



# **Cambodian Mine Action Standards**

## **Chapter 20**

### **Environmental Management in Mine Action**

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## Contents

Environmental management in mine action .....	3
Introduction.....	3
1. Scope.....	3
2. References .....	4
3. Terms and definitions .....	4
4. General requirements .....	4
5. Environmental management.....	5
5.1. Environmental Policy .....	5
5.2. Understanding the environmental context.....	5
5.3. Identifying and assessing environmental aspects .....	6
5.4. Determining environmental protection and mitigation measures .....	7
5.5. Environmental Impact Assessment .....	7
5.6. Planning and tasking of mine action operations.....	7
5.7. Implementing operations .....	8
5.8. Monitoring of environmental aspects.....	8
5.9. Review and improvement .....	9
6. Responsibilities and obligations .....	9
6.1 CMAA's responsibilities .....	9
6.2 Mine Action Operator's responsibilities .....	10
6.3 Donors and other stakeholders' responsibilities.....	10
Annex A: (Normative) References .....	11
Annex B: Guidance on protection and mitigation measures against adverse environmental impacts 12	
Annex C: (Informative) Guidelines for Environmental Impact Assessment (EIA).....	19
Annex D: (Informative) Environmental management checklist .....	22

# Environmental management in mine action

## Introduction

Effective management of environmental aspects of mine action operations is important from the perspectives of CMAA, mine action operators, affected communities, donors and other stakeholders. Protection of the environment is considered as a development priority by the Royal Government of Cambodia (RGC) (ministry and provincial department of environment) in order to achieve the Cambodian Sustainable Development Goal.

Mine action improves not only safety and security of population, but also opportunities for socio-economic development aligned with national and sub-national development plans as its aim is to “reduce social, economic and environmental impact of mines, submunitions and other ERW.” Mine action activities have a positive impact on environment, but this does not exclude potential to adversely impacts on the environment. It is thus important to prevent and mitigate possible adverse impacts through an appropriate environmental management that takes into account the specific activities conducted by mine action operators, the resources used and the context in which operations are conducted. This supports National Mine Action Strategy (NMAS) goal 8, objective 4.

Environmental management is meant to strengthen mine action effectiveness and efficiency in achieving its aim. Shortcomings in environmental management in mine action can: reduce or prevent the results and outcomes expected to arise from mine action operations; lead to short and long-term adverse impacts on land, water, soil and air and the communities living in the vicinity of mine action work sites; result in direct harm to people, damage to the environment and infrastructure; and give rise to legal action against mine action organisations and substantial claims for compensation. Adverse impacts on the environment can lead to associated negative social, economic and political impacts at local, regional and national levels. Environmental management therefore calls for holistic solutions which assess different impacts and an increased awareness towards environmental protection among all mine action operators.

CMAA and mine action operators have the responsibility to ensure that all mine action activities such as planning and prioritization, non-technical and technical survey, clearance and Explosive Ordnance Disposal (EOD), are carried out in accordance with applicable legislation, safely, effectively and efficiently, but also in a way that minimises any adverse impact on people, wildlife, vegetation and other aspects of the environment. Most concerns should be given to mechanical clearance and bulk demolition since these processes have the ability to severely impact the environment. The general aim on environmental management in mine action is to leave the environment in a state that is similar to, or where possible better than, before mine action operations commenced, and that permits the intended use of land once mine action operations have been completed.

Managing environmental aspects of mine action however need not be a burdensome task. There are many parallels with CMAS chapter 19 on quality management (QM) and basic principles of risk management – the QM principles of the process approach, improvement, involvement of people and evidence-based decision-making are all wholly applicable to environmental management. It is also important to note that one of the main, and most effective, ways of reducing the direct impact of mine action technical operations on land is through the application of land release (LR) methodology and minimize the needs for physical clearance activities.

## 1. Scope

This standard details the minimum requirements for environmental management of all mine action operations on land and underwater including planning, protection and mitigation measures. These requirements shall be complied with to ensure that the

environment is not degraded by mine action work and land is returned in a state that is similar to, or where possible better than, before mine action operations commenced, and that permits its intended use.

## 2. References

A list of normative references is given in Annex A. Normative references are important documents to which reference is made in this standard and which form part of the provisions of this standard. Special attention shall be given to national legislation as requirements for protection of the environment are often embedded in the national policy and law.

## 3. Terms and definitions

A general terms and definitions used in this chapter is explained below:

The term 'environment' refers to the "surroundings in which an organization operates, air, water, land, natural resources, flora, fauna, humans and their interrelationships".

The term 'environmental aspect' refers to an "element of an *organization's* activities or products or services that interacts or can interact with the *environment*".

The term 'environmental impact' refers to "change to the environment, whether adverse or beneficial, wholly or partially resulting from an *organization's environmental aspects*".

The term '**adverse impact**' refers to any harmful effect imposed on the environment. The reference to requirements set by national legislation, if existing and the intended future use of the cleared area are key factor for determining the adverse impacts.

The term '**environmental impact assessment**' (EIA) refers to "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant environmental impacts of activities prior to and during operations".

The term 'environmental mitigation measures' refers to actions taken before, during and/or after mine action operations to lower adverse environmental impact.

The term '**environmental management system**' (EMS) refers to the "part of the *management system* used to manage *environmental aspects*, fulfil *compliance obligations* and address *risks and opportunities*".

The term '**Erosion**' refers to the degradation of soil quality, structure, ability to retain moisture and the loss of soil nutrient caused by weather condition, water system, or wind.

## 4. General requirements

Mine action operations shall be conducted in a manner that minimises the adverse impact on the environment and is safe for mine action staff and men, women and children in the community.

Planning for mine action operations shall identify and assess relevant environmental aspects and determine appropriate and effective measures to mitigate adverse environmental impacts. Assessments also need to take into considerations of climate change (high rainfall, extreme weather events, landslips, drought etc...) and incorporate suitable adaptation measure.

Mine action operators shall take all reasonable measures to ensure that the environment

in which mine action operations take place is left in a state whereby it is suitable for its intended use once mine action operations cease. Mine Action operators should define reasonable mitigation measures based on cost-benefit considerations of different methods and end products, in agreement with CMAA.

Particular attention shall be given to environmental conditions (mine action operations take place includes land used for administrative, logistic, training and/or support purposes) that are required for subsistence or economic purposes to ensure that these activities can continue after mine action operations have been completed.

## **5. Environmental management**

Having an environmental management system is a requirement for CMAA and mine action operators. It is the mine action operators who have the responsibilities to assess the impact on the environment and to establish mitigation measures reflecting the needs on a local and/or national scale, in agreement with CMAA. The operator has the responsibility to meet the needs, criteria and mitigation measures given by the CMAA and has an easily accessible and transparent quality management system documenting the procedures and non-conformities.

### **5.1. Environmental Policy**

CMAA and mine action operators shall establish, review and maintain an environmental standard that:

- Is appropriate to their specific activities;
- Includes a commitment to protect the environment;
- Includes a commitment to comply with applicable legal and other obligations;
- Includes a commitment to the continual improvement of their environmental management;
- Is communicated to relevant internal and external stakeholders; and
- Is reviewed and, where appropriate updated as needed.

The CMAA and mine action operator's senior management shall ensure that:

- Adequate resources are allocated to enable effective environmental management in accordance with this standard;
- Staff members are adequately trained and have a clear understanding of their role in the protection of the environment;
- Management of environmental aspects is adequately incorporated into SOPs and other relevant documentation;
- Documentation relating to environmental management is openly and transparently available, including in additional languages where necessary to aid understanding, and is kept up to date; and
- Environmental management aspects of the mine action operators' activities are monitored, reviewed and improved.

### **5.2. Understanding the environmental context**

The CMAA shall:

- Identify and assess environmental obligations, relevant to the national mine action programme, contained in applicable national and international legislation; (*Refer to annex A*)

- Understand the cost – benefit of environmental protection;
- Define and communicate environmental obligations in Cambodian mine action standards (CMAS) and normative references relevant for mine action work;
- Identify and liaise with other Government Ministries, Agencies and Departments relevant to environmental management in mine action;
- Coordinate with national/international stakeholders to support/improve environmental protection/mitigation measures, avoid duplication of effort and identify and address gaps in environmental management within the mine action programme.

The mine action operators shall take all reasonable measures to understand the environmental needs and expectations of mine action stakeholders including women and men from local communities.

Understanding of the physical environment and the needs and expectations of mine action stakeholders shall inform the planning for, and establishing of, environmental protection and mitigation measures.

### **5.3. Identifying and assessing environmental aspects**

As a minimum, mine action operators shall identify, assess and document environmental aspects of mine action activities, inputs, products and services arising from those activities, including:

- emissions to air
- releases to water;
- releases to land;
- use of raw materials and natural resources;
- use of energy;
- emission of energy; and
- generation of waste.

Mine action operators shall identify those aspects that may give rise to an adverse environmental impact, including, as a minimum, the following potential environmental impacts:

- erosion and soil degradation;
- pollution of air, water and soil;
- Disruption, disturbance or harm to communities, infrastructure, wildlife and forestry/vegetation;
- litter, debris, residual waste and other degradation of the visible environment; and
- damage to heritage sites and objects.

When assessing the significance of environmental aspects, mine action operators should take into account the following criteria:

- the type of mine action activity;
- the size of the mine action operation;
- the frequency of mine action operations;

- the duration of mine action operations;
- the sensitivity of the environmental setting
- the severity of the impact
- relevant legal or standards requirements;
- the expectations of environmental stakeholders;
- the potential for combined effects of more than one adverse environmental impact
- the potential legal liability associated with impacts arising from environmental aspects.

Environmental aspects shall be documented in plans, SOPs and/or other records as appropriate.

The mine action operators should assess and respond to opportunities to protect the environment indirectly through procurement of resources, tasking, logistic, storage and waste disposal processes.

#### **5.4. Determining environmental protection and mitigation measures**

Mine action operators shall determine appropriate and effective mitigation measures in relation to environmental aspects assessed as bringing a significant risk of adverse environmental impact.

Environmental protection and mitigation measures shall be documented in task orders, operational plans, SOPs and other relevant documentation.

Environmental protection and mitigation measures shall include emergency response plans for potential critical/major environmental incidents and climate change adaptation plan.

#### **5.5. Environmental Impact Assessment**

Under some circumstances an Environmental Impact Assessment (EIA) may be appropriate or required (refer to Annexes A and C). An EIA should be made whenever:

- mine action operations are expected to take place within, or close to, designated protected environmental areas, or other areas known to be environmentally sensitive;
- there is a legal or contractual obligation to do so;
- the CMAA and mine action operators determines that an EIA is necessary; and/or
- any other occasion when there is uncertainty about the scale or significance of environmental impact.

#### **5.6. Planning and tasking of mine action operations**

When planning mine action operations, mine action operators shall take into consideration the guidelines in Annex C to this standard.

Planning of mine action operations shall:

- be appropriate to the environmental context;
- take into account legal and other compliance obligations;
- take into account future intended land use;

- understand cost – benefits of possible mitigation measures;
- incorporate identified environmental mitigation measures, including any emergency response and for example; extreme weather events, flooding, impact due to climate change (drought, fire..); and
- be consistent with the environmental standard.

### **5.7. Implementing operations**

CMAA and mine action operators shall comply with the requirements of this standard and other guidelines that may be relevant to mine action operations, and refer to their SOPs. When implementing mine action operations, operators shall take into consideration the guidelines in Annex C to this standard.

CMAA and mine action operators shall designate a person responsible for environmental protection at mine action worksites, and ensure compliance with all environmental requirements through project, contract and operational management processes.

All mine action operators shall promote knowledge, awareness and competence for protection of the environment of their staff through education and training. Also incorporate with explosive ordnance risk education (EORE) and other communities' engagement awareness of environmental protection and post clearance aftercare. Operators should provide training for emergency preparedness and response in case of environmental incidents.

Mitigation measures shall be taken to prevent adverse environmental impacts and to prevent pollution and degradation of soil, air and waterways. In addition, all reasonable effort shall be taken to prevent the adverse impact on wildlife and vegetation during mine action operations.

Human waste shall never be discharged into watercourses or onto the soil surface. The mine action operators shall minimise the environmental impact of mine action operations and shall take all reasonable measures to remove waste from mine action work sites on completion of operations and prior to handover of released land. Rubbish removed from the site shall be disposed of at approved rubbish disposal sites. Any rubbish spilled during the removal process shall be cleaned up. Wastewater shall not be released onto the ground surface or into watercourses.

The operation, repair, maintenance and servicing of mine action equipment shall be carried out in a manner that minimises the negative impact on the environment and in accordance with the requirements of the EIA, management.

Mine action operations may occur in locations where there are areas of cultural or historical significance. Where this occurs, CMAA and mine action operators shall take all practicable steps to prevent damage to these sites.

All relevant environmental mitigation measures detailed in CMAS, SOPs, task orders or otherwise documented, shall be fully and effectively implemented during mine action operations and shall be confirmed to be completed before land is handed over and/or the operator departs any mine action worksite.

### **5.8. Monitoring of environmental aspects**

CMAA and mine action operators shall implement a monitoring system in accordance with CMAS 03 and shall ensure that environmental requirements are included.

Environmental nonconformities shall be managed in accordance with CMAS 19 and CMAS 03. Environmental incidents and accidents should be treated as nonconformities and, additionally, investigated in accordance with CMAS 05.

Impact assessments/surveys undertaken after release of land should include assessment of environmental aspects including the effectiveness of any agreed environmental remediation measures. Post clearance monitoring should account for change in land use, environmental incidents and possible land conflicts,

## **5.9. Review and improvement**

Management reviews, as per CMAS 19, should include environmental aspects and be conducted by the senior management of CMAA, and mine action operators to ensure the continued effectiveness, suitability and alignment of environmental management with the organization's environmental standards.

Management reviews should be conducted as needed in light of prevailing circumstances and conditions. Management reviews should take into account:

- the status of actions arising from previous reviews;
- changes in the mine action environmental context;
- the environmental management performance of the mine action operators including:
  - satisfaction of stakeholders' environmental needs and expectations;
  - compliance with environmental standard;
  - environmental nonconformities and corrective actions;
  - environmental monitoring, measurement, audit and evaluation results.
- opportunities for improvement of environmental management.

Management reviews shall include decisions and actions related to:

- opportunities for improvement of environmental management;
- changes to environmental management;
- what action will be taken, who is responsible, schedule for completing and verification of effective implementation.

The results of management reviews shall be communicated to staff, managers and stakeholders.

This standard shall be reviewed as required.

## **6. Responsibilities and obligations**

### **6.1 CMAA's responsibilities**

- Document the environmental management in its CMAS, contracts, directives and other relevant publications;
- Monitor compliance with documented environmental management requirements;
- Ensure the implementation of an EIA if required;
- Ensure that protection of the environment is taken into account during planning for mine action operations;

- Maintain records of reported environmental incidents;
- Where necessary, conduct investigations into environmental incidents; and
- Promulgate information about significant environmental aspects of mine action, including recommendations for best practices and details of environmental incidents to mine action operators and other stakeholders.
- Coordinate environmental protection with national and international stakeholders.

## **6.2 Mine Action Operator's responsibilities**

Mine Action Operators shall:

- Establish, maintain and communicate an environmental SOP that is consistent with CMAS on environmental management in mine action.
- Document their environmental management in SOPs or other relevant documents and ensure that all personnel are trained and aware of relevant environmental requirements;
- Ensure that the protection of the environment is a factor in the planning and conduct of all mine action operations;
- Maintain records of environmental nonconformities and incidents and manage nonconformity in accordance with CMAS 03, CMAS 19 and
- Report any significant environmental incidents to the CMAA.

## **6.3 Donors and other stakeholders' responsibilities**

- Donors shall understand environmental aspects of mine action and its potential impacts.
- Donors should promote awareness and understanding of the role of environmental protection and mitigation in improving the social and economic situation on a local and national scale;
- Donors should emphasise the need to protect the environment among CMAA and mine action operators;
- Organizations active in the protection of the environment may contribute with resources to improve the awareness, understanding and implementation of environmental protection and mitigation measures;
- Stakeholders should be aware of the challenges of protecting the environment in mine action operations when developing tools or requirements.

## **Annex A: (Normative) References**

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this part of the standard:

- CMAS 02 Accreditation of demining organizations and licensing of operations
- CMAS 03 Monitoring of Demining organization
- CMAS 04 Storage, transportation and handling of explosives;
- CMAS 05 Reporting and investigation of demining incidents
- CMAS 08 Explosive Ordnance Disposal (EOD);
- CMAS 15 Land Release;
- CMAS 16 Cluster Munitions Remnant Survey
- CMAS 19 Quality Management in Mine Action
- National Mine Action Strategy (2018-2025)

The mine action operators should obtain copies before commencing mine action programmes.

## **Annex B: Guidance on protection and mitigation measures against adverse environmental impacts**

### **B.1 Introduction**

A number of general recommendations from lessons learned provide further guidance for protection of the environment and mitigation measures against the main adverse environmental impacts associated with mine action. This Annex provides additional guidance on the nature of different impacts and mitigation measures that may be taken to reduce adverse impacts. This information is provided for guidance purposes and is not definitive or comprehensive.

One of the primary methods by which direct impacts upon soil and vegetation are mitigated is through the effective implementation of land release principles and practice, as detailed in CMAS 15.

### **B.2 Erosion and soil degradation**

Soil erosion is caused by natural processes, which move, re-move or deposit sediment. The erosion can be initiated by human activities, which destabilise the top soil surface. The sediment on the surface is here by transported by wind, water, waves or slope instability.

Soil degradation occurs when the changes in the depth of soil or its physical or chemical properties reduce its quality. Soil degradation includes loss of the nutrient-rich topsoil through erosion, loss of organic matter, salinization, acidification and loss of structural stability.

Mitigation measures shall assure that survey and clearance operations do not lead to further erosion or soil degradation. If the area is already exposed to erosion, measures should aim to mitigate this effect. These measures may include:

- Minimising the area subject to direct intrusive technical investigation using manual or mechanical methods through well targeted survey and clearance operations;
- Re-seeding and re-planting (e.g. grass, trees, ground cover) as soon as possible after mine action operations or when appropriate;
- Construction of terracing as part of the site handover process, after consultation with local beneficiaries;
- Preparation of drainage systems;
- A schedule for technical survey and clearance operations that allows cultivating the site as soon as possible after such operations are completed;
- Scheduling mine action activities in a period, when the soil and vegetation is less vulnerable;
- Deep tracks or detonation craters should be filled to reduce erosion;
- Return of processed soil to the affected site (e.g. soils that have been mechanically sifted, or gone through remediation, etc.);
- Soil is stored in areas where it is not subject to erosion, while it is processed;
- Top soil structures are not broken over large areas;
- Local communities are involved in the process of implementing mitigation measures;
- Technical survey and clearance take place at a time when the climate does not contribute further to erosion;
- The natural flow of watercourses is not permanently obstructed or diverted by mine

action operations;

- If it is necessary to divert or dam a watercourse, the landowner or the local community is consulted and their agreement obtained before work commences;
- Routine community liaison about mechanical operations, including advice to property owners, local authorities and local communities about any possible damage to the environment. If necessary, advice to minimise damage should be given to property owners/controllers of land adjacent to mine action worksites.

### **B.3 Pollution of air, water and soil by toxics and hazardous chemicals**

Consideration shall be given to the possible contamination of the surrounding area (including vegetation and wildlife) by fragmentation, toxic or hazardous substances and provision shall be made for eliminating or minimising any contamination and disturbance of humans, wildlife and vegetation.

Different chemical compounds from mines, sub-munitions, ERW and improvised explosive devices (IEDs) ( could dissolve and enter waterways, crystalize into new components in the soil or be incorporated into existing soils and minerals. Being planted on the surface of land or just beneath it, landmines (especially improvised types) most direct impact is on soil quality and composition. Soil can be affected by the casing, explosions or leaking of toxic substances as a consequence of corrosion or decomposition.

Consequences of the corrosion of fragments may include the release of various alloy elements such as iron, manganese, chromium, zinc, copper etc. start emerging. A number of toxic and hazardous elements may appear as a pollutant after utilization of high-explosive weapons. In agricultural regions, toxic elements can penetrate the human food chain. Therefore, as toxic elements penetrate the soil and living thing, processes of bioaccumulation can start and affect human health.

To mitigate these processes the following should be considered:

- Survey and clearance operations do not contribute significantly to an increase of toxic components in soil, waterways or air;
- If degradation and corrosion have already taken place, investigate the composition of explosives in order to assess potential adverse impacts on waterways, soils and vegetation and identify possible mitigation measures to limit such impact.
- Seeking technical assistance for appropriate high contamination treatment in soil, water and air.

### **B.4 Pollution from disposal of mines, ERW and hazardous waste**

Mines and ERW shall be disposed of in a manner that minimises adverse environmental impacts. If mines or ERW must be destroyed in situ and there is a risk to the environment (noise, ground shock, damage to infrastructure, etc.), protective works should be used. If, even with protective works, there is still a risk of adverse impacts to the environment, the consultation about the operation should be made between mine action operators, local authorities and community members.

- Demolition should take place at a designated place or the mine/ERW should be rendered safe. If it is unsafe to move, it shall be disposed where it is found.
- All parts of heavy metals and explosives should be removed so that they will not dissolve and end up in waterways.

Further, to avoid hazardous contamination of safe areas mine action operators should:

- Prohibit the movement of mines and ERW from worksites unless this is part of a disposal or other authorised activity;
- Provide adequate security for any mines or ERW that have to be moved from a worksite until such time as the mines or ERW have been destroyed;
- Conduct thorough 'Free From Explosives' (FFE) and hazardous substance inspections of any packaging material moved from a worksite or any mines or ERW that are to be used for training aids in accordance with CMAS 08; and
- Thoroughly check the ground within the assessed danger area surrounding mechanical clearance or disposal worksites to ensure that no mines or ERW have been 'thrown' into these areas.

If explosives contents are open to the environment, the explosives or their residues can contaminate soil and water and can have a substantial effect upon the environment. In addition, asbestos, chemicals and liquid propellants can be found in missiles and fuzing systems. Chemical weapons, including chlorine and mustard gas munitions, and depleted uranium projectiles may also be encountered.

Other examples of toxic and hazardous waste include:

- Flammable substances, oily wastes, lubricants, fuel filters (FOL);
- Batteries; and
- Medical waste, old medicine, and other chemicals.

Toxic and hazardous waste products of mine action operations shall not be buried at the work site but handled, stored, transported, collected and removed to an approved and compliant disposal area in accordance with the requirements of provincial environment department.

### **B.5 Pollution from transportation of hazardous materials**

During the transportation of any hazardous, toxic or flammable materials with the potential to damage the environment, precautions shall be taken to ensure that risk is minimised. These should include:

- All materials to be transported in containers that will minimize or prevent spills or leakage;
- Materials to be securely loaded in the transport;
- Fire precautions to be taken relevant to the materials being transported;
- Vehicles carrying hazardous material to be driven in a safe and careful manner; and
- Vehicles meet national regulations for the transportation of these materials.

CMAS 04 Storage, transportation and handling of explosives provides specifications and guidelines for the safe storage, transportation and handling of explosives used by mine action operators in Cambodia.

### **B.6 Degradation of air quality**

Mitigation measures shall be put in place when conducting technical survey and clearance operations that can have an adverse impact on air quality. In this case, mine action operators should remain aware of the location of local communities, the prevailing wind conditions in the area and the ability of prevailing winds to carry smoke,

dust and toxic fumes to local communities. Mine action operators should ensure that the adverse impact on local communities of any degradation of air quality is minimised.

When degradation of air quality is likely to affect local communities, mine action operators should liaise with local communities and authorities to explain the scope, scale, duration of any likely air degradation and any evacuation requirements.

When ground shock or noise is likely to affect local communities, measures should be taken to minimise these affects. These measures may include:

- Siting disposal areas well away from inhabited areas;
- Limiting the size of individual disposal serials;
- Using pits to suppress noise;
- Using protective works to limit the effects of ground shock and noise; and
- Restricting the conduct of disposal activities when certain meteorological conditions, for example low cloud, may increase the effects of noise.

## **B.7 Impact on wildlife and vegetation**

### **B.7.1 Wildlife**

Wildlife should not, so far as is reasonably practicable, be impacted by mine action operations. CMAA and mine action operators shall enquire how protected nature may be influenced by the survey and clearance operations and consider:

- Scare off actions should take place before demolition.
- Whether demolition pits should be filled in or left open after destruction, taking into account their potential value as habitats for some species, as well as any increased erosion risk they may present;
- Limiting mine action operations to specific hours of the day during breeding/nesting periods in order to not disturb wildlife; and
- Limiting the timing of detonations to influence wildlife the least.

### **B.7.2 Vegetation**

Removal of vegetation may be necessary to allow detectors to get close enough to the soil so that detection and removal of mines and ERW can take place. However, the removal should be limited to minimum and in accordance to the national regulations. CMAA and mine action operators should consider the following:

- Slow growing vegetation used by the local communities should if possible not be removed/cut during clearance;
- Vegetation that stabilizes the soil and prevents erosion should be left alone especially on steep slopes and along streams and irrigation channels;
- The removal of vegetation should take into account what the site will be used for after release (housing, grazing, agriculture or industry);

## **B.8 Impacts from burning of vegetation**

Burning of vegetation should generally be avoided. However, the condition of some vegetation is improved when burned. This should be identified before burning. When mine action organisations and relevant stakeholders agree that vegetation burning is to be carried out, the following procedures and control measures should be applied:

- Plans for burning vegetation should be discussed with and approved by the

land owners/users, local authorities and local communities;

- Burning of vegetation should take place after wildlife scare off actions and not during breeding periods;
- Ensure that the land owners/users and local authorities are aware of the type of mines/ERW and their likely hazards (fragments, shocks, toxic, smoke etc.) in the event of burning vegetation;
- Burning should not to be carried out at night or continue into the night;
- No burning should be started unless there are sufficient personnel and fire fighting equipment on site to control, and if necessary, stop the burning;
- Wind and moisture conditions should be considered before any burning operations;
- All personnel involved in the burn should be briefed on the burning plan, including any safety procedures;

## **B.9 Pollution from waste in worksite facilities**

Protection of the environment should be considered during site selection and when planning the layout of worksites and temporary accommodation facilities.

The establishment and operation of worksites and temporary accommodation facilities should be carried out in a manner that minimises any contamination of the land or water systems and has minimal effect on flora and the natural habitats of wildlife.

Where applicable, temporary accommodation facilities should be located in consultation with men and women in the local communities to ensure that they do not adversely affect local conditions, economic activities or social and cultural values.

### **B.9.1 Toilets**

Human waste should never be discharged into watercourses or onto the soil surface. Where possible, temporary toilets should be made and used on all mine action worksites and temporary accommodation facilities. Sex- segregated facilities should be made available taking into consideration the needs of both men and women.

Where latrines are used, there should be at least one for every 20 persons. They should be located at least 6m from any accommodation or food preparation area and 20m from any watercourses or wells.

### **B.9.2 Domestic rubbish**

Rubbish removed from the site should be disposed of at approved rubbish dumping sites and should only be buried with the approval of the local communities/authorities and then in locations agreed to by them.

Rubbish pits should be located away from watercourses and wells, and be located and constructed so as not to contaminate groundwater.

Consideration should be given that no hazardous wastes, (e.g. petroleum products, hazardous metals, etc.) is buried.

### **B.9.3 Wastewater**

Where there is no municipal provision, Wastewater from washing, bathing or kitchen areas should be drained into soak pits large enough to take the amount of wastewater generated. Soak-away pits and wastewater should be located away from watercourses and wells, and be located and constructed so as not to contaminate water resources.

#### **B.10 Domestic water supply**

The supply of domestic water should be carried out in a manner that does not affect the supply of water to the local communities; unless the local communities have been consulted on this matter and have agreed to any arrangements made.

#### **B.11 Fuel, Oil and Lubricant ( FOL ) areas**

The operation, repair, maintenance and servicing of mine action equipment should be carried out in a manner that minimises the adverse impact on the environment and in accordance with the requirements of the national regulations.

Mine action operators should ensure that procedures are in place to contain and quickly clean up any spills of FOL. Contaminated materials containing spilled FOL should be collected and disposed of at controlled landfill.

Where it is necessary to establish fuel storage facilities, precautions should be taken to ensure that FOL is stored safely and does not contaminate the soil or groundwater. These precautions should include:

- No fuel storage facilities are positioned closer than 30m to a watercourse;
- All storage tanks, containers and fuel dispensing equipment are regularly maintained to ensure that there are no leaks; and
- Vehicle and equipment fuelling is undertaken on a hard surface or over drip pans to ensure that any spilled FOL is contained and disposed of in an environmentally acceptable manner.

#### **B.12 Maintenance areas**

When maintenance, repair or washing of vehicles, machines and equipment is required on worksites, specific areas should be designated for this activity. The environmental precautions to be taken include:

- Waste water shall not be released so that it will enter watercourses;
- Drained oil shall be contained using a drip pan or other suitable receptacle and disposed of in an environmentally acceptable manner; and
- Used parts, by-products of maintenance or other rubbish (except waste oils) shall be disposed of as for domestic rubbish.

#### **B.13 On completion of mine action operations**

On completion of mine action operations, all buildings, equipment, surplus materials, fencing (except the marking of not cleared hazardous areas) and other such items should be removed. Toilets, soak pits and rubbish pits should be filled in, covered with soil and the surface stabilised to prevent erosion and to allow natural regeneration of vegetation.

If local communities can re-use or find the use of any no longer required material or equipment, it should be handed over.

Administrative and clearance areas should be cleaned up including removal of all material, equipment and fragments lying at the surface after clearance . Where there is an opportunity to enhance or provide net environmental benefits, this should be fully considered and implemented (ex; planting and habitat enhancement).

When EOD operations cease the area used should be refurbished in accordance with the requirements of the standard and in consultation with local authorities and communities. If required, land used for ammunition and explosive disposal by detonation operations may be formally handed over.

#### **B.14 Risk to cultural or historical heritage**

Where mine action operations take place in locations where there are areas of cultural or historical significance, mine action operators should take all practicable steps to prevent damage to these sites.

Such action may dictate that any mines or ERW found at the worksite are removed to another area for destruction. If these items are unsafe to move and in situ demolitions are necessary, protective works should be used.

If any article is located during mine action operations and is suspected of being of cultural or historical significance, work in that area should cease and the matter be reported to the relevant authority.

## **Annex C: (Informative) Guidelines for Environmental Impact Assessment (EIA)**

### **C.1 Use of an EIA**

The EIA is instrumental in gaining knowledge of potential environmental impacts and making informed decisions about protection and mitigation measures as may be required by national law on environmental protection as national resource management. It also facilitates engagement with local communities and other stakeholders. The EIA is a comprehensive, formal process providing stakeholders with confidence that relevant environmental aspects have been fully identified, properly assessed and that effective mitigation measures have been determined. While an EIA may only be used on occasions when the scale, value, duration or proximity of mine action operations to locations of known environmental sensitivity, justifies it, the same underlying principles are valid at every mine action work site. Mine action organisations are encouraged to familiarise themselves with the EIA approach and adopt appropriate principles and elements whenever it is appropriate to do so on any mine action work site.

### **C.2 For CMAA**

The CMAA is responsible for ensuring the effective implementation of the EIA in order to provide mine action operators with requirements and goals to protect the environment and mitigate adverse consequences. The checklist below gives the main points to which CMAA should pay attention in fulfilling its responsibilities:

- Preliminary work:
  - Identify policy documents and environmental legislation at a national and international level which can influence survey and clearance operations;
  - Conduct a desk study on environmental aspects of relevant SHAs and CHAs;
  - Identify requirements and goals for the protection of the environment and mitigation measures;
  - Identify local, national and international stakeholders concerned by mine and ERW clearance and environment;
  - Identify sources for additional capacity or funding about environmental issues.
- Field work:
  - If it is necessary, CMAA should identify and coordinate the appointment of the specialist from other organization for implementing the EIA in the field
  - Contact local stakeholders and communities, including men and women from diverse groups, and enquire about their environmental concerns;
  - Identify point of contact (PoC) among stakeholders;
  - Complement the EIA with additional knowledge and information from local stakeholders;
  - Check the validity of the desk study's findings;
  - Check the validity of the proposed requirements and the feasibility of goals.
- Tasking or tendering:

- Policy and legal documents are available and accessible to those tasked to do the work or that are tendering;
  - Task order or tender includes specified requirements towards protection of the environment identified in the EIA;
  - Task order or tender documents include goals for the protection of the environment identified in the EIA;
  - Tender selection criteria include assessment of the extent to which tendering operators intends to fulfil the requirements and goals identified in the EIA;
  - Tendering/tasked operators submit an environmental protection and mitigation plan and other relevant documents (policy and SOPs) to CMAA;
  - The liability of the work concerning the environmental impact has to be an integrated part of the tasking or tendering;
- Monitoring and evaluation during mine action operations:
    - Monitor compliance with requirements and progress to fulfil goals identified in the EIA;
    - Evaluation is made by considering requirements and goals identified in the EIA;
    - A debriefing and feedback on protection of the environment is provided to the mine action operator;
    - Field assessment is made as needed after completion in order to evaluate EIA requirements and goals.
- Documentation:
    - Establish, maintain, secure and retain records of EIA findings, protection of the environment requirements and goals;
    - Establish, maintain, secure and retain records of environmental incidents;
    - Establish, maintain, secure and retain records of lessons learned and best practices;
    - Establish, maintain, secure and retain records of mine action operators' documents (work plan, policy and SOPs).

### C.3 For mine action operators

Mine action operators have the responsibility to conduct operations according to the requirements and goals determined by the EIA. All stakeholders need to make sure that such requirements are understood, satisfied and documented. The checklist below provides the main points to which operators should pay attention to in fulfilling their responsibilities.

- ❖ Tasking or tendering:
  - Requirements and goals for the protection of the environment in the tender/task order are based on a EIA;
  - Requirements and goals are understood and documented (policy, legislations, EIA findings), if not request explanation and documentation;
  - Make sure internal documentation on the protection of the environment is ready and available to the CMAA (policy, SOPs, plan);
  - Submit an environmental protection and mitigation plan showing how mine action operators will meet the requirements and fulfil the goals given in the EIA.
- ❖ Planning:

- Ensure that capacities for, and awareness of, protection of the environment match the requirements and goals identified in the EIA;
  - Make sure plans satisfy the requirements established in the EIA;
  - Provide feedback (lessons learned and best practices) to the CMAA on requirements and goals for protection of the environment.
- ❖ Monitor and evaluation:
- Requirements and goals identified by the EIA and included in the tender/contract/task order/work plan are integrated into the internal quality management system (QMS);
  - Appoint a PoC for implementation of requirements and goals for protection of the environment;
  - Include information relating to protection of the environment within reporting systems.
- ❖ Documentation:
- Establish, maintain, secure and retain records of policy and legislative documents provided by the CMAA;
  - Establish, maintain, secure and retain records of reports on the protection of the environment;
  - Establish, maintain, secure and retain records of lessons learned and best practices.

## **Annex D: (Informative) Environmental management checklist**

The following checklist can be used to assist managers and operational staff to confirm whether environmental aspects have been addressed or not when temporary facilities are occupied or used.

### **D1. Work Site Location**

- Selected in consultation with local community leaders.
- Preference given to existing access roads and sites.
- Avoids agriculturally productive or environmentally sensitive areas.
- Ensures the safe: provision of drinking water, disposal of human excreta, wastewater and garbage; control of insects and rodents; conduct of food handling and preparation; and drainage of the site.
- Avoids vegetation clearing by machine, or uses hand clearing if practical, and avoids soil disturbance or grubbing.
- Site is stable, well drained and, if necessary, have sufficient soil depth to permit the digging of latrines, wastewater soak-away pits, and garbage pits.

### **D2. Water supply**

- Arranged to avoid disrupting water supplies to nearby land users/owners and communities.
- Water supply is safe for human consumption.

### **D3. Solid waste**

- All areas are kept clear of litter and garbage.
- All personnel are instructed to properly dispose of food and other wastes.
- Solid waste containers are:
  - Large enough to contain all wastes generated between collection periods.
  - Sufficient to permit the separation of combustible and other waste.
  - Animal- and insect-proof, especially for rodents.
  - Designed to contain spilled liquids.
  - Regularly serviced.
  - Waste is hauled away for recycling or disposal at approved dumping sites wherever possible. Any waste materials or litter deposited along access routes is cleaned up.
- Unavoidable on-site disposal:
  - Combustible solid wastes should be regularly burned and disposed of in a pit. Ashes should be covered with soil after each burning/deposition.
  - Other wastes are buried in a pit and covered daily.
  - All burial pits are located well away from watercourses such that contamination of any stream, lake or groundwater system is avoided. Pit bottoms is at a suitable depth above the water table.
  - Toxic or hazardous wastes are collected and removed to an approved disposal site.

#### D4. Human waste

- Human waste is not discharged into watercourses or on the soil surface.
- Where latrines must be used – sex-segregated facilities should be considered:
  - There is at least one for every 20 persons.
  - They are at least 6 m from any accommodation or food preparation area, and at least 20 m from watercourses, wells or other drinking-water sources.
  - Surface water should drain away from and not into pits.
  - They are limed regularly.

#### D5. Wastewater

- waste water from washing, bathing and kitchen areas is drained to soak-away pits unless the quantities are quite small.
- Wastewater is not permitted to enter watercourses or latrines.
- Soak-away pits are:
  - Sufficient size to accommodate the volumes of wastewater generated.
  - Covered with material to secure around the edges of the pit
  - Treated regularly with disinfectant.

#### D6. Demobilization

- All temporary support facilities and camp infrastructure, including buildings, equipment, surplus materials, and other such items are completely removed.
- Latrines, wastewater soak-away pits, and garbage disposal pits are filled and covered with soil, and the surface stabilised to prevent erosion and allow natural re-vegetation.
- Roadbeds, temporary culverts, and buried water lines, etc. are removed and the sites similarly stabilised.
- The original drainage pattern is re-established.
- As far as is practicable and desirable, all disturbed areas are restored to their original condition or similar.

Phnom Penh date 13 June 2022

**Secretary General**



**H.E. Prum Sophakmonkol**