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MINISTRY OF HEALTH
MINISTRY OF AGRICULTURE AND WATER RESOURCES

INTERNATIONAL DEVELOPMENT ASSOCIATION

AVIAN INFLUENZA CONTROL AND HUMAN PANDEMIC
PREPAREDNESS AND RESPONSE PROJECT

ENVIRONMENTAL ASSESSMENT AND MANAGEMENT PLAN

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Avian Influenza Control and Human Pandemic
Preparedness and Response Project

Environmental Assessment and Management Plan

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ACRONYMS

AI    Avian Influenza
BSL   Bio-safety Level
DTRA  Defense Threat Reduction Agency
EA    Environmental Assessment
EAMP  Environmental Assessment and Management Plan
EMP   Environmental Management Plan
FAO   United Nations Food and Agriculture Organization
GOU   Government of Uzbekistan
GPAI  Global Program for Avian Influenza Control
HPAI  Highly Pathogenic Avian Influenza
IDA   International Development Association
MAWR  Ministry of Agriculture and Water Resources
MOH   Ministry of Health
NAPAI National Action Plan for Asian Influenza
NGO   Nongovernmental Organization
OIE   World Organization for Animal Health/International Office of Epizootics
PPE   Personal Protection Equipment
RRA   Rural Restructuring Agency
SCNP  State Committee for Nature Protection
SES   State Epidemiological Services
SOP   Standard Operating Procedures
SVD   State Veterinary Department
UNICEF United Nations Children’s Fund
US    United States
WHO   World Health Organization
Avian Influenza Control and Human Pandemic
Preparedness and Response Project

Environmental Assessment and Management Plan

1. INTRODUCTION

This Environmental Assessment and Management Plan (EAMP) has been prepared for the Avian Influenza Control and Human Pandemic Preparedness and Response Project in Uzbekistan in order to ensure that the project incorporates sound environmental and social management principles and practices and thus complies with both the environmental laws and regulations of the Government of Uzbekistan (GOU) and World Bank environmental safeguard policies.

1.1 Background

Uzbekistan is fortunate in that it has not yet had any recorded outbreaks of the highly pathogenic avian flu (HPAI H5N1). Cases of avian influenza (AI) have been reported, however, in neighboring countries in the region, including Afghanistan, Kazakhstan, Azerbaijan, Turkey, Russia, Iraq, India, and China. The risk to Uzbekistan of an H5N1 outbreak among domestic poultry remains significant as a result of migratory waterfowl patterns and/or cross-border poultry trade in the region. The GOU has taken a number of actions to prepare for an eventual outbreak, including increasing veterinary surveillance, upgrading veterinary and medical laboratories, providing technical training and preparing a National Action Plan for Avian Influenza (NAPAI). A number of donors (principally the US, UNICEF, FAO and WHO) are currently supporting the GOU’s AI efforts by upgrading veterinary and public health laboratories and providing technical assistance for increasing GOU preparedness and equipment and materials for improving veterinary responsiveness.

The GOU recognizes that building an effective national response to the threat of HPAI will require an enabling environment and the necessary resources to bring proven interventions quickly up to nationwide scale. The GOU has been proactive in this regard and has undertaken initiatives to improve the NAPAI, conduct training for AI preparedness and adopt public health regulations regarding AI. The GOU has requested assistance for these efforts from the World Bank. This assistance will be provided in the proposed project, which will be financed by a grant of US$ 3.0 million from the European Union (EU). The activities to be financed by the project will support key elements of the NAPAI. Adoption of an EAMP satisfactory to the GOU and the Bank is a condition of effectiveness for the animal and human health components of the project.

1.2 Objective

The objective of the environmental assessment (EA) in Sections 1-5 of this document is to identify the significant environmental and social impacts of the project (both positive and negative) and to specify appropriate preventive actions and mitigation measures (including appropriate monitoring) to prevent, eliminate or minimise any anticipated adverse impacts. The environmental management plan (EMP) contained in Sections 6-8 of the document is the framework that ensures that the environmental prevention/mitigation measures and monitoring activities identified in the EA will be properly undertaken during implementation.
of the project. The EMP also establishes the necessary institutional responsibilities, proposes a timetable for implementing these activities and estimates their costs for the proposed project budget.

1.3 World Bank Safeguard Policies

The World Bank classified the project as a Category “B” project, triggering the Bank’s safeguard policy for Environmental Assessment (OP 4.01, BP 4.01, GP 4.01). The anticipated environmental and social impacts of the project’s investments in animal health (i.e. equipment for culling and disposal of poultry, rehabilitation of veterinary laboratories) and human health (i.e. rehabilitation of laboratory and hospital space for AI diagnosis and patient treatment) trigger this safeguard policy. Because these anticipated impacts will be neither significant nor irreversible, however, and can be prevented or reduced through appropriate preventive actions or mitigation measures, the project’s Category “B” classification requires only a partial environmental assessment. This EAMP, ensuring that recommended preventive actions and mitigation measures will be undertaken, will satisfy this Bank safeguard policy.

The EA confirmed the Category “B” designation for the project, finding no significant, irreversible, cumulative or long-term adverse impacts. In fact, the EA identified a preponderance of positive project impacts and only minor negative impacts that could be effectively prevented or reduced through application of appropriate preventive actions or mitigation measures (see discussion of impacts in Section 5). The EA also confirmed that the Bank’s other safeguard policies (on natural habitats, pest management, cultural property, involuntary resettlement, indigenous peoples, forests, safety of dams and projects in disputed areas or on international waterways) do not apply to the present project.

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1 The policy will actually be satisfied once the EAMP has been publicly disclosed in Uzbekistan, consulted with stakeholders, found satisfactory by the GOU and the Bank, and filed in the Bank’s InfoShop.
2. DESCRIPTION OF CURRENT SITUATION

Poultry Sector Family poultry in Uzbekistan has a long tradition of supplying rural households with protein, as well as providing additional income, especially for women. These backyard flocks are largely tended by women with the help of children. Such backyard flocks have limited access to veterinary care and vaccinations, making them susceptible to various disease outbreaks, e.g. Newcastle disease, which has occurred frequently. Their scavenging nature also makes backyard poultry highly susceptible to avian HPAI. In contrast, Uzbekistan’s commercial poultry farms, which account for about 25 percent of poultry in the country, have enclosed poultry houses and are thus less susceptible to HPAI infection. Furthermore, the commercial farms are required to have in place qualified veterinary staff and facilities for culling and disposal of culled carcasses and associated wastes. Two types of veterinary services are available to supervise culling and disposal: (i) public veterinary service staff; and (ii) private veterinary services. The private vets work under contract with the government to provide a variety of services.

Veterinary Services The State Veterinary Department (SVD) in the Ministry of Agriculture and Water Resources (MAWR) supervises the full range of veterinary activities in Uzbekistan, including the Republican Expedition of Epizootic Patrol, the State Veterinary Surveillance at the Border and Transportation and the Republican Patrol on Foot-and-Mouth disease. The department receives regular reports from the laboratories with regard to their respective activities. Branches of the SVD are located at the oblast and raion levels and recent SVD reform resulted in the creation of veterinary clinics that provide services on a private basis. The system is interlinked with the laboratory system so that veterinary laboratories are located in the same premises. Although the veterinary system appears to provide an organizational structure able to provide services at the local level, it suffers from being under-resourced, particularly in financial terms. Furthermore, the system would benefit from technical assistance to review the regulatory framework and develop Standard Operating Procedures (SOPs) for the different activities that the SVD has to coordinate in case of an HPAI outbreak in the country.

Uzbekistan has three main veterinary laboratories in which a diagnosis for animal avian influenza could be carried out: (i) the Republican Central Veterinary Laboratory (RCVL), which has a network of oblast and raion laboratories that provide services at the local level but suffer from weaknesses in terms of equipment and procedures. (ii) the Veterinary Laboratory for Especially Dangerous Pathogens (VLEDP), which is a branch of the RCVL created during Soviet times to deal with especially dangerous pathogens (e.g. anthrax, brucellosis, rinderpest, etc.), has benefited recently from the U.S. Defense Threat Reduction Agency (DTRA) program, which installed new laboratory facilities and trained staff. (iii) the Veterinary Laboratory for Poultry Diseases (VLPD), which was created in 1972 to serve the poultry factories established by the Soviet Union, has declined in status, with fewer activities, old equipment and expired reagents.

The veterinary surveillance system relies on the structure of the SVD from central to raion and sub-district (ushasta) level. Data from surveillance activities are sent on a daily basis to the Department of Contagious Animal Diseases. These data are based on clinical observations carried out at households in villages in a raion. Clinical inspections are also carried out in the commercial sector, live birds markets and wetlands. These surveillance activities have been intensified recently so as to provide early detection of any disease event which may be consistent with the presence of HPAI. Otherwise, the ordinary reporting system is done on a
monthly basis. Although this surveillance network is basically sound, its performance needs improvement. The reporting system, for example, could be strengthened through an improvement of the information technology infrastructure.

Wildlife surveillance will be carried out at 52 identified sites, wetlands with a high presence of wild and/or migratory birds. The Institute of Zoology, a research center under the Academy of Science, has been involved in the identification of sites. Wildlife surveillance needs to be carried out with closer interdisciplinary coordination among the Institute of Zoology, the SVD and the Ministry of Health (MOH). Data on the susceptibility of specific wild bird species are now available and it is therefore essential to target surveillance activities on species that can provide relevant epidemiological information.

Public Health Services

The MOH has taken the leadership role in dealing with AI in Uzbekistan, preparing the NAPAI, conducting training programs for AI preparedness and passing regulations regarding AI. The Institute of Virology within the MOH has taken the lead in technical work regarding preparation for IA-related activities. AI reporting and surveillance procedures currently follow the pattern of reporting of other highly pathogenic infectious diseases with step-by-step reporting and level-by-level of health care for patient management referral procedures. Unfortunately, this pattern might not be adequate where AI is concerned. The principle of minimum delay and handling in the field and reduction of exposure of medical personnel to potential infection with AI is not fully utilized in the current procedures. The MOH needs a comprehensive revision of its operating procedures that would detail the coordination of the emergency response, the logistics involved, the protocols to be followed for surveillance, diagnosis, immunization and anti-viral therapy during inter-pandemic, pandemic alert and pandemic periods, and the means of communication and public information.

Poor collection and utilization of data and inadequacies in reporting present the biggest obstacles in early containment of a possible outbreak of AI in the country. Despite good results in containment of infectious diseases in general and understanding of the epidemiological situation at present, inadequacies in collection and utilization of data and deficiencies in reporting, combined with inadequate funding and policy implementation at different levels of the health care system, ongoing public health programs and surveillance might not be adequate to combat emerging diseases in the future.

Uzbekistan has two central laboratories, one in the Institute for Virology and the other in the Republican State Epidemiological Services (SES), that are capable of handling AI virus testing and identification. The Republican SES laboratory is more of a clinical facility, while the one in the institute is mainly designed and structured for academic research purposes. Both laboratories, including several labs in the field have been supported by the DTRA program. Under this program, the Republican SES laboratory will be upgraded to meet Biosafety Level (BSL) 2. AI will be part of their surveillance program. Ideally, this laboratory would be further upgraded to BSL3.

Although mass vaccination is the preferred intervention, the availability of seasonal flu vaccines or specific AI vaccine in case of a pandemic might be a problem as production capacity is limited and an efficacious vaccine may not be ready and/or available for use as part of a large-scale vaccination campaign soon enough to contain the pandemic. It seems that there will be no reduction in the price of seasonal flu vaccine as anticipated earlier. Also
there are no indications that there will be significant increase of production capacity for seasonal flu vaccine that could fill the gap in production in case of AI pandemic.
3. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

3.1 Policy Context

The Constitution of Uzbekistan establishes the basic framework for environmental protection and rational use of the country’s natural resources. Article 55 of the constitution provides that Uzbekistan’s land, water, minerals, flora, fauna and other natural resources are national assets to be rationally used and protected by the State. Article 50 makes it the duty of Uzbekistan’s citizens to manage these resources rationally. The constitution also guarantees the “environmental security” or “ecological safety” of Uzbekistan’s population and environmental legislation adopted following independence has reinforced this concept, as well as generally accepted principles of environmental protection and rational management of natural resources.

The blueprint for environmental policy of Uzbekistan is contained in the State Program for Environmental Protection and the Rational Use of Natural Resources of the Republic of Uzbekistan for 1999–2005 (Environmental Program of Actions). Based on a National Environmental Action Plan prepared in 1998, the main goal of the Environmental Program of Actions is to establish a clear environmental strategy and support it with coherent environmental policies and appropriate programs to promote the initial stage of the country’s transition to sustainable development. During this period, the Program of Action seeks to identify the most important environmental problems, specify the ways and means to address them and undertake the relevant interventions needed. The State Committee for Nature Protection (SCNP) of the Republic of Uzbekistan has made every effort in recent years to improve coordination among the various ministries, departments and organizations involved in environmental management in the country and directed activities to ensure implementation of the Environmental Program of Actions.

In addition, the GOU prepared a National Environmental Health Action Plan in 1999, which promotes prevention and reduction of negative health impacts from pollution, increased access to environmental information and cooperation of environmental agencies and public health units with NGOs and the population. Without necessary additional legislative actions and administrative decisions, however, the full benefits of this action plan have yet to be realized.

Finally, the GOU has initiated a new national program to address the management of wastes, under which it prepared a National Waste Management Strategy and identified an associated action plan adopted as government policy. It covers all forms of waste—from municipal to industrial, including hazardous substances—and includes options for source reduction/minimization, collection, storage, treatment and disposal. The action plan will emphasize not only technical solutions but also a range of policy measures focused on identifying least-cost approaches to waste management, including the use of economic incentives. The project will need to ensure that this National Waste Management Strategy properly addresses medical and laboratory wastes, as well as the wastes resulting from the culling and disposal of infected poultry and associated materials.

In the international arena, the GOU has ratified a number of the important international environmental conventions, most notably, the United Nations Conventions on Biological Diversity Conservation, Climate Change, and Combating Desertification. As a result of these commitments, the GOU approved a National Biodiversity Strategy and Action Plan (NBSAP)
in 1998, a National Action Program for Implementation of the UN Convention on Combating Desertification (NAP-CCD) and an initial report under the UN Framework Convention on Climate Change.

3.2 Legal/Regulatory Framework for Environmental Assessment/Management

Uzbekistan has adopted a number of new laws to protect the environment since its independence, having passed approximately 250 legislative and regulatory acts directly or indirectly related to environmental protection and/or the management or use of natural resources. The Law on Nature Protection, enacted in 1992 and amended several times subsequently, provides the fundamental legal framework for environmental management in the country. It establishes the general legal, economic and organizational framework for environmental protection, provides authority for environmental standard setting and monitoring, authorizes economic incentives for environmental protection and imposes liability for environmental damage. The law prescribes basic principles for sustainable development and defines the overall environmental policies of Uzbekistan, including requirements for environmental impact assessment (EIA) and State Ecological Expertise (SEE).

Other legislative measures adopted include: the Law on Water and Water Use (1993); the Law on Specially Protected Areas (1993); the Law on Protection of Ambient Air (1996); the Law on Rational Use of Energy (1997); the Law on Protection of Plant Life (1997); the Law on Protection and Use of Wildlife (1997); the Land Code (1998); the Law on Forests (1999); the Law on State Cadastre (2000); the Law on Radioactive Safety (2000); the Law on Protection of Agricultural Plants against Pests and Diseases (2000); and the Law on Ecological Expertise (2000). See table 3.1 for more detail on laws potentially relevant to the project.

The Law on Ecological Expertise (2000) details the authority for environmental assessment mentioned above, requiring State review (SEE) of projects and assessment of environmental impacts for all activities that could have negative impacts on the environment. The SEE process is the responsibility of the SCNP and its regional offices. Under the law, the proponent of a project is required to submit project documentation along with the results of an environmental impact assessment (EIA) to the SCNP. The SEE provisions authorize the SCNP to assess the environmental impacts, as well as review and monitor proposed prevention and mitigation measures, for all investment projects and civil works, including rehabilitation works. The project will require an SEE review by the SCNP to ensure its compliance with the environmental and public health laws and regulations of Uzbekistan.

Table 3.1 - Relevant Environmental Laws

<table>
<thead>
<tr>
<th>Environmental Laws</th>
<th>Authority</th>
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<tbody>
<tr>
<td>Law on Water and Water Use (1993)</td>
<td>Ensures rational use and protection of water resources, including standard-setting, control over pollutant discharges to water and monitoring</td>
</tr>
<tr>
<td>Law on Specially Protected Areas (1993)</td>
<td>Establishes the legal framework for a variety of protected areas with different legal regimes (natural reserves, etc.)</td>
</tr>
<tr>
<td>Law on Protection of Ambient Air (1996)</td>
<td>Establishes the legal framework for environmental standard-setting, control over pollutant emissions and monitoring</td>
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</tbody>
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Law on Ecological Expertise (2000)
Establishes the administrative decision-making process for environmental assessment of projects that may have impacts on the environment

In principle, the present project will have to comply with any applicable provisions of Uzbek laws on the management of sanitary and epidemiological wastes (the EA did not identify any specific provisions), in order to assure the public health and safety in dealing with AI-infected animals and materials. However, the extent to which provisions of these laws apply to the activities to be financed by the project remains to be determined. This may, in fact, be an area where the project can provide support to strengthen the legal and regulatory framework for ensuring proper environmental management of such wastes.

Certainly, the regulations, standards and norms of the Law on Water and Water Use and the Law on Protection of Ambient Air will apply to any project-financed activities that may result in water or air pollution. By the same token, the Law on Specially Protected Areas will apply with respect to any management or disposal of AI-infected animals or materials in or near the protected areas of Uzbekistan.

3.3 Institutional Framework for Environmental Assessment/Management

The GOU institution with primary responsibility for environmental policy, planning and management is the SCNP, whose mandate is based on the “Regulation on the State Environmental Committee of the Republic of Uzbekistan”, approved by Parliament on 26 April 1996.

The SCNP’s mandate is to supervise, coordinate and implement the State’s control over environmental protection and the use and renewal of natural resources at both the central, oblast and raion levels. The SCNP issues permits for pollution control, collects pollution charges, performs monitoring functions, manages the Environmental Fund and initiates liability actions for environmental damage. Its organizational structure consists of a central office in Tashkent with oblast and district offices and associated agencies for scientific and technical support. In Tashkent, the SCNP consists of various authorities and departments. The authorities have responsibilities for protection of air, water and land resources. The departments address other administrative and technical responsibilities related to environmental standards, environmental law, international relations, the environmental fund, etc. The institutional capacity of the SCNP, however, is reportedly quite weak.

As noted above, the SCNP has overall responsibility for state ecological review of projects and activities with potential adverse impacts on the environment. As part of its SEE responsibilities, the SCNP approves regulations proposed by the environmental committees at various levels. It also issues permits for pollution discharge emissions and may prohibit projects and construction works that do not comply with (environmental) legislation. The SCNP also promotes low waste technologies, arranges implementation of ecological regulations and standards, coordinates environmental programs, oversees environmental monitoring and governs the nature reserves.
4. DESCRIPTION OF THE PROJECT

4.1 Objective

The project development objective is to minimize the threat that HPAI infection and other zoonoses pose to humans and the poultry sector in Uzbekistan, and to prepare for, control and respond to influenza pandemics and other infectious disease emergencies in humans.

4.2 Components

The project comprises three basic components: (i) Human Health, (ii) Animal Health and (iii) Communication. The activities supported by these components may be summarized as follows.

**Component I - Human Health (US$ 1.365 million)** will support activities to increase AI preparedness and response capabilities in the public health sector: (i) updating the SOPs for sample collection for laboratory testing and patient referrals to ensure that (a) patients with suspected AI will be referred to the central referral hospital in the shortest time possible, (b) samples for laboratory testing will be immediately transported to the Republican SES laboratory and (c) no laboratory viral analysis or testing for AI would be done in the field; and (ii) upgrading the bio-safety level of the Republican SES laboratory to BSL3. The component will also provide technical assistance to: (i) review and disseminate updated procedures for reporting, clinical protocols and therapeutic guidelines; (ii) review the relevant regulatory system; (iii) redefine risk groups for control of AI infections; (iv) develop systems and training for samples management; (v) provide training in crisis management; (vi) build effective coordination mechanisms and epidemiological teams for an eventual human influenza pandemic; (vii) upgrade surveillance arrangements, including verification of suspected cases through serological testing and biological sub-typing; and (viii) support prevention through immunization, case management with antiviral drugs and effective hospitalization and health system response.

**Component II – Animal Health (US$ 1.375 million)** will (i) strengthen the veterinary services, reinforcing a more central role in surveillance and refurbishing veterinary laboratories at the oblast level for handling AI, (ii) facilitate access to international knowledge on AI and (iii) provide technical and material support for the veterinary system. The surveillance system will be strengthened adopting less ambitious and more realistic targets, including clearer case definition and the design and funding of a compensation scheme. The compensation scheme is an essential element to assure collaboration from farmers and the population alike and its development, including a clear communication of the details of implementation, represents an important missing element in the current action plan.

**Component III – Communication (US$0.3 million)** will (i) provide technical assistance in the design of a comprehensive communications strategy; (ii) supply priority ministries with information to raise awareness and promote changes of behaviour in highly vulnerable populations (e.g. women and children in peri-urban and rural areas, health care and veterinarian staff involved in AI-related activities); (iii) support the training of the human health and animal health components with the production of instructional materials; (iv) produce and disseminate public information through state-owned and commercial mass-media, reinforcing the impact of the messages at the oblast, district and community levels; (v) train selected journalists and media units in priority ministries in professional reporting of the
AI situation; (vi) engage the commercial poultry sector in the design and production of educational materials on bio-safety for their associates and develop media campaigns on the safe handling and consumption of poultry; and (vii) ensure high visibility for the GOU’s response in terms of prevention, preparedness, control and mitigation programs.

5. POTENTIAL ENVIRONMENTAL IMPACTS AND PREVENTIVE ACTIONS/MITIGATION MEASURES

The project in Uzbekistan has been designed to provide social and environmental benefits to the people and poultry of the country by strengthening institutional capacity in the human and animal health sectors for preparing for, controlling and responding to an AI pandemic. Thus the overall environmental impact of the project will certainly be positive. In fact, the EA identified a preponderance of positive impacts, including increased public awareness, enhanced preparedness planning and coordination, more effective human and animal surveillance and diagnostics, strengthened containment capabilities and enhanced response capacity for the health care system. The EA also identified some potential negative impacts on social and environmental conditions that will require attention, preventive action and appropriate mitigation measures in the planning, design, construction, operation and maintenance phases of the project. These potential negative impacts, however, are relatively minor and easily addressed. In the end, they are far outweighed by the positive social and environmental impacts the EA considered. A discussion of these impacts follows.

5.1 Positive Social and Environmental Impacts

The project’s prevention-focused, public sector capacity-building activities are expected to have positive environmental and social impacts in improving Uzbekistan’s readiness for dealing with outbreaks of AI in domestic poultry. Certainly project investments in facility improvements, equipment, laboratories and training of appropriate personnel will improve the safety and effectiveness of existing AI handling and testing procedures by ensuring that they meet the international standards established by the World Organization for Animal Health (OIE) for this purpose (see OIE Guidance in Annex A). This will be reinforced by the mainstreaming of environmental safeguards into the veterinary service’s protocols and procedures for culling and disposal of animals during AI outbreaks (see excerpts from FAO Recommendations in Annex B), as well as the decontamination of animal production facilities/areas (also see Annex B). Further, the upgrading and institutionalization of appropriate laboratory bio-safety practices and procedures (also see Annex A) will ensure international best practice in bio-safety at medical and laboratory facilities.

5.2 Potential Negative Environmental and Social Impacts

Some activities under the project will have the potential for limited adverse environmental impacts. These potential negative environmental and social impacts may arise with respect to: (i) inadvertent human exposure and spread of the virus as a result of improper culling, transport and disposal of infected poultry, farm waste and other materials; (ii) inadvertent release of chemicals to the environment from inadequate decontamination practices for personnel, poultry sheds and transport vehicles; (iii) release of chemicals or infectious agents to the environment from inadequate management of laboratory and medical wastes; and (iv) environmental and social impacts from construction or renovation of laboratories, hospitals and other facilities handling AI-related activities. Each of these is discussed below.
5.2.1 Improper Culling, Transport and Disposal of Infected Poultry, Farm Waste and Other Materials

The environmental and social impacts of concern in the culling, transport and disposal of infected poultry (and wild bird) carcasses, farm waste and other materials stem from the risks of inadvertently exposing humans to and spreading the AI virus. Of primary concern are the health and safety of the veterinary workers (as well as the general public) who may be exposed as a result of the use of improper culling and disposal procedures or of the lack/improper use of personal protection equipment (PPE). Of less concern are risks of potential soil and water contamination from leaks from the poultry carcass waste or the excavation of materials and disposal of surplus soil/earth and other materials at disposal sites. Among the environmental considerations in selecting suitable sites for disposal of AI-infected carcasses and wastes are: (i) the proximity of the disposal site to public areas like national roads, health centers, markets, schools or natural reserves or historic sites; (ii) the potential risks to environmentally sensitive areas, flora and fauna; and (iii) the suitability of the site location with respect to natural hazards, including floods, erosion and slide-prone areas.

Recommended Preventive Actions or Mitigation Measures

The EA recommends a number of preventive actions in order to avoid these potential risks by developing and employing culling, transport and disposal procedures (including proper use of PPE) based on international best practice guidelines for the culling and disposal of poultry carcasses (see excerpts from FAO Recommendations in Annex B). The SVD currently has established procedures for culling and disposal of poultry, which it considers adequate to the challenge posed by an AI outbreak (the EA team requested but did not see any documentation on these procedures). Given the evolving nature of the AI threat to both wild birds and domestic poultry and eventually to the human population of Uzbekistan, a review of these procedures in light of current international best practice seems warranted.

Therefore, the EA recommends that these procedures be reviewed at the beginning of the project by a team of international and national experts and strengthened based on their recommendations in order to bring them up to international best practice (i.e. incorporating OIE and FAO recommendations on culling, destruction, removal and disposal of carcasses, removal of faeces and litter, and cleaning and disinfection of premises). To the extent feasible, OIE and FAO should be called upon to provide technical guidance in this undertaking. These revised procedures will help ensure the health and safety of veterinary personnel and the potentially affected public. It should also ensure the selection of appropriate disposal methods and areas (see comparison of disposal methods in Annex C), assure protection of sensitive areas within or close to the disposal site and describe measures to ensure appropriate drainage and soil stabilization at sites selected. The Animal Health Component of the project provides technical assistance for reviewing SVD’s regulatory framework and upgrading its SOPs for dealing with an HPAI outbreak, so this activity should already be covered by the existing project budget for this component.

Further, the EA recommends the regular training of SVD veterinary staff, particularly at the oblast and raion level, in employing these procedures in order to ensure the proper handling of potentially infected materials. To the extent feasible, SCNP staff at the appropriate central, oblast and raion level should also be included in this training program, so that they understand the human health and environmental implications of these culling and disposal activities. In addition to this training, the EA recommends the provision of appropriate PPE for veterinary staff at the oblast and raion level, as well as fully-equipped vehicles for rapid response to AI emergencies. Again, the Animal Health Component already provides technical assistance for training SVD field teams in the different operations in which they might be involved (e.g.
clinical inspections, outbreak investigations, sample collection, culling and disposal, disinfection, etc.) and vehicles for rapid mobilization of human resources in the field, so these activities also should be covered by the existing project budget for the component.

**Monitoring** The SVD will oversee the performance of the team of international and national experts in undertaking the above tasks, as well as the design and delivery of the training program for SVD veterinary staff. In the event of an outbreak of AI that requires the culling and disposal of poultry carcasses, the SVD will collaborate with environmental experts from the SCNP in performing regular inspections of culling and disposal practices and sites, in order to ensure full compliance with the above-specified procedures. The SVD may employ qualified national environmental experts, as needed, to perform these inspections. Such inspections will be coordinated with the relevant oblast, raion and district officials.

### 5.2.2 Inadequate Decontamination Practices for Personnel, Poultry Sheds and Transport Vehicles

The environmental and social impacts of concern in the decontamination activities incidental to handling an AI outbreak are based on the inadvertent release of chemicals to the environment (and subsequent exposure to humans). Although essentially minor in potential impact, the risk of release of the toxic chemicals used in the decontamination of personnel (clothing and equipment), poultry facilities (sheds, houses, pens) and transport vehicles (trucks, loading equipment) poses a threat to human and animal health, as well as to soil and water quality, and should be addressed.

**Recommended Preventive Actions or Mitigation Measures** The EA again recommends a number of preventive actions in order to avoid these potential risks by ensuring that decontamination procedures and practices incorporate international best practice (see excerpts from FAO Recommendations in Annex B). Although the SVD has established procedures for culling and disposal of poultry, it is not clear that these procedures adequately address the environmental concerns raised by decontamination activities resulting from an AI outbreak.

Therefore, the EA recommends that the review by the team of international and national experts recommended above include recommendations for strengthening the procedures to bring them up to international best practice (i.e. incorporating OIE and FAO recommendations on decontamination of PPE, removal of faeces and litter, and cleaning and disinfection of premises and vehicles). To the extent feasible, OIE and FAO should be called upon to provide technical guidance in this undertaking. These revised procedures will help ensure the health and safety of veterinary personnel and the potentially affected public. As noted above, the Animal Health Component already provides technical assistance for reviewing and upgrading SVD’s SOPs for dealing with HPAI, so this activity should already be covered by the existing project budget for this component.

Of course, the EA further recommends that the training of SVD veterinary staff recommended above include appropriate practices for decontamination activities. Again, the Animal Health Component already provides technical assistance for training SVD field teams in the different operations in which they might be involved, so these activities also should be covered by the existing project budget for the component.

### 5.2.3 Inadequate Management of Laboratory and Medical Waste

The environmental and social impacts of concern in the management of laboratory and medical waste stem from the inadvertent release of chemicals or infectious agents to the environment, presenting health
and safety hazards for the laboratory and hospital personnel and risks of media contamination, release to and exposure of the general public.

**Recommended Preventive Actions or Mitigation Measures** The EA emphasizes preventive actions in order to avoid these potential risks by employing laboratory and medical waste handling and disposal procedures based on international best practice guidelines. The project’s planned investments in upgrading the SVD veterinary laboratories at the oblast level and the Republican SES laboratory to BSL3 should certainly be accompanied by parallel improvements in operating procedures for management of laboratory and medical wastes.

The **EA recommends that the procedures for the SVD and SES laboratories and medical facilities be reviewed at the beginning of the project by a team of international and national experts and strengthened based on their recommendations in order to bring them up to international best practice (reflecting WHO policies and principles) in light of changed conditions resulting from the spread of AI. These procedures should include preparation of appropriate, site-specific waste management plans for the SVD laboratories and the SES laboratories and medical facilities. This review process and implementation of the revised procedures should not disrupt the normal operations of these laboratories and hospitals. The revised procedures, however, once they are put in place and implemented, should help ensure the health and safety of laboratory and hospital personnel and the protection of the general public.**

As noted above, the **Animal Health Component** of the project already provides technical assistance for strengthening the SVD laboratories at the oblast level. Furthermore, the **Human Health Component** provides technical assistance for developing SOPs for the range of human health care functions, including raising the biosafety level to BSL3 at the Republican SES laboratory. Thus, these activities should already be covered by the existing project budget for these components.

Again, the EA recommends the delivery of appropriate training to SVD veterinary staff, SES laboratory personnel and hospital workers, in employing these procedures in order to ensure the proper handling of potentially infected materials. To the extent feasible, SCNP staff at the appropriate central, oblast and raion level should also be included in this training program, so that they understand the human health and environmental implications of laboratory and medical waste management. Both the **Animal Health** and **Human Health Components** provide adequate training for personnel at all levels of the animal health and human health care systems, so these training recommendations should already be included in the existing project budget.

**Monitoring** The SVD and SES will oversee the performance of the international and national experts in undertaking the above tasks, as well as the design and delivery of the training program for SVD veterinary staff, SES laboratory personnel and hospital workers. Both SVD and SES will collaborate with experts from the SCNP, as appropriate, in performing regular inspections of laboratory and hospital biosafety and waste management practices, in order to ensure compliance with the above-specified procedures. Again, the SVD and SES may perform these inspections or they may employ qualified national experts, as needed, to perform them. Such inspections will be coordinated with relevant oblast, raion and district officials.
5.2.4 Impacts from Construction or Renovation of Laboratories, Hospitals and Other Facilities

The environmental and social impacts resulting from the civil works to be financed by the project for construction or renovation of laboratories, hospitals and other facilities handling AI-related activities will consist mainly of (i) the management of construction wastes and debris, (ii) the disruption of access to laboratory and hospital facilities, and (iii) the attendant noise, dust and other interference with the normal life of the surrounding population.

Recommended Preventive Actions or Mitigation Measures

The EA recommends preventive actions to minimize potential construction-related impacts. First, all construction contracts should have standard environmental, health and safety covenants required by Uzbek legislation and World Bank procedures (see environmental management guidelines for contracts in Annex E). Second, all contractors will need to follow a set of environmental management guidelines for contractors prescribed by the project (to be developed by MOH and MAWR in the first year), as well as any construction standards applied by Uzbekistan, that describe in detail the measures to prevent and mitigate construction-related environmental impacts.

Monitoring

The SVD and SES will collaborate with appropriate experts from the SCNP in conducting site inspections prior to, during and upon completion of construction activities to ensure full compliance with the contract conditions, the environmental management guidelines and the construction waste disposal requirements of Uzbekistan. Final payment to the contractor should be contingent upon a final inspection by the above agencies in order to ensure full compliance with all specified environmental management requirements.

5.3.5 Wildlife Surveillance

Uzbekistan has a wealth of protected areas, wetlands and habitats/sites for migratory birds, which make it imperative that Uzbekistan increase its surveillance of the wild birds that come to these areas. After all, it is from wild migrating birds using Uzbek territory as a flyway that AI is most likely to enter the country and infect domestic poultry. Given this situation, the EA recommends that the project provide technical assistance to organize and institutionalize collaboration between SVD, the Institute of Zoology and the MOH in order to increase surveillance activities and ensure effective reporting practices at Uzbekistan’s primary sites attracting wild and migratory birds.
6. ENVIRONMENTAL MANAGEMENT PLAN

The EMP, contained in the following sections, is the framework that ensures that the environmental prevention and mitigation measures and monitoring activities identified in the EA will be properly undertaken during implementation of the project. The EMP establishes the necessary institutional arrangements, proposes a schedule for implementing these activities and indicates their costs in the proposed project budget.

6.1 Prevention, Mitigation and Monitoring Plan

The preventive actions and mitigation measures recommended by the EA above are shown in the prevention, mitigation and monitoring plan in Table 6.1. The plan identifies these measures according to the component of the project under which the potential impacts are likely to occur:

- **Component I – Human Health** includes potential impacts from refurbishment of the Republican SES laboratory and the Republican Infectious Diseases Hospital AI, as well as the civil works for renovation of the SES laboratory and the four hospital units.
- **Component II – Animal Health** includes potential impacts from activities involving the culling, transport and disposal of poultry carcasses, waste and other materials in the event of an AI outbreak in Uzbekistan; the refurbishment of SVD’s oblast laboratories, provision of equipment, reagents, etc.; and the limited civil works for renovation of the SVD laboratories.

The plan identifies the recommended preventive actions and mitigation measures for these impacts, specifies the monitoring requirements to ensure that these measures have been implemented, estimates the budget necessary for implementing the measures, and assigns the various institutional responsibilities (i.e. MOH, MAWR, SCNP) for implementing the measures and monitoring compliance.

6.2 Institutional Arrangements

As indicated in the prevention, mitigation and monitoring plan, the line ministries responsible for project implementation, i.e. MOH and MAWR, will also assume primary responsibility for implementation of the activities identified in the EMP. The Rural Restructuring Agency (RRA) will assist the two line ministries in handling procurement and financial management (e.g. contracts for international and national experts, training programs) and in supporting monitoring/supervision (e.g. outputs of international and national consultants, training program and monitoring/inspection activities) of EMP implementation. The SCNP will play a key role in monitoring compliance with the environmental legal/regulatory requirements of Uzbekistan and evaluating the environmental impacts of project activities.

6.3 Proposed Schedule

The activities identified in the EMP prevention, mitigation and monitoring plan will be implemented over the three-year life of the project. The first year of the project will begin with the initial technical assistance activities to support (1) revising the SVD procedures for culling, transporting and disposing of poultry carcasses, wastes and other materials and (2) updating laboratory procedures for SVD labs. These activities will be followed in each case by training in the revised procedures for appropriate SVD staff. Similar technical assistance
activities in the first year will also support (1) reviewing the existing laboratory procedures for the Republican SES laboratory to ensure appropriate biosafety standards and (2) reviewing the existing hospital procedures for medical waste management at the
<table>
<thead>
<tr>
<th>Project Activities</th>
<th>Potential Major Impacts/Issues</th>
<th>Prevention/Mitigation Measures</th>
<th>Monitoring Requirements</th>
<th>Budget (US$)</th>
<th>Responsibility Prevention/Mitigation</th>
<th>Responsibility for Monitoring and Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upgrading of Republican SES laboratory for handling AI diagnostic specimens (BSL3)</td>
<td>Risks of cross-contamination or infection caused by viral agents due to improper management of laboratory specimens/wastes</td>
<td>Ensure existing procedures incorporate appropriate biosafety level standards</td>
<td>Verify use of appropriate safety procedures, staff training, proper specimen and waste management according to waste management plan</td>
<td>3,000</td>
<td>MOH/SES</td>
<td>MOH oversight of experts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Train SES laboratory staff in procedures</td>
<td></td>
<td>3,000</td>
<td>MOH/SES</td>
<td>MOH oversight of training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure procedures follow internationally accepted lab waste management practices</td>
<td></td>
<td>(see above)</td>
<td>MOH/SES</td>
<td>SES inspections/SCNP oversight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prepare site-specific waste management plan</td>
<td></td>
<td>1,000</td>
<td>MOH/SES</td>
<td>SES inspections/SCNP oversight</td>
</tr>
<tr>
<td>Refurbishment of specialized AI referral units for patient treatment in Infectious Diseases Hospital</td>
<td>Risks of cross-contamination or infection caused by viral agents due to improper management of infectious medical wastes</td>
<td>Ensure existing procedures incorporate appropriate biosafety level standards</td>
<td>Verify use of appropriate safety procedures, staff training, proper medical waste management according to waste management plan</td>
<td>3,000</td>
<td>MOH</td>
<td>MOH oversight of experts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Train hospital staff in procedures</td>
<td></td>
<td>3,000</td>
<td>MOH</td>
<td>MOH oversight of training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure procedures follow internationally accepted medical waste management practices</td>
<td></td>
<td>(see above)</td>
<td>MOH</td>
<td>MOH inspections/SCNP oversight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prepare site-specific waste management plan</td>
<td></td>
<td>1,000</td>
<td>MOH</td>
<td>MOH inspections/SCNP oversight</td>
</tr>
<tr>
<td>Limited civil works for renovation of SES laboratory and for specialized AI referral units in Infectious Diseases Hospital</td>
<td>Construction-related impacts, including disturbance and disruption of access, noise, dust and construction waste</td>
<td>Include environmental covenants in construction contracts and provide environmental management guidelines for contractors</td>
<td>Perform site inspections prior to, during and after construction to ensure compliance</td>
<td>negligible</td>
<td>Construction contractors</td>
<td>MOH inspections, SCNP oversight</td>
</tr>
</tbody>
</table>

**Table 6.1 Prevention, Mitigation and Monitoring Plan**
<table>
<thead>
<tr>
<th>Project Activities</th>
<th>Potential Major Impacts/Issues</th>
<th>Prevention/Mitigation Measures</th>
<th>Monitoring Requirements</th>
<th>Budget (US$)</th>
<th>Responsibility for Monitoring and Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Component II – Animal Health</strong> (US$ ? million)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the event of an AI outbreak, culling, transport and disposal of poultry carcasses, waste and other materials (including collection and disposal of wild birds)</td>
<td>These activities may pose risks of spreading the virus and exposing the personnel involved. Improper disposal or disposal site may pose risk of spreading the virus, contaminating groundwater and other media.</td>
<td>Revise procedures for culling, transport and disposal activities, following FAO/OIE guidelines, ensuring use of trained personnel and protective equipment. Follow revised procedures in choosing disposal method and disposal site. Annex C compares different disposal methods. Train SVD staff (including SCNP staff) in revised procedures. Follow revised procedures for decontamination, using recommended detergents to disinfect areas and materials.</td>
<td>Verify preparation and use of revised procedures, trained personnel and proper protective equipment. Verify adequate training of SVD and SCNP staff. Verify preparation and use of revised procedures and trained personnel.</td>
<td>20,000</td>
<td>MOAWR/SVD (FAO/OIE technical guidance) MOAWR oversight of experts SCNP monitoring</td>
</tr>
<tr>
<td>Decontamination of contaminated personnel, areas, vehicles</td>
<td>Risks of spreading the virus, polluting groundwater and other media.</td>
<td></td>
<td></td>
<td>9,000</td>
<td>MOAWR/SVD MOAWR oversight of training program SCNP monitoring</td>
</tr>
<tr>
<td>Refurbishment of SVD oblast laboratories, provision of equipment, reagents, etc.</td>
<td>Risks of cross-contamination or infection caused by viral agents. Improper management of lab waste.</td>
<td>Revise procedures to promote appropriate biosafety level standards. Train SVD staff in revised procedures. Revise procedures to follow internationally accepted lab waste management practices. Prepare site-specific waste management plan.</td>
<td>Verify preparation and use of revised safety procedures, staff training, proper waste management according to waste management plan.</td>
<td>20,000</td>
<td>MOAWR/SVD MOAWR oversight of experts MOAWR oversight of training program SCNP monitoring</td>
</tr>
<tr>
<td>Limited civil works for renovation of SVD laboratories in the oblasts</td>
<td>Construction-related impacts, including disturbance and disruption of access, noise, dust and construction waste.</td>
<td>Include environmental covenants in construction contracts and provide environmental management guidelines for contractors.</td>
<td>Perform site inspections prior to, during and after construction to ensure compliance.</td>
<td>negligible</td>
<td>Construction contractors MOAWR inspections, SCNP oversight</td>
</tr>
<tr>
<td>Project Activities</td>
<td>Potential Major Impacts/Issues</td>
<td>Prevention/Mitigation Measures</td>
<td>Monitoring Requirements</td>
<td>Budget (US$)</td>
<td>Responsibility Prevention/ Mitigation</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Support to SVD surveillance network</td>
<td>Risk of domestic poultry contamination from wild migrating birds without early detection</td>
<td>Improve collaboration among SVD, Institute of Zoology and MOH to increase surveillance activities and ensure effective reporting practices</td>
<td>Verify increase in surveillance activities and field reports</td>
<td>5,000</td>
<td>SVD Institute of Zoology</td>
</tr>
</tbody>
</table>
Republican Infectious Diseases Hospital to ensure appropriate medical waste management practices. Again, these activities will be followed in each case by training in the approved procedures for appropriate SES and hospital staff.

The environmental covenants and guidelines for contractors will be put in place in the first year and construction activities, which are likely to take place in the second and third years of the project, will be monitored accordingly. Monitoring of routine implementation of the laboratory and hospital procedures developed under the project and of the management of laboratory and hospital waste, as well as, in the event of an outbreak, the culling and disposal of poultry, will continue throughout the life of the project and (ideally) beyond. Finally, the bulk of the technical assistance for increasing wildlife surveillance and reporting will take place in the first year, but the surveillance itself will continue through the end of the project and beyond. The proposed schedule for these activities is shown in Table 6.2.

Table 6.2 EMP Implementation Schedule

<table>
<thead>
<tr>
<th>EMP Activities</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Component I – Human Health:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reviewing laboratory procedures for SES lab</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training SES laboratory staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reviewing hospital procedures for medical waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training hospital staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enforcing environmental management guidelines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Component II – Animal Health:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revising SVD culling and disposal procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training of SVD staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Updating SVD laboratory procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training SVD laboratory staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enforcing environmental management guidelines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing wildlife surveillance and reporting</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. CONSULTATION WITH STAKEHOLDERS AND BENEFICIARIES

7.1 Environmental Screening Mission

The preparation of this EAMP began the process of consulting the relevant stakeholders and beneficiaries of the project during an environmental screening mission in November 2006: meeting with officials in the MAWR, the MOH and the SCNP, as well as with officials from the commercial poultry sector. The list of stakeholders met during the environmental screening process can be found in Annex F.

7.2 Roundtable in Tashkent

In order to expand the consultative process to include a wider range of stakeholders and beneficiaries, the EAMP should be the focus of a roundtable meeting in Tashkent where all interested institutional parties would have the opportunity to review the recommendations of the EAMP and provide comments before the draft EAMP is presented to other project-affected groups, nongovernmental organizations (NGOs) and the general public in a public
consultation. The roundtable meeting should include, but not be limited to, wider participation by the MAWR, the MOH and the SCNP, as well as representatives from the other relevant GOU ministries, institutions and offices that may be affected by implementation of the project.

7.3 Public Consultation

After the interested institutional parties have had the chance to comment on the draft EAMP in the roundtable, there should be one or more public consultations on the draft document in Tashkent (or some other location), where project-affected groups, relevant NGOs and concerned members of the general public can discuss and provide comments on the draft EAMP. Project-affected groups may include concerned farmers and commercial poultry owners, private veterinary groups, medical and nursing associations, etc. The draft EAMP will be made available in the Uzbek (or Russian) language so that interested persons and groups will be able to read the document in advance of the consultation. Once the consultative process has been completed and the comments raised have been fully addressed, the final version of the EAMP will be published in Uzbek (or Russian) and English and made available to the public.

8. PROPOSED BUDGET

The proposed budget for the prevention and mitigation measures identified in the EA and specified in the EMP is shown in Table 8.1. Because the activities proposed involve technical assistance (i.e. national and international consultants, training programs, monitoring support) rather than any additional purchase of equipment or civil works, they do not represent a significant amount of the overall project budget (i.e. US$ 3.0 million).

In fact, all of the activities identified in the EMP fall squarely within the current design and budget envelope of the project:

- **Component I – Human Health** includes provisions for (i) developing standard operating procedures and (ii) training staff at different levels of the health care system.
- **Component II – Animal Health** includes provisions for (i) reviewing and strengthening the legal/regulatory framework, (ii) elaborating and distributing standard operating procedures and (iii) conducting training, etc. of veterinary staff.

Therefore, the activities prescribed by the EMP, while adding additional emphasis on environmental impacts, should impose no costs beyond the proposed project budget.
### Table 8.1 Proposed EMP Budget

<table>
<thead>
<tr>
<th>EMP Activity</th>
<th>Quantity</th>
<th>Unit Cost (US$)</th>
<th>Total Cost (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- international expert (SVD culling and disposal procedures)</td>
<td>1 m*</td>
<td>20,000/m</td>
<td>20,000</td>
</tr>
<tr>
<td>- international expert (SES and SVD laboratory procedures)</td>
<td>1 m</td>
<td>20,000/m</td>
<td>20,000</td>
</tr>
<tr>
<td>- national expert (SVD culling and disposal procedures)</td>
<td>2 m</td>
<td>1,500/m</td>
<td>3,000</td>
</tr>
<tr>
<td>- national expert (SES and SVD laboratory procedures)</td>
<td>2 m</td>
<td>1,500/m</td>
<td>3,000</td>
</tr>
<tr>
<td>- national expert (waste management procedures/plans)</td>
<td>2 m</td>
<td>1,500/m</td>
<td>3,000</td>
</tr>
<tr>
<td>Training Activities:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- train SVD veterinary staff (all oblasts)</td>
<td>6 m</td>
<td>1,500/m</td>
<td>9,000</td>
</tr>
<tr>
<td>- train SVD laboratory staff (all oblasts)</td>
<td>6 m</td>
<td>1,500/m</td>
<td>9,000</td>
</tr>
<tr>
<td>- train SES laboratory AI diagnostic staff</td>
<td>2 m</td>
<td>1,500/m</td>
<td>3,000</td>
</tr>
<tr>
<td>- train AI hospital staff</td>
<td>2 m</td>
<td>1,500/m</td>
<td>3,000</td>
</tr>
<tr>
<td>Monitoring/Surveillance Support:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- national experts (as needed)</td>
<td>4 m</td>
<td>1,500/m</td>
<td>6,000</td>
</tr>
<tr>
<td>- technical assistance</td>
<td></td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td></td>
<td><strong>84,000</strong></td>
</tr>
</tbody>
</table>

*p*person month
## Annex A

### OIE Guidance on the Bio-Safety Levels for Laboratories

<table>
<thead>
<tr>
<th>REQUIREMENTS OF THE LABORATORY</th>
<th>Bio-Safety Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

**A) Laboratory siting and structure**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not next to known fire hazard</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2. Workplace separated from other activities</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Personnel access limited</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4. Protected against entry/exit of rodents and insects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>5. Liquid effluent must be sterilized</td>
<td>Yes and monitored</td>
<td>Yes and monitored</td>
<td></td>
</tr>
<tr>
<td>6. Isolated by airlock. Continuous internal airflow</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Input and extract air to be filtered using HEPA or equivalent</td>
<td>Single on extract</td>
<td>Single for input, double for extract</td>
<td></td>
</tr>
<tr>
<td>8. Mechanical air supply system with fail-safe system</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Laboratory sealable to permit fumigation</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Incinerator for disposal of carcasses and waste</td>
<td>Available</td>
<td>Yes</td>
<td>Yes on site</td>
</tr>
</tbody>
</table>

**B) Laboratory facilities**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Class 1/2/3 exhaust protective cabinet available</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>12. Direct access to autoclave</td>
<td>Yes</td>
<td>Yes with double doors</td>
<td>Yes with double doors</td>
</tr>
<tr>
<td>13. Specified pathogens stored in laboratory</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>14. Double ended dunk tank required</td>
<td>Preferable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Protective clothing not worn outside laboratory</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>16. Showering required before exiting laboratory</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>17. Safety Officer responsible for containment</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>18. Staff receive special training in the requirements needed</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>C) Laboratory discipline</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Warning notices for containment area</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>20. Laboratory must be lockable</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>21. Authorized entry of personnel</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>22. On entering all clothing removed and clean clothes put on</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>23. On exiting all laboratory clothes removed, individual must wash and transfer to clean side</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Individual must shower prior to transfer to clean side</td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>25. All accidents reported</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>D) Handling of specimens</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Packaging requirements to be advised prior to submission</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>27. Incoming packages opened by trained staff</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>28. Movement of pathogens from an approved laboratory to another requires a license</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>29. Standard Operating Procedures covering all areas must be available</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
ANNEX B

Excerpts from
FAO Recommendations on the Prevention, Control and Eradication
of Highly Pathogenic Avian Influenza (HPAI) in Asia
September 2004

4.4.4 Destruction of infected and at-risk poultry (stamping out)

Destruction of infected and at-risk poultry (stamping out) has long been the accepted method of control for HPAI in the face of a disease outbreak.

Success rates for this method are high when it is implemented rapidly, prior to secondary spread, and combined with rigorous movement controls, proper decontamination of infected farms and careful monitoring and surveillance to establish the extent of infection.

Under a stamping out policy, poultry on infected premises are destroyed. Some countries consider that all poultry in a zone of specified radius (which may vary from 1 to more than 10 km) around infected premises should be destroyed. Others direct attention to “dangerous contact premises” and only destroy birds on these farms when there is evidence that the disease has spread. Such farms are closely monitored for evidence of infection.

FAO recommends that policy on the culling of “at risk” poultry as part of a stamping out policy be risk-based, taking into account the likelihood that the birds are infected. It can be difficult to accurately establish the extent of infection. If in doubt, a conservative decision should be made. Attention must be paid to local spread in densely populated poultry areas and to direct and indirect contacts in integrated poultry farms. If there is a high risk of reinfection of farms following restocking (e.g. due to the existence of reservoirs of infection in wildlife), the benefit of culling non-infected poultry is questionable. Equally, there is little reason to cull clinically normal, properly vaccinated poultry in a zone around an infected farm.

Infected poultry should be culled as quickly as possible and preferably within 24 hours of detecting infection. Delayed culling of poultry on infected premises results in production of large quantities of virus that increase the likelihood of spread.

When diagnosis can be presumptively based on clinical, pathological and/or epidemiological evidence, FAO recommends that culling not be delayed while awaiting laboratory confirmation of infection with HPAI. However, samples should always be taken before or at the time of culling to enable retrospective analysis of the infection status of the flocks destroyed.

In all premises suspected and confirmed as infected with HPAI, Veterinary Authorities should carry out a full investigation to establish the source of infection.

This involves detailed observation on the farm and its surroundings as well as interviews with the farm and workers to determine normal farm management practices. One of the critical objectives is to establish the time/date the disease was first detected and to trace the movements of people, poultry, feed and equipment onto and from the farm before and after the first signs of the disease. This should cover movements in the period 14-21 days before the outbreak and all movements off the farm after the disease was first detected. Premises with poultry that may have been exposed to the virus via direct
or indirect contact with confirmed infected premises should be investigated for signs of disease and, if warranted, put in quarantine.

Veterinary Authorities should take steps to obtain the necessary legal authority to destroy infected poultry and, if required, those on surrounding farms. They should be able to obtain, at short notice, the services of teams of workers trained in the humane destruction of poultry. These workers must have proper training and knowledge of health and safety risks associated with HPAI and be appropriately prepared.

In the event of a widespread outbreak of HPAI, to which a rapid response is required, trained personnel are likely to be in short supply and priorities need to be determined for the response action to be undertaken. This should be addressed, to the extent possible, in contingency plans.

FAO recommends that countries take steps to ensure that workers contacting potentially infected poultry wear appropriate personal protective equipment (PPE) in accordance with WHO recommendations (see references) and receive training in the correct fitting of this equipment. Under hot, humid conditions, practical problems may be encountered in fulfilling these requirements.

FAO recommends compliance with WHO advice on the vaccination of workers on infected farms with current human influenza virus vaccines before anticipated exposure to AI viruses in any response to HPAI, to minimise the potential risk of acquiring concurrent infection with avian and human influenza viruses. Two weeks are required to develop protective immunity. In practice, it is rarely possible to access a large number of immune workers at the beginning of the emergency.

Antiviral therapy is available and could be supplied to people working on known infected premises. Veterinary Authorities should conform with recommendations of WHO and relevant national health organizations with respect to public health considerations in responding to HPAI.

### 4.4.4.1 Methods used for the destruction of poultry

Various methods are used for destruction of poultry on farms. The method used should be humane and should not cause spread of disease. Importantly, it should not endanger workers. The methods to be used should be incorporated into contingency plans.

It may be difficult to prevent completely the spread of infection during destruction of poultry (and subsequent disposal of waste materials). Increased human movement and required cleaning, disinfection and disposal activities inevitably result in the release of dust and dander, which can potentially spread AI viruses to nearby farms. Appropriate risk reduction strategies include rigorous cleaning and disinfection of clothes, equipment and transport vehicles, and good personal hygiene on the part of workers, veterinarians and government officials. Litter and feed supplies, if contaminated, may be sprayed with water to minimise the generation of dust. If possible, disposal of waste materials on farm is preferred (also see below).

Asphyxiation using carbon dioxide is the method of choice for destruction of chickens and is most effective where birds are reared on the floor. Sheds must be properly sealed and gassing continued until there is no movement of birds in the shed. Other gases have been used but present a greater risk to operators.

For houses with open wire mesh walls or where birds are kept in cages, the birds must be removed from the shed or cages before destruction. This may involve placing poultry in large containers or
skips, smaller garbage bins or even strong plastic bags into which carbon dioxide is added. The containers must be free from leaks. Difficulties can be experienced with freezing of gas regulators when high flow rates of carbon dioxide are required.

Poultry placed in these containers must be handled humanely and live birds must not be piled on top of each other before death occurs.

Asphyxiation by carbon dioxide is not as effective in ducks and geese as in chickens. Physical methods such as cervical dislocation using cattle castration forceps are preferable for the humane destruction of waterfowl.

Sites where destruction is taking place must be secure to prevent unauthorised entry or exit of people and vehicles. A single entrance/exit is recommended and techniques should be employed to ensure all vehicles, items and personnel moving off the premises have been decontaminated. Veterinary Authorities should have the legal authority to control movements on and off infected premises and premises that are subject of quarantine or other disease control measures.

Destruction of infected poultry should be performed on site. The slaughter of uninfected poultry (e.g. on “at risk” premises) may be arranged through controlled processing at approved slaughterhouses. This should only be done if the birds are shown to be free from infection (e.g. by pre-movement testing). The slaughterhouse should be within the zone that is the subject of surveillance and/or disease control measures.

Before the destruction of poultry for disease control, samples should be submitted for laboratory testing and all investigations that rely on the presence of live birds should be completed (e.g. the precise location of dead or sick birds, the pattern of disease spread on the farm).

Accurate records of the age and type of birds killed and, as appropriate, records of valuation, should be kept to facilitate payment of compensation in situations where this may be required. These requirements apply to all farms on which poultry are being destroyed.

4.4.5 Disposal of carcases and potentially infective material in a biosecure and environmentally acceptable manner

Decontaminating infected farms and removing or disinfecting potentially infectious material are critical to effective disease control. The methods used must prevent spread of infection, have minimal impact on the local environment and must be acceptable to environmental protection agencies.

The main methods used for disposal of carcases and other materials are burial, burning and composting.

4.4.5.1 Removal of carcases

It is preferable to dispose of carcases on farm, providing that there is a suitable site for burial or composting. It is important to avoid contamination of water supplies, for reasons of animal, public and environmental health. Relocation of carcases to another site creates an additional risk to farms along the route between the infected farm and the site of disposal. For biosecure transport, carcases must be placed in leak proof containers or sealed in plastic bags. Vehicles carrying carcases must be leak proof.
The rate of depopulation of farms must be monitored to avoid a build up of carcases, which will occur if flocks are destroyed more quickly than carcases can be removed. This may present problems, especially when depopulating multiple farms and using off-site burial. Under these circumstances, it usually takes less time to kill birds than it does to remove the carcases. Carcases are easier to handle before decomposition has set in. Composting carcases in combination with faeces and litter is another acceptable means of disposal.

4.4.5.2 Removal of faeces and litter

Faeces and litter are not readily dealt with by burial or composting. The material should be piled up in a secluded part of the farm, the surface disinfected and the stack covered with plastic or other suitable material.

4.4.5.3 Cleaning and disinfection

Cleaning and disinfection of infected places and equipment are a crucial part of control strategies for avian influenza. This should start with an initial dry cleaning (scraping and carting away faeces, litter feed and other organic material) followed by preliminary disinfection (e.g. by spraying an appropriate liquid disinfectant). This should be followed by more thorough cleaning and a second round of disinfection. Items that cannot be properly disinfected should be destroyed.

Influenza viruses can survive for some time in organic material, so thorough cleaning with detergents is an important step in decontamination. All organic matter must be removed from poultry houses. Effective cleaning results in no visible feathers or faeces remaining in the shed.

Many disinfectants are effective against AI viruses, including detergents, hypochlorites, alkalis, glutaraldehyde, and Virkon®. The chemical chosen depends largely on the nature of the material being disinfected. Vehicles should not be disinfected with corrosive chemicals. Care needs to be taken when using disinfectants to balance the need to destroy the virus with the adverse environmental effects associated with excess use.

Outdoor areas used by poultry can be difficult to disinfect, especially if these include vegetated areas or earth. Poultry should be excluded from these areas for a minimum of 42 days to allow natural ultraviolet radiation to destroy any residual virus. The period of exclusion should be longer in cold weather. Spraying of disinfectants on vegetated outdoor areas or soil is of limited value due to the inactivation of these chemicals by organic material. Removal of surface soil is not normally recommended unless it is heavily contaminated with faeces.

Ponds are also difficult to disinfect and potential adverse environmental effects must be taken into account in implementing treatment measures. In the absence of other action, screening ponds to prevent bird access for a minimum period of six months would reduce the levels of infective HPAI virus considerably but may not guarantee freedom from virus, especially during cooler parts of the year.

If using ponds or dams to supply drinking water for farmed poultry, the water should be treated before use. Treatment with ultraviolet radiation or chlorination reduces the likelihood of viral contamination.

Farms that have been cleaned and disinfected should be the subject of an official inspection before restocking is permitted. Restocking should not occur less than 21 days following completion of cleaning and disinfection after destocking.
## ANNEX C

### Comparison of Disposal Methods for Animal Wastes Generated from Avian Influenza Outbreaks

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>ENVIRONMENTAL CONSIDERATIONS</th>
<th>SAFETY CONSIDERATIONS</th>
<th>ADVANTAGES/ DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decomposition of dead birds/ carcasses and other wastes through biological degradation in a pit and involves: • Excavation of a burial pit. • Placing carcasses in a deep burial pit. • Covering carcasses and other wastes with soil (about 40 cm) to: (a) prevent carcasses from rising out of the pit; (b) prevent scavengers digging up carcasses; (c) help filter out odors; and (d) absorb the fluids of decomposition. • Adding an unbroken layer of slaked lime [Ca(OH)₂] to protect carcasses from being uncovered by carnivores and earthworms after pit closure (lime should not be placed directly on carcasses because in wet conditions it slows, and may prevent, decomposition). • Closing the pit to ground level with soil (at least 2 meters of soil is required in total).</td>
<td>Site Selection Considerations: • Distance to watercourses, bores, and dug wells. • Height of water table (the base of the pit must be well above the water table). • Slope of the land at the burial site to the nearest watercourse (drainage to and from the pit). • Soil permeability. • Distance to human settlements and public lands (including roads). • Prevailing wind direction (for odor emission). • Availability of space for temporary storage of excavated soil. • Accessibility of the burial site by digging equipment (e.g., excavator). Burial Site Inspection: Three (3) months after closure, inspection of the burial site to identify any potential problems (e.g., seepage) and take corrective measures. Transportation-Related Waste/Wastewater Treatment: Any wastewater generated from cleaning/disinfection of vehicles/ containers should be disinfected before discharge. Any waste generated during loading and unloading of vehicles as well as cleaning/disinfection of vehicles/containers should be safely disposed.</td>
<td>• Use of personal protection equipment (PPE) to ensure hygiene and safety of personnel working at the site. • Availability of emergency response measures and equipment for safety breaches (e.g., availability of first aid equipment and availability of fire fighting equipment).</td>
<td>Advantages: • Safe disposal if environmental conditions are met. • Risk of disseminating the virus to other sites can be avoided if burial can be done on site. • Low cost. Disadvantages: • Likely to be affected by surface water, groundwater, soil and topographical conditions. • If transportation to an environmentally suitable site is required, then: (a) increases the risk of disseminating the virus to other sites, and (b) higher costs for transportation and associated mitigation measures. • Risk of groundwater contamination if site selection is not appropriate.</td>
</tr>
</tbody>
</table>

**OPTION 1: BURIAL IN A PIT**

This method is based on destruction of infective pathogens, animal carcasses and other wastes through thermal destruction in open air. It involves: • Digging trenches, which act as air vents. Site Selection Considerations: • Potential adverse impacts of heat, smoke or odor on nearby people, infrastructure (structures, underground and aerial utilities, roads, etc.) and environment (e.g., trees). • Accessibility of equipment to construct and maintain the fire and for delivery of fuel and carcasses. Maintenance adequate fire break around the pyre (consult local fire brigades or residents for advice). Use of PPE to ensure hygiene of personnel working at the site. Availability of emergency response measures and equipment for safety breaches (e.g., availability of first aid equipment and availability of fire fighting equipment. | **ADVANTAGES/ DISADVANTAGES**

**OPTION 2: OPEN AIR BURNING (CREMATION)**
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>ENVIRONMENTAL CONSIDERATIONS</th>
<th>SAFETY CONSIDERATIONS</th>
<th>ADVANTAGES/ DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Placing pyre (wood) on top of trenches (upwind, at right angle to the prevailing wind direction). • Placing carcasses and other wastes at the opposite side. • Pouring fuel (e.g., kerosene) onto carcasses, other wastes and pyre and starting fire (adequate supply of fuel must be at the site to ensure complete cremation).</td>
<td>• The ashes should be buried and the site should be restored. Waste Pretreatment/Containment: • To avoid emission of dioxins or furans during cremation, carcasses should not be pretreated with a chlorine-bearing disinfectant or should not be contained in PVC bags. For the same reason, no other material destined for cremation should contain chlorine-bearing chemicals.</td>
<td>• Established and documented cleaning/disinfection procedures. • Availability of cleaning/disinfection supplies/equipment. • Personnel training on personnel hygiene and safety measures.</td>
<td>• Infective pathogens may not be effectively destroyed if combustion of carcasses and wastes is incomplete, especially under adverse atmospheric conditions (wind, precipitation). • It is not possible to easily verify that all infective pathogens are destroyed in the incomplete combustion process. • Air emissions from open air burning (PM, CO2). • Disposal of ash from cremation requires consideration for surface water, groundwater, soil and topographical conditions. • More expensive than option 1 (burial).</td>
</tr>
</tbody>
</table>

**OPTION 3: COMPOSTING**

This method is based on thermal deactivation of the virus and decomposition of carcasses, litter and other contaminated organic wastes through aerobic biological degradation. Success of composting depends on: (a) proper nutrient mix; (b) moisture; (c) temperature; and (d) pH.

Site Selection Considerations:
• Must be done at the affected farm in a secure area not accessible by other animals (such as birds, rodents, cats, or dogs).
• Proximity to residential areas and water sources (must be away).

Use of PPE to ensure hygiene of personnel working at the site.

Advantages:
• Effective for manure and litter waste.
• Can be undertaken within sheds or otherwise on site to avoid the risks of disseminating the virus through transport.
• No transportation cost.

Disadvantages:
• Maintaining optimum temperatures for many days in cold climate areas/seasons may not be possible (or may be costly).
• Infective pathogens may not be effectively destroyed if ideal conditions are not achieved.
• Risk of disseminating the virus if the composting area is not effectively secured/isolated.
• It may not be possible to easily verify that all infective pathogens are destroyed.

**OPTION 5: INCINERATION (FIXED)**

This method is based on thermal destruction of infective pathogens, carcasses and other wastes in an

Site Selection Considerations:
• Should not be in a floodplain.
• Distance to human settlements.

Use of PPE to ensure hygiene of personnel working at the site (incinerator operators must change their PPE before handling animal carcasses

Advantages:
• Complete destruction of infective pathogens.
**DESCRIPTION**

Incinerator. It involves:
- Transporting carcasses and other wastes to the incineration site.  
- Cleaning containers and vehicles transporting carcasses and wastes, with treatment of the resulting wastewaters.  
- Incinerating carcasses and other wastes (using fuel and air) at a high temperature.  
- Transporting incineration residues (bottom ash/slag and fly ash) to the disposal site and disposal at the sanitary landfill.

**ENVIRONMENTAL CONSIDERATIONS**

- Human settlements upwind of the prevailing wind direction (for odors before incineration and emissions from incineration).  

**Technology Requirements:**

- Incinerator at a minimum temperature of 850°C and with a minimum residence time of 2 seconds. Temperature must be measured and recorded.  
- Incinerator equipped with an auxiliary burner that can be switched on when the temperature falls below 850°C.  
- Incinerator automatic feed system connected to temperature measurement.  
- Site security and inaccessibility by animals (such as birds, rodents, insects and other vermin).  
- Storage areas for animal carcasses and other wastes as well as incineration residues must be covered. These areas must be labeled and designed and operated to prevent accidental releases of polluting substances to the environment. Storage capacity provided to collect contaminated storm water and wastewater from spillage or firefighting.  
- Transportation of bottom ash/slag and fly ash in closed containers to prevent environmental releases.  
- Disposal of bottom ash/slag and fly ash in a sanitary landfill.  

**Waste Pretreatment/Containment:**  
To avoid emission of dioxins or furans during incineration, carcasses should not be pretreated with a chlorine-bearing disinfectant or should not be contained in PVC bags. For the same reason, no other material destined for incineration should contain chlorine-bearing chemicals.  

**SAFETY CONSIDERATIONS**

- Established and documented cleaning/disinfection procedures.  
- Established and documented emergency response procedures.  
- Availability of cleaning/ disinfection supplies/equipment.  
- Availability of emergency response equipment (e.g., first aid, fire fighting)  
- Personnel training on personnel hygiene/cleaning, safety and emergency response measures.  
- Regular inspections of the environment and equipment, with documented inspection schedules and results.  

| **Transportation of Carcasses/Wastes to the Incineration Site:**  
When carcasses and other contaminated materials are transported to the fixed incineration site, then:  
- The vehicles must be leak-proof and covered;  
- The vehicles and the external surfaces of containers should not leave the culling area without first being thoroughly cleaned/disinfected; and  
- The vehicles and internal/external surfaces of containers should be cleaned/ disinfected after unloading carcasses and other wastes at the incineration site.  

| **Transportation of Incineration Residues to the Disposal Site:**  
- The vehicles must be covered.  
- The vehicles and containers should not leave the incineration area without first being thoroughly disinfected.  

**ADVANTAGES/DISADVANTAGES**  
- Over 95% waste reduction.  
- Complex technology which may be imported to the country.  
- High investment cost.  
- High operating cost (especially fuel cost).  
- Some spare parts may need to be imported (cost and downtime of incinerator in case of AI outbreak).  
- High level of operator training.  
- Scrutinized administrative requirements (recordkeeping, etc.).  
- The incineration facility may be too far from the location with the AI outbreak, requiring extensive transportation of carcasses and other wastes with infective pathogens, resulting in: (a) increased risks of disseminating the virus to other sites; and (b) higher costs for transportation and associated mitigation measures.  
- Air emissions from the incinerator (PM, SO₂, CO₂).

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**OPTION 6: INCINERATION (MOBILE)**

This method is based on thermal destruction of infective pathogens, animal carcasses and other wastes in an incinerator. It involves:
- Transporting the mobile incinerator to the culling site.  
- Incinerating carcasses and other wastes in an incinerator.  

**Technology Requirements:**

- Incinerator at a minimum temperature of 850°C and with a minimum residence time of 2 seconds. Temperature must be measured and recorded.  
- Incinerator equipped with an auxiliary burner that can be switched on when the temperature falls below 850°C.  

**SAFETY CONSIDERATIONS**

- Use of PPE to ensure hygiene of personnel working at the site (incinerator operators must change their PPE before handling animal carcasses and other wastes).  
- Established and documented cleaning/disinfection procedures.  
- Established and documented emergency response procedures.

**ADVANTAGES:**

- Complete destruction of infective pathogens.  
- Over 95% waste reduction.  
- Avoids the need to transport the infective pathogens, carcasses, and other wastes to the incinerator (i.e., reduced transportation costs).
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>ENVIRONMENTAL CONSIDERATIONS</th>
<th>SAFETY CONSIDERATIONS</th>
<th>ADVANTAGES/ DISADVANTAGES</th>
</tr>
</thead>
</table>
| wastes (using fuel and air) at a high temperature.  
- Transporting incineration residues (bottom ash/slag and fly ash) to the disposal site and disposal at the sanitary landfill. | • Incinerator automatic feed system connected to temperature measurement.  
• Storage areas for animal carcasses and other wastes as well as incineration residues must be covered. These areas must be ventilated, labeled, and designed and operated to prevent accidental releases of polluting substances to the environment.  
• Transportation of bottom ash/slag and fly ash in closed containers to prevent environmental releases.  
• Disposal of bottom ash/slag and fly ash in a sanitary landfill.  
Waste Pretreatment/Containment:  
To avoid emission of dioxins or furans during incineration, carcasses should not be pretreated with a chlorine-bearing disinfectant or should not be contained in PVC bags. For the same reason, no other material destined for incineration should contain chlorine-bearing chemicals. | • procedures.  
• Availability of cleaning/disinfection supplies/equipment.  
• Availability of emergency response equipment (e.g., first aid, fire fighting)  
• Personnel training on personnel hygiene/cleaning, safety and emergency response measures. | risk of disseminating the virus to other sites compared to the fixed incineration case.  
Disadvantages:  
• Complex technology which may be imported to the country.  
• High investment cost.  
• High operating cost.  
• Some spare parts may need to be imported (cost and downtime of incinerator in case of AI outbreak).  
• High level of operator training.  
• Scrutinized administrative requirements (recordkeeping, etc.).  
• Transportation of the mobile incinerator to the culling site is associated with: (a) the risk of exposing the incinerator (i.e., the investment) to damage/total loss in case of an accident (contributed by poor road conditions, severe weather, etc.); and (b) high cost of transporting incinerator to the culling site.  
• Accessibility of the culling site by the mobile incinerator.  
• Air emissions from the incinerator (PM, SO₂, CO₂). |
ANNEX D
International Best Practice in Safety of Research Laboratories

2 US National Institutes of Health
<table>
<thead>
<tr>
<th>Procurement / Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Minimize acquisition / quantity of hazardous materials, minimize storage time needed</td>
</tr>
<tr>
<td>• Identify mechanism of waste disposal before acquisition</td>
</tr>
<tr>
<td>• For chemicals, have Material Safety Data Sheets (MSDSs) accessible/confine deliveries to areas that are equipped to handle them (and train relevant personnel)</td>
</tr>
<tr>
<td>• Insure container is intact and appropriately labelled (US regulations detail how hazardous materials have to be identified, packaged, marked, labelled, documented and placard)</td>
</tr>
<tr>
<td>• Transport in appropriate (secondary) containers</td>
</tr>
<tr>
<td>• Use triple packaging system for infectious and potentially infectious substances</td>
</tr>
<tr>
<td>• Adhere to international air transport regulations</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage / Management</th>
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</thead>
<tbody>
<tr>
<td>• Inventory should have name as printed on the container</td>
</tr>
<tr>
<td>• For chemicals: include molecular formula for further identification and to provide a simple means of searching chemicals; include CAS (Chemical Abstract Service) registry number for unambiguous identification of chemicals despite the use of different naming conventions</td>
</tr>
<tr>
<td>• Source</td>
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<tr>
<td>• Size of container</td>
</tr>
<tr>
<td>• Hazard classification, as a guide to safe storage, handling, and disposal</td>
</tr>
<tr>
<td>• Date of acquisition, to ensure that unstable chemicals are not stored beyond their useful life, and Storage location</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedures</th>
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<tbody>
<tr>
<td>• Dispose of materials anticipated to not be needed within a reasonable time frame</td>
</tr>
<tr>
<td>• Use approved containers; make sure storage containers remain intact and sealed</td>
</tr>
<tr>
<td>• Dispose of chemicals prior to expiration date, monitor reactive chemicals</td>
</tr>
<tr>
<td>• Replace deteriorating labels before information is obscured or lost</td>
</tr>
<tr>
<td>• Follow regulations for safe storage in stockroom or lab</td>
</tr>
<tr>
<td>• Avoid storing chemicals on bench tops or lab hoods</td>
</tr>
<tr>
<td>• Store volatile chemicals in ventilated cabinet (near hood)</td>
</tr>
<tr>
<td>• Ventilation is not required, store in closable cabinet or on shelf with lip to prevent sliding</td>
</tr>
<tr>
<td>• Do not expose stored chemicals to heat or direct sunlight</td>
</tr>
<tr>
<td>• Observe all precautions regarding the storage of incompatible chemicals</td>
</tr>
<tr>
<td>• Provide vented cabinets beneath hoods for storing hazardous materials</td>
</tr>
<tr>
<td>• Use chemical storage refrigerators for storing chemicals</td>
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<tr>
<td>• Have fire protection system (sprinklers)</td>
</tr>
<tr>
<td>• Follow storage limits for flammable and combustible liquids</td>
</tr>
<tr>
<td>• Restrict access to storage facility</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protocols / Facilities for Use in Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Wear and use appropriate personal protection materials to minimize exposure</td>
</tr>
<tr>
<td>• Wash hands</td>
</tr>
<tr>
<td>• Reduce the possibility of creating splashes or aerosols</td>
</tr>
<tr>
<td>• Contain in biological safety cabinets operations that generate aerosols</td>
</tr>
<tr>
<td>• Use good housekeeping</td>
</tr>
<tr>
<td>• Use mechanical pupating devices</td>
</tr>
<tr>
<td>• Promptly decontaminate work surfaces</td>
</tr>
<tr>
<td>• Never eat, ring, smoke, handle contact lenses, apply cosmetics, or take medicine in the lab</td>
</tr>
<tr>
<td>• Take special care when using sharps</td>
</tr>
<tr>
<td>• Keep lab doors closed when experiments are in progress</td>
</tr>
<tr>
<td>• Use secondary leak-proof containers to move or transfer cultures</td>
</tr>
<tr>
<td>• Decontaminate infectious waste before disposal</td>
</tr>
<tr>
<td>• Post appropriate warning signs</td>
</tr>
</tbody>
</table>
- Mark emergency equipment, maintain it, inspect it; list telephone numbers to call in case of accident
- Control access

**For Radioisotopes**
- Use only in designated areas
- Allow the presence of essential staff only
- Use personal protective equipment
- Monitor personal radiation exposures
- Use spill trays lined with disposable absorbent materials
- Limit radionuclide quantities
- Shield radiation sources
- Mark radiation containers with the radiation symbol, including radionuclide identity, activity, and assay date
- Use radiation meters to monitor working areas, protective clothing, and hands after completion of work
- Use appropriately shielded transport containers
- Remove radioactive waste frequently from the working area
- Maintain accurate records of use and disposal of radioactive materials
- Screen dosimeter records for materials exceeding the dose limits
- Establish and regularly exercise emergency response plans
- In emergencies, assist injured persons first
- Clean contaminated areas thoroughly
- Write and keep incident reports

**For Animal laboratories**
- Require good microbiological techniques
- Establish policies and protocols for all operations and for access to vivarium
- Establish appropriate medical surveillance program and supervision for staff
- Prepare and adopt safety or operations manual
- Post warning signs
- Decontaminate work surfaces after use
- Use appropriate biological safety cabinets or isolator cages; handle and decontaminate animal bedding and waste materials appropriately
- Transport material for autoclaving or incineration safely, in closed containers
- Treat, report, and record injuries

### Training of Personnel

**Employer develops Chemical Hygiene Plan containing (models available from U.S. government and from some professional societies)**

- Employee information and training about the hazards of chemicals in the work area:
  - How to detect their presence or release
  - Work practices and how to use protective equipment
  - Emergency response procedures
- Circumstances under which a lab operation requires prior approval from the institution
- Standard operating procedures for work with hazardous chemicals
- Criteria for use of control measures
- Measures to ensure proper operation of fume hoods and other protective equipment
- Provisions for additional employee protection for work with select carcinogens and toxins
- Provisions for medical consultations and examinations for employees
- Labs should establish their own safety groups at the department level (include students and support staff)
- Labs should provide training in safety and waste management for all lab workers, including students in laboratory classes
- Labs should incorporate institutionally supported lab and equipment inspection programs into their overall health and safety programs
- Review exit / evacuation routes
- Know how to report fire, injury, chemical spill, or summon emergency response
- Know first aid
- Know location and use of emergency equipment such as safety showers and eyewashes
- Know location and use of fire extinguishers and spill control equipment (have appropriate kits readily available)
- Lab personnel should establish ongoing relationships and clear lines of communication with emergency response teams
- Include information on safe methods for highly hazardous procedures commonly encountered by lab personnel that involve:
  - Inhalation risks
  - Ingestion risks
  - Risks of percutaneous exposures
  - Bites and scratches when handling animals
  - Handling of blood and other potentially hazardous pathological materials
  - Decontamination and disposal of infectious material

### Segregation / Triage of Waste

<table>
<thead>
<tr>
<th>Multi-hazardous waste – goal is reduction of waste to a waste that presents a single hazard.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider frequency and amount of waste generated; assess risk</td>
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<tr>
<td>Identify / characterize waste:</td>
</tr>
</tbody>
</table>
  - Physical description
  - Water reactivity
  - Water solubility
  - pH and possibly neutralization information
  - Ignitability / flammability
  - Presence of oxidizer
  - Presence of sulfides / cyanides
  - Presence of halogens
  - Presence of radioactive materials
  - Presence of biohazardous materials
  - Presence of toxic constituents |
| Minimize waste’s hazards |
| Determine options for management of hazards |
| If appropriate, take steps to neutralize waste or render it non-hazardous |
| When possible, select a single management option |
| Establish procedures for dealing with unstable waste, or waste that requires special storage or handling |
| Store safely: |
  - Designated room or facility modified to contain the waste (with ventilation and effluent trapping)
  - Protect workers
  - Minimize risk of fire or spill
  - Minimize radiation levels outside of area
  - Consider compatibility of materials being accumulated (e.g., aqueous and non-aqueous waste should be separated) |
| Give particular attention to the handling or cleaning of radioactive laboratory ware, and to the proper disposal of sharps. |
  - Non-contaminated (non-infectious) waste can be reused or recycled or disposed of as general waste
  - Contaminated (infectious) sharps – collect in puncture-proof containers fitted with covers and treated as infectious; autoclave if appropriate
  - Contaminated material for decontamination by autoclaving and thereafter washing and reuse or recycling
  - Contaminated material for direct incineration |

**Disposal**

- No activity should begin unless a plan for the disposal of hazardous waste has been formulated
  - Use appropriate disposal method for each category of waste
• Use appropriate containers
• Label and securely close waste containers
• Separate wastes as appropriate

For low level radioactive waste, options include
• Storage time for decay and indefinite on site storage,
• Burial at a low-level radioactive waste site,
• Incineration, or
• Sanitary sewer disposal

For biological waste, options include
• Disinfection
• Autoclaving

• For liquids, disposal in sanitary sewer; putrescible waste disposed of by incineration; needles and sharps require destruction, typically by incineration or grinding

Collection and storage of waste
• At satellite area near lab:
  - should be clearly identified, ventilated if necessary
  - determine whether to recycle, reuse, or dispose
  - hold here for less than one year; when containment volume limits reached, move to central accumulation area – package appropriately
• At central accumulation area:
  - separate according to compatibility, commingle solvents when appropriate
  - label clearly, store in appropriate containers
  - limit storage time to 90 days
  - (ensure that employees are trained to handle waste materials as well as contingency planning for emergencies)
  - When transporting, make provisions for spill control in case of accident; have internal tracking system to follow movement of waste
  - Ensure that all necessary records have been generated (Quantities and identification of waste generated and shipped; Documentation and analyses of unknown materials; Manifests for waste shipping as well as verification of waste disposal; Any other information required to ensure compliance and safety from long-term liability)

• Disposal options:
  - Incineration – is method of choice for most wastes, but is most expensive
  - Normal trash – only where appropriate, must be clearly identified and appropriately labelled
  - Sanitary sewer – not commonly used; solutions must be aqueous and biodegradable, or low toxicity inorganics – make sure sewer doesn’t drain into water supply inappropriate for waste disposal, and make sure waste is highly diluted
  - Release to the atmosphere – not acceptable; fume hoods must have trapping devices to prevent discharge to atmosphere

• If hazardous and non-hazardous wastes are mixed, entire waste volume must be treated as hazardous
• Preparation for transport to a treatment, storage, and disposal facility (TSDF)
• Waste generator must obtain assurance (in terms of documentation, permits, records) that provider is reliable

For infectious material
• Decontaminate, autoclave, or incinerate in lab
• Package appropriately (for incineration or for transfer to another facility for incineration)
• Protect against hazards to others to those who might come in contact with discarded items
ANNEX E

ENVIRONMENTAL MANAGEMENT GUIDELINES
FOR CIVIL WORKS CONTRACTS

All contractors are required to use environmentally acceptable technical standards and procedures during the implementation of construction of works. All construction contracts will contain the following requirements:

- Take necessary precautions against negative impacts on the environment, any environmental damage or loss through prevention or suppression measures (where it is possible), instead of liquidation or mitigation of negative consequences.
- Observe all national and local laws and rules on environmental protection.
- Identify officers responsible for the implementation of activities on environmental protection conforming to instructions and directions received from the construction and design or environmental protection agencies.
- Minimize dust, smoke and particulate emissions to avoid or minimize negative impacts on air quality.
- Provide pedestrian crosswalks and roads to ensure access to public places.
- Prevent or minimize vibrations and noise from the operation of vehicles and machinery during construction activities.
- Minimize damage to natural setting and vegetative cover and assure vegetation recovery.
- Protect surface and underground water from pollution sources. Assure adequate water collection and distribution.
# Annex F

**Environmental Screening Mission**  
8-15 November 2006  
Meetings with Project Stakeholders and Beneficiaries

<table>
<thead>
<tr>
<th>NAME/TITLE</th>
<th>INSTITUTION</th>
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</thead>
</table>
| Mr. Alauddin Ibragimov  
Head, State Veterinary Department | Ministry of Agriculture and Water Resources |
| Mr. Tulagan Omarov  
State Veterinary Department | Ministry of Agriculture and Water Resources |
| Dr. Saidmurod Saidvaliev  
Head, Sanitary and Epidemiological Department | Ministry of Health |
| Dr. Sanat Shoumarov  
Head, Republican SES | Ministry of Health |
| Mr. Askhad Khabibuliaev  
Manager, Central Asia Biodiversity Project | State Committee for Nature Protection |
| Mr. Ahmat Sadikov  
Head, Mat Parranda Holding Company | Mat Parranda Holding Company |
| Mr. Muhitdin Eranov  
National Epidemiologist | FAO Regional Project – Transboundary Animal Diseases in Central Asia |