

TERMS OF REFERENCE

A. Service Title

The design/operational planning/approvals of construction works applicable to the development of a national chemical hazardous waste storage and management facility, based on upgrading of an existing storage facility near Hrazdan town in Kotayk region of Armenia.

B. Project Title

The subject of this assignment is a sub-component of a UNDP/GEF full sized Project entitled “Elimination of Obsolete Pesticide Stockpiles and Addressing POPs (Persistent Organic Pollutants) and Contaminated Sites within a Sound Chemicals Management Framework in Armenia” being undertaken by the United Nations Development Programme (UNDP) in cooperation with the Ministry of Emergency Situations (MES) and Ministry of Nature Protection (MNP).

C. General Assignment Description, Background and Context

This consulting assignment applies to the provision of design documentation, tender specifications, implementation procedures, training, environmental and social impact assessment, and design/environmental approvals required for reconstruction, upgrading and renovation works applied to a former medical/military supplies storehouse, for use as a national chemical hazardous waste (HW) management facility that will serve as a secure storage and transfer (for subsequent degradation) station, and potential collection site for hazardous waste treatment, as well as other related hazardous waste management operations.

Background

As noted above, this assignment is part of a Project entitled “Elimination of obsolete pesticide stockpiles and addressing POPs contaminated sites within a sound chemicals management framework in Armenia”. It is a Global Environment Facility (GEF) Project with UNDP acting as the GEF Implementing Agency. The Project, as approved by the GEF and formally agreed between UNDP and the Government of Armenia (GoA), is documented in the Project Document (PD)¹.

The Project consists of three main operational Components, plus the standard Monitoring/Evaluation and Project Management provisions. The overall structure of the Project in terms of Components, Outcomes and Outputs as approved in the PD, is provided in Annex 1.1. The Project’s primary targets, as specified under Components 1 and 2 and the various Outcomes under each, are: i) elimination of a large Soviet-era POPs and other obsolete pesticide (OP) stockpile/burial site at Nubarashen located in the outskirts of Yerevan (Component 1); ii) development of related hazardous waste management capability as part of the latter; iii) export of high concentration POPs stockpiles for disposal; and iv) treatment/containment of high and lower contaminant level soils in Armenia (Component 2).

This assignment falls under Component 1 Outcome 1.2, which covers the development of the proposed Kotayk national chemical hazardous waste management site that would serve for the Project as a secure interim storage for concentrated POPs pesticides and POPs-contaminated waste removed from the

¹ <http://goo.gl/c0mPH8>

Nubarashen burial landfill and other sites prior to export for environmentally sound disposal, as well as providing basic infrastructure to allow introduction of HW treatment / soil remediation technologies in Armenia, and operated for the treatment of POPs pesticides and associated contaminated materials. One of the key objectives of the Project is that the Kotayk newly developed site will comprise the basic infrastructure providing Armenia with modern hazardous waste management capability consistent with international standards.

The site is located east of Hrazdan city in Kotayk region of the Republic of Armenia, adjacent to the main northeast-southwest M4 highway. This site is a former medical/military supplies logistics storehouse and staging base. The facility used to be fully provided with utilities, but now these are mostly out of service, despite all the utility sources are located at or around the site boundaries. The facility contains a number of deserted structures in poor conditions, which in the Project's preparation phase found to be suitable for upgrading as storage, as well as other structures suitable for support services. It is located approximately in 2 km from the nearest settlements or other development sites and water bodies, nominally outside any national sanitary exclusion zones, and according to preliminary observations is consistent with accepted national and international criteria defined for such facilities. During the project preparation phase (PPG), limited conceptual design work was done, mainly applicable to the upgrading of the main building structure as obsolete pesticide storehouse. This has been documented in a PPG consultant's report (in Armenian)² and has been summarized in the English Explanatory Note and supporting cost-estimate spreadsheets. These documents and supporting drawings are available as reference material for this assignment and relevant parts may be provided during the orientation workshop.

The following (with photos below) provides a summary description of the site as recently inspected by the UNDP Project team.

- The site covers a nominally fenced area of approximately 17 hectares occupying a generally flat area of high ground on the east side of the M4 highway approximately 4 km is east of Hrazdan with direct access from the highway. It has been inactive for some period of time but was originally developed as a military support materials base for such things as medical supplies. It is understood that it has no history of having contained



hazardous materials (except perhaps fuel) or munitions, although this has not been formally documented or evaluated by an organized site survey and assessment.

Several general Google Earth views of the site (dated 2016) are provided below.

These remain consistent with the site's current condition and layout.

² "Report of conceptual design and costs estimation of "Transformation of storage area existing in Kotayk region of the Republic of Armenia into in-country intermediary hazardous waste (HW) storage facility for (Hazardous Waste Storage)" within the PPG phase of the UNDP/GEF full sized Project "Elimination of Obsolete Pesticide Stockpiles and Addressing POPs Contaminated Sites within a Sound Chemicals Management Framework in Armenia", A.Manukyan, 2013.

- The site contains six substantial buildings one of which appears to be a two story office structure, two single story buildings that may have been barracks, and three storage buildings. The two smaller storage buildings were perhaps used for vehicles and equipment storage, and the largest and most intact being a main material/supplies storage building. In addition there are five other above ground structures that were likely gate houses, a support building for the main storage area, and housing for various utilities. The remnants of several cisterns also exist as does a fairly substantial underground bunker.
- The site is serviced by what appeared to have once been a wide, heavy duty, perimeter road leading from the main highway along the west site boundary and around the south boundary behind the three storage buildings and entering gate houses at either end of the main storage building. This connects to an asphalt apron on the north side of the main storage building where the main loading deck and access doors are located. These roads are passable, although generally in poor condition.



- The structure of most interest is the largest/main storage building which is 60m x 18m. It is of concrete construction with a truss girder hold roof giving reasonable head room at the center across the structure but more constrained at the walls (pictures below). Seven door openings of exist leading onto a loading deck and likewise 10 window opening exist along each of the main side walls.

Picture 1.

A large framed access door opening also exist at the west end of the structure. The floor is largely intact and is constructed from reinforced concrete slabs. No information exists on the bearing capacity.

- In terms of condition, the primary structure of main storage building in the picture above, itself appears to be structurally sound and stable, including the roof that seems to have had some maintenance (unlike other structures) as indicated by absence of any evidence of moisture penetration or obvious gaps. The window and door openings are in generally poor condition but readily repairable, either by closure or enlargement following by installation of replacement doors/windows as required. Adequate locations for active and/or passive ventilation etc. would be available. The concrete floor is generally intact but requiring repair. Likewise, the condition of its underlying supports and what is its actual load bearing capacity would need to be assessed. The loading deck is generally badly degraded and would require substantial repair.



Picture 2. Main Storage Building



Interior Looking East



Interior Looking West

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Roof bearing construction and the concrete slab floor

- The other buildings of potential interest are the small service building (cloakrooms formerly) at the west side of main storage facility and the two smaller but still substantial storage buildings to the west of the primary storage building (pictures of inside are below). The service building which could serve as an operational facility is in reasonable shape structurally and in terms of its roof although it has been stripped of windows and doors. The two smaller storage buildings offer good potential as additional waste storage, equipment storage, or potential support locations for possible contamination treatment operations. However the second small storage building (to the west from main storage building) is generally in better condition and will be considered for future operation.



Picture 3. Small Storage Buildings / exterior and interior



- Site drainage appears to rely on natural contours with overall flow across the north and eastern side of the overall site with the only visible standing water observed in the north western corner. However a substantial area of flat higher land which could be graded to provide segregated storm water management exists over most of the southern and western portion of the site and could serve as a containerized laydown area with or without temporary cover.



Picture 4. Structures to be designed and estimated in the scope of this assignment.

1. Large storage facility - 60mx18m
2. Former cloakroom building for the staff- 9mx6m
3. Small storage building - 36mx12m
4. Former electric transformer/converter building
5. Gatehouse
6. Water accumulation pit and pump
7. Aseptic pit
8. Site
9. Shelter construction (24mx12mx5m).
Location to be identified.

The ownership of the site has been transferred from the GOA to MES of RA who represents the primary beneficiary client and counterpart for this assignment and who will jointly fund it with the GEF. They are also assumed to be the ultimate operator of the facility and to act in the role of project initiator of the site's development for purposes of this assignment and for the national design approval process, noting that the of construction works applicable to the development of a national chemical hazardous waste storage and management facility, based on upgrading of an existing storage facility should satisfy the requirements of Republic of Armenia licensing for the type of operation applicable for this facility, and the Consultant undertaking this assignment would assume responsibility for as the "author" of the design and supervision of its execution as required under national regulations and practice.

D. Assignment Objective

The overall objective of this assignment is to estimate and provide a detailed technical and costing definition of the required works to upgrade the overall infrastructure of the Kotayk site in terms of access, utilities, building facilities operational secure chemical hazardous waste storage and treatment capability, consistent with national and international standards, such that it can support a national chemical hazardous waste management facility as defined in the PD for the UNDP/GEF Project entitled "Elimination of Obsolete Pesticide Stockpiles and Addressing POPs (Persistent Organic Pollutants) and Contaminated Sites within a Sound Chemicals Management Framework in Armenia". This includes provision of appropriate environmental assessment and impact mitigation associated with the proposed actions, supporting operational procedures and plans, national approvals, training of operational personnel, and author's supervision of the construction works execution.

E. Scope of Work

The overall design scope for the development of the Kotayk site needs to encompass the spectrum of uses and commitments that are defined in the PD (the corresponding summary excerpt is attached to this TOR). These uses are defined as three basic levels of development covering the near and medium term needs of the GEF project, and the longer term national development objective of the project providing the basis for a national chemical hazardous waste facility. It also specifies the requirement that the development be in accordance with both national and international standards. Annex 1.2 provides a list of international reference standards and example national standards, noting that the basic compliance guidance overall are the Basel Convention Guidelines and the GEF STAP guidelines. Annex 1.3 provides a list of relevant national regulations that are deemed to apply.

Consistent with the above, the required development process can be defined by three stages that the overall design and operational planning and approvals processes need to reflect respectively. These are: i) provision of secure interim storage of POPs pesticides and associated high concentration POPs waste residuals that would then be exported abroad for destruction, noting that these quantities and likely packaging configurations will be refined during the parallel site assessment/operational planning work being undertaken on the Nubarashen site³ assessment work; ii) provision of basic support infrastructure required for receiving of POPs and other contaminated waste (including soil for treatment/decontamination on site, if identified). Within the scope of the Project, this infrastructure will serve as a collection point, if needed and determined so, for approximately 7,000 t of POPs contaminated soil selected for removal from the Nubarashen site (treatment option to be determined through demonstration step; and iii) operation as a permanent national HW storage/transfer unit station for other priority chemical hazardous waste streams (i.e. PCBs, other POPs/obsolete pesticides, contaminated site residuals) with basic support infrastructure to deploy stationary and/or portable treatment techniques, as it may be justified in the future.

In undertaking this work it is recognized that the implementation of actual development works being designed under this assignment might be done in phases recognizing that it will be ultimately dependent on the availability of financing beyond the GEF committed funds. This specifically applies to co-financing currently being arranged by the GoA for the overall project. As is anticipated to become clear during the course of the GOA's co-financing efforts and the parallel Nubarashen site design work, this could impact: i) the scope and scale of civil works undertaken at Nubarashen; ii) funding available for treatment of POPs contaminated soil, and iii) consequentially the degree of utilization for storage and potentially treatment capability required at the Kotayk facility site.

However, in order to be prepared for implementation of the full GEF project as approved by the GEF and GoA, the scope of this assignment defined herein will cover the full range of project requirements for purposes of design, operational planning and approvals such that tendering and implementation inputs needed to address all three aspects in terms of specification and cost estimates. However, it should also incorporate a sequential development plan that can be matched to the project's evolution and as well longer term national requirements, and include sufficient flexibility to be adjusted for potential staged and reduced scale development.

This assignment will be undertaken by a selected national or international Consultant firm (the Consultant) experienced in civil engineering/construction, industrial site development (experience in design of facility for chemicals material storage is preferred), and building design/technical service provider as well as experienced in environmental assessment and approvals. The Consultant either should have direct experience in dealing with hazardous waste management and related facilities internationally or/and through a partnership relationship with an international firm or individual international expert (with experience relevant to this assignment requirements) can input such expertise. **Hereby, accordingly the Consultant is expected to assure relevant international expertise with experience in the design and operation of hazardous waste management facility and site development for secure waste storage and treatment.**

Consistent with the above assignment objective and contextual information, the scope of work to be undertaken by the Consultant is described under the following task definitions and documented outputs:

Task 1. Assignment familiarization and mobilization: This assignment inception task will involve the mobilization of the Consultant team, and development of sufficient understanding of the project to initiate

³ The Nubarashen RFP/TOR documents are available from the UNDP PMU who will also coordinate liaison with the consulting team selected to undertake that work.

the subsequent substantive technical tasks. This will include the review of existing data and conceptual design documentation, making contact and establishing working relationships with counterpart organizations (MES, MNP, Local and Marz authorities, ENGOs, and supporting service providers, etc.), and mobilization of technical support resources as required. A primary part of this task will be becoming familiar with the site in detail, inclusive of initial assessments of key aspects related to the assignment design work. The principle aspects involved include: i) visual inspection of the overall site; ii) preliminary assessment of surface water drainage flow; iii) obtaining any existing hydrogeological, and geotechnical data available; iv) preliminary research on the site and constructions previous usage history; v) identification of utility access points; vi) preliminary integrity assessment of the building structures and their utility; vii) preliminary assessment of potential environmental issues; and viii) confirmation of sanitary protection zone requirements. The Task 1 outputs as will be documented in an Inception Report are the following: i) a technical site familiarization report with detailed findings of the above noted investigations; ii) recommendations respecting further investigation and design considerations including integration of international hazardous waste management requirements; iii) discussion and agreement with the client and stakeholders on execution approach, and updated work plan for the overall assignment (developed based on the Consultant's technical proposal); and iv) description/confirmation of mobilization and assignment implementation status.

Task 2. Detailed Investigation of Site Conditions: This task involves the analytical assessment of the basic site conditions where additional data and knowledge are identified as required from the preliminary assessments undertaken in Task 1. This will specifically involve:

- Site mapping and survey activities to obtain a basic data and hard copy drawing characterization information on the overall site defining locations and elevations across the site locations of all major features including property boundaries, identified above and below ground structures and access routes, former utility routing and utility connection points.
- Surface drainage/hydrology analysis defining runoff patterns and routing onto, within, and off of the site including identification of receiving water courses and/or ground water recharge points.
- Site history assessment including investigation of potential locations where hydrocarbon storage, handling or spills may have occurred, waste dumping locations and characteristics; and other site uses of consequence that may be of concern.
- Hydrogeological survey to develop a geological profile underlying the site and ground water characteristic and hydraulic gradient (flow), inclusive of base line ground water quality analysis upstream and downstream of the potential areas of the site to be developed for hazardous waste management activities.

The Task 2 Outputs will be a composite Site Investigation Report with chapters detailing the results and products from each of the above site assessment subject areas.

Task 3. Building and Infrastructure Assessment: This task will cover the engineering integrity assessment of the existing building structures of operational interest and primary access/utility infrastructure that would presumed to be potentially utilized developed as part of the near and long term development of the site as a hazardous chemical waste management facility. The specific building structures to be assessed in detail are: i) the large main storage building – construction (1) on the Picture 1.; ii) the utility/administrative (former cloakroom) building for the operating staff adjacent to the main access apron for the large storage structure (2); iii) the smaller secondary storage/utility building in a better condition second after the main storage facility (3); iv) the former electrical/water utility buildings/structures (4) and the existing gate houses (5); v) water accumulation pit and pump station (6); vi) aseptic pit (7). In each case the structural integrity, weather resistance (roof integrity), and suitability for installation of utilities, doors, windows, ventilation and fire

protection should be defined. For access and utility infrastructure the basic condition and capacities for i) access and roads to the above; ii) the loading apron area; iii) the loading dock access in the large storage building and any other as identified; and iv) site security infrastructure (fences and gates) should likewise be assessed in engineering terms and in accordance with standards. The Task 3 Output will be a Building and Infrastructure Assessment Report that will document the results of the above activities and make detailed recommendations on the suitability of the subject elements for future use and the proposed scope of engineering, material additions and works required for their upgrading for the uses defined herein.

Task 4. Detailed Design Package Preparation: This task will cover the core work in the assignment, namely the design of each aspect and component of the facility to a level that provides bills of material quantities, drawing packages and construction technical specifications all suitable for regulatory approvals by authorized body. This would include but not necessarily be limited to the following components:

- Security infrastructure inclusive of entry gate, basic overall property boundary fence, and high security fencing of the proposed active operations and storage areas.
- External bordering road, access and internal road repair.
- Civil works for an overall site storm water management system segregating run off from active and other areas of the site.
- Repair/reconstruction of main storage building with required capability to safely install/locate stored chemical HW in configurations of UN certified and other formally approved waste containment in the form of barrels on pallets or “big bag” containers, and other packaging consistent with recommended international practice; availability of the following construction elements: floor, wall, ceiling constructions, openings, lighting, air ventilation, as well as maintenance of required temperature regime, security voice-light alarming system and other elements required for assurance of storage operations.
- The smaller storage building is to likewise be reconstructed as the main storage facility making feasible its use as a supplementary storage for waste or equipment, also as a facility where potential waste treatment/decontamination (including contaminated soil) operation may be organized. The renovation/reconstruction requirements are similar to those for the main storage facility.
- Construction (24mx12mx5m) of a lay down area suitable for temporary location of improperly contained waste and contaminated soil under covered shelter to be located on advisable/reasonable space of the open site. This area should have a dedicated storm water collection capability and be bermed (bunded).
- Utility system for supply and utilization of electricity, water and natural gas service as well as handling of sanitary waste water, external lighting and security systems, all inclusive of required housing of electrical panels and transformer, fire ponds and equipment, waste water disposal, other necessary systems.
- Service buildings and structures for the operational staff with worker amenities, including a working room, dining room, wardrobe, toilet.

The output of this task will be the full design package containing for each component as required:

1. Architectural-construction drawings
2. Engineering and technical drawings
3. Methodology for works organization
4. The timetable for works implementation
5. Cost estimates
6. Bill of quantities
7. The technical specifications
8. Other required materials and documents.

Task 5. Develop facility operational plans and procedures: This task will develop an overall operational plans covering the staffing, commissioning and startup of the facility inclusive of the complete range of operational procedures including but not limited to those covering: i) receipt of waste material; ii) materials handling and placement; iii) inventory control; iv) QA/QC procedures; v) EHS procedures; vi) event reporting procedures; vii) public consultation and information disclosure procedures; and viii) emergency response procedures. The output deliverable for this task will be a fully developed Operational Planning and Procedure Manual.

Task 6. Tender technical specifications for storehouse development works and for selected operational work plan: This task will involve of the translation of the storehouse development works selected operational work plan upon Task 4 and Task 5 into a formal tender technical specification (or TOR) to be used for selection of a competent organization in a bidding process and ultimately undertaking the works. The specifications shall be compliant with any national requirements and norms applicable to such tender documents where national budget resources are being utilized in addition to UNDP/GEF investment. It will include specification of all performance requirements of the works and the materials used therein, for the equipment used for the site operational safety when it is functional. The principle Task 6 output will be the final Kotayk national hazardous waste management center works Technical Specification and Tendering Documents Package.

Task 7. Develop, submit, and ensure approval of environmental/social impact assessment documentation: The development of the Kotayk site is subject to a) national regulatory environmental approval process (EIA – the ROA Law “On Environmental Impact Assessment/EIA and Expertise” 21.06.2014) through MNP, and compliance assurance of UNDP Social and Environmental Standards, as well as Environmental, Health, and Safety (EHS) procedures (refer to <http://goo.gl/YksYlk> and <http://www.undp.org/ses> for more information). While information included in each will generally be common, these may differ in format and approach, something the Consultant should research and accommodate. In the case of the national Environmental Expertise, the required submission is termed an EIA Report that would be in compliance with the standards, rules and procedures applied by MNP and based on the selected design and operational planning material as defined in Tasks 4 and 5 above and utilize the materials assembled in Task 2. The UNDP/GEF documentation would involve a standard high level Environmental Assessment (EA), Social Assessment (SA) and Environmental Management Plan (EMP). The latter will detail a check list of measures to be applied and which are monitored against in the inspection safeguarding process as part of the projects monitoring and evaluation procedures. In terms of timing, the national practice requires that the EIA Report and resulting decision on the Environmental Expert Examination (EIA statement or Expert Conclusion) be completed and included in the subsequent submission for technical expertise of civil works design (TECWD) approval (Task 6). The Consultant is required to make the submission for environmental expertise approval on behalf of the project initiator. Other regulatory/procedural/approval requirements and the response initiatives will be determined as needed.

The UNDP/GEF safeguards documentation is less time constrained and would be required before any decision on release of investment funding for this portion of the project is made under UNDP procedures. The national Environmental Expert Examination process is anticipated to take up to 9 weeks after EIA final report submission. For the UNDP/GEF safeguards approval process it would be anticipated to take 10 weeks. The principle Task 5 outputs, will be considered as the respective expert-examination assessment and approved documents. It should be noted that all fees and charges (the currently established fee is 500,000 Armenian drams) associated with the national Environmental Expert Examination (EIA) approval process need to be paid in accordance with the national regulations requirements.

Task 8. Develop, submit and ensure approval for the design technical expertise (TECWD) approvals in accordance with national regulations and requirements: Based on the results of Tasks 4, 5 and 6, the Consultant in its legal capacity as the “author” of the facility design will prepare the necessary submission documents for the required technical approvals for the designed works at the Kotayk Storehouse site/infrastructures and buildings site, within the scope of applicable national approvals process. The facility area development design is required to pass engineering/civil works expert examination by the certified company in compliance with the state regulations, and shall include the results of the national EIA covered in Task 6 above. MES, as the initiator, will submit the technical design package (the approved/positive EIA will be incorporated into the technical design package) for technical expert examination, and based on the recommendations of technical expertise the design package will be approved. The Consultant will support the submission process throughout its approval. Other regulatory/procedural/approval requirements and the response initiatives will be determined as needed. Implementation of the design undertaken under the MES direction, will be subject to technical inspection and author’s inspection as part of the Task 8 below.

The principle output of the Task 8 will be the positive technical expert-examination conclusion of engineering/civil works and approval. It should be noted that all the fees and charges associated with this process (the currently established fee is 25,000 Armenian drams, and the payment for the design expertise is negotiable within 2-3% of the designed operational works estimated budget) need to be paid in accordance with the requirements of national regulations.

Task 9. Author’s supervision support conducted during construction works implementation: During the implementation of construction works on site, the Consultant shall provide author’s supervision for the implementation of the works inclusive of development and submission of reports on the status of reconstruction/renovation to the client and other responsible stakeholder organizations.

Task 10. Training for site supervision and labor staff: Under this task, the Consultant will develop a training program and deliver courses specifically designed for operational/labor personnel and site supervisory staff involved directly in the operation of the Kotayk facility in preparation for operation. The detailed scope of the training programs, its various components and the levels of instruction required will be determined in consultation with the relevant stakeholder. However, the program design should utilize guidance materials on accepted local and international standards, and should include, but not necessarily be limited to, the following topics: i) overall scope and purpose of the Kotayk Hazardous Waste Facility; ii) site access and movement rules, iii) use of PPE (personal protective equipment); iv) procedures on key operational activities; v) environmental practices to minimize contaminant spread; vi) emergency response procedures; vii) health monitor requirements; viii) record keeping; ix) EHS communication and feedback mechanisms; x) violation reporting; and xi) public communication/liaison. Course delivery will be in the Armenian language and should be a combination of classroom and practical demonstration formats. The number of primary trainees up to 12 persons who are anticipated to be drawn from MES operational staff will be determined by stakeholder in consultation with the Consultant based on operational staffing requirements defined in the selected operational plan (Task 5). The program will be supported by a training manual, which along with the program presentation materials will be the Task’s main outputs. It is anticipated that the training for operational personnel will be delivered immediately before operation of the facility. Therefore, it can be anticipated at least two training course sessions: in parallel with the periodic refresher course and short update made during the work as required. Optimization of delivery through the use of a phased “training of trainers” (TOT) approach may be considered, noting that leaving a cadre of qualified trainers within MES is desirable. It should be noted that requests for additional attendees might be made by various stakeholder organizations such that

space for attendance may be required for MNP regulatory staff, general stakeholder emergency response personnel, local authorities, and others. It should be noted that the Consultant’s scope is confined to provision of the program design, instruction, instructional materials and the core copies of training manual and presentations and a TOT for selected staff.

F. Consultant’s Responsibilities and Schedule of Deliverables

The primary responsibility of the Consultant is to efficiently deliver the above tasks and deliverables at a high level of quality and competence within the agreed schedule by ensuring the required resources and expertise is applied when and where required to do so. The following summarizes client’s expectations with respect to deliverables and an indicative schedule.

| | Task | Deliverable | Indicative duration (weeks) | Indicative Delivery Date* |
|---------|--|--|--|--|
| Task 1 | Assignment familiarization and mobilization | Inception report | 2 weeks | 3 th week |
| Task 2 | Detailed Investigation of Site Conditions | Site Investigation Report | 3 weeks | 4 th week |
| Task 3 | Building and Infrastructure Assessment | Building and Infrastructure Assessment Report | 3 weeks | 4 th week |
| Task 4 | Detailed Design Package Preparation | Full Design Package | 7 weeks (inclusive of 2 week decision making by UNDP/PMU) | 10 th Week |
| Task 5 | Develop facility operational plans and procedures | Operational Planning and Procedure Manual | 4 weeks | 12 th week |
| Task 6 | Develop Tender Technical Specification for selected operational work plan | Technical Specification and Tendering Documents Package | 4 weeks | 14 th week |
| Task 7 | Develop, submit, and ensure approval of environmental/social impact assessment documentation | EIA report for Environmental Expertise submission; EA, SA and EMP for UNDP safeguards review | 15 weeks (inclusive of up to 1 week for publishing the decision, up to 9 weeks for expert examination, 5 weeks for EIA development). | 18 th week |
| Task 8 | Develop, submit and ensure approval for technical expertise (TECWD) approvals in accordance with national regulations and requirements | Technical expertise submission documentation | 4 weeks plus 4 weeks approval period (TBD) | 19 th week for submission of materials (subject to Task 6 approval) |
| Task 9 | Works implementation author’s supervision support | Inspection reports, Assembled data, As-built records | TBD (25 weeks cumulative) | TBD – contingent upon initiating restructuring works |
| Task 10 | Training program for site supervision and labor | Training Manual, Presentation materials; Delivery of training modules /course, delivery of TOT | 5 weeks | TBD – delivery of training is contingent upon start of operations |

* Weeks from date of contract signing. Certain activities may have overlap timing.

G. Reporting Arrangements

The contracting arrangements for this assignment will be made through the UNDP Armenia Country Office with technical, administrative and financial supervision provided by the PMU through Project Coordinator. It is anticipated that day to day operational level coordination will be undertaken by the PMU civil engineer and designated MES focal point. Technical peer review of outputs in addition will be provided by MES, the UNDP's regional and HQ staff including the International Adviser. For purposes of scheduling deliverable review, the Consultant should assume at least one week response time for review and comments from counterparts as administered and coordinated through the PMU. Where the work involves significant decision points requiring such action in the form of major scoping decisions from MES, UNDP and the PMU on project options and direction, a period of two weeks shall be assumed.

H. Duty Station

Contractor's office and the storage site located near Hrazdan community of Kotayk Marz, Republic of Armenia.

I. Consulting firm/Partner/Sub-contractor Qualifications

The Consultant firm (the Consultant) may be an international or national engineering/construction design/technical service provider firm who either has direct experience in dealing with hazardous chemical waste management and related facilities internationally or through a partnership relationship with an international firm or individual expert can include such expertise.

Specific technical capability and experience exhibited by the Consultant that should be presented for purposes of assessing qualification and capability will include:

- Demonstration that the consulting firm is a well-established consultancy in the above mentioned services of at least 10 years of proven experience (company profile with description of proven records and experience in the area of required expertise) in construction, **experience in assessing and designing special purpose public facilities**. Similar experience in the design and operational planning of facilities handling/storing dangerous goods and chemicals is an asset.
- Capability to undertake relevant assessments and supervision in the required technical and engineering disciplines defined in the scope of work including cost estimation and economic evaluation, as well as supporting, environmental/social impact assessment (supported by relevant project references).
- Familiarity with national environmental and technical regulatory approvals processes in Armenia as demonstrated by specific reference to approvals work undertaken on like projects;
- CVs of professional staff to be involved:
 - Team Leader/Task Coordinator with at least 10 years' experience in construction design and management,
 - One expert with at least 5 years' international experience in the design and operation of hazardous waste management and storage facilities developed to high safety/security standards referring to international best practices,
 - One expert with at least 5 years' experience in site assessment with respect to hydrology, and hydrogeology,
 - One expert in EIA with at least 5 years' experience,
 - One expert in construction engineering with at least 5 years' experience,
 - One expert in hazardous chemical waste management facility/storehouse operation and maintenance with trainer's experience
- Language of the proposal English.

Annex A.1

Elaborated project design framework by Outcome, Output and Activity

| Outcome | Outputs | Activity Description |
|--|---|--|
| Component 1: Capture and Containment of Obsolete Pesticide Stockpiles and Wastes | | |
| <p>Outcome 1.1 Removal of priority POPs pesticide waste from the Nubarashen burial site, secure containment of residual contamination on-site, site stabilization and restoration, with the site secured under appropriate institutional arrangements providing effective access limitations, monitoring and future land use control, all endorsed by an informed public.</p> | <p>1.1.1 Design documentation, tender specification, implementation procedures to undertake the required works. 1.1.2 EHS procedures documented and promulgated in support of the works required. 1.1.3 EIA and Environmental Expertise approval to proceed with the works 1.1.4 Removal to secure storage of 900 t of pure pesticides and high concentration POPs wastes from the Nubarashen burial site 1.1.5 Removal to secure storage of 7,000 t of POPs pesticide waste in the form of highly contaminated soil from the Nubarashen burial site completed 1.1.6 Onsite secure containment of 12,000 t of low and moderately contaminated soil in an engineered landfill within the Nubarashen site in place. 1.1.7 Restoration and access control provisions for the Nubarashen burial site are in place and civil works to stabilize the surrounding land and drainage are completed. 1.1.8 Training delivered to 20 national technical and regulatory staff in support of Nubarashen operations. 1.1.9 5 public consultation events held and 10 public documents/web/media products delivered.</p> | 1.1.1 Detailed site assessment, clean-up design, geotechnical/hydrological stabilization design, EIA, permitting and tender document preparation for excavation/packaging/containment and site works supervision including on-site screening analysis capability for segregation of POPs pesticide waste categories. |
| | | 1.1.2 Installation of site access and safeguarding infrastructure for recovery and restoration activities |
| | | 1.1.3 Excavation, packaging and removal of OP burial cells and other associated priority POPs pesticide wastes involving estimated 900 t Category 1 POPs pesticide wastes (pure pesticides and POPs pesticide wastes >30% pure pesticides) |
| | | 1.1.4 Redistribution, segregation and initial containment of Category 2 and 3 soils |
| | | 1.1.5 Excavation, packaging and removal of 7,000 t Category 2 POPs wastes (high concentration soils using health risk criteria of > 1,500 ppm), packaging and removal |
| | | 1.1.6 On-Site final Containment of 12,700 t Category 3 POPs waste (< 1,500 ppm health risk criteria, >0.7 ppm agricultural risk criteria) |
| | | 1.1.7 Site restoration, undertaking area site geotechnical/hydrological stabilization, and drainage improvements. installation of monitoring and establishment of long term land use control arrangements |
| | | 1.1.8 Operational and safeguards training for hazardous waste and contaminated site management including site excavation, packaging and restoration operations – Estimated 20 national technical staff trained for work on site. |
| | | 1.1.9 Supporting public consultation for design, permitting, operational and restoration/monitoring phases of Nubarashen site work. Estimated 5 formal events held and 10 public documents/web/media products produced. |
| | | <p>Outcome 1.2: Development of the Kotayk national hazardous waste management site at equipped with secure storage and basic infrastructure to allow introduction of HW treatment soil remediation technologies constructed and operated for the secure storage of POPs pesticide waste and OP stockpiles, and the treatment of POPs pesticide contaminated soil.</p> |
| 1.2.2 Storage Facility upgrading and construction works for indoor secure storage capacity for 1,100 t of Category 1 POPs pesticides and OPs from Nubarashen and OP storehouses, and covered external secure on-site storage of up to 7,100 t of highly contaminated soil (Category 2) from Nubarashen and OP storehouse clean ups | | |
| 1.2.3 Receiving storage and custody operations for Category 1 and Category 2 material received from Nubarashen and OP stockpiles from storehouses | | |
| 1.2.4 Technical and safeguards training for hazardous waste facility operation. Estimated 20 operational staff from MTAES or contracted service providers involved | | |
| 1.2.5 Supporting public consultation for design, permitting, and operational phases of Kotayk facility development. Estimated 5 formal events held and 10 public documents/web/media products produced. | | |

| Outcome | Outputs | Activity Description |
|---|---|---|
| | pesticide in an environmentally sound manner. 1.2.7 20 HW facility operational staff trained and equipped with respect HW management, safeguards and EHS practices. 1.2.8 5 public consultation events held and 10 public documents/web/media products delivered. | |
| Outcome 1.3: Remaining significant historical OP storehouses have OP stocks packaged and removed for destruction and residual site contamination cleaned up. | 1.3.1 Screening assessments completed/documentated on 24 identified historical OP stockpile sites and 150 t of OP stockpiles and clean up residuals packaged and removed to the Kotayk HW facility. | 1.3.1 OP Storehouse screening assessments, stockpile packaging and surficial (surface) clean up and removal to the Kotayk storage facility (150 t of OP and clean-up residuals from 24 sites) and export of 150 t for destruction |
| | 1.3.2 Detailed contaminated site and risk assessments and remediation/clean up designs on 6 identified priority sites completed/documentated | 1.3.2 Follow up detailed site assessment, clean up design, and supervision permitting on 6 priority sites identified during PPG but subject to results of Activity 1.3.1 above. |
| | 1.3.3 Excavation/removal, remediation and/or containment on 6 identified priority sites completed | 1.3.3 Excavation/Removal, containment and/or remediation up to 200 t Category 2 and 3 contaminated soil of the 6 priority sites |
| | 1.3.4 6 public consultation events held at 6 priority sites and 10 public documents/web/media products delivered. | 1.3.4 Supporting public consultation for design, permitting, and operational phases of clean ups under 1.3.2-1.3.3 on 6 priority sites. Estimated 6 formal events held and 10 public documents/web/media products produced |
| Component 2: Obsolete Pesticide Stockpile and Waste Elimination | | |
| Outcome 2.1: Removal from Armenia of all substantially all high priority POPs pesticides, associate very high concentration wastes and OP stockpiles. | 2.1.1 Export of 900 t of Category 1 POPs pesticides, priority POPs pesticide wastes, and OPs from the Kotayk facility for destruction in a qualified international facility | 2.1.1 Export of 900 t of Category 1 POPs pesticides, priority POPs pesticide wastes, and OPs from the Kotayk facility for destruction in a qualified international facility |
| Outcome 2.2: Environmentally sound remediation of heavily POPs pesticide contaminated soil inclusive of destruction of extracted POPs pesticides demonstrated. | 2.2.1 7,100 t of heavily contaminated POPs contaminated soil (POPs pesticide waste) remediated to levels below the low POPs content returned and contained on the Nubarashen site 2.2.2 Commercially viability of in-country remediation of POPs contaminated soil demonstrated 2.2.3 Operational training of 20 national technical personal on a modern contaminated soil technology | 2.2.1 Environmentally sound remediation of 7,100 t of Category 2 POPs pesticide contaminated soil (7,000 t from Nubarashen and 100 t from 6 OP storage sites), involving the removal and destruction of residual POPs pesticide contaminants (to <50 ppm) at market selected soil remediation facilities either operated at the Kotayk site or a qualified facilities in another country. |
| Component 3: Institutional and Regulatory Capacity Strengthening for Sound Chemicals Management and Contaminated Sites | | |
| Outcome 3.1: Legal/regulatory and technical guidance tools for management of chemical wastes, including POPs, and, contaminated sites management within a national sound chemicals management framework strengthened | 3.1.1: Policies, legislation and regulatory measures respecting hazardous chemical wastes and contaminated sites management reviewed, updated and appropriate revisions implemented | 3.1.1 Rationalization, updating and revision of polices, legislation and guidelines covering hazardous chemicals waste and contaminated sites management |
| | 3.1.2. Adopted technical guidelines on operational safety procedures for hazardous chemicals waste handling, transport, storage and disposal, developed in accordance with international practice and 50 relevant national personal trained | 3.1.2 Preparation and adoption of technical guidelines on operational safety procedures for hazardous chemicals waste handling, transport, storage and disposal, developed in accordance with international practice, including national training. |
| | 3.1.3 Guidance documentation on environmental and health risk assessment methodologies and practices applicable to hazardous waste stockpiles and contaminated sites developed in accordance with international practice introduced and adopted, and 50 professional trained. | 3.1.3 Introduction of environmental and health risk assessment methodologies and practices applicable to hazardous waste stockpiles and contaminated sites developed in accordance with international practice inclusive of training programs. . Estimated 18 institutional, academic, industrial, private service provider and NGO professionals trained |

| Outcome | Outputs | Activity Description |
|---|---|---|
| <p>Outcome 3.2: Technical/environmental performance evaluation and upgrading requirements for existing national destruction capability</p> | <p>3.2.1 Qualification test burns undertaken based in international standards on the <i>EcoProtect</i> incineration facility to determine appropriate HW streams for its application. 3.2.2 Technical assessment produced defining upgrading and investment requirements for expanded application</p> | <p>3.2.1 Undertaking technical and environment performance assessment of the <i>Eco Protect</i> incineration facility inclusive of an international standard test burn on characteristic waste streams and a design assessment to define required upgrading requirements</p> |
| <p>Outcome 3.3: Basic national capacity for effective hazardous chemicals sampling and analysis for multi-environmental media and contaminated sites in place, operational and certified to international standards</p> | <p>3.3.1 Adopted national strategy for rationalization and upgrading national laboratory capability to serve a sound chemicals management framework including hazardous waste and contaminated sites management. 3.3.2 3 national laboratories, including one each in the regulatory, academic and private sector upgraded with suitable capability for hazardous chemical waste and contaminated site sampling and analysis 3.3.3 30 laboratory and associated personnel training upgraded 3.3.4 3 laboratories with international certification and international methods and practice in place</p> | <p>3.3.1 Development of a national laboratory rationalization and optimization strategy 3.3.2 Laboratory infrastructure and equipment upgrading as required to optimize national capacity 3.3.3 3 Training of laboratory personal on site and multi-environmental media sampling, laboratory analysis and QA/OC procedures. Estimated 30 professional staff will be trained 3.3.4 International laboratory certification support for selected labs in accordance with the strategy. 3 designated national laboratories to be certified.</p> |

International References/Standards/Guidelines for HW Storage/Transfer Facilities

- 1. Basel Technical Guidelines: General technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants - UNEP/CHW.12/5/Add.2/Rev.1, July 2015 (Latest adopted edition),**
<http://www.basel.int/Implementation/POPsWastes/TechnicalGuidelines/tabid/5052/Default.aspx>

This is the main governing guidance adopted by the Stockholm Convention as a basis for obligations under Article 6 (Measures to reduce or eliminate releases from stockpiles and wastes) relevant to this project (Web links for English and Russian versions -

<http://chm.pops.int/TheConvention/Overview/TextoftheConvention/tabid/2232/Default.aspx>)

Section IV: Environmentally Sound Management

- Part A encompasses handling, collection transport and storage
- Part B promotes coverage of the above by enforced national regulations within an overall framework covering HW and life cycle management applied to legislation on siting of HW infrastructure
- Part F details reference standard and main principles applicable to handling, collection, packaging, labelling, transportation and storage including those specific to the design and operation of HW storage facilities (Para. 126-128).
- Part J outlines emergency response requirements that would be applicable (Para. 339-340)
- Part K provides guidance on applicable public participation provisions (Para. 341-346)

- 2. FAO, 2009, Obsolete Pesticides Tool Kit Environmental Management Tool Kit, Volume 2, Section D Selection of Collection Centres, Section E Management of Collection Centres:**
<ftp://ftp.fao.org/docrep/fao/011/i0474e/i0474e.pdf>

Current FAO OP Tool Kit series document that provides factual design guidance on layout, and operation of storage facilities including case study examples.

- 3. UNEP, 1993. Storage of Hazardous Materials: A Technical Guide for Safe Warehousing of Hazardous Materials. Available at:**
<http://www.unep.fr/shared/publications/pdf/WEBx0063xPASafeWarehousing.pdf>

Dated but useful practical guidance on hazardous waste storage facility design and operation.

- 4. GEF STAP (Scientific and Technical Advisory Panel of the Global Environment Facility), 2011. Selection of Persistent Organic Pollutant Disposal Technology for the Global Environment Facility: A STAP, Advisory Document. Global Environment Facility, 2011, Washington, D.C**
https://www.thegef.org/gef/sites/thegef.org/files/publication/POPs_Disposal_Final_low.pdf

General prerequisites for secure storage prior to elimination

- 5. IPPC Reference Document for Best Available Techniques for Waste Management Industries, European Commission, 2006.** http://eippcb.jrc.ec.europa.eu/reference/BREF/wt_bref_0806.pdf

The general BREF covering BAT applicable to waste management operations, including all aspects of transfer station and storage operations as well as operations incorporating treatment activities. Specific references are found in:

- Section 1.1 Page 3 – General Information on Waste Transfer Installations
- Section 2.1.4 Page 36 - Common Techniques Applied for Storage and Handling
Section 4.1.4 Pages 320-336 - Techniques to Consider in Determining BAT – Storage and Handling

6. Example National Guidance Documents on Hazardous Waste Storage

- Province of Ontario (2007): Guidelines for Environmental Protection Measures for Chemical and Waste Storage Facilities <https://dr6j45jk9xcmk.cloudfront.net/documents/1759/196-chemical-and-waste-storage-facilities-en.pdf>
- Province of Alberta (1988): Hazardous Waste Storage Guidelines. <http://environment.gov.ab.ca/info/library/7238.pdf>
- USEPA (2014): <https://www3.epa.gov/epawaste/hazard/tsd/permit/tsd-regs/tsdf-ref-doc.pdf>

Annex A.3

National Legislation, Regulations, Standards

The Consultant shall perform the design works corresponding to requirements of the existing Republic of Armenia civil engineering-development legislation, regulations, and respective construction design norms, standards and technical regulations.

At the same time the following environmental legislation framework (not limited with the below listed acts) should be considered and the requirements and established order reflected.

| | Legal Act Name | Adoption date/ No. |
|---|--|---------------------------------|
| 1 | Republic of Armenia Law "On Waste" | November 24, 2004 / No. 159-N |
| 2 | Governmental Decision of the Republic of Armenia "On the order of regulating the import, export and transit transportation of hazardous and other wastes over the territory of the Republic of Armenia" | December 8, 1995/ No. 97 |
| 3 | Governmental Decision of the Republic of Armenia "On list of measures for ensuring fulfillment of the Republic of Armenia obligations under several environmental conventions (Chapter IX -Basel Convention on Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal) | 10 November, , 2011/ No. 1594-N |
| 4 | Decision of the Government of the Republic of Armenia "On the order of licensing for activity on processing, treatment, storage, transportation, and placement of hazardous wastes in the Republic of Armenia"; | January 30, 2003 / No.121-N |
| 5 | Decision of the Prime Minister of the Republic of Armenia "On measures ensuring realization of the Republic of Armenia "Law on Waste" | May 30, 2005 / No. 380-A |
| 6 | Decision of the Government of the Republic of Armenia "On approval of the order to approve draft standards for waste generation and placement limits" | December 9, 2005/ No. 2291-N |
| 7 | Law on "Transportation of dangerous goods and non- decontaminated containers by motor vehicle " | February 17, 2012/ No 30-N |
| 8 | Order of the Minister of Health of the RA #01-N, dated 25.01.2010 : "The hygienic requirements towards soil quality" N 2.1.7.003-10 sanitary rules and normatives | Jan, 25,2010/01-N |
| 9 | Order of the Minister of Health of the RA 20-N, dated 29.10.2009, "Hygienic requirements towards the storage and transportation of the hazardous chemical waste" N 2.1.7.001-09 sanitary rules and normatives | Oct. 29, 2009/20-N |