MONITORING BARRIERS AND GAPS TO SUSTAINABLE HEALTHCARE WASTE MANAGEMENT IN UKRAINIAN HEALTHCARE FACILITIES
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCF</td>
<td>Healthcare facilities</td>
</tr>
<tr>
<td>HCW</td>
<td>Healthcare waste</td>
</tr>
<tr>
<td>MNE</td>
<td>Municipal Non-commercial Enterprise</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>CDH</td>
<td>Central District Hospital</td>
</tr>
<tr>
<td>WMP</td>
<td>Waste Management Plan</td>
</tr>
<tr>
<td>OHS</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>HCWM</td>
<td>Healthcare waste management</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

This report is prepared by the Individual Consultant within the framework of the “Monitoring barriers and gaps to sustainable healthcare waste management in Ukrainian healthcare facilities” Assignment. It includes the analysis of the HCW management system at the selected HCF and the identification of risks and barriers to the safe handling and final disposal of the generated waste as per the national legislation of Ukraine, taking into account the international best practices.

The verification of the information provided by the selected HCF is out of the Assignment tasks. Therefore, the responsibility for the accuracy of data is fully on the target hospital representatives. This report is not a comprehensive audit or a compliance assessment of the hospital with regard to environmental legislation.

This report presents the Consultant’s opinions based on the findings of visually observable on-site waste management practices, a review of received documents, comments made by interviewees, and information obtained from open sources.

1.1. OBJECTIVES

The overall aim of the project is to contribute to the establishment of an efficient, cost-effective, and safe HCW management system in Ukraine to minimize the negative impacts of waste on the environment and human health.

There is a specific goal clearly stated in the ToR: to conduct an assessment of the overall healthcare waste management system in Ukraine on the example of one of the typical secondary healthcare facilities to identify the main gaps in the management system and propose the improvement measures based on the best international practice.

The project-specific objectives are briefly described below:

- Identify and describe the HCW management practices in the HCF, starting from the waste collection and accounting (registration) and ending with the final disposal,
- Identify the environmental and occupational health and safety impacts and risks arising from inadequate management of HCW on site (at HCF) and during the transportation and final treatment/disposal,
- Recommend the measures to improve the HCW management system at the HCF to avoid, minimize and mitigate identified risks,
Identify the resources, investment needs, and responsibilities required to bring the HCW management system in line with international best practices.

Based on the ToR, the following international standards are considered the best practices:

- WHO Rapid Assessment Tool -WHO-HCWM-RAT (2011),
- UNEP Compendium of Technologies for Treatment / Destruction of Healthcare Waste (2012),
- Disaster Waste Management Guidelines UNEP/OCHA Environment Unit 2013.

1.2. APPROACH

The Consultant will use the following approach for the Project implementation (see Figure).

The Consultant’s activities will be focused on 5 stages:

- **Stage 1: Selection of the target healthcare facility.** During this stage, the Consultant will concentrate on the screening and selection of the healthcare facility to analyze the healthcare waste management system and barriers and gaps for safe HCW management.

The proposed selection criteria are as follows:

- Total number of beds- not less than 200;
- Total number of patients (per year)- not less than 20,000.
In addition, a particular focus should be given to the possible impact of war in Ukraine on the HCW management system; therefore, when selecting the HCF, it is proposed to consider the territories impacted by the Russian-Ukrainian war – Kyiv, Chernihiv, Sumy regions.

- **Stage 2: Data collection.** After screening and selection of the HCF, the Consultant will contact the administrative department of the selected facility and send the questionnaire. To make the process of data collection smooth and efficient, the questionnaire is proposed to be filled by the HCF in Ukrainian only. The analytical results will be further presented to UNDP in English as stipulated by the ToR.

- **Stage 2a: On-the-spot analysis.** Depending on the safety situation in Ukraine and the location of the target HCF, the Consultant can organize a site visit to collect the photo/relevant data on the HCW collection, segregation, storage and transport. *This stage remains an option and will be discussed with UNDP in the coming weeks.*

- **Stage 3: Data analysis.** Based on data collected during the previous stages, the Consultant will concentrate on the analysis of the HCW management practices at the HCF, impacts and risks to the environment and human health. In addition, the gaps and barriers to sustainable HCW management at the target healthcare facility will be identified based on national and international policies, guidance, and other relevant documents.

- **Stage 4: Demand analysis.** During this stage, the Consultant will assess and describe the capacities and resources needed to overcome the identified gaps and barriers and to improve the HCW management system in line with the best HCW practices.

- **Stage 5: Recommendations.** Based on the results of the previous steps, the Consultant will prepare a list of recommendations, an indicative budget, and an Action Plan regarding the improvement of the HCW management system for the target HCF.

### 1.3. MAIN CONSTRAINTS

Data availability is considered one of the main constraints to project successful implementation.

Furthermore, implementing the recommendations will be complicated because the development of normative legal acts as per the National Waste Management Strategy (NWMS) of Ukraine requirements has not yet begun. The needed legal acts are aimed at:

- Introduction of an effective system of reporting and permitting procedures for participants in the HCW management system;
• Creation of a comprehensive nationwide network of facilities for processing HCW, which will include a primary network (which will ensure disinfection of infectious waste by autoclaving at the place of generation and temporary storage) and a centralized network of high-temperature incineration of HCW that cannot be autoclaved (pharmaceuticals, anatomical waste, sharp objects, laboratory waste, chemotherapy waste, etc.);

• Ban on burial, chemical and microwave disinfection, and incineration of HCW in cement kilns and thermal power plants.

In addition, adequate and safe treatment and disposal of the HCW cannot be thoroughly investigated within the current project’s framework. For such an assessment, it is necessary to include the specialized treatment company in the research objects.
2. DESCRIPTION OF ACTIVITIES

2.1. HCF SELECTION

Municipal Non-commercial Enterprise “Intensive Treatment Hospital of Boyarka City Council” (hereinafter to be referred to as ‘the hospital”) was selected as the target HCF for the Assignment. The Consultant had telephone conferences with five healthcare facilities in the Kyiv region and two in the Sumy region.

Considering the security situation in Ukraine and the possibility of the site visit to clarify the situation on the spot and identify possible gaps and problems, it was considered to concentrate on the HCFs situated in the Kyiv region.

Two of the five facilities were interviewed and asked to fill out the questionnaire.

The Municipal Non-commercial Enterprise “Intensive Treatment Hospital of Boyarka City Council” was selected due to eligibility of three main criteria:

Table 1. Eligibility criteria fulfilment by the Municipal Non-commercial Enterprise “Intensive Treatment Hospital of Boyarka City Council”

<table>
<thead>
<tr>
<th>Eligibility criteria</th>
<th>Intensive Treatment Hospital of Boyarka City Council</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of beds - not less than 200:</td>
<td>355 in the last reporting year (2021)</td>
</tr>
<tr>
<td>Total number of patients (per year) - not less than 20,000</td>
<td>45 824 in the last reporting year (2021)</td>
</tr>
<tr>
<td>Impact of war in Ukraine on the HCW management system</td>
<td>Boyarka was impacted by the military actions during February-April 2022</td>
</tr>
</tbody>
</table>

2.2. DATA RECEIVED

The HCW management system in the selected hospital described in the Draft analytical brief is based on:

- the filled-in questionnaire;
- documents review;
- site visit; and
● the interview with the hospital representatives (Director and the Head Nurse).

The site visit was held on 5 October 2022. The territory of the hospital was observed by the Consultant, including the primary waste collection in the Department of Surgery, centralized storage of Category A waste, and the storage of Category B waste.
3. DATA ANALYSIS

3.1. HCW MANAGEMENT PLANNING

An effective waste management system of any organization or institution includes the development and implementation of the Waste Management Plan. The Plan is a core document that specifies the policy and procedures for safe waste management. The WMP usually consists of the following main elements (based on the recommendations of the WHO guidance document on Safe Management of Wastes from Healthcare Activities, 2nd edition, 2014):

- Description of the current waste management practices;
- Identification of waste types and quantities generated, as well as requirements for records keeping;
- Definition of the waste minimization, reuse/recycling possibilities;
- Description of the waste segregation, collection, transportation, and storages practices;
- Identification and evaluation of waste treatment and disposal options;
- Assigning responsibilities and prescription of personnel training requirements;
- Description of the monitoring actions;
- Estimation of costs related to waste management.

The WMP, in the sense described above, has not been developed in the hospital. Instead, the hospital provided for the Consultant’s review Policy of the Municipal Non-commercial Enterprise “Intensive Treatment Hospital of Boyarka City Council”, the “Waste management diagram in the MNE “CDH of the Kyiv-Svyatoshinsky District Council” approved by the Director of the MNE “CDH of the Kyiv-Svyatoshinsky District Council” on 7.08.2019, and Standard Operating Procedures (SOPs) as internal documents developed and adopted in hospitals in Ukraine to meet the requirements of the national legislation.

The Policy provides the waste categorization description and the basic principles for waste separate collection, safe storage, and transfer for treatment or disposal following the requirements of the only national legal act approved so far in Ukraine. The HCW is categorized into the following four categories according to Order No.325 of the Ministry of Health of Ukraine ‘On approval of the State Sanitary and anti-epidemiological rules and standards on the healthcare waste management’, dated 8.06.2015:

1 https://zakon.rada.gov.ua/laws/show/z0959-15#n13
Table 2. Waste categorization in Ukraine

<table>
<thead>
<tr>
<th>Waste Category</th>
<th>Description</th>
</tr>
</thead>
</table>
| Category A waste – epidemically safe HCW | ● food waste from all departments of the hospital, except infectious, venereological, and physiatric;  
● municipal waste (solid, bulky, repair) of all departments, except infectious, venereological, and physiatric; |
| Category B waste – epidemically hazardous HCW | ● used medical devices (sharp waste: needles, syringes, scalpels and their blades, ampoules, etc.);  
● liquid waste (blood, urine, faeces);  
● waste contaminated with blood or other biological fluids;  
● pathological waste (tissues, organs, body parts, placenta, embryos, etc.);  
● food waste from infectious departments;  
● laboratory waste (microbiological cultures, live vaccines, laboratory cups, equipment, etc.); |
| Category C – toxicologically hazardous HCW | ● pharmaceutical waste;  
● batteries, mercury-containing devices, and equipment containing heavy metals; |
| Category D – radiologically hazardous HCW | ● all materials generated as a result of the use of radioisotopes for medical and/or scientific purposes exceeding the allowable levels established by radiation safety standards. |

The Policy is not internally approved by the hospital management; thus, its application cannot be confirmed.

The SOPs provided for review are listed below:

- SOP “HCW management”, approved by the Director of the MNE “Intensive Treatment Hospital of Boyarka City Council” on 1.08.2022.
- SOP No.IK 05.1 “Safe management of category A waste”, approved by the Director of the MNE “Intensive Treatment Hospital of Boyarka City Council” on 18.10.2021.
- SOP No.IK 05.2 “Safe management of category B waste”, approved by the Director of the MNE “Intensive Treatment Hospital of Boyarka City Council” on 12.10.2021.
MONITORING BARRIERS AND GAPS TO SUSTAINABLE HEALTHCARE WASTE MANAGEMENT IN UKRAINIAN HEALTHCARE FACILITIES

- SOP No.IK 05.3 “Safe management of category C waste”, approved by the Director of the MNE “Intensive Treatment Hospital of Boyarka City Council” on 18.10.2021.

The SOPs describe the overall HCW management approach, including waste types, waste collection and segregation requirements, disinfection of waste before transportation, transportation within the hospital, central storage, and minimum frequency for waste transfer for treatment or disposal. In addition, the responsibilities for HCW management, personnel training, and monitoring are prescribed. However, none of the reviewed documents specified the requirements and procedures for waste accounting and records keeping, waste minimization, and reuse/recycling practices.

Revision of the waste management documents showed some contradictions in the requirements. For instance, concerning containers colours, containers labelling, and types of waste generated. Moreover, the documents hierarchy is unclear, which allows concluding that there is no unified approach to waste management in the hospital. However, based on the interview with the hospital representatives, the documents are planned to be improved.

Waste accounting in the hospital is carried out on a daily basis. Each department should keep the data both in paper and electronic forms.

The internal accounting for category A waste is absent at the hospital. The category A waste is taken by a local treatment company—Public Utility Company “Hromada”. The factual volumes of the generated waste are considered when PUC “Hromada” takes the waste from the hospital.

Each of the HCF departments should submit a table with an indication of categories B and C waste generated during the reporting month. The data are aggregated and processed by the Head Nurse in a table form with an indication of the waste generated by the categories.

The waste treatment and disposal companies are selected based on the tendering process. The selection criteria include the presence of the license for HCW management. The waste transfer acts confirm the waste transfer for treatment or disposal.

The budget allocated for waste management at the beginning of each year covered the respective costs. However, due to the COVID pandemic and the war in Ukraine, the procedure for cost allocation changed, and now purchases are made when the need arises, and it is impossible to plan funds in advance.

The waste management system elements implemented in the hospital are described in detail in the following sections of this report.
3.2. HCW MINIMIZATION AND REUSE/RECYCLING PRACTICES

As was mentioned in the sections above, waste minimization is not prescribed in the available documents. However, the hospital has taken some actions in this regard, specifically concerning Category C waste.

Medicines are ordered taking into account the needs of departments. In addition, at the beginning of each year, the Head Nurse conducts an audit of drugs. Those drugs due to expire in the current year are listed in the table, along with their quantity and expiration date. Such a table is available to all heads of departments, who book the medicines they need in real-time and use them first.

Mercury-containing thermometers were replaced with electronic ones. And almost all mercury-containing germicidal and lighting tubes were replaced with LED.

3.3. HCW COLLECTION SYSTEM

As was mentioned above, the HCW are collected separately based on their categories. In the Department of Surgery, the following waste bins were observed in a manipulation room:

- Blue waste bin padded with a black plastic bag, labelled “Category A waste”;
- Five yellow waste bins for Category B waste are padded with a black plastic bag and labelled according to content. The bins are labelled “Category B waste” and have a bio-hazard symbol.

Almost all waste collection bins were not provided with lids (see Figure 1). And those equipped were hand-manipulated; therefore, their opening is impossible without the hands of the personnel coming into contact with them.

Figure 1. Waste collection in the Department of Surgery
Based on the interview with the hospital representatives, the described waste collection system is applied at all hospital departments. The following paragraphs describe the waste collection system at the selected hospital.

**Category A waste**

Category A waste is collected together – during the visit, no containers for sorting valuable components such as plastic, glass, or paper were observed. However, the SOPs include some requirements for a separate collection of plastic. In addition, the documents prescribe the collection of sharp waste, which is not considered infectious as Category A waste. Although the hospital doesn’t do this in practice, the written procedure can mislead the personnel and lead to injuries or infection.

The waste furniture is collected at the centralized container for bulky waste. However, during the site visit, broken chairs and bedside tables were noticed at the storage for Category A waste.

Food waste (Category A) is discharged with the wastewater into the municipal wastewater network, which is forbidden by Order No. 316 of the Ministry of Regional Development, Construction and Utilities of Ukraine “On the approval of the Rules for the acceptance of wastewater into centralized wastewater network and the Procedure for determining the number of fees for excessive discharges of wastewater into centralized wastewater network”, dated 12.01.2017.  

**Category B waste**

Category B waste is divided into ‘soft’, ‘sharp’, liquid, pathological and anatomical waste. All waste is disinfected using the chemical method at the place of generation, as no autoclaves are installed at the hospital.

The preliminary disinfection is carried out with the “Econorm DEZ Chlorine” (see [Figure 2](#)) disinfectant in strict correspondence with the SOPs. The disinfectant is used according to the recommendations of the Ministry of Health of Ukraine on using the disinfectants and the provisions on the Order No.1983 of the Ministry of Health of Ukraine “On state registration (re-registration) of disinfectants”.

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2 https://zakon.rada.gov.ua/laws/show/z0056-18#Text
“Econorm DEZ Chlorine” is intended to disinfect all HCW generated, including dressing material, blood, biological secretions, and others, as well as to disinfect and wash indoor surfaces, sanitary technical equipment, dishes, linen, etc.

Soft waste bins are yellow, padded with plastic bags, appropriately labelled with the type of waste collected, and marked with the biological hazard sign. The SOPs also require the stated ‘Caution – infectious waste’ statement on the bin. However, such practice is not applied, and the bin states only the waste type and the biological hazard sign.

According to hospital representatives, the sharp waste is collected in puncture-proof specialized containers (padded with plastic bags) or burnt with needle burners. As well as for soft waste, SOP requires a ‘Caution – sharp waste’ statement. However, needles are also contained in HDPE bottles of used disinfectants and glass ampoules in used water bottles due to insufficient funding. This method is allowed in the shortened financing provided that improvised means ensure the safe collection of sharp items, namely, their puncture resistance. However, the question remains on safeguarding non-spillage waste from such tare if they are kept open and contactless manipulation of such containers if they are closed with a screw-on lid.

The needle burners are not often used by staff since burning the needle takes a long time and is ineffective in conditions of a large influx of patients in manipulation rooms. In addition, the odour produced by the working needle burner interferes with the normal activities at the hospital premises. Thus, the easiest way is to collect the needles in special containers. Therefore, the instruction on proper and safe usage of such machines is not prescribed in the SOPs.
Liquid waste (blood, vomit, urine, faeces) is disinfected and discharged into the municipal wastewater network, which is allowed by national legislation (Order No.325).

Food waste from infectious hospital departments is firstly disinfected and then discharged with the wastewater into the municipal wastewater network.

The pathological and anatomical waste (tissues, organs, body parts, etc.) is collected at the place of generation and brought to the refrigerator for storage.

No microbiological processes occur in the hospital laboratory. Thus, all laboratory waste is disinfected with the chemical method and treated as other Category B waste.

**Category C waste**

According to the SOPs, all Category C waste is collected into red bins and stated ‘Caution – toxic waste’. In one part of the SOPs, intended for category C waste management, it is stated that the bins must be marked with a biohazard sign and, in others – with a toxicity sign.

Waste pharmaceuticals are rarely generated due to good practice of waste minimization applied in the hospital. The hospital representatives confirmed that each hospital department collects the expired drugs following the procedure prescribed.

The supply manager of the hospital collects waste batteries and mercury-contained waste (Category C) in the locked rooms in the basement after the generation. Unfortunately, the collection point was impossible to visit; however, the hospital representatives assured that the waste is appropriately collected and labelled according to the national legal requirements.

Cytotoxic waste of Category C is not generated at the hospital.

**Category D waste**

No radioactive waste of Category D is generated at the hospital.

### 3.4. HCW TRANSPORTATION WITHIN THE HCF AND CENTRAL STORAGE

HCW transportation within the hospital is prescribed in the SOPs, and the hospital representatives confirm that the process generally complies with the prescriptions. Although the waste transportation scheme is not developed, the responsible persons try to avoid the patients/visitors’ routes and the most
crowded time when transporting the waste. No separate elevators for waste transportation are available at the hospital.

Each waste bag or bin transported to the central storage is labelled with the name of the Department, date of waste collection, type of waste, decontamination note, and name of the person responsible for waste management.

The following paragraphs describe the selected hospital’s waste transportation and central storage system.

**Category A waste**

The nurses collect the plastic bags from the bins twice daily and transport them to the centralized containers by hand or carts. Staff usually prefer manual transport, most likely due to the insufficient number of carriages. The centralized containers area is arranged at the hard-paved ground, which is partially fenced. The storage, as well as the containers, lacks labels; and the containers also lack lids (see Figure 3).

![Figure 3. Central storage of Category A waste](image)

The bulky waste – construction and repair and waste furniture – is collected in the central container installed on the hospital territory.

**Figure 4** presents the scheme of Category A waste transportation and centralized storage.

3. DATA ANALYSIS
Figure 4. The transportation of Category A waste within the hospital and central storage scheme

Category A waste

Collection at the hospital subdivisions

Waste furniture

Transportation within the hospital

as needed

twice a day

after the generation

Central storage

Centralized container for bulky waste

Centralized storage area

Discharged into the municipal network with wastewaters

Category B waste

All types of Category B waste are transported by special carts to the Central storage of Category B waste: sharp waste is usually picked up once every three days (depending on the generation quantities at each hospital department) and soft – twice a day. The hospital representatives confirm that the carts are appropriately labelled, used only for the said waste type, and disinfected after each use.

The central storage area for Category B waste is organized in the 6 m3 garage, which is locked to prevent unauthorized access. Due to insufficient funds, waste is stored in bulk on the hard-paved ground of the garage without containers. The storage is not equipped with washing basins, ventilation and lighting systems, and spillage cleaning and containment means. See Figure 5.
Figure 5. Central storage of Category B waste

The pathological and anatomical waste is collected into black plastic bags and transported by carts to the morgue, where it is put into refrigerators. There are three refrigerators installed in the morgue.

Figure 6 presents the scheme of Category B waste transportation and centralized storage.

Category B waste

Collection at the hospital subdivisions

- **Sharp waste**
- **‘Soft’ infectious waste**
- **Pathological and anatomical waste**
- **Liquid infectious waste**

Transportation within the hospital

- Once in 3 days
- Twice a day
- After the generation
- After the generation

Central storage

- Central storage of Category B waste
- Refrigerator for waste
- Discharged into the municipal network with wastewaters

Figure 6. The transportation of Category B waste within the hospital and central storage scheme

Category C waste

The waste pharmaceuticals are transferred to the hospital pharmacy for internal storage before moving to the producers for final treatment or disposal.

3. DATA ANALYSIS
The waste batteries and mercury-containing devices are stored in the locked room located in the basement. The Consultant received a confirmation that the storage requirements of the legislation are duly followed.

Figure 7 presents the scheme of Category C waste transportation and centralized storage.

![Diagram of Category C waste](image)

**Figure 7. The transportation of Category C waste within the hospital and central storage scheme**

### 3.5. WASTE TRANSFER FOR FINAL TREATMENT AND DISPOSAL

The waste transfer is performed according to the schedule for the removal of category B and C waste, approved by the Director of MNE “CDH of the Kyiv-Svyatoshinsky District Council”. As was mentioned in Section 4.1, the waste treatment/disposal facilities are selected based on the tendering process. In Ukraine, it should be done through the national platform “Prozorro”. The technical selection criteria include only the presence of a license for hazardous waste management, where should be listed the types of waste the company can treat/dispose.

Table 3 presents the frequency of waste transfer and the Treatment/disposal companies.
Table 3. Frequency of waste transfer at MNE “CDH of the Kyiv-Svyatoshinsky District Council”

<table>
<thead>
<tr>
<th>Category and type of waste</th>
<th>Frequency</th>
<th>Treatment/disposal company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A waste</td>
<td>On a daily basis</td>
<td>Public Utility Company “Hromada”</td>
</tr>
<tr>
<td>Category B waste</td>
<td>Three times a week, but at least once a month</td>
<td>LLC “Eko Zahyst Ukraine”</td>
</tr>
<tr>
<td>Soft and sharp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category B waste</td>
<td>As needed, but at least once a month</td>
<td>Ritual service “Kyiv Crematorium”</td>
</tr>
<tr>
<td>Pathological and anatomical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category C waste</td>
<td>As needed, but at least once a month</td>
<td>To producer or LLC “Eko Zahyst Ukraine”</td>
</tr>
<tr>
<td>Waste pharmaceuticals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category C waste</td>
<td>As needed, but at least once a month</td>
<td>LLC “Eko Zahyst Ukraine”</td>
</tr>
<tr>
<td>Waste batteries and mercury-containing equipment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on the Registry of the licensed companies for hazardous waste management, dated 28.05.2020, LLC “Eko Zahyst Ukraine” possesses a perpetual license since 12.09.2016 for the HCW management, including collection, storage, and treatment of HCW of Category B, pharmaceutical waste, waste batteries, and mercury-containing equipment. Furthermore, the Ritual service “Kyiv Crematorium” is respectively licensed since 6.07.2016.

The licensing body in Ukraine is the Ministry of Environmental Protection and Natural Resources, which, based on the legal requirements, checks the presence of the needed equipment for hazardous waste treatment before issuing the license. However, there is no legal way in Ukraine for the hospital to check the operational facilities before contracting said companies.

Based on the information received from the hospital representatives, due to the numerous formalities in tendering the servicing company for Categories B and C waste acceptance, this waste was stored at the central storages for the respective Category for the last 1.5 months.

### 3.6. ORGANIZATIONAL CAPACITY AND COMPETENCY

The responsibilities for HCW management are assigned in SOP “HCW management”, including

- for the provision of the necessary PPE at the chief engineer of the MNE;
● for the provision of disinfectants and detergents at the Head Nurse;
● for the overall operational safety at the heads of the structural units.
● for control over the safety of work processes (use of PPE by employees, the safety of work processes, maintenance of premises, waste management, etc.) at the Department heads.

In addition, all employees are personally responsible for compliance with the procedures described, which is clear from the staff’s signatures at the end of the document.

Order No.325 of the Ministry of Health of Ukraine ‘On approval of the State Sanitary and anti-epidemiological rules and standards on the healthcare waste management, dated 8.06.2015, stipulates that the hospital’s personnel must undergo introductory training when hiring. And then regular training on HCW management on an annual basis.

The requirements for personnel training – induction and annual ongoing – are included in the SOPs. The responsibility for the personal training is assigned to the head of the infection control department and the Head Nurse. In addition, the relevant hospital’s personnel get regular on-the-job training when SOPs or other internal rules are updated or when the regular site walkover by the Head Nurse reveals non-compliances in the waste management area.

The awareness raising is organized by the Head Nurse through constant access to the relevant personnel to the SOP’s and the hospital’s internal rules and policies related to HCW via cloud storage (GDrive). Each of the hospital’s departments is equipped with computers; therefore in doubtful cases, the personnel can immediately access the relevant instructions or apply to the Department’s responsible person or Head Nurse.

The competency of the responsible personnel is confirmed by a number of courses regularly attended by the Head Nurse in the area of best practices and updates in legislation/procedures.

### 3.7. OCCUPATIONAL HEALTH AND SAFETY

Like every other institution or organization in Ukraine, the hospital must assign an occupational health and safety (OHS) manager to ensure the OHS of employees by identifying, ranking, and managing risks and hazards. In addition, the OHS manager develops and acquaints the personnel with the OHS instructions on safety measures during its professional duties, conducts OHS training, and investigates incidents, accidents, near-misses, and cases of occupational disease.
In the selected hospital, general OHS duties are performed by the appointed OHS manager, and in the area of waste management – by the Infection Control Department (ICD).

The waste management SOPs described in Section 4.1 of the Draft analytical brief provide the measures for the safe handling of HCW, which include the following:

- Was in the area of possible aerosol formatiste transportation within the hospital should be carried out with the help of special carts;
- The carts for waste transportation should be exclusively used for this purpose;
- Coloured containers should be appropriately used for the designation waste type;
- Waste should be segregated after the generation and not from the containers;
- Sharp waste should be collected into puncture-proof containers;
- Waste disassemble, cutting is prohibited;
- Category B waste should be decontaminated before transportation within the HCF;
- Waste containers should be installed at least 1 m from heating devices;
- All workers handling waste should wear gloves, a medical mask, glasses or a shield, overalls, and special boots if the worker ion or come into contact with liquid waste.

The ICD responsible person developed an SOP “Algorithm of actions of medical personnel in the event of an incident during the performance of professional duties”, approved by the acting Medical Director, as an internal procedure for safety measures during medical care, including handling used sharps and materials contaminated with biological fluids. The safety measures include:

- the need to use appropriate PPE when handling patients and sharp objects, blood, and other biofluids of patients: surgical gowns, rubber gloves, masks or protective screens, waterproof aprons, arm sleeves, goggles;
- requirements for collecting sharp tools in puncture-proof containers that must be tightly closed and regularly replaced upon need;
- requirements for the disinfection of contaminated objects and equipment.

The document also describes first aid, which includes washing the skin/ wounds with soap and water, treating with a disinfectant solution, and prescribing antibacterial therapy.

3. DATA ANALYSIS
In addition, this SOP describes the actions in case of an incident and prescribes the steps for its investigation. The incident investigation process includes immediate notification of the department head and registration of each case into a Logbook – the form No.108-0 “Logbook of incidents during medical assistance to HIV-infected persons and works with HIV-infected material.” In cases when investigation according to the described criteria determines the expediency of prescribing post-contact preventive treatment, the employee is sent for tests, which, among others, include an analysis for the presence of infections caused by hepatitis B and C viruses. And then, appropriate treatment is carried out.

No clear written instruction is available for the Consultant review about clean-up measures in case of waste spillage.

According to the hospital representatives, there were no personnel infections due to waste management in the last three years.

### 3.8. PROCUREMENT AND FUNDS MANAGEMENT

Based on the information received with the questionnaire, the Intensive Treatment Hospital of Boyarka City Council dedicated only 0.2% of its annual budget to issues related to waste management.

By the date of this Report preparation, the tenders for the services on HCW management are regulated by the Law "On Public Procurement". This made procurement of HCW treatment services more transparent but still does not guarantee the selection of a reliable company.

All of the tender documents and tender-related procedures usually develop by the HCF tender department based on recommendations of the Ministry of Health of Ukraine. On the practice Intensive Treatment Hospital of Boyarka City Council only indicates the need for some services/goods related to the HCWM.

### 3.9. MONITORING AND REPORTING

The internal monitoring of the compliance of the HCW management takes place during inspections of structural subdivisions according to the approved schedule – Order No. 189 "On Amendments to Order No.46 dated 9.02.2022 “On Approval of the Schedule of Inspections of Structural Subdivisions of MNE “Intensive Treatment Hospital of Boyarka City Council” on prevention of infections and infectious diseases”, dated 4.07.2022. According to the schedule, each subdivision is audited monthly. The inspection results in the form of inspection protocols with the recommendation of actions,
implementation period, and the responsible person are presented to the subdivision and the hospital Director.

The inspection results are analyzed annually at the commission’s meeting on infection control, and corrective measures are prescribed.

External monitoring from authorities was not carried out in the hospital in the last three years.

The reporting on the types and quantities of generated waste and waste management practices are performed by all institutions and organizations (entities) in Ukraine, including hospitals, in the form of ‘Report On Waste Generation And Management’ following the Form No.1-Waste (annual), approved by the Order No.164 of the State Statistic Service of Ukraine on 25.06.2021. The hospital submits No.1-Waste (annual) on a regular basis.

But the Consultant’s experience shows that this reporting mechanism is poorly implemented due to the following legal and enforcement gaps:

- Low “reporting discipline”, mainly caused by the low penalties (both legal and financial) to be applied to the entities that did not submit the reports. On the date of this report issuance, the Code of Ukraine on Administrative Offences, No.8073-X, dated 7.12.1984, revised 16.07.2022⁴, established a fine for legal entities which not sublimed the annual reports on waste generation and management in the amount of UAH 6,202 (USD 167.9);
- Accuracy of reporting data submitted: the figures in the reports are not verified/confirmed by third parties. So, the entity can underestimate the HCW annual generation;
- Public availability: the register/data of these reports are not publicly available, which makes the entire procedure of such reporting practically useless for the community.

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⁴ https://zakon.rada.gov.ua/laws/show/8073-10#Text
4. EXISTING GAPS AND BARRIERS FOR HCWM IN THE SELECTED HEALTHCARE FACILITY

A review of the HCW management system at the selected hospital showed a good implementation of some of the elements. These elements include the existence of developed operating procedures that describe the collection, disinfection, a centralized waste storage system, investigation and management of personnel infectious cases. However, the documents themselves and the document management system need improvement and, most importantly, the implementation of management practices.

As a result, the following gaps and barriers to safe waste management were identified during the document review and investigation of management practices at the facility:

1. Regarding document management:
   - Considering the absence of a waste management plan as a separate document, it is not clear how the hierarchy of documents is established. Thus, it is impossible to determine which documents are main and are subordinate to it. The availability of the Waste Management Policy is a positive factor; however, the Policy is not a document internally approved within the hospital, so its application cannot be confirmed. In addition, the Policy is written as a requirement of Ukraine’s legislation, not a declaration of the hospital’s compliance with specific requirements. Operating procedures (SOPs) have contradictions in parts of the same document and between different SOPs. Operating procedures suggest collecting sharp waste that is not considered infectious as a separate Category A waste stream, which does not comply not only with international best practices but also Ukrainian legislation. Although in practice, such a waste stream is not segregated.
   - No document prescribes waste accounting procedures for both departments and generally at the hospital, and therefore there is no unified procedure for waste accounting. In addition, there are no documents aiming at the application of practices to minimize the amount of waste generated and the possibility of reusing some of it and recycling.
   - There is no procedure for the collection and decontamination of hazardous waste spills.

2. Regarding on-site waste management practices:
MONITORING BARRIERS AND GAPS TO SUSTAINABLE HEALTHCARE WASTE MANAGEMENT IN UKRAINIAN HEALTHCARE FACILITIES

● Containers for collecting waste of different categories are not provided with lids, and those provided are opened manually, which poses a threat to the safety of workers.

● Food waste is discharged into the wastewater network, which violates Ukraine’s legislation and is not also considered the best practice.

● The container labelling system needs to be revised since the requirements prescribed in the operating procedures do not correspond to what is implemented in practice. Although the applied approach is not a direct violation of the provisions of the law, there must be a correspondence between the internal procedures and their practical application.

● The secondary use of containers from disinfectants for sharp waste is not considered non-compliance, but this possibility should also be prescribed in the SOPs. In this case, safeguarding non-spillage waste from such a container should also be ensured.

● The absence of an autoclave in the hospital prevented the implementation of proper practice of physical disinfection of waste, as opposed to chemical disinfection.

● The scheme for transporting waste within the hospital is not developed, so there is no assurance that the staff involved are doing it correctly, avoiding the routes used by staff, patients and visitors to move around the hospital.

● Central storage of Category A waste, as well as containers, is not labelled. In addition, the storage area is not equipped with roofs, and the containers are not equipped with lids.

● The central storage of Category B waste is not equipped with appropriate containers, adequate lighting, ventilation, and washing basins. The walls and floor are not designed for quick and easy cleaning. In addition, the storage facility is not equipped with means for collecting and decontaminating waste spills.

3. Regarding the waste transfer for treatment/disposal:

There is no legal way in Ukraine for the hospital to check the operational facilities before contracting waste treatment/disposal companies. Which, of course, is not a gap in hospital waste management, but rather Ukrainian legislation

Adequate and safe treatment and disposal of the HCW cannot be thoroughly investigated within the current project’s framework, as the treatment/disposal facilities are not subject to the current Assignment.

4. Regarding the competence and awareness of the staff regarding waste management:
• Despite the regular trainings held in frames of the national legislation, and the availability of the HCWM procedures to all hospital employees, the inconsistencies and gaps in documents (described above) prevent employees from their duties regarding safe waste management correctly.

5. Regarding budgeting and financial management:

• Due to the numerous formalities in tendering the servicing company for collection and disposal of categories B and C waste, this waste was collected at the territory of HCF for 1.5 months. Considering the absence of containers for category B waste and the right premises for the collection, the situation is posing the risk to the environment and human health.

• Only 0.2% of the hospital’s annual budget was spent in 2021 on issues related to waste management. Lack of finance for the HCWM system leads to supply failure (packages, containers, etc.) and inconsistencies in the hospital’s daily operations with the HCW.
5. HCW DATA ANALYSIS

NOTE: The analysis below made on the base of the documents and information provided by the HCF. Due to absence of the reporting system which considers the splitting of the different categories waste into waste types (i.e. sharps waste, soft infectious waste, anatomical waste etc.) the waste streams for the last three years were analysed only by categories (Category B and Category C). The Category A waste records are kept only at the accountant service of the hospital in the form of the act of acceptance while waste transferring.

The improvement of the HCF reporting & monitoring systems on waste generation with breakdown on the waste types is one of the goals for the next periods to bring these systems to the level of best international practices.

The Consultant conducted the analysis of the healthcare waste of Categories B and C generated. Table 1 in Annex 1 is based on the data on generation of the healthcare waste during 2020-8 months of 2022.

The analysis shows that the average annual generation of Category B waste by the HCF reached approx. 5.5 tones per year. For Category C waste the-40 kg per year.

A separate focus was made on the analyzing the impact of war on the generation of the HCW by the selected facility. Since the war in Ukraine began in February 2022, and the data from the HCF available until August 2022 the respective period of 2021 was taken into account. To make the analyzed data and periods comparative.

Figure 8 and Figure 9 show the waste of categories B and C generation during February-August 2021 and for the same period 2022.

![Figure 8. Category B waste generation at MNE “CDH of the Kyiv-Svyatoshinsky District Council” (8 months 2021/2022)](image-url)
Key findings from HCW data analysis:

- Impact of war in Ukraine on the generation of category B waste at MNE “CDH of the Kyiv-Svyatoshinsky District Council” was not significant during the first three months (February-April 2022). During the noticed period the HCF generated approx. 500 kg of category B waste. Which is less than in the same period in 2021. Such situation could be explained by the measures for COVID-19 response (vaccination, medical services for the threatened people) in winter-spring 2021. When significant quantities of the medical waste category B were generated.

The generation of category B waste exceeded the respective figures for 2021 starting from May 2022. Which (most probably) was caused by two factors:

- Local citizens back homes and applied for medical services after the reoccupation of the Kyiv region;
- Some troops applied for a medical service apart from local population.

In general, the increase in category B waste generation during the summer 2022 amounted to 100-150 kg per month.

- The generation of category C waste during February-May 2022 was increased by 2-4 per month. This fact was caused not by the impact of war, but related to the replacement of the mercury lamps at the HCF with modern LED ones.
6. RECOMMENDATIONS

6.1. HCW SYSTEM IMPROVEMENTS

Based on the identified gaps and barriers to the safe management of HCW, several system improvements are needed to bring waste management to the best international practices requirements.

A good waste management system is based on generally recognized principles prescribed by both international and partly Ukrainian legislation. Some of the principles that can be applied at the hospital level are listed below.

Waste management hierarchy (WMH)

The waste management hierarchy provides for waste management actions in the best preferable order. It is stipulated in both Ukrainian legislation (the National Waste Management Strategy for Ukraine – NWMS) and the international requirements and best practice – EU Waste Directive and WHO guidance document on Safe Management of Waste from Health-care Activities (2nd edition, 2014)).

The general shape of the WMH as per the EU Waste Directive and the WHO Guidelines is presented in Figure 10 below.
As can be seen from Figure 10 above, the most desirable is the prevention of waste generation, reuse, and recycling. Therefore, most efforts and volumes of waste should be directed precisely to the management options in the upper part of the WMH triangle.

**Proximity principle**

The proximity principle refers to the waste treatment as closer to the generation source as possible. This principle is of great importance in the case of hazardous waste: the closer the treatment facility, the lower the risks of contaminating the environment and impacting human health during transportation.

**The duty of care principle**

The duty of care principle implies the personal responsibility of each person handling the hazardous substances or waste to treat this with the needed care to prevent the leakages into the environment. Thus, hospital staff must be sufficiently knowledgeable and trained in waste management procedures.

Also, this principle applies to the selection of transport and waste processing/treatment companies, paying due attention to the availability of necessary permits and licenses.

The following specific waste management system improvements are recommended for the hospital:

**I. Improvement of the Policy**

The core document of the management system is the Policy, which should summarize the commitment the hospital has made to managing the waste and corresponding environmental and OHS risks and impacts. A good practice for writing policies and making them understood is a Policy Statement. According to the IFC Environmental and Social Management System Implementation Handbook, “the Policy Statement should be written in a way that all staff, suppliers, and contractors have a common understanding of the core values of the company”. The same can also be applied by the hospital in the area of waste management.

**II. Development of waste prevention and minimization procedures/instructions**

Waste minimization should start with the supply department. Therefore, Procurement Procedures should be supplemented with the principles of green procurement:

- Clear procurement plans based on carefully estimated needs for a certain period.
- Purchasing products that have an expiration date or are unstable in the environment in small batches.

- Giving preference to safer products and excluding environmentally hazardous materials (e.g., polyvinyl chloride (PVC)) where possible.

The existing procedure of drug minimization at the hospital should also be described in one of the SOPs/separate SOP, updated by the strict requirements to follow them, as well as the implementation of the good practices of “use the oldest batch first” and “use all the content of each container”.

**III. Development of waste accounting procedure**

Waste accounting is an essential part of the waste management system. The procedure for the daily/monthly volume of different categories and types of waste should be clearly prescribed and disseminated to all relevant staff. Based on the waste records analysis, the hospital can adequately plan the finances required for the purchase of containers, disinfectants, waste transportation and treatment services, as well as organizational issues, for example, regarding the required area of centralized storage. Therefore, it is important to keep records of all categories of waste, even those considered safe.

The data collection form can vary from country to country and hospital; however, unified waste accounting records in all hospitals of the country help in planning the required number and capacity of waste processing/treatment facilities. WHO Guidelines recommend the following daily data-collection form (see Figure 11 below).

| Date _________________________________________ | Name of data collector ____________________________ |
| Name of health facility __________________________ | Number of occupied beds __________________________ |
| Number of outpatients ___________________________ | Department | Type of waste | Weight (kg) | Volume (litre) | Notes |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Figure 11. Daily data-collection form**

All records should be kept on paper or electronically and collected by the assigned person. Data analysis can be simplified by entering them into an
aggregated table for the department, where data will be accumulated for a week, a month, and a year. And to understand the waste management system as a whole, general hospital data on the amount/volume of generated waste and options for managing it can be entered and kept in the following form:

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of waste generated</th>
<th>Weight/volume, t/l</th>
<th>Waste management option</th>
<th>Treatment/Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reuse/Recycling</td>
<td>On-site</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weight/volume, t/l</td>
<td>how the materials will be reused on site</td>
</tr>
<tr>
<td>Category A waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category B waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category C waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV. Development of a procedure for the collection and decontamination of hazardous waste spills

The procedure for preventing accidental hazardous waste spills or leaks must include precautionary measures during waste handling. The actions to mitigate the leakages in case of occurrence must consist of clear steps to decontaminate the surface and strict OHS instructions for personnel.

The required decontamination kits and PPE must be ensured at the storage areas.

V. Supplement the relevant SOPs with a food waste management

The management of food waste – both those that are considered safe (Category A) and those that are considered hazardous (Category B) must be prescribed in the relevant SOP following the requirements of Ukrainian legislation:

Collection of food waste is carried out separately from other waste in reusable containers or disposable bags installed in the premises of food units, canteens, and cafeterias. The temporary storage of food waste in separate special containers in the absence of specially allocated refrigeration equipment is allowed for no more than 24 hours. Food waste containers are washed and disinfected after each emptying⁵.

⁵ https://zakon.rada.gov.ua/laws/show/z0959-15#Text
Ways must be found to adequately dispose of food waste instead of discharging it into the wastewater network, which violates Ukraine’s legislation. Composting and transferring sterilized food waste to animal feeding is considered the best practice. In Ukraine, food waste can be transferred to companies that have the appropriate equipment for food waste disposal.

**VI. Exclusion from SOPs of information on the sharp waste of Category A**

This recommendation is based on the absence of the concept of safe sharp HCW in Ukrainian and international requirements. All sharp wastes are hazardous and must be labelled accordingly and managed following the requirements for Category B waste.

**VII. Improvement of the documents management system**

The document management system ensures that document users clearly understand the requirements written there and exclude the possibility of misinterpretation. In addition, it is a good management practice included in many international standards.

Based on the identified gaps in document management, the following improvements should be made:

- Clear identification and spelling out of the documents hierarchy (in the separate guidelines or internal order of the hospital management), where the main document is the Policy, and the SOPs are subordinated to it.
- Unification of the terminology through all documents of the waste management system.
- Unification of the requirements for collection, labelling, disinfection, and movement inside the hospital of certain types of waste.
- Prescription in documents only those methods of waste management that are used in practice (for example, if the sharp waste is collected in containers of used disinfectants, this should be included in the procedures).
- All waste generated on the territory of the hospital must be included in the procedures, regardless of the degree of their safety (for example, bulky waste, green waste, etc.).

**VIII. Development of the scheme for waste movement within the hospital**

The scheme for transporting waste within the hospital is needed for assurance that the waste and hospital staff/patients/visitors routes are well-separated based on the physical and spatial capabilities of the hospital.

**IX. Improvement of the competence and awareness raising**
Although the competence and awareness-raising aspects of the hospital's internal procedures were identified as a good point during the assessment stage, the following recommendations are intended to systematize and formalize the implemented actions in this regard:

- Create an annual training plan on waste management issues. If appropriate, the issue of waste management can be added to the occupational health and safety training plan. The topics to be covered should also be spelled out.
- In case of changes in national legislation and/or internal procedures of the hospital, unscheduled training should also be conducted. This possibility should also be documented.
- Develop a system for knowledge assessment based on training results.
- Keep records of conducted trainings, as well as knowledge assessment results in relevant Logs.
- Plan the allocation of funds for the external training of responsible personnel, who will then transfer knowledge at in-hospital training.
- Document the on-the-job training procedure that occurs regularly in the hospital.

X. Improvement of budgeting and financial management

The following improvements of the budgeting and financial management at the target HCF are proposed to be implemented:

- Budget planning: the HCF should ensure that a sufficient budget is allocated to manage Category B waste in the appropriate planning period (calendar year). Since the delays in payments/tendering the licensed company bears a risk of improper final waste treatment.
- Funds management: the HCF should analyse the external sources for funding to fill the existing gaps at the HCWM. Such sources are presented by international grants, loans, specific donor funds, etc. Effective funds management will allow the HCF to fill the “physical” needs- purchase equipment (refrigerators, containers, autoclaves). As well as to fill the “capacity” needs- to get the consultancy services and trainings on the improvement of the relevant staff knowledge.
- Procurement: the approach to the procurement of waste management services according to the local tender legislation typically foresees only one criterion- price. At the same time the Law of Ukraine “On Public Procurement” don not forbid setting the other qualification criteria to the bidders. Therefore, it is recommended to include the criteria related to the environmental and health impacts (i.e. experience of the company, brief description of the technologies to be used for medical waste transport.
and utilization, availability of the environmental policies at the contracting company, etc.) besides the formal availability of license for hazardous waste management.

6.2. TECHNOLOGICAL IMPROVEMENTS OF HCW MANAGEMENT SYSTEM

Apart of the “methodological” improvements listed in the previous chapter the technological improvements of HCW management system are the elements which allow reducing of the risks related to improper waste management and possible negative effects on the environment and health.

Some of the measures prosed below (for example correct labelling) will not require significant financial and time resources. At the same time, the technical needs of the HCF should be evaluated and categorized according to the priorities (i.e. to be purchased/procured in the short-, medium- or long-time perspective).

The Action Plan with the needs evaluation and prioritization will be presented in the Final Consultancy Report.

I. Waste collection bins at departments

The types of bins in the departments should clearly correspond to those prescribed in the hospital’s procedures (SOPs). They must be appropriately labelled, and equipped with lids and spill protection measures, and the possibility of the hands-free opening should also be considered.

Containers for collecting food waste must comply with the norms prescribed in Ukrainian legislation, which in this part does not conflict with European practices.

As mentioned above, using containers from disinfectants for sharp waste is not considered non-compliance, but this possibility should also be prescribed in the SOPs. In this case, safeguarding non-spillage waste from such a container should also be ensured.

II. Category A waste centralized storage

The centralized storage of the Category A waste should be appropriately labelled (both the storage itself and the containers). To prevent waste filtrate leakages, the containers should be equipped with lids, which should be closed all the time. The roof of the storage can also be considered.

III. Category B waste centralized storage
The central storage of Category B waste should be equipped with appropriate containers, adequate lighting, ventilation, and washing basins. The premises can still be used for storage purposes; however, repair is needed to make the walls and floor smooth for quick and easy cleaning. In addition, the storage facility should be equipped with means for collecting and decontaminating waste spills.

The following requirements are set for the HCW central storage by the WHO guidance document on Safe Management of Wastes from Healthcare Activities, 2nd edition, 2014, which is considered the best practice:

The storage area should:

- have an impermeable, hard-standing floor with good drainage (away from watercourses); the floor should be easy to clean and disinfect;
- include the facility to keep general waste separated from infectious and other hazardous waste;
- have a water supply for cleaning purposes;
- have easy access for staff in charge of handling the waste;
- be lockable to prevent access by unauthorized persons;
- have easy access for waste-collection vehicles;
- have protection from the sun;
- be inaccessible to animals, insects and birds;
- have good lighting and at least passive ventilation;
- not be situated in the proximity of fresh food stores and food preparation areas;
- have a supply of cleaning equipment, protective clothing and waste bags or containers located conveniently close to the storage area;
- have a washing basin with running tap water and soap that is readily available for the staff;
- be cleaned regularly (at least once per week);
- have spillage containment equipment;
- be appropriate to the volumes of waste generated from each healthcare facility.
IV. Technical needs

To implement the practice of physical disinfection of waste instead of chemical disinfection, the hospital needs an autoclave and the appropriate place for its installation.

6.3. RECOMMENDATIONS ON HCWM STUDY

It should be noted that the gaps and barriers identified by the IC during this Assignment’s performance could also be applied to the other numerous healthcare facilities in Ukraine.

A significant part of these issues is the document management system and very limited budgets dedicated to the HCWM. The absence of special containers for collecting waste of different categories, a lack of equipped storage for infectious waste (e.g., Category B), proper container labelling, absence of an autoclave, and confusion in the documents is most likely characteristics of major district hospitals in Ukraine. And the magnitude of such gaps will increase with distancing from the capital. The target HCF is located 28 km from the Kyiv city center, which allows assuming that supplies and procuring at MNE “CDH of the Kyiv-Svyatoshinsky District Council” take place on a higher level than “average” in Ukraine.

Hence, the barriers and gaps to sustainable healthcare waste management in Ukrainian healthcare facilities could be studied deeply through the extension of the Assignment tasks for a few regions of Ukraine.

The possible extended Assignment should cover at least 10-15 healthcare facilities located in at least five regions (oblast) of Ukraine. At least one HCF should be selected in a city with a population of 1 mln. and at least three – in the towns with less than 100K people. Such a distribution will allow us to check whether our assumptions about the inadequate state of HCW management in most hospitals of Ukraine are accurate and whether the situation is better in those closer to the center. In addition, it will help to make more extensive recommendations, not only for each of the hospitals separately but for the management authorities of the state as a whole. The consequences of such an assessment will be the improvement of the planning of public funds, their movement in the right direction, and the improvement of the management of hazardous waste that poses a threat to people and the environment.

The data and information will be collected via inspection missions made by the Consultant and online/phone interviews with the HCF staff dealing with HCW. Due to safety reasons, site visits will most likely not occur, but the IC will ask for photos of the most critical locations.

The Assignment will cover all aspects of the HCW management system, namely:
● Waste management plans, policies, and procedures;
● Waste management practices – collection, separate collection, storage, and treatment (disinfection) of waste;
● Waste accounting and statistics;
● Information on responsible personnel, training and capacity building;
● Occupational health & safety and emergencies;
● Procurement and funds management;
● Capacity building and training (incl. on-the-job training and periodical training for the relevant staff);
● Monitoring and reporting.

Such study will allow:
● To support a wider range of Ukrainian HCF with practical recommendations on the HCWM improvements;
● To develop “typical” recommendations for a smaller and larger HCFs;
● To identify the needs and indicative budgets required for the HCWM improvements on the local and regional levels through a deeper analysis of the HCF needs in different locations with different financial capabilities and levels of HCW management practices;
● To identify the needs for waste treatment and disposal at the HCF in several regions in Ukraine;

In addition, it is also proposed to evaluate (perhaps as a separate Assignment or sub-task) treatment/disposal companies dealing with HCW of category B: their adequate hazardous infectious waste management and technical capabilities. The results of this sub-task allow for making the recommendation on the needs for the creation of the local/regional HCW management hubs and their equipment with all required waste treatment/disposal equipment.

The above will ensure the progress towards the implementation of the National Waste Management Strategy of Ukraine (NWMS)6, which provides, in particular, “the creation of a centralized network of high-temperature incineration of HCW that cannot be autoclaved (pharmaceuticals; anatomical waste; sharp waste; laboratory waste, chemotherapy waste, etc.)”. And also find necessary funds, for instance, through public-private partnerships (PPP).

6 https://zakon.rada.gov.ua/laws/show/820-2017-%D1%80#Text
7. ACTION PLAN FOR THE HCWM IMPROVEMENTS

Based on the needs analysis, the Individual Consultant developed an action plan for the HCWM improvements at MNE “CDH of the Kyiv-Svyatoshinsky District Council”. The actions listed in the Plan are ranged by the priorities: short-medium- and long-term prospective.

A full version of the Action Plan is presented in Annex 2 to this report.

The priority measures, where external support will be needed within the next 6-12 months to improve the HCWM at the target HCF, are listed in Table 4.

Table 4. Priority actions on HCWM improvements at MNE “CDH of the Kyiv-Svyatoshinsky District Council”

<table>
<thead>
<tr>
<th>№</th>
<th>Action</th>
<th>Indicative budget, USD</th>
<th>Effect/Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Improvement/Construction of Category B waste centralized storage (60-80 sq.m)</td>
<td>15,000-45,000</td>
<td>Environmental and health risks minimization</td>
</tr>
<tr>
<td>2.</td>
<td>Provision of containers for Category B waste centralized storage (5 pieces)</td>
<td>2,500</td>
<td>Environmental and health risks minimization</td>
</tr>
<tr>
<td>3.</td>
<td>Purchase of the autoclave</td>
<td>5,500</td>
<td>Implementation of physical methods of waste disinfection</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>23,000-53,000</td>
<td></td>
</tr>
</tbody>
</table>
## ANNEX 1. HEALTHCARE WASTE OF CATEGORIES B AND C GENERATION DURING 2020-8 MONTHS 2022

### Table 5. HCW generation at “CDH of the Kyiv-Svyatoshinsky District Council”

<table>
<thead>
<tr>
<th>Month, year</th>
<th>Waste type</th>
<th>Total weight/volume, tones</th>
<th>Preliminary treatment at HCF yes/no</th>
<th>Transferred for final treatment and disposal to Company name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Category B, tones</td>
<td>Category C, tones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>January 2020</td>
<td>0.75</td>
<td>0.001</td>
<td>0.751</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>February 2020</td>
<td>0.6</td>
<td>0.002</td>
<td>0.602</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>March 2020</td>
<td>0.45</td>
<td>0.001</td>
<td>0.451</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>April 2020</td>
<td>0.32</td>
<td>0.002</td>
<td>0.322</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>May 2020</td>
<td>0.3</td>
<td>0.001</td>
<td>0.301</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>June 2020</td>
<td>0.34</td>
<td>0.007</td>
<td>0.347</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>July 2020</td>
<td>0.3</td>
<td>0.001</td>
<td>0.301</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>August 2020</td>
<td>0.33</td>
<td>0.002</td>
<td>0.332</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>September 2020</td>
<td>0.34</td>
<td>0.004</td>
<td>0.344</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>October 2020</td>
<td>0.48</td>
<td>0.004</td>
<td>0.484</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>November 2020</td>
<td>0.45</td>
<td>0.002</td>
<td>0.452</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
<tr>
<td>December 2020</td>
<td>0.6</td>
<td>0.003</td>
<td>0.603</td>
<td>Ritual service of the Kyiv Crematorium, &quot;Utilvtorpom&quot; LLC</td>
</tr>
</tbody>
</table>

### TOTAL 2020

|             | 5.26       | 0.03                  | 5.29                                |


<table>
<thead>
<tr>
<th>Month, year</th>
<th>Waste type</th>
<th>Total weight/volume, tonnes</th>
<th>Preliminary treatment at HCF</th>
<th>Transferred for final treatment and disposal to Company name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2021</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January 2021</td>
<td>0.79</td>
<td>0.001</td>
<td>0.791</td>
<td>Ritual service of the Kyiv Crematorium, ”Utilvtorpom”LLC</td>
</tr>
<tr>
<td>February 2021</td>
<td>0.66</td>
<td>0.002</td>
<td>0.662</td>
<td>Ritual service of the Kyiv Crematorium, ”Utilvtorpom”LLC</td>
</tr>
<tr>
<td>March 2021</td>
<td>0.68</td>
<td>0.002</td>
<td>0.682</td>
<td>Ritual service of the Kyiv Crematorium, ”Utilvtorpom”LLC</td>
</tr>
<tr>
<td>April 2021</td>
<td>0.46</td>
<td>0.002</td>
<td>0.462</td>
<td>Ritual service of the Kyiv Crematorium, ”Utilvtorpom”LLC</td>
</tr>
<tr>
<td>May 2021</td>
<td>0.3</td>
<td>0.001</td>
<td>0.301</td>
<td>Ritual service of the Kyiv Crematorium, ”Utilvtorpom”LLC</td>
</tr>
<tr>
<td>June 2021</td>
<td>0.34</td>
<td>0.007</td>
<td>0.347</td>
<td>Ritual service of the Kyiv Crematorium, ”Utilvtorpom”LLC</td>
</tr>
<tr>
<td>July 2021</td>
<td>0.3</td>
<td>0.004</td>
<td>0.304</td>
<td>Ritual service of the Kyiv Crematorium, ”Utilvtorpom”LLC</td>
</tr>
<tr>
<td>August 2021</td>
<td>0.33</td>
<td>0.004</td>
<td>0.334</td>
<td>Ritual service of the Kyiv Crematorium, ”Utilvtorpom”LLC</td>
</tr>
<tr>
<td>September 2021</td>
<td>0.34</td>
<td>0.005</td>
<td>0.345</td>
<td>Ritual service of the Kyiv Crematorium, ”Utilvtorpom”LLC</td>
</tr>
<tr>
<td>October 2021</td>
<td>0.65</td>
<td>0.007</td>
<td>0.657</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>November 2021</td>
<td>0.5</td>
<td>0.002</td>
<td>0.502</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>December 2021</td>
<td>0.36</td>
<td>0.003</td>
<td>0.363</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>TOTAL 2021</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.71</td>
<td>0.04</td>
<td>5.75</td>
<td></td>
</tr>
<tr>
<td><strong>2022</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January 2022</td>
<td>0.45</td>
<td>0.007</td>
<td>0.457</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>February 2022</td>
<td>0.56</td>
<td>0.004</td>
<td>0.564</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>March 2022</td>
<td>0.38</td>
<td>0.004</td>
<td>0.384</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>April 2022</td>
<td>0.41</td>
<td>0.005</td>
<td>0.415</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>May 2022</td>
<td>0.35</td>
<td>0.006</td>
<td>0.356</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>June 2022</td>
<td>0.45</td>
<td>0.004</td>
<td>0.453</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>July 2022</td>
<td>0.4</td>
<td>0.003</td>
<td>0.404</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>August 2022</td>
<td>0.48</td>
<td>0.005</td>
<td>0.485</td>
<td>LLC “NVK Ukrecoprom”</td>
</tr>
<tr>
<td>TOTAL 8 months 2022</td>
<td>3.48</td>
<td>0.038</td>
<td>3.518</td>
<td></td>
</tr>
</tbody>
</table>

ANNEX 1. HEALTHCARE WASTE OF CATEGORIES B AND C GENERATION DURING 2020-8 MONTHS 2022
**ANNEX 2. ACTION PLAN FOR THE HCWM IMPROVEMENTS AT MNE “CDH OF THE KYIV-SVYATOSHINSKY DISTRICT COUNCIL”**

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Impacts and Risks</th>
<th>Requirement (Legislation, Best Practice)</th>
<th>Capacity and Resources Needs</th>
<th>Indicative budget, USD</th>
<th>Timetable</th>
<th>Target and Evaluation Criteria for Successful Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Improve the Waste Management Policy, summarizing the commitment of the hospital to managing the waste and corresponding environmental and OHS risks and impacts.</td>
<td>Inadequate waste management due to the incompleteness of waste management documentation.</td>
<td>Best Practice</td>
<td>Local staff</td>
<td>0</td>
<td>Short-term</td>
<td>A new waste management policy is adopted and distributed among the relevant HCF staff.</td>
</tr>
<tr>
<td>2.</td>
<td>Develop waste prevention and minimization procedures/instructions development. Supplement the HCF Procurement Procedures with the principles of green procurement.</td>
<td>Inadequate waste management due to the incompleteness of waste management documentation.</td>
<td>Best practice – WHO Guidelines</td>
<td>Local staff</td>
<td>0</td>
<td>Short-term</td>
<td>A procedure of waste minimization at the hospital is described in one of the SOPs/separate SOP.</td>
</tr>
<tr>
<td>No.</td>
<td>Action</td>
<td>Impacts and Risks</td>
<td>Requirement (Legislation, Best Practice)</td>
<td>Capacity and Resources Needs</td>
<td>Indicative budget, USD</td>
<td>Timetable</td>
<td>Target and Evaluation Criteria for Successful Implementation</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------------------------------</td>
<td>------------------------------</td>
<td>------------------------</td>
<td>-----------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>3.</td>
<td>Develop waste accounting procedure in order to adequately planning of the finances required for the purchase of containers, disinfectants, waste transportation and treatment services, as well as organizational issues.</td>
<td>Inadequate waste accounting procedure. Risk to the environment and human health.</td>
<td>Best practice – WHO Guidelines</td>
<td>Local staff</td>
<td>0</td>
<td>Short-Term</td>
<td>Daily data-collection forms are adopted, and records are kept on a regular basis (paper, electronic, or both forms) and stored by the assigned person.</td>
</tr>
<tr>
<td>4.</td>
<td>Develop a procedure for the collection and decontamination of hazardous waste spills. Equip the areas where leakages can occur with decontamination kits.</td>
<td>Risk to the environment and human health.</td>
<td>Best practice</td>
<td>Local staff</td>
<td>0</td>
<td>Short-term</td>
<td>The procedure adopted. Clear steps to decontaminate the surface are written as strict internal instructions for personnel. Decontamination kits are available.</td>
</tr>
<tr>
<td>No.</td>
<td>Action</td>
<td>Indicative budget, USD</td>
<td>Target and Evaluation Criteria for Successful Implementation</td>
<td>Time Table</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>--------</td>
<td>------------------------</td>
<td>-------------------------------------------------------------</td>
<td>------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Supplement the relevant SOPs with food waste management. Manage food waste according to the legal requirements, preventing them from being discharged to the wastewater network.</td>
<td>0</td>
<td>The relevant SOPs are supplemented and adopted. Food waste is sterilized and transferred to animal feeding or companies with the appropriate equipment for food waste disposal.</td>
<td>Short-term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Exclude information on the sharp waste of Category A from all SOPs.</td>
<td>0</td>
<td>The information on the sharp waste of Category A is excluded from the relevant SOPs. All sharp waste is labelled and managed as Category B waste.</td>
<td>Short-term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Improve the document management system, including the implementation of a clear document hierarchy and terminology.</td>
<td>0</td>
<td>Clear documents hierarchy is implemented. All documents include unified terminology. The documents contain only those methods of waste management that are used in practice.</td>
<td>Short-term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Action</td>
<td>Impacts and Risks</td>
<td>Requirement (Legislation, Best Practice)</td>
<td>Capacity and Resources Needs</td>
<td>Indicative budget, USD</td>
<td>Timetable</td>
<td>Target and Evaluation Criteria for Successful Implementation</td>
</tr>
<tr>
<td>-----</td>
<td>--------</td>
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<td>------------------------------------------</td>
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<td>------------------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td>8.</td>
<td>Develop the scheme for waste movement within the hospital so that waste and hospital staff/patients/visitors' routes are well-separated based on the physical and spatial capabilities of the hospital.</td>
<td>Risk to human health</td>
<td>Ukrainian legislation/Best Practice</td>
<td>Local staff</td>
<td>£0</td>
<td>Short-term</td>
<td>The scheme is developed, adopted and distributed among the relevant staff. The waste and people routes are separated. Annual training plan and the knowledge assessment system are developed. The records on conducted training are kept on a regular basis. On-the-job trainings are documented.</td>
</tr>
<tr>
<td>9.</td>
<td>Improve the competence and awareness-raising of the hospital staff.</td>
<td>Inadequate waste management, Risk to the environment and human health</td>
<td>Best Practice</td>
<td>Local staff</td>
<td>£0</td>
<td>Short-term</td>
<td>The scheme is developed, adopted and distributed among the relevant staff. The waste and people routes are separated. Annual training plan and the knowledge assessment system are developed. The records on conducted training are kept on a regular basis. On-the-job trainings are documented.</td>
</tr>
</tbody>
</table>
### Action Plan for the HCWM Improvements at MNE “CDH of the Kyiv-Svyatoshinsky District Council”

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Impacts and Risks</th>
<th>Requirement (Legislation, Best Practice)</th>
<th>Capacity and Resources Needs</th>
<th>Indicative budget, USD</th>
<th>Timetable</th>
<th>Target and Evaluation Criteria for Successful Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Improve the procurement procedure by supplementing it with new qualification criteria for the bidders are developed and included in the tender documentation (i.e., the experience of the company, brief description of the technologies to be used for HCW transport and treatment/disposal, availability of the environmental policies at the contracting company, etc.).</td>
<td>Risks to the environment and human health in connection to suppliers operation (supply chain management.)</td>
<td>Best Practice</td>
<td>Local staff</td>
<td>0</td>
<td>Short-term</td>
<td>Procurement procedure is improved, and qualification criteria are added.</td>
</tr>
<tr>
<td>11</td>
<td>Improve the waste collection bins system in the departments, providing all bins with lids and, where possible, a hands-free opening system. Also, align the descriptions of waste bin types, their labelling, etc., with the implemented in the HCW departments.</td>
<td>Risk to human health.</td>
<td>Ukrainian legislation/Best Practice</td>
<td>Local staff, internal costs</td>
<td>n/a</td>
<td>Short-term</td>
<td>The waste collection bins are equipped with lids and (where applicable) with a hands-free opening system. Labelling is in line with internal HCW policies, Ukrainian legislation and best practices.</td>
</tr>
<tr>
<td>No.</td>
<td>Action</td>
<td>Impacts and Risks</td>
<td>Requirement (Legislation, Best Practice)</td>
<td>Capacity and Resources Needs</td>
<td>Indicative budget, USD</td>
<td>Timetable</td>
<td>Target and Evaluation Criteria for Successful Implementation</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------</td>
<td>------------------------------------------</td>
<td>----------------------------</td>
<td>-----------------------</td>
<td>-----------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>12.</td>
<td>Improve the Category A waste centralized storage, including appropriate labelling and containers cover with lids. Consider storage roof cover.</td>
<td>Risk to the environment and human health</td>
<td>Ukrainian legislation/Best Practice</td>
<td>Local staff Internal/external funds</td>
<td>2,000</td>
<td>Short-term</td>
<td>The centralized storage of the Category A waste is appropriately labelled (both the storage itself and the containers). All containers are equipped with lids. Lids are closed.</td>
</tr>
<tr>
<td>13.</td>
<td>Improve/Construct the Category B centralized storage (60-80 sq.m)</td>
<td>Risk to the environment and human health</td>
<td>Ukrainian legislation/WHO guidance document on Safe Management of Wastes from Healthcare Activities</td>
<td>Design/Construction company Internal/external funds</td>
<td>Improvement: up to USD 15,000 New construction: up to USD 45,000</td>
<td>Mid-term</td>
<td>Category B centralized storage is improved/constructed and meets at least the requirements of local legislation (Annex 2 to Order No. 325 of the Ministry of Health of Ukraine ‘On approval of the State Sanitary and anti-epidemiological rules and standards on the healthcare waste management’).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Requirement (Legislation, Best Practice)</th>
<th>Capacity and Resources Needs</th>
<th>Indicative budget, USD</th>
<th>Time Table</th>
<th>Target and Evaluation Criteria for Successful Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Provide Category B centralized storage with containers (5 pieces)</td>
<td>Ukrainian legislation/Best Practice</td>
<td>Supply company/Internal/external funds</td>
<td>2,500</td>
<td>Short-term</td>
<td>Containers are purchased. Category B waste is stored in the containers.</td>
</tr>
<tr>
<td>15</td>
<td>Equip the HCF with the autoclave</td>
<td>Best practice</td>
<td>Supply company/Internal/external funds</td>
<td>5,500</td>
<td>Mid-term</td>
<td>Autoclave is purchased and properly installed. The HCW is physically disinfected.</td>
</tr>
</tbody>
</table>

### Impacts and Risks

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Impacts and Risks</th>
<th>Requirement (Legislation, Best Practice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Provide Category B centralized storage with containers (5 pieces)</td>
<td>Risk to the environment and human health.</td>
<td>Ukrainian legislation/Best Practice</td>
</tr>
<tr>
<td>15</td>
<td>Equip the HCF with the autoclave</td>
<td>Risk to the environment and human health.</td>
<td>Best practice</td>
</tr>
</tbody>
</table>

### Final Consultancy Report

**Monitoring Barriers and Gaps to Sustainable Healthcare Waste Management in Ukrainian Healthcare Facilities**

The report focuses on identifying and addressing barriers and gaps in sustainable healthcare waste management in Ukrainian healthcare facilities. It includes an action plan with specific actions, requirements, capacities, resources, indicative budgets, and time frames to improve healthcare waste management. The plan outlines the purchase of centralized storage containers and the installation of an autoclave, highlighting the need for regulatory compliance and best practices to minimize environmental and health risks.