, describing where all hazardous materials are handled, stored, used, disposed, and/or otherwise managed. The hazardous materials must be stored in a dedicated, fit-for-purpose, storage facility that isolates hazardous materials and prevents their escape. Co-storage of multiple hazardous materials may be allowed only in facilities that meet conditions required by relevant Safety Data Sheets, and only compatible materials may be co-stored.
18. The Plan must describe security measures, including fencing and other safety requirements as well as the need for locked isolation, where appropriate.
19. The Plan must describe the requirements for hazardous material transport and loading and unloading, along with authorized transport routes. Appropriate transferring vehicles and machinery must be described, considering Tajikistan legal requirements for transporting various types of hazardous materials.

⁶ <https://unece.org/transport/standards/transport/dangerous-goods/ghs-rev9-2021>

20. The Plan must describe the measures to be taken to transport, store, contain, use, dispose, and otherwise manage all hazardous materials. Examples of mitigation measures to be used, as appropriate, are provided in section 4.
21. If third parties are used for transportation or other management, the Plan must provide evidence they are licensed or otherwise lawfully authorized to undertake the activities for which they will be responsible.
22. The transportation of hazardous materials to and within the Project site must align with site specific protocols and applicable regulatory standards to ensure safe operations and environmental compliance. Contractors must include appropriate requirements concerning routes, vehicle and driver requirements in the Traffic Management Plan (TMP).
23. The Plan must describe storage, containment, and handling requirements for each hazardous material, which must be in accordance with appropriate Safety Data Sheet (SDS) requirements.. This will include the size, volume, and containment method for hazardous material storage. In general, storage facilities should be located so as to minimize the risk to sensitive environments (e.g., water bodies) or to workers or others during routine operations and in case of spills or other incidents.
24. The Plan must describe how grievances or complaints concerning hazardous substances will be addressed, including who will be responsible for investigating, communicating with the complaining party, identifying potential measures to resolve the issue (if any), making decisions on actions (or no actions) to be taken, and on implementing actions as needed.
25. Preparation of the Plan must be coordinated with the Emergency Preparedness and Response Plan and the Occupational Health and Safety Plan so that responses to major spills which could potentially threaten human health and safety or the environment are dealt with consistently.
26. Besides the initial inventory, the inventory of hazardous materials must be updated on at least a semi-annual basis, whenever a new hazardous material is to be managed, when there is a significant change in the quantities of hazardous materials or their management methods, and/or when there is an incident that suggests current requirements are not sufficient to manage risks.

I. Potential Mitigation Measures

27. The Plan must describe the measures that will be used to manage hazardous materials. The selection of measures should be based first on their effectiveness in avoiding releases, and only then with consideration of other factors.
28. The mitigation measures must include, but are not limited to:
 - Clearly visible labels that are placed in all areas where hazardous materials are stored or used and on all containers. Where possible, pictograms should be posted at storage and use locations. Labels should clearly identify the name and hazard classification of the substance. Where possible placards should include a pictogram that illustrates the danger posed by the material.
 - Safety Data Sheets (SDS) for all hazardous substances in the language(s) of the personnel who use or may be exposed to them. SDSs for the relevant materials must be available in all locations where hazardous materials are stored or used, including vehicles used to transport them, in the main office, in the Contractor's and JSC Rogun's medical clinics, and at the Rogun City hospital. In addition, the Plan must require that medical personnel be informed of the hazardous materials to which workers may be exposed.

- PPE appropriate for the materials provided to all workers who may be involved in material handling and use in line with the Occupational Health and Safety Plan and the specifications of the relevant Safety Data Sheet, and requirements for enforcement of PPE usage by the Contractor's supervisors, HSE specialists, and managers. Training for all workers who may be involved in the transportation, storage, and use of hazardous materials. Training should cover hazard identification, safe handling and storage, proper use of personal protective equipment, emergency response procedures, and understanding safety data sheets and information. It should also include function-specific training based on a worker's role, security awareness training, and information on proper labeling, placarding, and waste disposal.
- Medical screening of all personnel who may be exposed to hazardous materials. Initial screening must occur within 30 days of approval of the HWMP for existing personnel, and prior to any potential exposure for new personnel. In addition, the Plan must require medical screening of personnel who may be exposed to hazardous substances as a result of spills or other incidents, including personnel who are involved in responding to such incidents.
- Functioning ventilation systems in areas where chemicals or reagents may be dispensed or mixed, and where volatile materials are stored or used, in accordance with SDS precautions
- Monitoring systems and programs in locations where volatile materials are stored or used. This would include hazardous volatile materials, including organic compounds materials such as fuels, oil-based paints, lubricants, adhesives, cleaning compounds, etc. This may include personal exposure monitoring as well as perimeter monitoring, as needed to characterize potentially toxic, explosive, or otherwise harmful environments.
- Secondary containment installed in all locations where fuel and other hazardous liquid materials are stored. Bunds must be concrete or other impervious material capable of containing liquids. Containment must be sufficient to hold at least 110 percent (130 percent for flammable liquids) of the net capacity of the largest container or tank within the bunded area, considering foundations and tank supports, or 25 percent of the combined tank volume in areas with above ground tanks with a total storage volume equal to or greater than 1000 liters.
- Floors and walls of areas used for storage of hazardous materials, including materials in drums, made of impermeable materials,, and storage areas with have cover or roof for protection. Surfaces in areas used to store reactive materials must be impervious to the material and materials being stored together must be compatible.
- Treatment of rainwater drained from bunded areas in an oil-water separator or equivalent device before the water is discharged, with the oil and solids stored and managed as a hazardous waste. Hoses or pipes that penetrate the bund to remove spillage or rainwater must be enclosed in flexible glands that prevent leakage.
- A leak detection system in locations where large volumes of fuel or other hazardous materials are stored or used, and where sensitive environments could be affected by leaks or spillages.

- Storage of neutralizing materials in areas where acidic or alkaline materials are stored and used.
- Detailed procedures to address:
 - Cleaning and/or neutralizing of empty containers and management of residue and the containers themselves, with residues and containers to be considered hazardous waste.
 - Containment and neutralization of water used to wash cement trucks, which must take place over an impervious surface with water settled and neutralized before discharge. The procedure will also apply to water that comes in contact with cement mix or uncured concrete.
 - Controlling accidental releases of hazardous liquid materials during storage and transfer. This would include such measures as the use of drip trays for refueling, the use of all hazardous materials over permeable surfaces, and providing cleanup kits in all vehicles and plant with diesel or petrol engines (with the kits identified as present on daily pre-start checklists).
 - Spill response procedures to address accidental release of hazardous materials.. All contractors must have appropriate spill kits available for spills or leaks to be cleaned, and spill kits must be available wherever materials are stored, transported, and used, including in vehicles (note that this includes all vehicles that use petroleum-based fuels). This procedure will also include a detailed description of how spilled materials will be controlled and contained. The procedure must describe the steps to be taken in cleaning up, considering the location and quantity of spilled material, and how contaminated soils and cleanup media will be stored and disposed.
- Identification of designated and clearly marked areas for loading, unloading, and temporary staging of hazardous materials, with containment measures.
- Vehicles transporting hazardous materials must meet site and regulatory standards, including proper labelling, containment systems, and spill response equipment. Only trained and licensed drivers approved and trained for hazardous material transport may operate these vehicles.
- Special rules for the transport of flammable materials in tunnels must be prepared by the relevant Contractor and implemented, including relevant training for drivers of tankers containing flammable materials.
- Fire safety measures (e.g., secondary containment, leak detection systems, etc.) for storage and use of flammable materials. Plans must specify the types and locations of fire extinguishers, describe the fire detection systems and alarms, and define the inspection protocols that will be used to ensure they are functional. Plans must also describe fire response procedures and coordination with emergency services as well as require fire drills and training for all personnel handling flammable materials. The Plan must cross-reference the Construction Emergency Preparedness and Response Plan for fire-specific scenarios.
- Designated routes for transporting hazardous materials that avoid high-risk areas such as pedestrian pathways and congested zones.

- Engagement with local authorities concerning the transport of hazardous materials through their communities or when storage or use of materials could affect the communities. This would include engagement with local responders if they may be involved in dealing with incidents involving hazardous materials.

J. Monitoring, Recordkeeping, and Reporting

29. The Plan must require that inventories of hazardous materials be kept up to date, with changes in quantities, use, and other management of hazardous materials recorded at the time they occur, or as soon as practicable thereafter. The Plan will be updated as soon as a new hazardous material is to be introduced to the site, with updates at least semi-annually (that is, each six months).
30. The Plan will identify the means by which, and the level within the Contractor and the ER/PMC to which violations of requirements or adverse effects due to hazardous materials management will be reported.
31. The Plan must require periodic (at least twice per year) inspection or monitoring by qualified HSE personnel of transportation, loading/unloading, storage, and use of all hazardous materials, as well as of labelling and material usage records, off-site management, and all other aspects of management. The Plan will specify:
 - The location, activities, and records that must be inspected, including the areas and activities to be inspected, containment and segregation measures, transport and unloading operations, labelling, material usage records and training records.
 - The frequency of inspection
 - The required qualifications of persons who will conduct the monitoring
 - Records that must be kept and the person responsible for keeping the records. This will include checklists that will be used for transport, storage, use, and other management of materials
 - Special hazards for inspection, including appropriate cross-references to the Occupational Health and Safety Plan and SDS for required and recommended risk reduction measures
32. The Plan will define the reports that will be prepared, who will review the reports and the length of time records will be kept. Reports will include:
 - Summaries in monthly progress reports submitted to the ER/PMC. At a minimum, such reports must include information on the types and quantities of hazardous materials received, used, and stored during the month, as well as any minor or major spills and other incidents that were experienced (such as theft, misuse, dangerous exposure, etc.) and significant changes in quantities and/or management methods. Reports will also describe any complaints that were made during the period regarding hazardous materials and how they were addressed.
 - Immediate notification of the ER/PMC of any significant incidents that occur, which would include fires and major spills (including those that result in exposure to workers, responders, or others, those that result in significant quantities of cleanup media), followed by a more detailed report that describe the root causes of the incident and actions taken to avoid recurrence. The Plan must describe what actions will be taken, and by whom, if inspection results show that the materials management practices do not meet applicable requirements, or if there is evidence that there may have been releases of materials from usage, storage, and/or disposal activities and sites.

33. The HMMP will require that records be kept as required by Tajik law, but no less than the term of the Contractor's works at Rogun HPP.

K. Implementation

34. The Plan must identify and describe the organizational positions and responsibilities of all parties who will have responsibility for managing hazardous materials. This should be shown in organograms that include as much detail as possible, down to the individual position/person and their titles and their specific responsibilities with relation to hazardous materials.

L. Training

35. The Plan must identify the training that will be provided to all staff and managers who will be involved in any way in hazardous materials management, including those who respond to fires, spills, or other incidents, so they can perform their responsibilities at minimum risk to themselves, other workers, the Project, and the environment.
36. The Plan must identify who will be responsible for conducting the training and who will be trained in what topics. Training will focus on the assigned responsibilities of the trainees and will cover technical and administrative skills needed to perform assigned responsibilities related to hazardous material management, the actions required in case of incidents, and topics related to occupational health and safety, including PPE required to conduct assigned activities.
37. The Plan will require workers, including drivers, to receive specific health and safety training for the materials they use or could be exposed to, and all drivers and equipment operators must receive training for fueling and spill cleanup. Workers will also receive training for spill response and cleanup and will be provided with appropriate hazmat suits and equipment for cleanup activities.
38. Only workers who have received the relevant training will be allowed to work with or be exposed to hazardous materials.

M. Relationship to Other Plans

39. Other plans that are or may be related to the Hazardous Materials Management Plan include:
- Asbestos Management Plan
 - Blasting and Explosives Management Plan
 - Community Health and Safety Plan
 - Construction Emergency Preparedness and Response Plan
 - Occupational Health and Safety Plan
 - Site Rehabilitation Plan
 - Spill Prevention and Response Plan
 - Stakeholder Engagement Plan
 - Traffic Management Plan
 - Waste Management Plan

N. Revision

40. The HMMP will be reviewed at least semi-annually (that is, twice per year) and updated when:

- There is a significant change in Project or site conditions or material management (e.g., new hazardous material, change in treatment or storage, change in mitigation measures, etc.)
- Any mitigation measure is determined to be insufficient to achieve its purpose.
- There is a major spill or release of a hazardous substance.
- It is necessary to improve materials management in order to ensure compliance with applicable standards and GIIP.

41. If a review determines the Plan does not need to be updated, this will be communicated to the ER/PMC for concurrence or further consideration as needed.

42. When the Plan is updated, the revised Plan must be submitted to the ER/PMC for review and approval prior to implementation of the changes.

Noise and Vibration Management Plan Framework

A. Purpose and Applicability

1. Each Contractor employed at Rogun Hydropower Project (the Project) will prepare and implement a Noise and Vibration Management Plan (NVMP, or Plan) that is consistent with this Framework. The Plan will be reviewed by the Employer's Representative (ER) and/or the Project Management Consultant (ER/PMC) and once approved must be implemented.
2. New Contractors must have an approved Plan before mobilizing to site and generating noise and vibration. Existing Contractors must have an approved Noise and Vibration Management Plan within six months of the date that World Bank financing is provided to the Project.

B. Applicable Standards

4. The Plan must include such requirements that will ensure the Project meets the requirements of Tajikistan law, standards of the International Financial Institutions supporting the projects, the international obligations of Tajikistan, and good international industry practice (GIIP).
5. Such requirements will include, at a minimum, the requirements listed in this Framework.
6. In all cases, site-specific engineering and scientific judgment will be used to confirm that standards are sufficient to prevent unacceptable impacts on people and the environment. If there are inconsistencies among or between requirements, the Plan must adopt the more stringent target.

C. Tajikistan Legislation

7. In Tajikistan, noise levels are established by Sanitary Norm 2.2.4/2.1.8.562-96 (Noise at Working Places, Indoors of Residential and Public Buildings and the Territories of Residential Areas), as detailed in Table 1.

Table 3. Tajikistan Noise Standards

Receptor location	Day: 0700-2200 (DBA)	Night: 2200-0700 (DBA)
• Residential areas	• 55	• 45
• Commercial areas	• 60	• 50
• Industrial areas	• 70	• 70
• Hospitals	• 35	• 25
• Schools, Libraries	• 45	• 45
• Hotels, etc.	• 60	• 45
• Workplaces of drivers/operators & service staff of trucks and construction equipment	• 70-80	
The A-weighted, equivalent continuous sound level in decibels measured over a one-hour period		

D. International Financial Institutions

8. Various international financial institutions are providing financing for the construction and operation of Rogun HPP. Each of these institutions requires that the Project comply with not

only national legislation but also the institution's own standards. The standards that are relevant to noise and vibration are exemplified by World Bank Environmental and Social Standards (ESSs):

- ESS2: Labor and Working Conditions – managing conditions of work that are likely to be hazardous include, among others, noise and vibration levels that are damaging to health
- ESS3: Resource Efficiency and Pollution Prevention –avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution, including noise and vibration
- ESS4: Community Health and Safety - adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and nonroutine circumstances should be avoided.

E. Good International industry Practice

- World Bank Group (WBG) General Environmental, Health, and Safety (EHS) Guidelines Section 1.7 provides detailed guidance for management of noise beyond the site boundary and Section 2.3 provides guidance on occupational exposure to noise. Table 2 shows numeric levels at or outside site boundaries and Table 3 shows levels for working environments.
- In addition, the General Guidelines specify that “the use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). In addition, “no employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection” and that “no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).”

Table 4. World Bank Group Noise Guidelines Beyond Site Boundary

Location	Criteria $L_{Aeq,1hr}$
Residential, Institutional, Educational	- Daytime: 55dB (07:00 – 22:00) - Night-time: 45dB (22:00 – 07:00)
Industrial, commercial	Daytime and night-time: 70dB
Source: WBG General EHS Guidelines, Table 1.7.1	

Table 5. Noise Limits for Various Working Environments

Location/ activity	Equivalent level $L_{Aeq,8h}$	Maximum $L_{Amax,fast}$
Heavy Industry (no demand for oral communication)	85 dB(A)	110 dB(A)
Light industry (decreasing demand for oral communication)	50-65 dB(A)	110 dB(A)

• Open offices, control rooms, service counters or similar	• 45-50 dB(A)	• -
• Individual offices (no disturbing noise)	• 40-45 dB(A)	• -
• Classrooms, lecture halls	• 35-40 dB(A)	• -
• Hospitals	• 30-35 dB(A)	• 40 dB(A)
Source: WBG General EHS Guidelines, Table 2.3.1		

11. Other GIIP that Contractors should consult in the development of their NVMPs include:

- Directive 2000/14/EC specifies the permissible sound power levels for outdoor use of various construction equipment, including compaction machines, dozers, loaders, graders and excavators; and the guaranteed sound power level of equipment subject to noise marking⁷, including concrete or mortar mixers ([Directive - 2000/14 - EN - EUR-Lex](#)).
- Directive 2002/44/EC of 25 June 2002 establishes minimum health and safety requirements for workers exposed to risks associated with risks from hand-arm and whole-body vibration ([Directive - 2002/44 - EN - EUR-Lex](#)).

F. Project Limits

12. Project noise limits that apply to the Project are the more stringent of Tajikistan noise standards and World Bank Guideline levels. The limits and their respective sources are presented in Table 4.

Table 6. Noise Standards for Rogun HPP Project

Location/Activity	Unit/Duration	Construction (dB(A))	Operation (dB(A))	Source
• Crusher/conveyor/quarry	• LA _{eq} ,8h	• 70	• -	• Tajik Legislation
	• LA _{max} ,fast	• 110	• -	
• Workshop s, vehicle/equipment cabins	• L _{eq} ,1hr	• 70-80	• 70-80	
• Offices	• L _{eq} ,1hr	• 40-50	• 40-50	• WBG EHS Guidelines
• Schools	• L _{eq} ,1hr	• 35-40	• 35-40	• WBG EHS Guidelines
• Residential areas (off-site, Pasi Muhraro,	• L _{eq} ,1hr	• 55	• 55	• Tajik Legislation (because
	• LA _{eq} ,1hr (nighttime)	• 45	• 45	

^{7 7} The affixing on the equipment of the CE marking defined in Decision 93/465/EEC accompanied by the indication of the guaranteed sound power level

worker accommodations)				residential has same values as WBG EHS Guidelines)
• Hospitals/ clinics	• $LA_{eq,8h}$	• 35	• 35	• WBG EHS Guidelines
	• $LA_{max,fast}$	• 40 db(A)	• 40 db(A)	

G. Management Approach and Activities

13. The NVMP will be based on a detailed evaluation of ongoing and new operations. The Plan will be informed by and based upon the best judgment of qualified professionals. The Plan will become part of the Contractor's system for managing environmental and social risks and impacts.
14. Noise- and vibration-generating activities must be managed to protect human health and the environment. The Plan must identify the workers and residents that may be potentially affected by activities undertaken by the Contractor and describe how noise levels caused by construction, demolition and the operation of equipment will be minimized or reduced as needed to comply with the noise standards that apply.
15. The activities that will generate noise and vibration include, but are not limited to, the following:
 - Blasting
 - Crushing
 - Heavy earth moving and other heavy equipment
 - Operating plant and equipment
 - Conveyor and Crusher operation
 - Demolition of buildings
 - Movement of vehicles and equipment.

H. Potential Mitigation Measures

16. The NVMP will require such measures as are needed to ensure that noise and vibration comply with the applicable standards at all times. The selection of measures must be based first on their effectiveness in avoiding or minimizing noise and vibration, and only then with consideration of other factors.
17. Examples of measures to minimize noise generated from heavy vehicles and plant include:
 - Ensuring that maintenance, servicing and repairs of equipment, plant, and vehicles are up to date and that equipment and vehicle operation areas are strategically placed so as to reduce or minimize exposure to noise.
 - Installing engine and exhaust mufflers on vehicle and plant and placing acoustic panels and sound dampening mats in the equipment or vehicle
 - Replacing noisy exhaust systems with noise dampened exhausts
 - Turning off equipment and vehicles when not in use.
 - Using acoustic barriers, hoardings, or sheds for operating machinery.
 - Operating equipment with acoustic covers and in noise-minimizing modes.
 - Scheduling and sequencing noisy activities carefully in line with guidance provided on standards to be maintained.

- Using low-noise warning systems via the use of advanced technology to deliver alerts efficiently and effectively while minimizing noise pollution.

18. Measures to protect workers and residents from exposure to high noise levels (to be included in Occupational Health and Safety Management Plan as needed):

- Ensuring workers do not stay in areas where noise levels exceed the Project noise limit for longer than necessary to perform their work
- Providing workers who are exposed to a noise level exceeding 70dB with appropriate hearing protection (ear plugs, ear muffs, canal caps and/or electronic ear muffs as deemed appropriate for the nature of works) and doubling up of protection equipment in high noise areas (a combination of ear plugs and muffs).
- Regularly inspecting hearing protection equipment for damage and follow cleaning and maintenance instructions from the manufacture to ensure they remain effective.
- Providing workers in areas exposed to noise levels that exceed the Project noise limits for indoor areas periodic medical hearing checks.
- Planning the routes used by construction vehicles to minimize the impact on the Pasi Muhraho village adjacent to Construction Site 2.
- Enforcing speed limits on roads in areas where workers are near the road and
- Installing noise barriers between construction traffic routes and worker accommodation, where applicable.

19. Measures to avoid or minimize noise and vibration levels due to blasting activity include:

- Restricting blasting times to workforce break times between 12:00-13:00 and 18:00-19:00 and ensure that a minimal workforce is within the area exposed to noise levels from blasting
- Evacuate workers to more than 50 m from the blast zone at least 30 minutes prior to the blast
- Ensure that all acoustic barriers are in place

20. Measures to reduce noise from heavy earth moving equipment and vehicle movements include:

- Setting and enforce speed limits of 40 km/h above-ground and 20 km/h in tunnels
- Procuring plant and equipment that complies with GIIP, including standards in European Union Directive 2000/14/EC
- Installing acoustic barriers and insulation at sensitive receptor locations, including at worker accommodation, to ensure that sleeping quarters meet the Project nighttime standard for residential areas during day and night (i.e., at all times workers are off duty)

21. Measures to reduce noise from crusher and conveyer plant include:

- Following manufacturers operating instructions for the start-up and shutdown procedures, and efficiently feeding primary, secondary, and tertiary crushers
- Following manufacturers operating instructions for start-up and shutdown procedures and efficient loading of conveyors
- Ensuring that conveyors are well maintained and installing noise attenuation devices such as acoustic panels within the equipment to minimize noise

- Installing partial acoustic enclosure or noise barriers at primary crushers to reduce noise level by 10dB
- Installing acoustic enclosures if needed to ensure long distance conveyors do not exceed 75dB at 10m.

22. Measures to reduce noise from demolition include:

- Dismantling steel frame and corrugated iron cladding without generating excessive noise
- Installing noise barriers around concrete structures to be demolished by percussion
- Planning the deconstruction and demolition work to sequentially move away from sensitive receptors.

23. Measures to reduce noise and vibration during operations, including ongoing operations, include:

- Implement measures from paragraphs 13 through 19 as needed to minimize noise and vibration levels and meet noise levels described in paragraphs 8 and 9. .
- Conducting a noise analysis under different intake flows to optimize the noise levels of the turbines during the commissioning process

I. Monitoring, Recordkeeping and Reporting

24. The Plan must include a comprehensive and systematic program for noise and vibration monitoring for the construction and operational phases. The monitoring program will be developed by acoustic specialists with expertise and experience in preparing and implementing monitoring programs for large construction sites having multiple types of noise-generating activities.

25. The Plan will specify acoustic monitoring to be undertaken at locations associated with sensitive receptors, including but not limited to:

- Working areas--all areas where Contractor and sub-contractor workers are present
- Worker accommodations
- Residential and other community areas, including dwellings, schools and medical centers in Rogun City, Pasi Muhraho, and possibly resettlement villages.

26. The Plan will include specific requirements for noise monitoring including:

- Sampling is to be carried out using a Type 1 sound level meter (SLM) that meets all appropriate IEC standards and is subject to (at least) annual calibration by an accredited laboratory
- The following acoustic indices are to be recorded and reported: LAeq (T), LA1eq (T), statistical noise level LA90, LAFmin and LAFmax, octave band or 3rd octave band frequency spectra
- The sound level meter must be located approximately 1.5 meters above the ground and no closer than three meters from any noise-reflecting surface.
- Noise measurements must be taken during day and night shifts during each 15-day on-off shift.

27. The Plan will identify the monitoring instrumentation to be used. The monitoring instrumentation must conform to the requirements for integrating averaging sound level meters in accordance with ISO 1996-2:2017. Adequate proof of calibration for the instrumentation

tested in accordance with ISO 1996-2:2017 must be maintained. Appropriate calibration checks before, during (in case of maintenance visits for long term measurements), and after measurements must be recorded in a Noise Equipment Calibrations Log.

28. The Plan will stipulate the vibration monitoring, recognizing specific requirements for vibration monitoring that is aligned with GIIIP (e.g., Directive 2002/44/EC), which requires:
 - Daily exposure limit values standardized to an eight-hour reference period of 1.15 m/s²
 - Daily exposure action value standardized to an eight-hour reference period of 0.5 m/s².
29. The Plan should be consistent with and meet the requirements established in the Blasting and Explosives Management Framework.
30. The Plan must require that activities that use new equipment, new process, new locations, or other changes to be inspected and monitored repeatedly by qualified HSE personnel until the pattern of noise and vibration at the location is understood. As needed, additional mitigation must be installed/provided until noise/vibration levels routinely comply with standards.
31. The Plan must require no less than semi-annual (twice per year) inspection/ monitoring by qualified HSE personnel of all ongoing activities and noise and vibration control activities. The Plan must specify:
 - The location, activities, and records that must be inspected and/or monitored
 - The frequency of inspection and monitoring
 - The required qualifications of persons who will conduct the inspection/monitoring
 - Records that must be kept and the person responsible for keeping the records
 - Reports that will be prepared, to whom reports are to be submitted for review, and the length of time records will be kept
 - The instruments that will be used to measure noise and/or vibration (if any)
32. The Plan must describe the process by which actions will be taken, and by whom, if inspection results show that noise or vibration levels exceed standards or that required mitigation measures are not being in place or being implemented.
33. The monthly progress reports submitted to the ER/PMC must include a summary of inspection/monitoring during the period, a description of instances where noise or vibration standards were exceeded (including locations and degree of exceedance), and actions taken in response to such exceedances.
34. The Plan should require that major changes in the activities that generate noise and/or vibration managed by contractors, or major changes in management methods, be subject to repeated monitoring until the pattern of noise/vibration is confirmed to be within the applicable standard, and that this be summarized in monthly progress reports.
35. The NVMP will require that records be kept as required by Tajik law, but no less than the term of the Contractor's works at Rogun HPP. The records will include, but not be limited to:
 - A copy of the latest Noise Monitoring Register (see example in Appendix A);
 - Description of noise sources and control measures (If any), location of affected receptors, measurement technique (including type of instrumentation; measurement procedure

and position of measurements), prevailing conditions during the measurements, and any relevant qualitative data.

- A copy of the latest Noise Equipment Calibrations Log.

36. If noise levels at or beyond site boundaries or at workplaces are 3 dB(A) or more above the applicable standard, the measurement will be repeated immediately and periodically for the remainder of the daily shift and at least daily thereafter until levels remain below the standard. If two or more measurements show that levels exceed the standard, the exceedance of standards will be reported to the supervisor of the workplace where noise is being generated, to the supervisor where workers or others are exposed to the noise, and to the HSE manager. The HSE manager will require the following:

- If noise levels being generated can be immediately reduced to acceptable levels, the supervisor will be required to take measures to reduce the noise, and measurement will continue through the remainder of the daily shift, with subsequent daily checks to verify the measures remain effective through the remainder of the 15-day on/off shift.

37. If they cannot be reduced immediately, workers will be provided hearing protection until they can be reduced to acceptable levels, a time period which may not exceed the current two-week on/off shift. Supervisors will be required to enforce the use of hearing protection, with repeated noncompliance resulting in removal of the worker from the workplace.

J. Implementation

38. The Plan must identify and describe the organizational positions and responsibilities of all parties who have a role in planning, implementing, and/or supervising the requirements of the NVMP. This should be shown in organograms that include as much detail as possible, down to the individual position or person and their titles.

K. Training

39. The NVMP must identify the training that will be provided to all staff and managers who will be involved in any way in noise and vibration control, including all supervisors, so they can perform their responsibilities at minimum risk to themselves, other workers, the Project, and the environment. It must identify who will be responsible for conducting the training and who will be trained in what skills. Training will focus on the assigned responsibilities of the trainees and will cover technical and administrative skills needed to perform assigned responsibilities related to noise and vibration control, the actions required in case of incidents, and topics related to occupational health and safety, including personal protective equipment required to conduct specific activities.

40. The NVMP must identify the HSE personnel responsible for monitoring noise and/or vibration be trained to follow ISO 1996-2:2017 international best practice during their recording and reporting of noise and vibration, and that such training be documented in the NVMP. Following initial training, refresher training must be provided on at least an annual basis.

L. Relationship with Other Plans

41. Other plans that are or may be related to the Noise and Vibration Management Plan include:

- Community Health and Safety Plan
- Occupational Health and Safety Plan

- Stakeholder Engagement Plan
- On-Site and Off-Site Traffic Management Plans.

M. Revision

42. The NVMP will be reviewed at least semi-annually (that is, twice per year). It will be updated when:
- There is a significant change in project or site conditions
 - Repeated violations of standards demonstrate that a mitigation measure is insufficient to achieve its purpose.
 - It is necessary to improve noise and vibration control to ensure compliance with applicable standards and GIIP.
43. If the Plan is updated or otherwise revised, the Contractor will submit the revised Plan to the ER/PMC for review and approval prior to implementation of the changes. If a review determines that the Plan does not require updating, The Contractor will report this to the ER/PMC for concurrence.

Annex A

Example Noise Monitoring Register.

[illegible]

Retrenchment Management Plan Framework

A. Purpose and Applicability

1. If there will be a retrenchment of the workforce by a Contractor employed at the Rogun Hydropower Project (the Project), the Contractor will prepare and implement a Retrenchment Plan (the Plan) that is consistent with this Framework as soon as practicable once it is known there will be retrenchment.
2. As used in this Framework, and in Contractor Plans, “retrenchment” is explained as redundancy or downsizing and does not relate to the quality of work the employer receives. Another term used for retrenchment could be “collective dismissals.” Plans will be prepared during the construction and operations and management stages of the dam.⁸
3. Reasons for retrenchment may include the following scenarios:
 - Restructuring of the workforce as a result of downsizing.
 - The closure of an organization or institution that leads to job losses. For example, construction site closure will have a direct and indirect impact on the workers as well as the surrounding communities.
4. The completion of the dam’s construction will lead to the conclusion of many jobs at the dam site and retrenchment plans need to specify the terms and conditions of contract closures, terminations and re-assignments. For all workers in operations and maintenance, contractors should consider retrenchment as a last resort. Alternatives to job losses may include the following: 1) imposing a freeze on new hiring 2) restricting overtime 3) shifting away from sub-contracting 4) spreading the workforce reduction out over time, to allow for natural reduction of the workforce 5) (re) training workers 6) reduction in hours worked by existing workers 7) job sharing (e.g. two workers sharing a position formerly held by one 8) work sharing (e.g. workers’ hours are reduced, while employers pay wages with governmental support) 9) asking for volunteers to take early retirement with appropriate income protection 10) internal transfers of workers within the enterprise 11) transfers of workers to other entities, e.g. relocating some workers to a sister company or outplacing them to another local employer.
5. This framework defines the expected standards and legislative requirements to be met, and the measures and processes to implement, as part of retrenchment processes.

B. Applicable Standards

6. The Plan must include such requirements that will ensure the Project meets the requirements of Tajikistan law, standards promulgated by International Financial Institutions that support the Project, the international obligations of Tajikistan, and good international industry practice (GIIP).

⁸ During the construction stage of the dam, most workers have term contracts, but due to changes in planning, it may be necessary to have retrenchment plans for construction workers.

Such requirements will include, at a minimum, the requirements in this framework. In all cases, site-specific judgment will be used to confirm that standards are sufficient to prevent unacceptable impacts on affected people. If there are inconsistencies among or between requirements, the Plan must adopt the more stringent rules or procedures.

C. Tajikistan Legislation

7. The Labor Code of the Republic of Tajikistan⁹ provides the national legislative requirements that govern the execution of retrenchment in the country. The legislation addresses the following key aspects:
 - Legal framework for termination of employment,
 - Rights and obligations of the employers and the employees, and
 - Compliance procedures to be followed.

D. International Financial Institutions Standards

8. The IFC Retrenchment Good Practice Note¹⁰ is the primary international guidance that relates to retrenchment planning and execution and includes the requirements that need to be reflected in the Plan:
 - Brief description of the reason retrenchment is necessary
 - Impact of the retrenchment
 - Alternatives that were considered and why retrenchment is the only remaining option
 - The process of consultation that will be undertaken
 - Description of how representatives of workers have been involved in the planning process
 - Criteria for selection of retrenched workers
 - Severance packages and measures to be taken to assist workers
 - Procedures to be followed and the schedule
 - Monitoring

E. Good International Industry Practice

9. Other GIIP for retrenchment includes the following:
 - International Labor Organization guidelines on the management of fair and transparent retrenchments.
 - Fair Labor Association (FLA) Principles which set out an approach to responsible retrenchment.
 - Better Work Guidelines on Responsible Retrenchments.

⁹ An English summary can be found at: https://cis-legislation.com/document.fwx?rgn=87595&utm_source=chatgpt.com. The Code is available in Tajik at mehnat.tj

¹⁰ <https://www.ifc.org/content/dam/ifc/doc/mgrt/retrenchment.pdf>

F. Management Approach

10. Although Contractors can experience difficult circumstances that lead to retrenchments, following good practices that minimize the impact on the workforce is critical. Retrenchment processes must be based on clear communication, consultation, fairness and transparency. The process must exclude any form of discrimination against any specific groups¹¹.
11. The Plan must describe the Contractors' support systems to assist the affected workforce when retrenchment occurs. The support should be for the workers identified to be retrenched, as well as for any employees who may remain in the organization.
12. When preparing the Plan, in accordance with the IFC Good Practice Note, the following elements need to be included:
 - Demonstration that alternatives to retrenchment have been considered, such as reduced work hours or salaries, enforcement of retirement ages, redeployment within the company/organization, or placement with another employer.
 - Identification of likely impacts on employees and the communities they live in.
 - Identification of stakeholders, such as trade unions, workers' associations, employee groups, the Ministry of Labor, Migration and Employment of Population (MoLMEP), and other government agencies that provide guidelines and input into the retrenchment process.
 - Description of how the consultation process will be conducted.
 - Definition of the roles and responsibilities of the team managing and executing the retrenchment process.

Добавлено примечание ([HT1]): Before proceeding with retrenchment, management should consult with the Basic Labor Organization or workers' representatives (or workers, in their absence) to consider and discuss alternatives to retrenchment. Retrenchment should only be implemented after all other alternatives have been ruled out.

Добавлено примечание ([JM2R1]):

G. Consultation

13. The Plan will define the consultation process for retrenchment. In accordance with the Labor Code, consultation must be undertaken before the retrenchment process starts. The Plan should identify who needs to be consulted and the reasons for consultation. These consultations have to be conducted in a fair and transparent manner, without discrimination, and must seek to identify alternatives before workers are retrenched.
14. The consultations should at least cover the following themes:
 - sessions and consultation times with the stakeholders
 - alternatives to retrenchment
 - mechanism and selection criteria for workers to be dismissed
 - dismissal schedule (time frame)
 - payment of severance allowances and other termination payments

¹¹ To avoid discrimination against particular groups during the retrenchment process, it is necessary to assess the impact of the overall retrenchment and particular aspects of the process on defined groups. In particular, attention should be paid to: gender, membership in trade unions, worker associations, and/or employee group; race or color; national origin or ethnicity; religion; disability; and/or age.

- criteria and mechanisms for ensuring priority in rehiring dismissed workers if/when the company is able to re-hire workers
 - support activities to assist affected workers, if any
15. The consultation process should be agreed upon with the key stakeholders.
16. Not all information has to be released at the same time. Good practice encourages a phased release of information and consultation on a scheduled basis, which includes the following:
- announcement of the need to reduce workforce numbers (should take place reasonably early in the process)
 - consultation and discussion about the alternatives and likely numbers of workers affected
 - consultation on selection criteria
 - announcement of the proposed final numbers and the proposed criteria for dismissal
17. The Plan should provide timescales for the consultation process. The consultation can take a few weeks or months, depending on the Contractor's size. Key factors that will determine the length of the retrenchment process will need to be considered, including for example:
- The decision-making process leading to retrenchment may take a few months.
 - Employers must negotiate with employees, employee representatives, and trade unions. Depending on the size of the workforce, this can take at least a few months.
 - Employers are required to notify their workers of the decision to retrench. Depending on the workforce size, this process can take a few months.
 - The actual implementation phase, which involves terminating workers' employment, making severance payments, and supporting impacted employees, can take over year or more to complete.
18. The Plan will define the individuals and stakeholders who are to be included in the consultation process. At a minimum these are to include:
- Trade unions, workers' associations or employee groups are responsible for representing the workers.
 - Workers identified for retrenchment.
 - The Contractor's human resources and legal departments, or other organizational entity that will have a role in overseeing the execution of retrenchment processes and in ensuring fair selection.
 - Relevant government authorities, such as MoLMEP, will need to be consulted to ensure compliance with national law.
 - Community leaders
17. Figure 1 shows a summary of the retrenchment consultation process that will be described in the Plan and followed throughout the process.
18. Companies and institutions must notify the affected workers in advance that a decision for retrenchment was made. The Plan must define the notice period for workers facing retrenchment. A reasonable notice period should be at least two months before workforce

reduction. Contractors allowing for collective bargaining with union representation may require a more extended notice period, depending on the agreements between the parties.

H. Implementation

19. A Working Group to oversee decision making, consultations and the execution of the retrenchment process will be established by the Contractor. The Plan will define the role of the Working Group, as well as its membership, which at a minimum will hold the following responsibilities:
 - Decide the new workforce layout regarding departments, units, levels, and employee numbers.
 - Plan in detail the timeframe required for each stage of the retrenchment process and the internal and external support required.
20. The Plan must require that the affected workers will be notified in advance that a decision for retrenchment has been made, and define the notice period for the workers facing retrenchment. The notice period should be at least two months before workforce reduction. The Plans for Contractors that will involve collective bargaining with union representation may require a more extended notice period, depending on the agreements between the parties.
21. The Plan must require the Contractor to establish a Working Group to oversee decision-making, consultations and the execution of the retrenchment process. The Plan will define the role of the Working Group, as well as its membership, which at a minimum will hold the following responsibilities:
 - Decide the new workforce layout regarding departments, units, levels, and employee numbers.
 - Plan in detail the timeframe required for each stage of the retrenchment process and the internal and external support required.

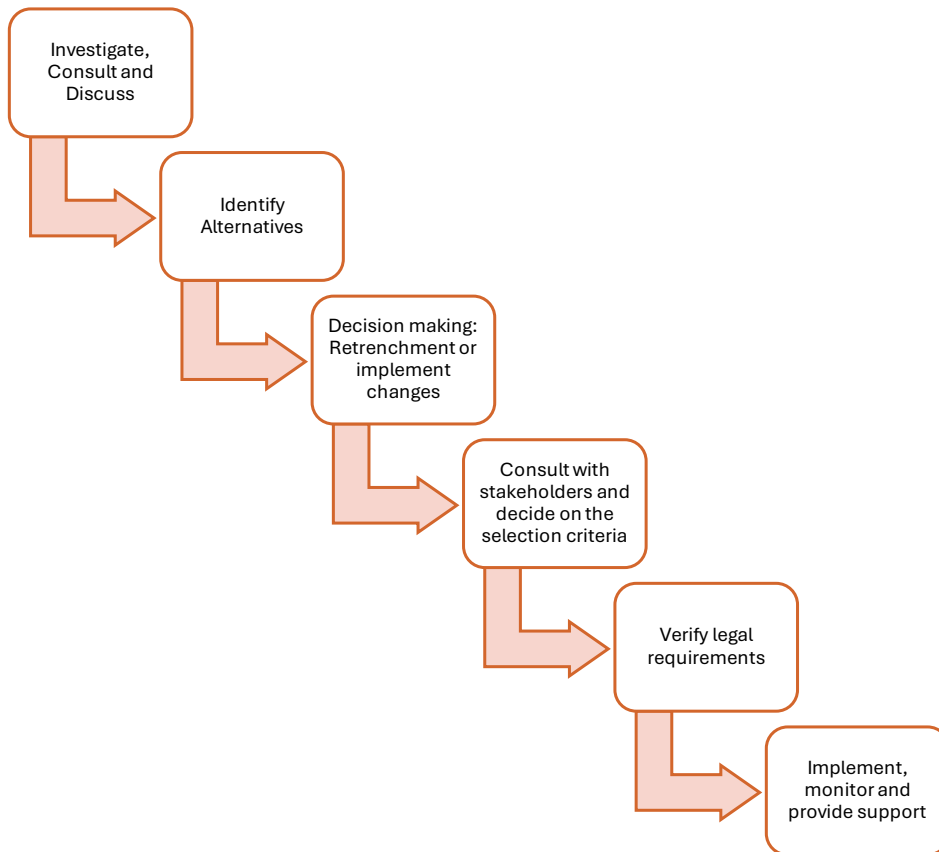


Figure 1. Consultation and Decision-Making Process

- Develop fair and transparent criteria for retrenchment aligned with the Labor Code and international guidelines.¹²
- Determine the costs of the retrenchment packages, staff retention, voluntary packages, early retirement, and the economic impacts on the local community.
- Make a final decision on the timeline and expected deliverables during the retrenchment process.

¹² Examples of such criteria may include: length of service; performance record; disciplinary record; absence record; skills and knowledge.

22. A number of stakeholders are likely to be involved in a retrenchment process. The roles and responsibilities for each of these parties will need to be defined in the Plan. Likely stakeholders to include are:

- Human resource (HR) Department
- Corporate and Project Managers
- Legal Department
- Trade union, workers' association and/or employee legal representatives

23. The Plan will define the timeline, and methods, for communicating information about possible retrenchment and the retrenchment process. [The following communication methods are recommended for inclusion:]

- Face-to-face meetings with affected employees that allow for emotional support.
- Internal communication *via* email or memoranda to keep employees updated about the process.
- Group announcements online or face-to-face to inform offices, departments, or units of the start and progress of a retrenchment process. Such announcements should indicate the number of dismissals which will take place and the manner in which workers will be selected for dismissal in writing.
- The provision of direct letters or emails to individuals who are impacted.
- Virtual meetings with employees, departments, or units to share information about the retrenchment process, including meetings to clarify issues and ensure that workers understand the retrenchment process and their rights.

24. The Plan should also refer to the Worker Grievance Redress Mechanism (GRM) that Contractors have in place. This Mechanism enables workers to raise complaints and includes the option of doing so anonymously. Whether the Plan provides for the Worker GRM or another mechanism to be used for retrenchment appeals, it is essential that the Plan clearly communicates to workers regarding appeals and grievances, including potential availability and use of the judicial system.

I. **Monitoring**

25. Monitoring of the retrenchment plan could include the following:

Key measures:

- **Legal compliance audits** – Verify that every retrenchment step complies with local labor law (e.g., Tajikistan's *Labor Code*, Articles 42–45, and related provisions on redundancy and severance).
- **Notification and approval tracking** – Monitor whether all required government or union notifications were sent and acknowledged on time.
- **Severance and benefits validation** – Check that compensation, notice periods, and accrued benefits are calculated and paid accurately.

Tools / Methods:

- HR compliance checklist updated with current legal references.
- Periodic review by legal or external auditors.
- Document retention system for evidence (letters, calculations, approvals).

Добавлено примечание ([ИТ3]): Announce the number of dismissals that will take place and the manner in which workers will be selected for dismissal in writing. Arrange for clarification sessions for workers; make sure they all understand the process and their rights.

Добавлено примечание ([М4R3]): These topics are covered in section 3

Добавлено примечание ([GG5]): Add details as needed

Добавлено примечание ([AB6R5]): Added in.

26. The monitoring system could also include:

1. Workforce Impact and Fairness Monitoring

- **Selection criteria review** – Track application of objective criteria (e.g., performance, tenure, skill redundancy) to avoid bias.
- **Demographic analysis** – Analyze the distribution of retrenched employees by age, gender, and position to identify patterns of potential discrimination.
- **Grievance tracking** – Monitor the number and nature of employee complaints or appeals related to retrenchment.

Tools / Methods:

- Independent HR committee review before finalization.
- Anonymous staff surveys or hotlines.
- Statistical dashboards comparing expected vs. actual impact.

2. Communication and Employee Engagement Monitoring

- **Information flow tracking** – Assess whether employees receive timely, clear communication about the process.
- **Employee understanding surveys** – Use quick pulse surveys to gauge whether staff understand reasons, timing, and support mechanisms.
- **Manager feedback loop** – Gather feedback from supervisors on how communications are being received and acted upon.

Tools / Methods:

- Communication plan tracker with dates and responsible parties.
- Short post-announcement sentiment surveys.
- Internal FAQ portal analytics (page views, search terms).

3. Employee Well-being and Reintegration Monitoring

- **Outplacement participation rate** – % of retrenched employees who engage in counseling, training, or job placement support.
- **Re-employment rate** – % of retrenched employees re-employed within 3–6 months.
- **Morale and stress indicators** – Absenteeism, turnover, and engagement among remaining staff.

Tools / Methods:

- Exit interviews and follow-up surveys.
- Collaboration with employment centers or retraining programs.
- Regular check-ins and HR climate surveys.

4. Reporting and Continuous Improvement

- **Retrenchment monitoring report** – Monthly or quarterly summary of compliance, HR impact, and outcomes.
- **Lessons-learned sessions** – Review after each retrenchment phase to refine processes.

- **Stakeholder feedback** – Gather input from unions, ministries, and community representatives.

J. Support Measures

27. Retrenchment represents a challenge for organizations and requires significant planning from employers and employees. Workplaces that experience retrenchment should allow for support measures for the employees who remain employed, as well as for those laid off. The Plan should define any support measures that will be provided, these could include:

- **Job search assistance:** The Plan should provide for and describe the support PMG, OJSC Rogun, and/or the Contractor will provide to MoLMEP to assist affected workers in finding new employment. This could include, for example, help in preparing a CV, guidance on job interviews, or providing ideas for new employment opportunities. Other options including support to retrenched workers to establish businesses to provide goods and services to the company or other elements of the Project.
- **Severance Packages:** The Plan should provide for compensation and benefits to an employee identified for retrenchment. Severance pay is generally calculated according to the length of service, average weekly salary, or some factor multiplication. For instance this could be calculated by taking the number of years of service multiplied by the weekly pay. Additional benefits can be included, for example, unused vacation or sick days, gratuity benefits, pension benefits, etc.
- **Counselling and Mental Health Support:** Retrenchment is an emotional time for everyone involved. Providing mental health support to remaining workers and individuals being retrenched would be necessary during this time.
- **Training and Development:** Providing skills development and training to assist workers in acquiring new knowledge would make them more competitive in the employment market. Specialized skills take time, but guidance about the training courses available could equip workers for new employment opportunities. Early retrenchment planning can provide time for this type of support to be effective.
- **Financial Planning:** Providing workers access to financial planners to help them manage retrenchment can help the affected individuals plan for the time ahead. This could include financial guidance about investments, budgeting, or other means of coping financially during the transition period.
- **Legislative Guidance:** Providing workers access to company or institutional legal advice would allow them to maintain a trusting relationship with their employer. Access to legal assistance also allows for transparency and a clear understanding of why this process is happening.
- **Extra Support for Vulnerable Workers:** Some workers may need extra support because they are vulnerable, such as assistance in returning to their communities or countries, transportation, food aid, health care, skills training, etc.
- **Support for Migrant Workers.** The Plan must provide measures to ensure that migrant workers are provided with logistical and financial support to return to their countries of origin and that they have adequate housing, health care, and other social support while they remain in Tajikistan

- **Conversion** of company facilities, equipment, infrastructure, or land post-closure for productive use by individuals and communities: If land or assets can be left after retrenchment, or after the Company's role is complete, communities may be able to convert them to productive commercial, agricultural, economic and social uses. Community engagement would be critical in considering options for local development.

K. Resourcing

28. The Plan must include a budget to cover the costs of retrenchment. Likely considerations for this budget include:

- Severance payment packages
- Legal costs
- Counselling and support services
- Administrative costs
- Skills development support
- Specialist support systems, such as financial advisors.

Site Management Plan Framework

A. Purpose and Applicability

1. Each Contractor employed at Rogun Hydropower Project (the Project) will prepare and implement a Site Rehabilitation Management Plan (SRMP, or Plan) that is consistent with this Framework. The Plan will be reviewed by the Employer's Representative (ER) and/or the Project Management Consultant (PMC) and once approved it must be diligently implemented. New Contractors must have an approved Plan before mobilizing to site and undertaking construction activities. Existing Contractors must provide a Plan within six months of the date that World Bank financing is provided to the Project.

B. Applicable Standards

2. The Plan will include such requirements that will ensure the Project meets the requirements of Tajikistan law, standards promulgated by International Financial Institutions, the international obligations of Tajikistan, and good international industry practice (GIIP).
3. Such requirements will include, at a minimum, the requirements listed in this Framework.
4. In all cases, site-specific engineering and scientific judgment will be used to confirm that standards are sufficient to prevent unacceptable impacts on the people and environment. If there are inconsistencies among or between requirements, the Plan will adopt the more stringent unless that requirement conflicts with national law, in which case national law applies.

C. Tajikistan Legislation

5. Article 51 of the Land Code of the Republic of Tajikistan (327 of 1996), as amended on 19-07-2022 is intended to:
 - Ensure the improvement and restoration of land that is being degraded or disturbed
 - Create a mechanism for accounting and verification of the ecological condition of lands, as well as provide land users with ecological standards approved by orders established by the Government of the Republic of Tajikistan.
6. Article 52 of the Land Code requires land users to undertake the following:
 - Ensure an appropriate site layout to avoid or reduce potential land degradation
 - Restore and improve soil fertility, as well as other properties of the land
 - Protect land from water and wind erosion, mudflows, waterlogging, swamping, compaction, salinization, pollution by industrial wastes, chemical and radioactive substances and other degradation
 - Maintain agricultural lands to reduce overgrowth (e.g. with weeds, trees and bushes), and other types of degradation to the cultural value or soils structure
 - Appropriate stripping, storage, and preservation of topsoil during construction
 - Restoration and/or rehabilitation of soil fertility and properties of the land.

7. Article 53 of the Code requires all developments to:

- Be undertaken in a sustainable manner, and
- Implement land conservation measure and meet ecological, sanitary, hygienic, and other special requirements (norms, rules, standards).

D. International Finance Institutions Standards

8. Various international financial institutions are providing financing for the construction and operation of Rogun HPP. Each of these institutions requires that projects comply with not only national legislation but also the institution's own standards. The various standards that are relevant to site rehabilitation management are exemplified by World Bank Environmental and Social Standards 1 (Assessment and Management of Environmental and Social Risks and Impacts) and 3 (Resource Efficiency and Pollution).
9. ESS1 requires that Projects assessing, manage, and monitor environmental and social risks and impacts in order to achieve outcomes consistent with the Environmental and Social Standards (ESSs) and GIIP.
10. ESS3 focuses on resource use, waste management, and pollution prevention during Project activities, including rehabilitation, in order to ensure responsible use of resources and minimize pollution. Specific considerations relating to Site Rehabilitation include providing regarding:
 - Generation of dust, noise and waste during rehabilitation activities
 - Safe handling and disposal of hazardous materials (including asbestos)
 - Management of non-hazardous and hazardous waste during rehabilitation to prevent pollution and environmental damage
 - Appropriate erosion and sediment control measures
 - Minimizing impacts on nearby communities
 - Where contamination or hazardous waste is present, compliance with national waste laws and Good International Industry Practice (GIIP) for environmentally sound and safe management of site rehabilitation.
11. Paragraphs 11 to 14 of ESS3 outline the following principles for site rehabilitation management:
 - Identify historic pollution and ensure remediation to GIIP or National requirements whichever is most stringent
 - Minimize emissions in line with the mitigation hierarchy
 - Reduce pollution risks, restore land and landscape, and prevent further degradation.

E. Good International Industry Practice

12. World Bank Group Environmental, Health and Safety (EHS) General Guidelines: Environmental, sections 1.6 (Waste Management) includes relevant GIIP for management of wastes and contaminated land.

13. WBG EHS Guidelines for Construction Materials Extraction includes relevant GIIP for rehabilitation of quarries and borrow areas. This GIIP is also relevant to any other areas affected by construction.

F. Management Approach and Activities

14. The SRMP will be based on a detailed evaluation of past, ongoing, and new operations that were, are, or will be under the control of the Contractor, including subcontractors. The Plan will be informed by and based upon the best judgment of qualified professionals. The Plan will become part of the Contractor's system for managing environmental and social risks and impacts.
15. The SRMP must be developed by existing Contractors within six months of the date that World Bank Financing is provided to the Project. Any new Contractor will develop a conceptual SRMP prior to mobilization and a detailed SRMP at least six months before demobilization. All SRMPs must be submitted to the ER/PMC for review and approval prior to implementation.
16. The SRMP will require the Contractor to implement the measures specified by the ER/PMC based on a survey of contaminated lands by PMG and the resulting remedial plan for is removal, isolation, or other management of hazardous or unstable materials.
17. Land that is not to be inundated by the Rogun Reservoir or otherwise used following completion of construction activities will be restored to a condition equivalent to land-use -land cover baseline or, in the absence of a definitive baseline, to the approximate condition of the surrounding area.
18. The Plan will require the Contractor to apply the SRMP requirements to subcontractors.

G. Mitigation Measures

19. The Plan will describe the measures that will be used to manage site rehabilitation, based on an assessment of the site, and quantify residual impacts. The selection of measures shall be based first on their effectiveness in avoiding impacts from rehabilitation activities, and only then with consideration of other factors.
20. The Plan will include a detailed drawing showing disturbed areas, plans for erosion control (e.g., silt barriers, matting), revegetation or other restoration schedules, topsoil management, removal of all waste, and other actions mentioned below.
21. The Plan will describe the measure that will be implemented to avoid or reduce potential impacts. Such measures may include:
 - Phased rehabilitation and restoration of the site, as construction activities are completed in an area. Most of the rehabilitation will take place once the construction phase is over, but wherever practicable, concurrent rehabilitation will be undertaken during construction .
 - Removal of structures once they are no longer required
 - Land stabilization

- Topsoil management, defining procedures for stockpiling, replacing, and ripping compacted soil.
- Establishment of vegetation (in accordance with the Project's Biodiversity Management Plan, native species will be used) in areas that will not be used or inundated
- Removal of compounds, machinery plant, vehicles, and equipment
- For quarries in or near the future reservoir footprint, contouring of quarry and pit slopes to minimize the risk of landslips into the reservoir once the area is inundated
- Removal of all equipment, wastes, and other materials from underground areas once all excavation and other work is completed
- Rehabilitation of quarries outside the inundation zone in accordance with Tajikistan legislation and EHS Guideline for Construction Materials Extraction
- Detection and management of asbestos and asbestos-containing materials in accordance with the Asbestos Management Plan.

H. Monitoring, Recordkeeping, and Reporting

22. The Plan will require one or more of the Contractor's HSE specialists to monitor ongoing rehabilitation on a daily basis and to direct supervisors as needed to implement the SRMP effectively. Monitoring results will be recorded in a log that identifies the activities undertaken, observations, and instructions given.
23. The Plan will require that, upon the completion of rehabilitation, the Contractor's HSE Manager and Site Manager inspect and verify the SRMP has been implemented and rehabilitation is satisfactory. The criteria for "satisfactory rehabilitation" will be defined in the SRMP and will include measurable indicators (*inter alia* to improve transparency and accountability).
24. The Plan will also provide that, upon verification, the Contractor may initiate handover procedures in accordance with the construction contract.
25. The SRMP will require that records be kept as required by Tajik law, but no less than the term of the Contractor's works at Rogun HPP.
26. The Plan will identify how, and the level within the Contractor and the ER/PMC to which violations of requirements and/or adverse effects due to site rehabilitation will be reported. The Plan must specify requirements for daily and monthly monitoring, including, but not limited to, activities described below:
 - Stockpiles being stored for longer durations (over 4 months) shall require a stockpile management plan to be developed, which shall detail the long-term stabilization and management requirements and provide monitoring and rehabilitation measures.
 - If Contractors have continuing works after abandoning and rehabilitating land (e.g., upon rehabilitating sites in Construction Site 1 and moving camps), the Plan will require ongoing monitoring identify and remedy any emerging issues (e.g., unanticipated erosion impacts) until the area is inundated.
27. The SRM will require that all monitoring and rehabilitation/remedial actions be recorded on a Site Rehabilitation Register. An example of such a register is provided in Appendix A.

28. The Plan will require the Contractor's EHS Specialist to prepare a Monthly Site Rehabilitation and Restoration Monitoring Report. This report will be summarized and appended to the Contractor's monthly progress report to the ER/PMC. The Report will include (but not be limited to):

- Description of areas subject to rehabilitation and the actions taken to implement rehabilitation and remedial actions, including areas completed in the period and areas to be addressed in the coming period
- Significant findings and actions that were not anticipated in the SRMP or other planning documents and actions taken to overcome deficiencies or inadequacies
- Copy of the Site Rehabilitation Register for the period.

I. Roles and Responsibilities

29. The Plan must identify and describe the organizational positions and responsibilities of all parties who will implement, supervise, or otherwise have a role in implementing the requirements of the SRMP. This should be shown in organograms that include as much detail as possible, down to the individual position/person and their titles. The Contractor's SRMP must cover its own rehabilitation activities and those of all subcontractors.

30. The SRMP will describe how subcontractors will be supervised by the Contractor's HSE personnel.

J. Training

31. The SRMP will identify the training that will be provided to all staff and managers who will be involved in any way in site rehabilitation, restoration and the management of the site and activities. Training must be sufficient to allow them to perform their responsibilities at minimum risk to themselves, other workers, the Project, and the environment.

32. The Plan must identify who will be responsible for conducting the training and who will be trained. Training will focus on the assigned responsibilities of the trainees and will cover technical and administrative skills needed to perform assigned responsibilities related to site rehabilitation, the actions required in case of incidents, and topics related to occupational health and safety, including PPE required to conduct assigned activities.

K. Revision

33. The Plan will require the HSE Manager to review the SRMP at least annually while construction continues and at least six months before the Contractor's work is to be completed: The Plan must be updated when:

- The area controlled by the Contractor undergoes a significant change, either an increase or reduction
- The rehabilitation program is proposed to be modified in any significant way, which could include such things as changes or modification of mitigation methods or the discovery of contaminated areas
- Ongoing rehabilitation has proved to be ineffective in achieving its goal.

34. The Plan must require that updates be submitted for review and approval by the ER/PMC prior to implementation. If a review determines that no update is required, the Contractor will

provide an explanation to the ER/PMC, which will either concur with the rationale or require an update.

L. Relationship to Other Plans

35. Other management plans that are or may be related to Site Rehabilitation Management Plan include:

- Asbestos Management Plan.
- Biodiversity Management Plan
- Erosion Management Plan
- Non-Hazardous and Hazardous Waste Management Plan
- Waste Management Plan

Appendix A: Example Site Remediation Monitoring

[illegible]

Wastewater Management Plan Framework

A. Purpose and Applicability

1. Each Contractor employed at Rogun Hydropower Project (the Project) will prepare and implement a Wastewater Management Plan (WWMP, or Plan) that is consistent with this Framework.
2. The Plan will be reviewed by the Employer's Representative (ER) and/or the Project Management Consultant (PMC) and, once approved, must be diligently implemented. New Contractors must have an approved Plan, based on this Framework, before mobilizing to the Site. Existing Contractors must have an approved Plan in place within six months of the date that World Bank financing is provided to the Project.

B. Applicable Standards

3. The Plan must include such requirements that will ensure the Project meets the requirements of Tajikistan law, standards set by International Financial Institutions, the international obligations of Tajikistan, and good international industry practice (GIIP).
4. Such requirements will include, at a minimum, the requirements described in this Wastewater Management Plan Framework.
5. In all cases, site-specific engineering and scientific judgment will be used to confirm that standards are sufficient to prevent unacceptable impacts on the people and environment. If there are inconsistencies among or between requirements, the Plan must adopt the more stringent.

C. Tajikistan Legislation

6. The Water Code of the Republic of Tajikistan (April 02, 2020, No.1688) prohibits the discharge of polluted water into water. Wastewater that is treated prior to discharge is not considered polluted and no permit is required for the discharge. Ambient water quality standards are presented in Table 1.

Table 7. Tajikistan Ambient Water Quality Standards

Parameter	Unit	Tajik Water Code
pH	pH	6.5 - 8.5
Temperature	°C	-
Biological Oxygen Demand (BOD)	mg/L	-
Chemical Oxygen Demand (COD)	mg/L	-
Total Suspended Solids (TSS)	mg/L	1000
Total Dissolved Solids (TDS)	mg/L	1000
Total Phosphorus	mg/L	-
Total ammonia (as N)	mg/L	0.39
Oils and Grease	mg/L	0.05
Magnesium (as Mg)	mg/L	40
Chloride (as Cl)	mg/L	300

Добавлено примечание ([MMH7]): This table originally compared WBG EHS Guidelines for sanitary sewage effluent and ambient water quality standards under the Water Code. This is a fundamentally mistaken approach, as these things are not comparable. Therefore, I deleted the WBG effluents limits from this table and left them in the separate table below.

<i>Parameter</i>	<i>Unit</i>	<i>Tajik Water Code</i>
Sulphate (as SO ₄)	mg/L	-
Total Coliform Bacteria	MPN/100ml	-
MPN = Most Probable Number		

7. Tajikistan has also established Maximum Permissible Concentrations (MPCs) for discharges of effluent, including stormwater, to water bodies. These are presented in Table 2.

Table 8. Maximum Permissible Concentrations for Wastewater Effluent

<i>Parameter (unit)</i>	<i>MPC effluent limit Limit</i>
Temperature (°C)	40
pH (s.u.)	6.5-8.5
Turbidity (FAU)	1000
Total Nitrogen (mg /l)	45
Total Phosphorus (mg-eqv/l)	3.5
Oils and grease (mg/l)	10
Total Dissolved Solids (TDS) (mg/l)	3000
Total coliforms	10
Total suspended solid (mg/l)	50
Dissolved oxygen (DO) (mg/l)	>5

D. International Financial Institutions Standards

8. A number of International Financial Institutions are providing financing for the construction and operation of Rogun HPP. Each of these institutions requires that projects comply with not only national legislation but each institution's standards. International standards for the protection of water are exemplified by World Bank Standard Environmental and Social Standard (ESS) 3 (Resource Efficiency and Pollution Prevention and Management).

E. Good International Industry Practice

9. World Bank Group General Environmental Health and Safety (EHS) Guidelines Section 1.3 (Wastewater and Ambient Water Quality) and Section 4.1 (Wastewater Discharges) provide detailed guidance for wastewater management during construction. The General Guidelines state that effluent and stormwater discharges "...should not result in contaminant concentrations in excess of local ambient water quality criteria."
10. The Guidelines also provide examples of GIIP for managing stormwater, sanitary sewage, and process wastewater, and provide indicative effluent limits for treated sanitary sewage discharges; these limits are presented in Table 3.

Table 9. WBG EHS Guideline Discharge Limits for Treated Sanitary Sewage

<i>Pollutant</i>	<i>Units</i>	<i>Guideline Value</i>
pH	s.u.	6 - 9
Biological Oxygen Demand (BOD)	mg/L	30
Chemical Oxygen Demand (COD)	mg/L	125
Total Nitrogen	mg/L	10
Total Phosphorus	mg/L	2
Oil and Grease	mg/L	10
Total Suspended Solids	mg/L	50
Total Coliform Bacteria	MPN/100ml	400 (a)
Notes <i>a. Not applicable to centralized, municipal, wastewater treatment systems that are included in EHS Guidelines for Water and Sanitation</i> <i>MPN = Most Probable Number.</i>		

F. Project Standards

11. The Plan will include the standards for discharges of wastewater to the Vakhsh River, the Rogun Reservoir, or another water body that are presented in Table 4 and will include measures necessary to achieve these standards:

Table 10. Project Standards for Wastewater Discharges

<i>Parameter (unit)</i>	<i>MPC effluent limit</i>	<i>WBG EHS Guideline</i>
Temperature (°C)	40	
pH (s.u.)	6.5-8.5	6-9
Turbidity (FAU)	1000	
Total Nitrogen (mg /l)	45	10
Total Phosphorus (mg-eqv/l)	3.5	2
Oils and grease (mg/l)	10	10
Total Dissolved Solids (TDS) (mg/l)	3000	
Total coliforms	10	400
Total suspended solid (mg/l)	50	50
Dissolved oxygen (DO) (mg/l)	>5	

12. The Plan will also include standards sufficient to ensure that water quality in the receiving water (that is, the Vakhsh River and/or the Rogun reservoir) meets the ambient water quality criteria established under the Water Code (Table 1) at the edge of the mixing zone where wastewater enters the receiving water.

G. Management Approach and Activities

13. The WWMP will be based on a detailed evaluation of ongoing and new operations. The Plan will be prepared by qualified professionals. The WWMP will identify all treated and untreated

wastewater streams, including precipitation runoff as well as effluents and wastewater from accommodations, kitchens, batching plants, truck- and equipment-washing, and other workplaces and specify the standards that apply to each discharge to the Rogun reservoir, Vakhsh River, or other water body.

14. The WWMP will require that pollutant concentrations in all wastewater streams be characterized (by laboratory or field analysis, as appropriate) to determine if treatment (chemical, physical, or biological) is needed in order to ensure effluent and ambient water quality standards are met. Each wastewater stream, including precipitation runoff and waste water from labor camps, will require treatment unless it is demonstrated and confirmed that it meets effluent standards and/or does not cause violations of ambient water quality standards. For wastewater discharges that are determined not to require treatment, annual verification that pollutant concentrations have not changed will be required via analysis.
15. For wastewater that requires passive or active treatment, the WWMP must identify and describe the measures (including technologies, good practice measures, and/or ways of working) that will be implemented to achieve compliance with applicable standards.
16. The Plan must require that additional or modified treatment be implemented if monitoring results demonstrate that an effluent discharge does not meet standards and/or causes a violation of ambient water quality criteria.

H. Potential Mitigation Measures

17. To manage wastewater on a construction site, examples of implementable measures will include preventing runoff and erosion, managing and treating different types of contaminated water, recycling and reusing water such as the following. The plan will define and outline key measures accordingly. Such examples include, but are not limited to, the following:
 - Prevention and containment:
 - Isolate work areas to prevent polluted water from leaving the site
 - Store construction materials such as paints, oils, and cement indoors or under cover and aboveground to prevent contamination from stormwater.
 - Dig cutoff ditches, install retaining walls, or use silt fences to divert uncontaminated runoff away from active construction areas and workplaces.
 - Cover storm drains and inlets on and around the site to minimize the risk of pollutants entering them.
 - Regularly sweep and clean up debris, trash, and accumulated sediment from surface areas rather than hosing them down.
 - Management and treatment of contaminated water
 - Dewatering
 - Collected water in pits (sumps) within excavations and then pump it.
 - Install small wells around the site and connect them to a pump that “vacuums” water from the ground.
 - Install settling ponds and other facilities to treat wastewater from concrete mixer truck washdown areas and loading areas of the batching plant

- Before discharge, filter dewatering water using sand filters or dewatering bags to remove dirt, sand, and other pollutants.
- Neutralize runoff and collected water from concrete truck washing areas
- Pump treated dewatering water to an approved location, such as a detention pond or drainage system,.
- Install runoff collection systems for runoff from workshops and vehicle washdown areas, with effluent emptied into oil and grease traps prior to treatment (e.g., oil-water separation).
- Collect all sanitary wastewater (including sewage from fixed toilets, portable toilets, greywater from kitchen and laundry facilities, site canteens and accommodation shower blocks) and treat in septic systems or biological treatment systems.
- Concrete washout
 - Use designated, lined, and leak-proof containers or pits for all concrete washout. These should be placed at least 50 feet from storm drains or open ditches.
 - Once dried, the hardened material can be disposed of in a landfill.
 - Wash water (wastewater from washing vehicles and equipment.)
 - Use a designated, contained area for washing vehicles and equipment.
 - Perform vehicle maintenance in a contained area with drip pans and spill kits readily available.
 - Explore the potential use of advanced portable systems to collect, filter, and treat wash water so it can be reused, significantly reducing water consumption and preventing discharge.
 - If not treated on-site, haul wash water off-site for proper disposal or, if permitted, directed to a sanitary sewer.
- Site design and planning
 - Ensure adherence to the approved Erosion Control Management Plan, Excavation Spoil and Fill Management Plan, Hazardous Materials Management Plan, and Waste Management Plan, .
 - Explore options for Sustainable Urban Drainage Systems (SuDS) such as permeable pavements or bioretention basins to help manage surface water naturally.
- Recycling and reuse:
 - Treated wastewater can be reused on-site for non-potable purposes such as dust suppression or cleaning.
 - Collect rainwater in cisterns or barrels to use for cleaning, flushing toilets, or other tasks.
 - Install closed-loop systems for vehicle washing and concrete washout to conserve water by filtering and reusing it.

- Maintenance and Regular Monitoring Parameters and Limits
 - Monitor all wastewater streams for the parameters for which standards apply (see Table 4) to verify compliance or identify the need for additional action to ensure compliance. This includes field verification of pH, with neutralization as needed, of wastewater and runoff that may have come into contact with fresh concrete, including from truck washing
 - Empty, clean, and otherwise maintain settling tanks and oil and grease traps, with solids/sludge managed as a hazardous waste.
 - Provide all workers personal protective protection equipment and training in line with the Occupational Health and Safety Management Plan. This includes use of PPE (gloves, boots, cleaning of PPE and disposal of single use PPEs), handwashing protocols, regular health check-ups and immunizations in line with national health protocols.
 - Implement emergency spill response measures as needed, including communication with stakeholders, in line with the Hazardous Materials Management Plan, Waste Management Plan and the Construction Emergency Preparedness and Response Plan.

I. Monitoring, Recordkeeping, and Reporting

18. The WWMP will require that that all existing and new wastewater discharges be sampled and analyzed as follows:
 - As part of the initial evaluation/inventory
 - On at least an annual basis thereafter
 - At any time a receiving water shows discoloration or any other indication that a wastewater discharge may be causing a violation ambient water quality criteria
 - As soon as practicable after a violation of effluent limits or water quality criteria is detected.
19. The WWMP will specify the laboratory and/or field methods will be used to analyze for each pollutant and provide the rationale for the method specified, and will require laboratories to be accredited for the methods they will use. If accredited laboratory facilities are unavailable in Tajikistan, the monitoring plan must present alternative means of ensuring that the analyses are reliable.
20. The Plan will require that all instruments and methods used for field and laboratory analyses be calibrated as recommended by manufacturers, with calibration records provided with the results of analyses.
21. The Plan will require at least monthly visual observations of all treatment facilities and wastewater discharges by HSE specialists to verify whether there has been a change from previous observations. If there has been a significant change in treatment, in effluent volume, or in the receiving water (e.g., discoloration), the Plan must require the discharge and the receiving water to be analyzed, with a change in treatment if this is required to ensure standards will be met.

22. The WWMP will require the preparation of a monthly wastewater monitoring report that summarizes monitoring activities and monitoring results during the period. The report will be summarized and appended to the monthly progress report submitted to the ER/PMC.
23. The Plan will require that all monitoring activities and response actions be documented in a Wastewater Monitoring Register, which must be retained by the Contractor until completion of the Contractor's construction works, at which time the Register must be turned over to the ER/PMC.
24. The WWMP will require that records be kept as required by Tajik law, but no less than the term of the Contractor's works at Rogun HPP.

J. Implementation

25. The Plan must identify and describe the organizational positions and responsibilities of all parties who will implement, supervise, or otherwise have a role in implementing the requirements of the WWMP. This should be shown in organograms that include as much detail as possible, down to the individual position/person and their titles.
26. The WWMP must describe how the Contractor will apply the WWMP's requirements to subcontractors and how the subcontractor's implementation will be supervised and managed.

K. Training

27. The WWMP must identify the training that will be provided to all staff and managers who will be involved in any way in wastewater management and supervision so they can perform their responsibilities at minimum risk to themselves, other workers, the Project, and the waters of Tajikistan. The training must be sufficient:
 - To ensure personnel are competent in their tasks and understand the safety and environmental hazards associated with wastewater construction.
 - To instill the ability to identify all potential wastewater sources, including stormwater and snowmelt runoff, dewatering, concrete wash-out, and chemical spills.
 - To provide guidance on how to perform observation-based site-specific risk assessment to understand the hazards associated with each wastewater source for which they are responsible or to which they may be exposed, including chemical and biological hazards.
28. To define and establish a clear communication hierarchy for reporting incidents and concerns. The Plan must identify who will be responsible for conducting the training and who will be trained in what skills. Training will focus on the assigned responsibilities of the trainees and will cover technical and administrative skills needed to perform assigned responsibilities related to wastewater management, the actions required in case of incidents, and topics related to occupational health and safety, including PPE required to conduct assigned activities.

L. Relationship to Other Plans

29. Other plans that are or may be related to the Wastewater Management Plan and that may include requirements relevant to wastewater management include:
 - Community Health and Safety Management Plan
 - Construction Emergency Preparedness and Response Plan

- Erosion Control Plan
- Excavation Spoil and Fill Management Plan
- Hazardous Materials Management Plan
- Occupational Health and Safety Plan
- Waste Management Plan

M. Revision

30. The WWMP will be reviewed at least semi-annually (that is, twice per year) and updated when:

- There is a significant change in wastewater generation or discharges, in wastewater treatment, or in receiving waters
- There are repeated violations of effluent standards and/or ambient water quality criteria
- There is a major spill or release of wastewater.
 - When the Plan is updated, the revised Plan must be submitted to the ER/PMC for review and approval prior to implementation of the changes. If a review determines the Plan does not need to be updated, this will be communicated to the ER/PMC for concurrence or further consideration, as needed.

Worker Accommodation Management Plan Framework

A. Purpose and Applicability

1. Substandard worker accommodation facilities and poor camp management can have adverse effects on worker's physical and mental well-being.
2. Therefore, each Contractor employed at Rogun Hydropower Project (the Project) providing accommodation to its workers will prepare and implement a Worker Accommodation Management Plan (WAMP, or Plan) that is consistent with this Framework and the applicable standards. This requirement also applies to JSC Rogun and the Employer's Representative (ER) and Project Management Consultant (PMC) whenever they provide accommodation to their employees.
3. The Plan will be reviewed by the ER and the PMC and approved if it is consistent with applicable requirements. Once approved it must be diligently implemented. New Contractors must have an approved WAMP before mobilizing to the site and accommodating workers, as specified in their contracts.
4. As used in this Framework and in Contractor WAMPs, "Worker accommodation" refers to construction camps built specifically for the Project, as well as hotels, flats, houses and lodgings that are provided by Contractors to house the Project workforce. It also includes the kitchens, canteens, recreation facilities, and other amenities that are provided for the welfare of the workers.
5. The purpose of this document is to define the standards that when met will ensure (1) that accommodation provided for workers is safe, clean, and meets the needs of the workers, as well as (2) set out emergency preparedness measures and maintenance requirements.

B. Applicable Standards

6. The Plan must include such requirements that will ensure the Project meets the requirements of Tajikistan law, standards promulgated by International Financial Institutions, the international obligations of Tajikistan, and good international industry practice (GIIP). Such requirements will include, at a minimum, the requirements listed below, in particular the detailed requirements of the IFC/EBRD guidance note "Workers' Accommodation: Processes and Standards" (<https://www.ifc.org/content/dam/ifc/doc/mgrt/workers-accommodation.pdf>) and the World Bank Group Environmental Health and Safety Guidelines (<https://www.ifc.org/en/insights-reports/general-environmental-health-and-safety-guidelines>). In all cases, site-specific engineering and scientific judgment will be used to confirm that standards are sufficient to prevent unacceptable impacts on the workers and the environment. If there are inconsistencies among or between requirements, the Plan must meet the more stringent ones.

C. Tajikistan Legislation

7. The relevant legislation that applies is the Labor Code of the Republic of Tajikistan, 2016 (No. 1329, as amended) which stipulates requirements for occupational health and safety. It

establishes the right of workers to suitable working conditions, including accommodation if necessary, that are protected from exposure to dangerous and harmful factors.

D. International Financial Institutions Standards

- World Bank ESS 2: Labor and Working Conditions (ESS2)
- World Bank ESS 4: Community Health and safety (ESS4)

E. Good International Industry Practice

- IFC/EBRD guidance note, "Workers' Accommodation: Processes and Standards"

F. Management Approach and Activities

8. The WAMP will be based on a detailed evaluation of ongoing and new operations and requirements. The Plan will be informed by and based upon the best judgment of qualified professionals. The Plan will become part of the Contractor's Environmental and Social Management and Monitoring System.
9. The Contractors' Plans will establish requirements relevant to:
 - All accommodation and other spaces/facilities (e.g. kitchens, canteens, recreation facilities and other amenities) provided to workers at the Rogun HPP construction site and the operating HPP who are provided accommodation by their employer.
 - All the workers whose reside in or otherwise use such accommodation facilities.
10. The Contractors' Plans must include:
 - Specifications for accommodation, including descriptions of the accommodation and layouts
 - Roles and responsibilities of the various parties who are associated with the Plan
 - Training requirements
 - Monitoring and reporting procedures.

G. Accommodation Measures

11. JSC Rogun, the ER/PMC, and all Contractors (including sub-contractors) and Consultants who are employed for Project construction who provide accommodations for their workers will implement the following measures to avoid, minimize and control impacts and risks related to accommodation. The accommodations are for workers only and not their families. Consistent with the IFC/EBRD guidance note, therefore, the WAMP must require measures to accomplish the following:
 - Accommodation must be safe and secure, located away from sites for storage of hazardous materials/wastes, and be constructed in accordance with Tajikistan building codes, including relevant requirements for electrical circuits, plumbing, fire safety, etc.
 - An experienced and competent Worker Accommodation Manager will be appointed to supervise implementation of the requirements of the WAMP and oversee accommodation facilities and assigned staff

- Adequate emergency exits and escape routes have to be available, with prominent lights and signage that are clearly visible to occupants and visitors.
- There must be a system of preventive maintenance sufficient to keep the facilities in good condition and to repair defects and damage promptly.
- The workers will not be charged for the accommodations or services in the accommodations.

12. All accommodation facilities will provide:

- Supply of fresh and clean drinking water in such quantities as to provide for all personal and household uses. All tanks used for the storage of drinking water must be constructed and covered to prevent the stored water from becoming polluted or contaminated
- Separate cooking and eating areas that are cleaned at least daily
- Food that contains an appropriate level of nutritional value and accounts for religious and cultural backgrounds
- Mandatory training sessions for all kitchen staff to ensure that food handlers receive appropriate supervision and training in food hygiene
- Separate sanitary, accommodation, and recreational facilities for men and women
- First aid kits and/or medical facilities
- Laundry facilities or laundry services
- Basic collective social/recreational space for workers to use in their free time
- Clean toilet and shower facilities with hot and cold running water, soap, sanitary provisions in female toilets and sufficient privacy provided at all times, including ceiling to floor partitions and lockable doors. Toilet and shower facilities must have a checklist on the inside of the door providing details of when it was last inspected/cleaned and by whom. Inspections should happen at least on a daily basis
- Bedrooms that will be cleaned daily and preferably not shared by more than six workers. There must be at least 4-5.5m² of floor space per resident
- A clean and separate bed for each worker, with the practice of “hot bedding” prohibited during the 15-day monthly on-off shift. No workers on day shifts may be assigned to share a room with workers on night shifts
- Sanitary facilities in a convenient location within the accommodation, with at least one toilet, one wash basin, and one tub or shower for every six people. Soap and hygienic paper must be kept adequately stocked
- Lockers and/or secure storage facilities for workers to store personal belongings (standard 475-litre lockers and at least one meter of shelf unit)
- Good illumination, with natural and artificial lighting
- Ventilation/cooling in the summer and heating provisions in the winter as needed for reasonable comfort
- Adequate functional sewage and waste disposal systems
- Emergency plans tailored to local risks, such as landslides, seismic events, extreme weather, security breaches and damage or collapse of the dam structures. These plans should include training drills so that lodgers are aware of the evacuation plans.

- Fire protection measures, including fire alarms, smoke detectors, fire extinguishers and fire bucket stands. A specific fire safety risk assessment and plan will be prepared, including training of fire wardens, periodic testing and monitoring of fire safety equipment and periodic drills. Safety exits must be clearly marked and clear passageways with means of escape must be provided between all bedrooms and exits in case of fire or other emergencies.

13. A Project Worker Grievance Redress Mechanism is available to all Project workers to raise any complaints, suggestions or requests in relation to worker accommodation. An overview of the Worker Grievance Redress Mechanism, which allows for the submission of anonymous complaints, is presented in the **Labor Management Procedures** (LMP). A notice board posted in each accommodation building should advise workers of the availability of the Mechanism and a locked box should be provided where workers can deposit written complaints, including anonymous ones.
14. The **Stakeholder Engagement Plan** and **Community Health and Safety Plan** include measures for outreach, consultations, grievance management at the dam site, as well as relations and coordination with local communities.

H. Monitoring and Reporting

15. The WAMP will require that reports be prepared and submitted to the ER on at least a monthly basis. The reports will describe the Contractor's application of and compliance with applicable standards, including food safety, fire regulations, hygiene and sanitary standards, on the activities undertaken by the Accommodation Manager and associated staff to implement the WAMP, and on the Key Performance Indicators defined in the table below.

<i>Key Performance Indicator</i>	<i>Means of Verification</i>
a. Number of registered grievances received through the Grievances Mechanism related to accommodation, by category, including type and number (with gender-disaggregated data). b. Number of grievances resolved / unresolved within the stipulated timeframe. c. Repetition of the same grievance.	Grievance Logs
d. Corrective action and maintenance response time	Maintenance Logs
e. Number of corrective actions required	Completed Worker Accommodation Checklist

16. The WAMP will require a formal audit to be undertaken by the Worker Accommodation Manager using the Worker Accommodation Inspection Checklist (Appendix A) on at least a monthly basis, more frequently as needed to verify that measures to correct noncompliance have been implemented satisfactorily. Measures required to bring accommodation in compliance with the WAMP will be implemented as soon as practicable and closed out by the HSE Manager. For all

new accommodation, an audit must be conducted, and all identified instances of noncompliance corrected before the accommodation is used.

17. In addition to the formal audits by the Accommodation Manager, the WAMP will define the frequency of other monitoring activities that will be and the responsible party for such monitoring activity. Monitoring activities must be at least as frequently as shown below.

<i>Minimum Frequency</i>	<i>Monitoring Activity</i>
Daily	• Housekeeping in all bedrooms and toilets • Washroom and shower/bath areas
Weekly	• Kitchens, food preparation and restaurant areas • Housekeeping and worker conditions in all accommodation and recreational areas • Inspection of areas around accommodation for stagnant water, rubbish accumulation and general care and maintenance
Monthly	• First aid kit inventory (where applicable) • Fire systems and evacuation alarms and signage • Check-up of pest eradication systems
Annually	• Electrical system and fittings by qualified/competent person

18. The WAMP will define the records that are to be maintained, and the record control system. At a minimum the following will be recorded:

- Complaints and grievances from workers about accommodation quality, health and/or safety and the response provided to the complaint
- Accommodation maintenance records, including works required and records of their implementation, including 'sign-off' of works by the Worker Accommodation Manager or the HSE Manager
- Findings of audits and inspections, including corrective actions required. Reviews and updates of the WAMP, including at least annual reviews and updates as needed to reflect changes to accommodation and requirements.

I. Roles and Responsibilities

19. The WAMP will define the persons and positions that will be responsible for the following activities:

- Overseeing implementation of the WAMP following approval by the ER/PMC
- Ensuring sufficient resources and capacity are provided for implementation of the WAMP
- Preparing, reviewing, and approving of monthly inspection reports, including the review and approval of any incident reports and corrective actions required
- Maintaining training register

- Preparing the information that will be included in the monthly progress report to the ER, which will a summary of the current status of accommodations and use/occupancy, incidents and grievances, major issues encountered and/or addressed, and changes in the WAMP
- Conducting the inspections required under paragraphs 14 and 15 and preparing the records required under paragraph 16.

J. Training

20. The WAMP will identify training requirements for implementing the requirements of the Plan and ensuring the Applicable Standards are met. It will identify the training type, audience and the point in time when it will be held. At a minimum the following training requirements will be included in the Plan.

<i>Training</i>	<i>Description</i>	<i>Required Participants</i>	<i>Frequency</i>
Worker Accommodation Induction	Mandatory training provided to workers on the following topics include information relevant to accommodation: g. Rules and regulations for the facility h. Code of conduct i. Grievance Redress Mechanism j. Accommodation and camp management system k. Health, safety and security l. Fire and emergency procedures for accommodation	All users and occupants of accommodations, all site managers and supervisors	m. Upon mobilization to site n. Annual refresher
Food Hygiene	Training sessions to ensure that food handlers receive the appropriate supervision and training in food hygiene.	All camp kitchen staff	o. Upon employment p. Daily “toolbox talks” by facility managers/supervisors
Fire Safety	Training sessions to ensure that fire wardens are familiar with emergency procedures and their responsibilities in the case of a fire.	All fire wardens	q. Upon employment r. Quarterly drills s. Annual refresher

K. Plan Review and Update

21. The WAMP will require the Worker Accommodation Manager to review the WAMP and update it as needed as follows:
 - Bi-annual (twice per year) reviews by the Worker Accommodation Manager
 - Unscheduled reviews and updates as needed following significant instances of noncompliance with the Applicable Standards in order to identify and incorporate changes required to improve compliance.
22. If a bi-annual or unscheduled review determines that no update to the WAMP is required, the Contractor will report the same to the ER/PMC.
23. If a bi-annual or unscheduled review results in material changes to the WAMP, the Contractor will submit the revised Plan to the ER/PMC for review and approval.

Appendix A

 ROGUN HYDROPOWER PROJECT WORKER ACCOMMODATION AUDIT FORM				
Workers Accommodation Audit - Form				
Date:				
Contractor:				
Location:				
Number of Employees:				
Inspection Team Members:				
(1) General Living Facilities				
	Yes	No	Remarks	
1.	Is transport provided to worksite safe and free?			
2	Are the living facilities built in accordance with Tajikistan building code/standards?			
3	Is there evidence of pests, possible disease vectors (e.g., rats), or mold and mildew?			
Sub Total				
(2) Drainage				
	Yes	No	Remarks	
1	Is the site adequately drained?			
Sub Total				
(3) Heating, air conditioning, ventilation and light				
	Yes	No	Remarks	
1	Are living facilities equipped with adequate heating, ventilation, air conditioning and light systems including emergency lighting?			
2	Do windows represent not less than 5% to 10% of the floor area?			
Sub Total				

(4) Water		Yes	No	Remarks
1	Do workers have easy access to a supply of clean/ potable water in adequate quantities?			
2	Does the quality of the water comply with national/local requirements?			
3	If tanks are used for the storage of drinking water, are they constructed and covered to prevent water stored therein from becoming polluted or contaminated?			
4	If commercial bottled water is not provided, is the quality of the drinking water regularly monitored?			
Sub Total				
(5) Wastewater and Solid Waste		Yes	No	Remarks
1	Are wastewater, sewage, food and any other waste materials adequately discharged in compliance with local or World Bank standards and without causing any significant impacts on the Project residential(s)?			
2	Are containers for rubbish collection provided and emptied on a regular basis?			
3	If pest extermination, vector control and disinfection are required, are they undertaken throughout the living facilities?			
Sub Total				
(6) Rooms/dormitories/facilities		Yes	No	Remarks
1	Are the rooms/dormitories kept in good condition?			
2	Are the rooms/dormitories aired and cleaned at regular intervals?			
3	Are the rooms/dormitories built with easily cleanable flooring material?			
4	Are the rooms/dormitories and sanitary facilities located in the same buildings?			
5	Are residents provided with enough space?			
6	Is the ceiling height high enough?			
7	Is the number of workers sharing the same room/dormitory minimized?			
8	Are the doors and windows intact and lockable?			
9	Are mobile partitions or curtains provided?			
10	Is suitable furniture such as table, chair, mirror, bedside light provided for every worker?			

11	Are separate sleeping areas provided for men and women?			
Sub Total				
(7) Bed arrangements and storage facilities		Yes	No	Remarks
1	Is there a separate bed provided for every worker?			
2	Is the practice of "hot-bedding" prohibited?			
3	Is there a minimum space of 1 meter between beds?			
4	Is the use of double deck bunks minimized?			
5	When double deck bunks are in use, is there enough clear space between the lower and upper bunk of the bed?			
6	Are triple deck bunks prohibited?			
7	Are comfortable mattresses, pillows and clean bed linens provided?			
8	Are the bed linen washed frequently and applied with adequate repellents and disinfectants as needed?			
9	Are adequate facilities for the storage of personal belongings provided?			
10	Are there separate storages for work clothes and PPE and depending on condition, drying/airing areas?			
Sub Total				
(8) Sanitary and Toilet Facilities		Yes	No	Remarks
1	Are sanitary and toilet facilities constructed from materials that are easily cleanable?			
2	Are sanitary and toilet facilities cleaned frequently and kept in working condition?			
3	Are toilets, showers/bathrooms and other sanitary facilities designed to provide workers with adequate privacy including ceiling to floor partitions and lockable doors?			
4	Are separate sanitary and toilet facilities provided for men and women?			
5	Is there an adequate number of toilets and urinals?			
6	Are toilet facilities conveniently located and easily accessible?			
7	Is the shower flooring made of anti-slip hard washable materials?			

8	Is there an adequate number of hand wash basins and showers/bathrooms facilities?			
9	Are the sanitary facilities conveniently located?			
10	Is soap and/or anti-bacterial hand gel provided in all toilet facilities?			
11	Are shower facilities provided with an adequate supply of cold and hot running water?			
Sub Total				
(9) Laundry Facilities		Yes	No	Remarks
1	Are adequate facilities for washing and drying clothes provided?			
2	Are sinks and tubs provided with hot and cold water?			
3	Is cleaning soap provided?			
4	Are drying lines provided for washing machines and dryers?			
5	Are there special laundry facilities for work clothes in contact with dangerous substance?			
Sub Total				
(10) Canteen and Cooking		Yes	No	Remarks
1	Are canteen and cooking facilities built with adequate and easy to clean materials?			
2	Are the canteen, cooking and laundry facilities kept in clean and sanitary condition?			
3	If workers cook their own meals, is kitchen space provided separately from the sleeping areas?			
4	Are workers provided with enough space in the canteen? (1 sq mtr to 1.5 sq mtr per person)			
5	Are canteens adequately furnished?			
6	Are kitchens provided with the facilities for kitchen workers to maintain adequate personal hygiene?			
7	Are places for food preparation adequately ventilated and equipped?			
8	Are kitchen floor, ceiling and wall surfaces adjacent to or above food preparation and cooking areas built of non-absorbent, durable, non-toxic, easily cleanable materials?			
9	Are wall surfaces adjacent to cooking areas made of fire-resistant materials and food preparation tables equipped with a smooth, durable, non-corrosive, non-toxic, washable surface?			

10	Are adequate facilities for cleaning, disinfecting and storage of cooking utensils and equipment provided?			
11	Are there adequate sealable containers to deposit food waste and other refuse? Is refuse frequently removed from the kitchen to avoid accumulation?			
Sub Total				
(11) Standards for Nutrition and Food Safety		Yes	No	Remarks
1	Is there a special sanitary process such as the WHO "5 keys to safer food" implemented in relation to food safety?			
2	Does the food provided contain appropriate nutritional value?			
3	Does the food provided take into account workers' religious/cultural backgrounds?			
4	Are hands washed before handling food and often during food preparation?			
5	Are hands washed after going to the toilet?			
6	Are all surfaces and equipment used for food preparation washed and sanitized?			
7	Are kitchen areas and foods protected from insects, pests and other animals?			
8	Is raw meat, poultry and seafood kept separate from other foods?			
9	Are separate equipment and utensils, such as knives and cutting boards, used for handling raw foods?			
10	Are foods stored in containers to avoid contact between raw and prepared foods?			
11	Is food cooked thoroughly, especially meat, poultry, eggs and seafood			
12	Are foods like soups and stews brought to boiling to make sure that they have reached 70°C.			
13	Is food kept at safe temperatures			
14	Is food kept at room temperature for less than 2 hours.			
15	Is all cooked and perishable food refrigerated promptly (preferably below 5°C)?			
16	Is safe water used, or treated to make it safe?			
17	Are fresh and wholesome foods selected?			
18	Are fruits and vegetables washed in safe water, especially if eaten raw?			
19	Is food used before its expiry date?			
Sub Total				

(12) Medical Facilities		Yes	No	Remarks
1	Are first aid kits provided in adequate numbers?			
2	Are first-aid kits adequately stocked?			
3	Is there an adequate number of staff/workers trained to provide first aid?			
4	Are there any other medical facilities/services provided on site? If so are they fully equipped and staffed?			
Sub Total				
(13) Leisure, social and telecommunications facilities		Yes	No	Remarks
1	Are basic social collective spaces and adequate recreational areas provided to workers?			
2	Are workers provided with dedicated places for religious observance?			
3	Are workers provided with access to internet facilities?			
Sub Total				
(14) Management and staff		Yes	No	Remarks
1	Are there carefully designed worker camp management plans and policies especially in the field of health and safety (including emergency responses), security, workers' rights and relationships with the communities?			
2	Where contractors are used, have they clear contractual management responsibilities and duty to report?			
3	Does the person appointed to manage the accommodation have the required background, competency and experience to conduct his mission and is he/ she provided with the adequate responsibility and authority to do so?			
4	Is there enough staff to ensure the adequate implementation of housing standards (cleaning, cooking and security in particular)?			
5	Are staff members recruited from surrounding communities?			
6	Have the staff received basic health and safety training?			
7	Are the persons in charge of the kitchen particularly trained in nutrition and food handling and adequately supervised?			
Sub Total				
(15) Health and Safety On Site		Yes	No	Remarks

1	Have health and safety management plans including electrical, mechanical, structural and food safety been designed and implemented?			
2	Has the accommodation manager a duty to report to the health authority specific diseases, food poisoning or casualties?			
3	Is there an adequate number of staff/workers trained in providing first aid?			
4	Has a specific and adequate fire safety assessment and corresponding management plan been completed and implemented?			
5	Is guidance on alcohol, drug and HIV/AIDS and other health risk-related activities provided to workers?			
6	Are contraception measures (condoms in particular) provided?			
7	Do workers have an easy access to medical facilities and medical staff, including female doctors/nurses where appropriate?			
8	Have emergency plans on health and fire safety been prepared?			
9	Depending on circumstances, have specific emergency plans, (earthquakes, floods, tornadoes) been prepared?			
Sub Total				
(16) Security on Workers' Accommodation		Yes	No	Remarks
1	Has a security plan including clear measures to protect workers against theft and attack been designed and implemented?			
2	Has a security plan including clear provisions on the use of force been designed and implemented?			
3	Have the backgrounds of security staff been checked for previous crimes or abuses?			
4	Has the recruitment of security staff from both genders been considered?			
5	Have security staff received clear instruction about their duty and responsibility?			
6	Have security staff been adequately trained in dealing with domestic violence and the use of force?			
7	Are body searches only performed in exceptional circumstances by specifically trained security staff of both genders?			

8	Do security staff have a good understanding about the importance of respecting workers' rights and the rights of the surrounding communities and adopt appropriate conduct?			
9	Do workers and communities have specific means to raise concerns about security arrangements and staff?			
Sub Total				
(17) Workers' rights, rules and regulations on workers accommodation		Yes	No	Remarks
1	Are limitations on workers' freedom of movement limited and justified?			
2	Is an adequate transport system to the surrounding communities provided?			
3	Is the practice of withholding workers' ID papers prohibited?			
4	Is freedom of association expressly respected?			
5	Are workers' religious, cultural and social backgrounds respected?			
6	Are workers made aware of their rights and obligations and provided with a copy of the accommodations' internal rules, procedures and sanction mechanisms in a language or through a media they understand?			
7	Are house regulations non-discriminatory, fair and reasonable?			
8	Are regulations on alcohol, tobacco and third parties' access to the camp clear and communicated to workers?			
9	Is a fair and non-discriminatory procedure to implement disciplinary procedures, including the right for workers to defend themselves, set up?			
Sub Total				
(18) Consultation and grievance mechanisms		Yes	No	Remarks
1	Have mechanisms for workers' consultation been designed and implemented?			
2	Are workers provided with processes and mechanisms to articulate their grievances?			
3	Have workers subjected to disciplinary proceedings arising from conduct in the accommodation had access to a fair and transparent hearing with the possibility to appeal the decision?			
4	Are there fair conflict resolution mechanisms in place?			

5	In cases where serious offences occur, are there mechanisms to ensure full cooperation with police authorities?			
Sub Total				
(19) Management of community relations		Yes	No	Remarks
1	Have community relation management plans addressing issues around community development, community needs, community health and safety and community social and cultural cohesion been designed and implemented?			
2	Do community relation management plans include the setting up of liaison mechanisms to allow a constant exchange of information and consultation of the surrounding communities?			
3	Is there a senior manager in charge of implementing the community relation management plan?			
4	Is there a senior manager in charge of liaising with the surrounding communities?			
5	Are the impacts generated by workers' accommodation periodically reviewed, mitigated or enhanced?			
6	Are community representatives provided with easy means to voice their opinions and lodge complaints?			
7	Is there a transparent and efficient process for dealing with community grievances, in accordance with ESS10?			
Sub Total				
(20) Fire Safety		Yes	No	Remarks
1	Fire safety plan available			
2	Evacuation map posted			
3	Emergency assembly point provided			
4	Fire alarm installed			
5	Fire detectors installed, tested and inspected - smoked detectors			
6	Fire extinguishers adequately provided			
7	Fire extinguishers conspicuously located/visible			
8	Firefighting equipment monthly inspected			

9	Fire team assigned/delegated			
10	Fire and emergency response contact/information posted			
11	Smoking area designated			
12	No smoking inside the building			
13	Emergency access is not obstructed			
Sub Total				
(21) Electrical		Yes	No	Remarks
1	Electrical fixtures are properly installed			
2	Monthly inspection program in place			
3	No loose and open connections			
4	Electrical circuit boards and panel boards adequately labelled (warning/danger)			
5	Temporary Power - generators have containment bunds, earthing rod, roof, fire extinguisher and exhaust is directed upwards to atmosphere (not into windows).			
Sub Total				
Item	Category	Yes	No	Total Items
1	General Living Facilities			2
2	Drainage			1
3	Heating, air conditioning, ventilation and light			2
4	Water			4
5	Wastewater and Solid Waste			3
6	Rooms/dormitories/facilities			11
7	Bed arrangements and storage facilities			10
8	Sanitary and Toilet Facilities			11
9	Laundry Facilities			5
10	Canteen and Cooking			11
11	Standards for Nutrition and Food Safety			19

12	Medical Facilities			4
13	Leisure, social and telecommunications facilities			3
14	Management and staff			7
15	Health and Safety on Site			9
16	Security on Workers' Accommodation			9
17	Workers' rights, rules and regulations on workers accommodation			9
18	Consultation and grievance mechanisms			5
19	Management of community relations			7
20	Fire Safety			13
21	Electrical			5
Overall Compliance Score				150