



# Environmental Impact Assessment

United Nations Support Office for AMISOM  
(UNSOA)

AMISOM Camps  
Mogadishu, Somalia



**FOI**



**UNEP**

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# **ENVIRONMENTAL IMPACT ASSESSMENT**

UNSOA

(United Nations Support Office for AMISOM)

**AMISOM CAMPS**

**MOGADISHU, SOMALIA**

Issued by: United Nations Environment Programme (UNEP) and the Swedish Defense Research Agency (FOI)

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## **1. Executive Summary**

To accommodate planned increases in troop numbers within the African Union Mission in Somalia (AMISOM) by several thousand, over ten years, work is underway to develop two new bases in Mogadishu. Following a request from the UN Department for Field Support (UNDFS) a reduced scope environmental impact assessment (EIA) has been conducted to assess key environmental concerns related to the development of these bases.

The two bases are intended for force protection as well as acting as resupply points for the AMISOM troops and are planned to accommodate 1,000 troops each. The bases are intended to be self-reliant concerning the majority of aspects necessary for sustaining the force including on-site water supply, sanitation and waste management, power supply, service areas with workshops, storage of equipment, fuel and medical facilities.

This EIA provides an assessment of potential positive and negative impacts of the construction and operation of proposed bases on the human, physical and ecological environment. This includes (to the extent possible given the resources available) socio-economics; community infrastructure and services; health, safety and security issues; natural resources; pollution of air, soil and water resources; and impacts on biodiversity as well as any endangered species of flora and fauna. Due to the local security situation in Mogadishu, on-site field studies were not possible. The results from this assessment are therefore based on a desk study only. Table below provides a summary of aspects and activities identified to pose either high or very high risk of causing a potentially significant impact on either of these resources are included in this summary. More detailed information on these as well as on all other identified impacts with lower risk ratings is provided in chapter 6.

<b>Mogadishu</b>	<b>Actual and Potential Risk</b>	<b>Mitigation required to reduce/prevent risk</b>
Hazardous waste management	<ul style="list-style-type: none"> <li>• Hazardous waste entering into the waste stream</li> <li>• Health impact to workers coming into contact with the waste</li> <li>• Potential impact to the environment at point of deposition (landfill)</li> </ul>	<ul style="list-style-type: none"> <li>• Develop waste management plan with clear identification of hazardous waste storage areas</li> <li>• Appoint and educate a single point of contact to be the waste manager</li> <li>• Understand the consequences of handling and shipping hazardous wastes.</li> </ul>
Increased groundwater abstraction	<ul style="list-style-type: none"> <li>• Reduced capacity for other users</li> <li>• Increased contamination from saline intrusion</li> <li>• Potential conflict situation</li> </ul>	<ul style="list-style-type: none"> <li>• Introduce measures to reduce consumption</li> <li>• Refer to UNSOA report on resource reduction measures and act on recommendations.</li> </ul>
Fuel Storage	<ul style="list-style-type: none"> <li>• Release of fuel from the storage tanks and into the groundwater</li> <li>• Release of fuel into the soil from fuel dispensers</li> </ul>	<ul style="list-style-type: none"> <li>• Place all tanks above ground on impermeable bunded base.</li> <li>• Place dispenser onto impermeable bases</li> <li>• Install collision prevention measures</li> </ul>
Sanitary Waste disposal (including septic tank wastes)	<ul style="list-style-type: none"> <li>• Contamination of the groundwater from fecal matter</li> <li>• Health impacts from increase of vectors (from the improper disposal of organic wastes)</li> </ul>	<ul style="list-style-type: none"> <li>• Prevent use of pit latrines or proper design of latrines</li> <li>• Design soakaways properly</li> </ul>
Site drainage	<ul style="list-style-type: none"> <li>• Increased ponding and mosquito prevalence</li> <li>• Impact to marine environment from surface run off.</li> </ul>	<ul style="list-style-type: none"> <li>• Camp management to understand risks – improved drainage</li> <li>• Use interceptors and consider settlement ponds</li> </ul>
Natural Resources	<ul style="list-style-type: none"> <li>• Degradation of natural resources through charcoal consumption</li> <li>• Potential conflict over supply</li> </ul>	<ul style="list-style-type: none"> <li>• Prevent use of charcoal – offer replacements</li> </ul>
Ecological sensitivities	<ul style="list-style-type: none"> <li>• Impact to endangered and sensitive species</li> <li>• Loss of credibility to UN</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare an ecological management plan</li> <li>• Understand and prevent impacts</li> </ul>

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# **1 Introduction**

## **1.1 Background**

The African Union Mission in Somalia (AMISOM) is a regional peace enforcement mission operated by the African Union. AMISOM is mandated to support the transitional government, implement a national security plan, train the Somali security forces, and assist in creating a secure environment for the delivery of humanitarian aid. AMISOM forces currently consist of 6,000 troops from Uganda and Burundi that are accommodated in base camps located within Mogadishu. Due to planned increases in troop numbers stationed in Somalia work is underway to develop two new bases, one at a military academy, here on referred to as the “Military Academy Base”, and the other at the Mogadishu University, here on referred to as the “University Base”, with additional infrastructure to be able to facilitate the planned expansion.

As part of the planning process, United Nations Department of Field Support (DFS) has requested that an environmental impact assessment be performed to analyze the impacts to the environment and to the local population caused by the development of the new bases. This has taken the form of a reduced scope environmental impact assessment (EIA). The assessment was conducted as a desk study due to the challenging security situation in Mogadishu at the time of assessment. Contained in this report are the results of the preliminary assessment process, intended to identify and assess key environmental concerns.

The environmental assessment has been performed by a team of professionals from the United Nations Environment Programme (UNEP) and the Swedish Defense Research Agency (FOI).

## **1.2 Objective**

The approach of the assessment as well as the format of this report in many ways resembles that of a formal EIA. However, due the size and nature of this development, a formal EIA is not a mandatory requirement under current international legislation. The aim instead is to perform a preliminary concise assessment focused on the key environmental and socio-economic issues of concern. The results of the assessment are followed by recommendations on suitable mitigation measures to reduce the negative impacts. The reason for the preliminary assessment is to ensure that the information is available as early as possible in the planning phase of the operation to allow for environmentally informed decisions regarding available alternatives.

### **1.3 Methodology**

The security situation in Mogadishu has prevented the assessment team from mobilizing any assessment activities on-site. Given this the assessment is mainly based on information gathered from remote sources, including a desk study of available and relevant documentation on the area and the bases. This included satellite imagery, information available on the internet, library resources and consultations with UN staff involved with the planning, and with on-site experience from the bases. The process was assisted by the use of an EIA screening checklist. The template of the screening checklist is provided in Appendix 1 together with other useful templates used in this EIA.

### **1.4 Scope and limitations**

This preliminary assessment is limited to environmental and socio-economic concerns associated with the development of the aforementioned AMISOM bases. This includes activities located in and around the two compounds. In addition, the increase in AMISOM presence in Mogadishu will result in the development of a third base for logistical support near the airport. This base, referred to as the Airport Base and operated by the United Nations Support Office to AMISOM (UNSOA), is located in very close proximity to the coast and sensitive marine environments. An assessment of selected impacts related to the Airport Base is therefore included within this assessment.

The wider logistical chain of the AMISOM operation such as ship traffic between Mombasa and Mogadishu for example is outside the scope of this report.

The assessment is also to be regarded as a 'reduced scope EIA assessment', specifically developed for conflict and crises situations, see template 2 in Appendix 1. Therefore, the work includes several limitations compared to a traditional EIA process, see template 3 in Appendix 1. The key limitation is the lack of a comprehensive public participation process, which is challenging to conduct in a post-conflict setting.

Furthermore, the current security situation in Mogadishu has limited site access and resulted in a reduced assessments of environmental aspects.

The report format is based on template 4 in Appendix 1.

## **1.5 Environmental Legislation**

As mentioned in the previous section, the assessment is to be regarded as a reduced scope EIA adapted for conflict and crises situations. While at the time of writing there were no host-country environmental standards in place, the report has drawn on the requirements and expectations of Environmental Impact Procedures from a number of institutions included UNEP, World Bank and the EU.

Furthermore, Basel convention for trans-boundary movements of hazardous waste (see Appendix 4) is applicable in the context of AMISOM as hazardous waste will be transported back to Kenya for final treatment/disposal.

## **2 General description of the activity**

The main function of the two bases under development in Mogadishu will be troop accommodation, and as such the bases will provide force protection as well as serving as points for re-supplying the troops. The bases will store all necessary supplies on-site in order to sustain the operation in the short term. The majority of the equipment and materials necessary, except fuel and ammunition, are brought in by ship from Kenya through an UNSOA (United Nations Support Office for AMISOM) logistics base located in Mombasa. These supplies are off-loaded, inspected and temporarily stored at an existing base at the Mogadishu airport, here on referred to as the “Airport Base”, before being distributed by truck to the Military Academy and University bases.

Hazardous waste is currently stored at the Airport base, however UNSOA also plan for hazardous waste, such as decommissioned vehicles/equipment, used car batteries and oils to be brought back to Kenya as a response to the absence of appropriate treatment facilities in Somalia,

## **3 Security situation in Mogadishu**

The security situation in the Somali capital Mogadishu can at best be described as extremely volatile. The chief reason for the present situation is the ongoing war between the Transitional Federal Government of Somalia (TFG), supported by the AU Mission to Somalia (AMISOM) troops, and the Al-Shabaab and the Hizbul Islam militant groups. The fighting has been ongoing since the TFG came into power in 2009. Presently, the heaviest fighting is located within the areas of strategic importance to AMISOM, i.e. the K4-road which connects the airport with the main AMISOM base, the Presidential Palace and the New Harbour.

Due to the dangerous situation every actor which has something to “defend”, whether a political agenda or a business, tends to rely on the militias to secure their interests. There are no known organised crime groups operating overtly outside the general security cluster.

Enforcing the two AMSIOM bases by the Mogadishu University and the Military Academy and giving them a more active role in the AU effort is likely to change the current security dynamic as it will put more stress, not only on the bases themselves, but also on their immediate surrounding and the connecting infrastructure. Shelling, sniping, suicide bombers entering the camps and improvised explosive devices (IED) along the roads are likely contingencies. Collateral damage around the bases should be expected.

Of special interest are the roads leading from K4 to the Mogadishu University and the Military Academy. These will have an increased strategic importance, for the AMISOM to control and for the Al Shabab to attack. A possible contingency is that the two new bases will be cut off from AMISOM HQ at times, due to IED threats. This will impede the logistics between the different AMSIOM locations. However, it will also force the Al Shabab to spread out their operations over Mogadishu.

The current security situation in Mogadishu has a significant impact on the possibilities of completing full assessments of all aspects included. The assessment has hence been completed using an adapted approach and with a reduced scope.

## **4 AMISOM bases**

### **4.1 Base 1, “University base”**

The main functions of Base 1 is force protection as well as acting as a resupply point. The base currently accommodates 1,000 troops.

#### **4.1.1 Site location**

Base 1 is situated within the facilities previously occupied by Mogadishu University. The site is located in the western part of the city approximately 3km from Mogadishu International Airport; and approximately 5km northwest of Mogadishu “New Port”, see figure 1. The base is located in the outskirts of the city. It is reported that people are living next to or even within the perimeter of the base. There is no identified industrial activity in the areas neighboring the base.

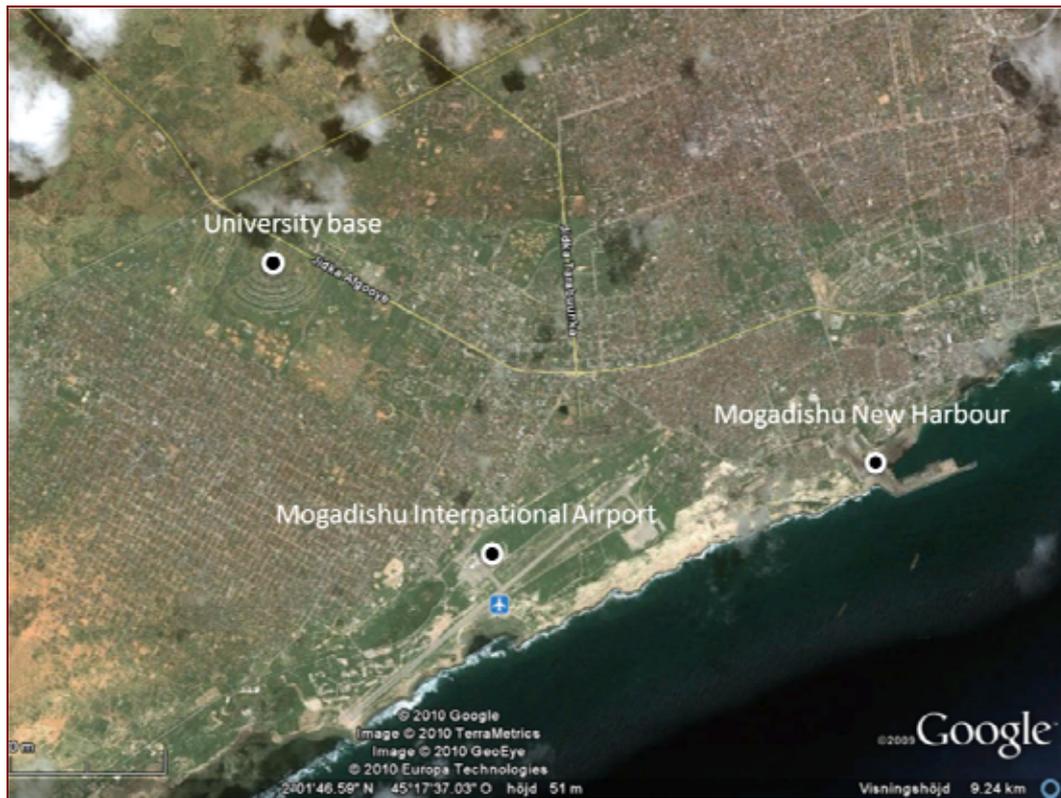


Figure 1: Location of base 1 “University base”.

#### 4.1.2 Site layout

Due to security implications it is not possible to include within this report detailed information regarding the exact location of site facilities. Thus, this information will only be described in terms which will not enable geographical referencing. The total area of the existing compound, including the security perimeter, is approximately 380,000m<sup>2</sup> (38ha).

#### 4.1.3 Buildings/facilities

##### Living/Dormitory accommodation

The troops at the base are accommodated in 86No ten-man tents and 62No three-man prefabs. Officers are accommodated in 2No one-module prefabs, 1No 3-module prefab and 3No six-module prefabs.

### **Office accommodation**

The operational headquarters (OPS-area) on the base is accommodated within 4No three-module prefab structures as well as within existing structures. The offices contain office equipment such as computer servers and communication systems, and are serviced with electricity derived from diesel generators.

### **Hygiene/sanitary facilities**

Sanitary facilities at the camp are currently made up primarily of pit latrines with certain WCs and urinals in existing buildings only available for officers. The planned developments of the base will include installing 18No twenty-foot WC containers. Hygiene facilities will be made up by communal, i.e. shared, field showers and wash basins including 14No twenty-foot shower containers, fitted with solar thermal water heaters as well as 6No twenty-foot and 4No ten-foot standard containers containing wash basins, all fitted with solar thermal water heaters.

### **Storage/holding areas**

There is a large open holding area at the compound which is complemented with roofed storage facilities consisting of 15No twenty-foot containers where goods entering the base are stored. There is also a separate ammunition storage area consisting of five modified sea containers.

There are currently no designated storage facilities or other arrangements for HAZMAT,

### **Vehicle wash area**

There is a designated vehicle wash area planned for the base; however there are no specifics on the design available. The intended location of the vehicle wash is adjacent to the planned waste water treatment plant.

### **Medical facilities**

There is a 'level 1+' hospital at the site consisting of 9No hard wall prefabs, including a helicopter landing site, which is intended for troops, as well as additional hospital facilities, consisting of 4No tents, for the treatment of civilian patients.

### **Fuel storage/filling stations**

There are 6No 7,500-litre fuel tanks planned to be installed to serve the generators to be located within the service area of the camp, as well as 1No 5,000-liter fuel tank adjacent to

the back-up generator planned within the OPS area. Included in the design of the fuel storage area within the service area are also two “retainer basins”, however no specifics on the design are available.

There is a designated area, “the fuel point”, planned for fueling vehicles. There is currently no information available on any spill containment arrangements. Currently the base gets its fuel supplied from within the country; however no details are available on exact source or supplier.

### **Kitchen and dining facilities**

There are simple facilities for cooking currently operated on the site; however there are no specifics available. Included in the planned upgrade of the camp are 3No 100-man kitchen and two storage/freezer modules. The planned dining area will be made up of 8No 3-module prefab structures.

While food had been sourced locally in the past, the majority of it is currently supplied by UNSOA from Kenya. Some bottled water is reported to be provided from the local market.

### **Laundry facilities**

There is a laundry module at the camp; however no specifics are available about its design.

### **Workshops**

There are designated repair and maintenance facilities, two warehouses and a hangar, contained within the service area of the camp. It has been reported that spill containment or management arrangements are absent or very limited.

#### **4.1.4 Power supply**

Electrical supply will be provided through on-site diesel generators. The current capacity is not known, however the planned development of the camp will include 4No 750KVA generators located within the service area as well as an additional 125KVA generator at the OPS area, to provide additional back-up. Currently charcoal is used for cooking, with a large storage existing at the base. However, it has been stated that the use of charcoal would be expected to be phased out as the base is developed.

#### **4.1.5 Water supply**

The main water demand on the base is for hygiene purposes (i.e. field showers and wash basins) as well as vehicle washing. The municipal water supply network is not operational, instead all the water used at the base, both potable and non-potable, is abstracted from an on-site borehole, except a very limited volume of potable water which is sourced in the form of commercially bottled water from the local market. There are currently no specifics available on the well or the abstraction rate.

The potable water is pretreated and chlorinated and the hygiene water is just chlorinated. Potable water storage is in a 10m<sup>3</sup> containers, hygiene water is stored in 8No 20m<sup>3</sup>, and 4No 10m<sup>3</sup> containers. There is also a pool for fire water storage. Distribution practices within the base are not known.

#### **4.1.6 Waste generation and disposal**

##### **Solid waste**

The solid waste produced at the base include non-biodegradable and non-hazardous waste such as office consumables, empty water bottles, miscellaneous packaging materials including cardboard, paper, plastics and timber, and electrical waste. There is also organic, biodegradable, waste produced at the kitchen and dining facilities, which comprises mainly food waste.

The solid waste is collected in bulk and it is either disposed at a “disposal yard” within the secure perimeter or burned. There are no further specifics available on the design or procedures for the burning/incineration or the disposal yard.

There is no information on any efforts to segregate the solid waste stream and there is hence a potential for hazardous materials to be present given the activities undertaken on the site in workshops and field hospitals for example. No attempts on detailed characterization have been made on any of the waste streams.

Notice has also been given on a planned off-base landfill site adjacent to the sea. It is intended that the landfill will be constructed in the secure area within the airport complex. The long term design plans will include facilities for the disposal of hazardous wastes.

## **Wastewater and sludge**

The site is not connected to any municipal sewerage system.

At the planned new base camp layout all wastewater being produced, including black water from WCs and grey water from hygiene/ablution, kitchen and laundry facilities, will be treated in on-site treatment/septic systems. These treatment units will be distributed to different facilities at which wastewater is generated, with some facilities sharing a single septic system. The final effluent from each septic system will be infiltrated in soakaway systems, which will be located adjacent to each septic unit. In total there will be 6No 100-man septic tank/soakaway systems located on the base site.

Two larger, centralized, wastewater treatment plants are intended to be installed at the base and are intended to coincide with the planned upgrade of the sanitary and hygiene facilities which will result in increased wastewater generation rates. There are no specifics on type or scale of the planned treatment works.

Sludge generated in pit latrines and septic tanks are currently untreated and disposed by burying it at the “disposal yard”.

## **Surface Water Run-off**

There are only very limited drainage arrangements installed at the base to collect surface water run-off from rain, general domestic cleaning as well as washing of vehicles. There is no information available on any specifics or on the final recipient of the run-off.

## **Hazardous waste**

Hazardous waste will include decommissioned/damaged vehicles and equipment, used motor vehicle batteries and waste oils from the workshops. Offices and operation of other facilities will also produce minor volumes of hazardous waste such as batteries for example. There is currently no detailed information on HAZMAT quantities or volumes established. As mentioned previously the solid waste produced on-site is currently not segregated which means that there is a risk that hazardous waste will be mixed with the solid waste stream.

Because of the lack of treatment capabilities within Somalia there are plans for shipping hazardous waste to Kenya, using the established logistics chain for bringing in supplies through UNSOA, for final treatment and disposal in Nairobi where contractors with adequate facilities are available. Awaiting such arrangements the waste is stored in the open, uncovered with no proper spill containment facilities in place for safe storage.

## **Clinical waste**

Clinical waste is produced at the two hospital sites within the compound. The waste is said to be burned; however there are currently no specifics on the collection arrangements or any designs of incineration facilities.

### **4.1.7 Possible sources of pollution**

AMISOM activities on the site that may cause pollution include:

- Hazardous waste storage
- Fuel storage and use.
- Inappropriate waste management and disposal routines.
- Liquid waste production and disposal (e.g. waste arising from septic tanks).

It is not known if spill prevention kits are available at the base, or if available, whether they are appropriately located and whether staff at the site have received appropriate training on how to use the equipment.

### **4.1.8 Emissions**

Solid waste has been reported to be burned on the base. As these potentially contain hazardous material including clinical waste (due to improper waste segregation routines) noxious fumes and/or hazardous fumes, which are easily spread by wind, could be generated from such activities.

The use of heavy diesel vehicles and generators within the camp will result in emissions of carbon monoxide, nitrous oxide, and possible oxides of sulphur. The use of vehicles is also likely to result in the generation of dust.

### **4.1.9 Noise and vibrations**

The major source of noise and vibrations related to the operation of the base will be from the use of heavy vehicles and machinery. In the absence of detailed information regarding the frequency of use and the type of heavy vehicles and machinery it is not possible to accurately evaluate the level of impact (such information is classified). Furthermore, it is considered that when applied to the context of actual military operations the impact arising

from machinery and vehicle use would be short term with an intensity relevant to the duration of the military operation.

#### **4.1.10 Construction process**

Construction on the site is ongoing. The new establishments related to the planned upgrade of the base will as much as possible make use of existing facilities, which includes renovating existing buildings at the site as well as existing road ways. Many of the new facilities will also be made up of prefabricated structures limiting construction on-site; however, there will still be a need for extensive civil works to prepare the site including site clearance and construction of hard standings. These works will result in vegetation being physically removed from the site. The works will include the construction of a perimeter security belt comprising a berm, partly constructed of sand filled bastions, a ditch and a 50m buffer area cleared from any scrubs.

General construction materials are reported to be mainly sourced locally and transported by local subcontractors directly to the site. There is no information available on management of construction waste.

#### **4.1.11 Liquidation process**

Following liquidation of the bases the infrastructure will be passed to the Government of Somalia. According to standard UN procedures, the hand-over should be preceded by a camp liquidation process, including an on-site contamination survey where the final condition of the site will be assessed to determine the extent of damage, if any, as well as any potential environmental and health and safety concerns. In case of any hazards these will be safely removed

## **4.2 Base 2, “Military Academy Base”**

The base currently accommodates 750 troops; however the expansion of the operation is expected to increase the troop count to 1,000. The main activities and facilities at Base 2 will be identical to those at Base 1 described in the previous sections. However, Base 2 will occupy a significantly smaller area of 200 000m<sup>2</sup> (20ha) compared to Base 1.

#### 4.2.1 Site location

Base 2 is located in the western part of the city approximately 4km north of Mogadishu Airport, approximately 4,5km northwest of Mogadishu “New Port” and approximately 2km northeast of Base 1. The base is located in the outskirts of the city; however settlements around the base are common. It is reported that in some areas people are living within, or next to, the perimeter of the base.



Figure 2: Location of base 2 “Military Academy base”.

#### 4.2.2 Site layout

As described previously, security reasons prevent the inclusion of a site layout of the base showing the location of the facilities within the compound.

#### 4.2.3 Buildings/facilities and infrastructure

As already mentioned, the planned facilities for Base 2 are almost identical to those described for Base 1, the University base. Thus, please refer to section 4.1.3 for facilities information. The only 2 differences that apply to Base, the Military Academy base, include a

smaller dining area of 4No 3-module prefabs and that all office accommodation as well as laundry facilities will be located within existing buildings.

#### **4.2.4 Power supply**

Same as for University base, see section 4.1.4

#### **4.2.3 Water supply**

Water supply at the base will be provided by an on-site borehole or by taking water from the University base borehole.

#### **4.2.5 Waste generation and disposal**

Same as for University base, see section 4.1.6

#### **4.2.6 Possible sources of pollution**

Same as for University base, see section 4.1.7

#### **4.2.7 Emissions**

Same as for University base, see section 4.1.8

#### **4.2.8 Noise and vibrations**

Same as for University base, see section 4.1.9

#### **4.2.9 Construction process**

Same as for University base, see section 4.1.10

#### **4.2.10 Liquidation process**

Same as for University base, see section 4.1.11

## **5 Description of the receiving environment**

This section presents a brief description of the environment surrounding the two base camp sites. The relatively close proximity of the two bases allows for the main contents of this description to apply to both sites with differences noted where relevant. The description will include aspects affecting ecological, human as well as the physical environment. The description is based both on desk based studies and consultations with DPKO/UNSOA staff. No on-site evaluation was possible due to local security conditions. The description will focus on issues of particular concern to the environmental assessment and information that has not been available to the assessors at the time of this assessment affecting the evaluation will be noted.

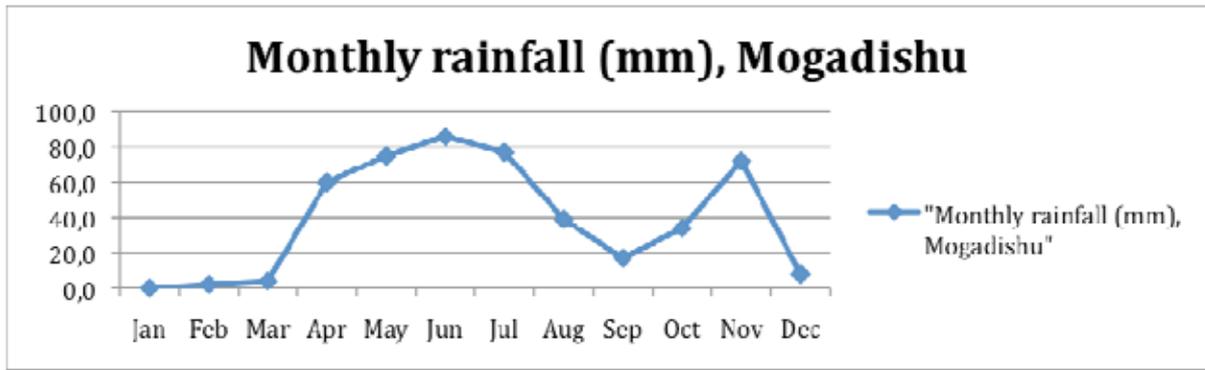
### **5.1 Physical environment**

#### **5.1.1 Climate**

Mogadishu is located in a semi-arid to arid climate with extremely low, variable and often unreliable rainfall patterns<sup>1</sup>. The mean average annual rainfall within the catchment area is 358mm, while rainfall within Mogadishu is approximately 300mm, slightly below average. There are two rainy seasons, the main one occurring between April and June, known as “Gu”, making up an average of 52% of the total annual rainfall, and the second between October and November, known as “Deyr”, with approximately 28% of the total annual rainfall, see figure 3. The annual potential evapotranspiration in Mogadishu is approximately 1,631mm.

The first dry season, known as “Xagaa”, normally lasts from July to September with limited showers along the coastline, but is in general dry and relatively cool. The second dry season, known as “Jilaal” and lasting from January to March, is dry and hot with very limited rain. Humidity is constant throughout the year at between 75% to 80%.

In Mogadishu, the average wind speed is relatively low varying from 3 m/s to 5 m/s over the year. On average the lowest values of wind speed occur during the months of April and November, coinciding with the peaks of the two rainy seasons. In the eastern coastal areas of the Central Coastal basin, the mean temperature is cooler than the inland and northern coastal regions and is more or less constant between 25°C to about 28°C throughout the year.



### Mogadishu

Weather Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Monthly Rainfall(mm)	0,0	2,0	4,0	60,0	75,0	86,0	77,0	39,0	17,0	34,0	72,0	8,0
Mean Temperature(°C)	26,6	26,8	28,0	28,5	27,6	26,6	25,8	25,6	26,1	26,9	26,8	26,7
Minimum Temperature(°C)	23,0	23,3	24,8	25,5	24,8	23,6	23,0	23,0	23,3	24,2	24,1	23,5
Maximum Temperature(°C)	30,1	30,1	30,8	32,1	31,1	29,5	28,5	28,5	29,3	30,1	30,5	30,6
Monthly PET(mm/month)	151,9	145,6	167,4	159,0	155,0	132,0	133,3	142,6	144,0	155,0	147,0	151,9
Monthly Windspeed(m/s)	4,8	4,5	4,0	3,0	3,7	4,4	4,6	4,6	4,2	3,4	3,4	4,2

Figure 3: Distribution of monthly weather parameters including precipitation, temperature, PET and wind speeds in Mogadishu<sup>2</sup>

#### 5.1.2 Geology, Soils and drainage

Existing data on the aquifers and groundwater systems in Somalia is old and scarce, and no detailed, site specific, information could be sourced for either of the camp sites.

Mogadishu is located in coastal lowland, with average elevation of only nine meters above the sea level and extensive flat areas rising gently from the sea level and inland. Mogadishu is part of the “central coastal basin” which is mainly recharged through direct rainfall. The coastal belt where Mogadishu is located comprises a variety of rocks including limestone, sandstone, marls and clay, sand, coral limestone, and sandstones, as well as a wide system of coastal sand dunes with the soil closest to the shore being pure loose marine sand. Permeability of the soils is generally high. The low rainfall within the catchment basin, of which only 5% infiltrates due to losses through high evapotranspiration, makes for very low recharge rates<sup>3</sup>

The flat area together with the generally high permeability of the soil makes the area vulnerable to ground water contamination. The depth to the groundwater at the sites is also

expected to be quite shallow (10-15m), hence increasing the ground water vulnerability. Local variations could occur; hence caution is advised when using the information and site specific assessments are recommended.

### **5.1.3 Existing contamination**

According to data retrieved from UNSOA no obvious signs of major on-site contamination have been observed.

### **5.1.4 Water resources**

Ground water is the only currently available source of fresh water in Mogadishu. Due to over-extraction and an inability of the natural system to sufficiently regenerate the aquifer, salt water intrusion has become a major problem in large parts of Mogadishu. In a study conducted by IRCR in 1997<sup>4</sup>, wells used by local water vendors in the district were investigated. This revealed that only wells located 3km or further inland were used as the level of salinity in ground water extracted nearer the coast was considered unacceptable by local residents for potable use.

Conductivity, a measure of the presence of salt in water, in a relatively large number of wells throughout Mogadishu was also analyzed confirming contamination by seawater. When presented geographically, the extent of salt water intrusion can be clearly illustrated, see figure 4. In the south west of Mogadishu, in the region in which both the Airport and University bases are located, salt water intrusion levels can be seen to be especially extensive. It should be noted that the figures are from 1997 and might not therefore correctly represent the current situation. However, the situation is assumed to be worse rather than better but an updated study is required to confirm this.

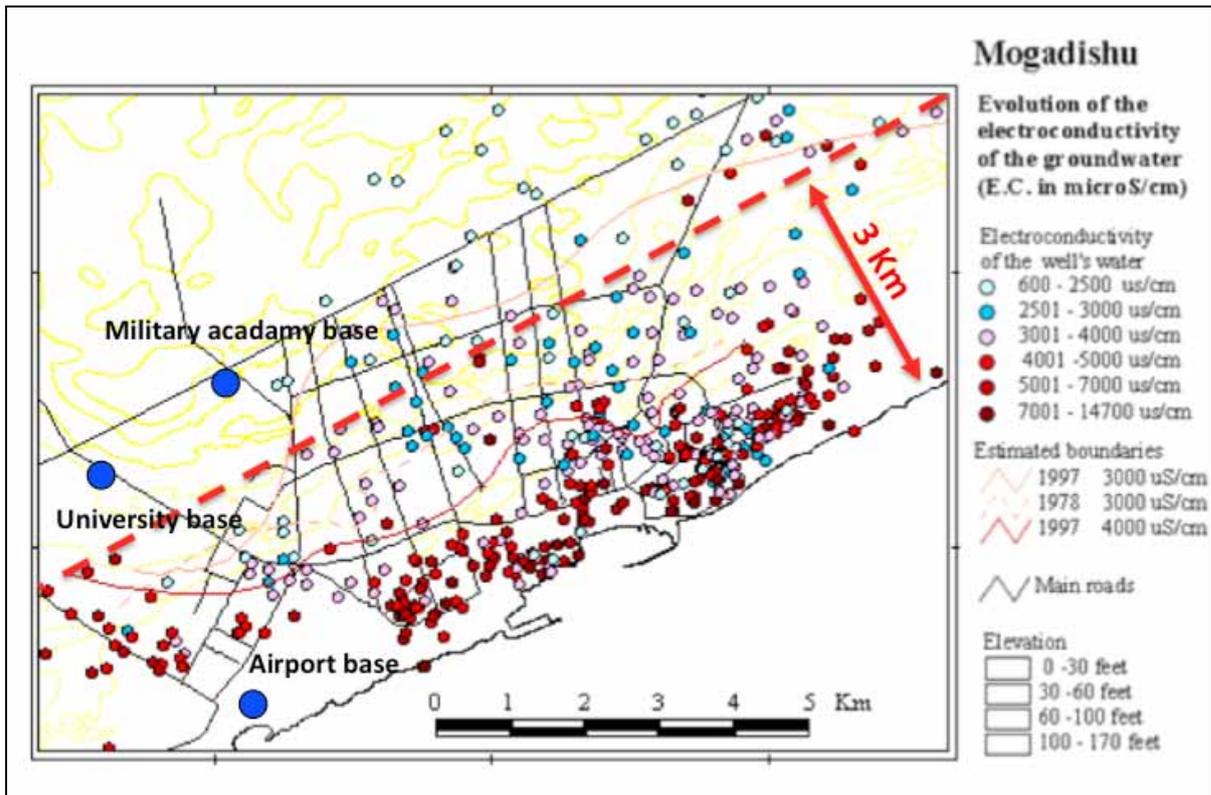


Figure 4: the figure illustrates the extent of saltwater intrusion in Mogadishu wells. The information is from 1997 and it is expected that the contamination has progressed even further<sup>5</sup>

### 5.1.5 Noise

The noise profile of the area where the two camps are located is one dominated by the movement of heavy vehicles. However, the overall sensitivity of the areas surrounding the sites with respect to the impact of noise emissions is low when compared to the noise generated by the conflict.

### 5.1.6 Air quality

Most formal industrial and commercial activities in Mogadishu have been interrupted due to the current conflict. The overall sensitivity of the areas surrounding the sites with respect to the impact of air emissions is low in the context of a conflict setting.

## 5.2 Human environment

The humanitarian situation in Somalia is reported to remain critical. The battles in Mogadishu and the south and central parts of the country have raised the number of internally displaced persons (IDPs) to 1.5 million people. Due to the tense security situation there are a limited number of organizations and non-governmental organizations (NGOs) that are operating in

the country.<sup>6</sup> The outlook for peace in the near future in Mogadishu is diminishing which has caused many of the refugee camps in Somalia to become permanent.<sup>7</sup>

Due to the security situation in Mogadishu it has not been possible to conduct an on-site socio-economic survey. The information in the section below is based on information collected from interviews with a Mogadishu UN staff member, UNSOA staff members, reports and articles. The information should be seen as a snap-shot of the socio-economic situation for the new camp areas. In order to evaluate these aspects in detail more information from the field is needed.

### 5.2.1 Demographics

Very limited recent information concerning the demographics of the region could be sourced. During the past decade there have been large numbers of people leaving the central urban areas of Mogadishu due to deteriorated security conditions. Large numbers of civilians do however remain in the outer regions of the city. A significant number of these inhabitants in Mogadishu are living in informal settlements some of which are located close to both bases<sup>8</sup>, see figure 5.

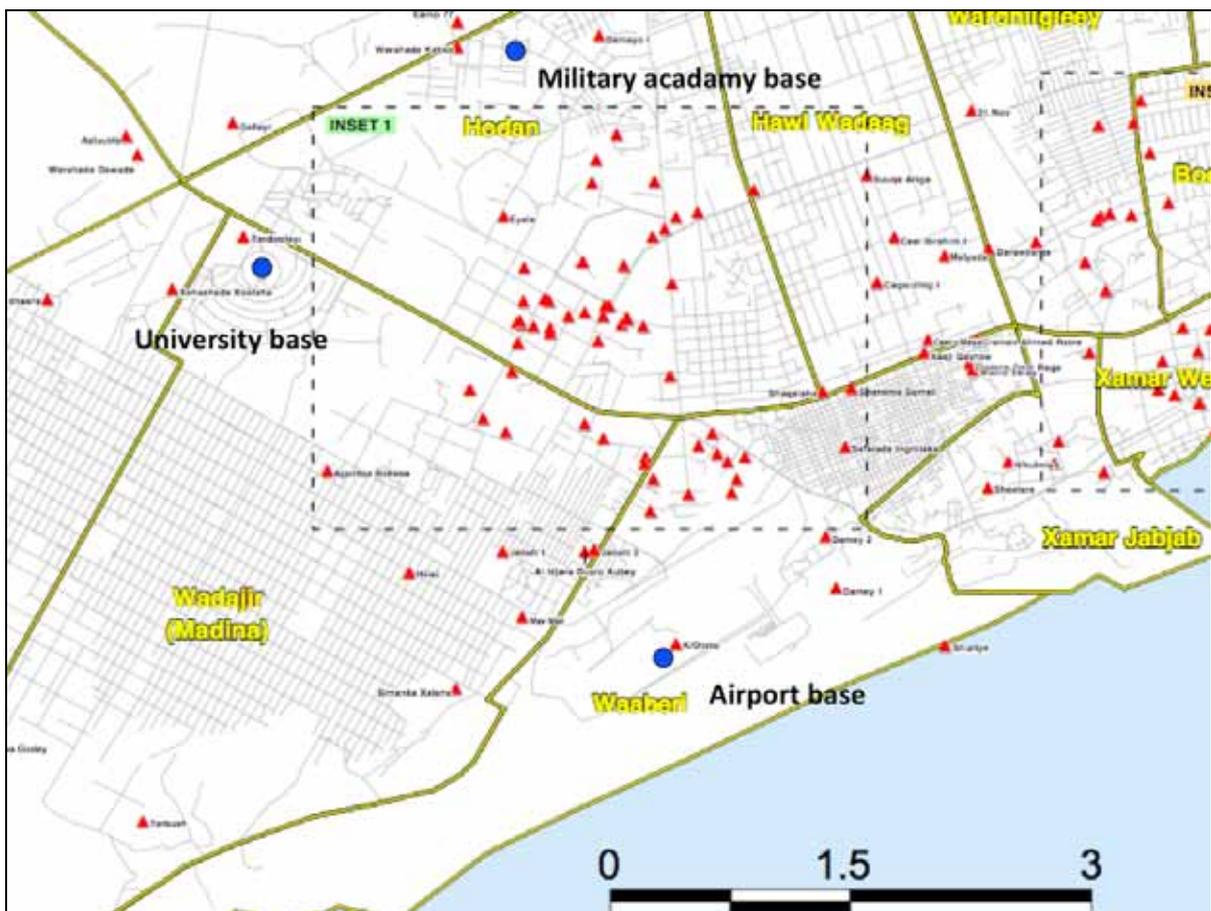


Figure 5: The figure illustrates the locations of the main IDP camps within Mogadishu. As can be seen in the figure several camps are indicated to be located very close to the two bases<sup>9</sup>

Settlements located in the immediate surroundings of both bases have also been reported to be common, also in some areas people are living immediately next to, or within, the perimeter of a base.

There have also been indications that the bases do attract people such as those seeking medical care, employment opportunities or perceived improved security conditions.

People who have fled the city also seem to be returning despite the deteriorated security conditions and heavy fighting<sup>11</sup>. However, the current state is not known but indications still show that over the past years the population has been increasing. The region of Mogadishu reported to receive the largest number of returnees is Hodan, which has received 890 IDPs since 1 February 2010. Coincidentally, Hodan is also the region in Mogadishu where both AMISOM bases are located, see figure 5<sup>12</sup>. Figure 6 contains a summary of key demographic data for Mogadishu<sup>13 14</sup>.

<b>Population</b>	<ul style="list-style-type: none"> <li>- 9 832000 10</li> <li>45% (male 2,215,331/female 2,204,503)</li> <li>52.6% (male 2,588,356/female 2,579,737)</li> <li>- Ages 0-14 years</li> <li>15-64 years</li> <li>- Mainly nomads and semi-pastoralists</li> </ul>
<b>Livelihoods/ economic activity</b>	<ul style="list-style-type: none"> <li>- Agriculture counting for 40 % of the total GDP</li> <li>- Export commodities: Livestock, hides, charcoal, bananas. fish</li> </ul>
<b>Refugees/IDP number (as of January 2010)</b>	<ul style="list-style-type: none"> <li>- Refugees 1815</li> <li>- Asylum seekers 24 668</li> <li>- IDP's 1 550 000</li> </ul>
<b>Medical care</b>	<ul style="list-style-type: none"> <li>- Infant mortality 109.19 deaths/1,000 live births (world ranking no 6)</li> <li>- Life expectancy 49.63 years</li> <li>- Fertility rate 6.44 born/woman (world ranking no 4)</li> <li>- Major infectious diseases: diarrhea, hepatitis A and E, typhoid fever, dengue fever, malaria, Rift Valley fever, rabies</li> <li>- HIV prevalence 0.5 % 2007 (world ranking 74)</li> </ul>
<b>Religion</b>	<ul style="list-style-type: none"> <li>- Sunni Muslim</li> </ul>
<b>Ethnic groups</b>	<ul style="list-style-type: none"> <li>- Somali 85 %</li> <li>- Bantu and other non-Somali 15 %</li> </ul>
<b>Language</b>	<ul style="list-style-type: none"> <li>- Somali</li> <li>- Arabic</li> <li>- Italian</li> <li>- English</li> </ul>

**Figure 6: Summary of key demographic data on Mogadishu**

### **5.2.2 Socio-economic activity at the base sites**

Local civilian population is reported to be living in close proximity to the perimeter of the bases. They have better access to medical support and a small income from trade with troops. They also benefit from casual employment from the various contracting companies who are appointed to work on projects associated with the military deployment.

With an increase in troop numbers there is a high likelihood that any itinerant population (or indeed IDP camps) will be displaced – paradoxically the security of the people living close to the camp area is both enhanced and threatened by that proximity as attacks on AMISOM may harm them.

As mentioned earlier there are many traditional conflicts linked to water scarcity. The local population is seriously affected, especially vulnerable groups such as women and children, who easily become targets for attacks as they have to walk long distances to collect water. Rape and abuse is commonly occurring and many people are already seeking protection close to the AMISOM camp sites.

IDPs are vulnerable and have very limited economic opportunities and could be dependent on the AMISOM camp for security and medical treatment. Negative social impact such as prostitution and spreading of sexually transmitted diseases are common under these types of circumstances. The presence of military camps and international contractors has a tendency to attract women whose economic opportunities are extremely limited.<sup>15</sup>

#### *Negative impacts*

The camp activities could lead to new job opportunities for men (see below) but leave out women. Prostitution and exploitation are likely to affect vulnerable groups and individuals.

#### *Positive impacts*

The possibility of employment may bring locals closer to the base and offer more opportunities. Local equipment and services are already being purchased for UNSOA projects. Locals sell a variety of cheap products to the troops.

### **5.2.3 Land use**

The bases are located in an urban environment at the outskirts of Mogadishu. Most formal industrial and commercial activities have been interrupted due to the current conflict. No such major ancillary activities have been identified close to any of the bases, which are located in surroundings, dominated by residential or public facilities. As previously described, there are informal settlements hosting IDPs in close proximity to both bases.

The security of the camp perimeter may affect the local use of land and prevent certain activities such as quarrying for building materials for example. Furthermore, AMISOM troops allow civilians to live amongst them, which could result in competing demands for space within the tight confines of the bases.

### **5.2.4 Community infrastructure & services**

#### *Waste management practices*

There are no formal or municipal solid or liquid waste management services or regulatory authorities currently operational in Mogadishu. Furthermore any functioning facilities present are assumed to be in a state of disrepair. Both solid and liquid waste is therefore assumed to be dumped without control by the general public. Human waste is most likely disposed of in simple pits or alternatively by open defecation. Current risk of contamination to soils and water sources is therefore regarded as very high.

There are also no capabilities to safely collect, treat or dispose of any types of hazardous waste in Somalia.

No municipal storm water management system have been identified.

#### **Water supply**

Due to civil unrest and conflict Mogadishu lacks regulatory institutions and operational municipal utilities and there is therefore no access to a conventional water infrastructure including piped supply<sup>16</sup>. There have been facilities present but most of these have been described as abandoned and in a state of disrepair. However, some purification and bottling plants have been reported to be operational. The price of water which normally is supplied in 20-litre containers is very high (around 50 USD cents) and can only be afforded by a minority of the population. Due to a lack of regulatory authorities the quality standard of water is also unknown<sup>17</sup>.

Access to potable and non-potable water is instead heavily dependent on ground water abstracted from private boreholes or hand dug wells from where it is distributed further,

normally by using donkey cart vendors. This situation of uncontrolled and unregulated abstraction relates to the current problems of over extraction and salt water intrusion.

Due to saline water often not being accepted for potable purposes, price of better quality water, which is in increasingly short supply, is likely to rise. Water has been reported to constitute one third of the daily income. This could ultimately force the local population to use unsafe sources of water. Problems with increasing water related health problems have also been reported. Security issues affecting mainly women and children have also been reported in connection with them being forced to travel long distances to collect water, making them vulnerable to assault.

Water has also been identified as one of the country's main traditional sources of social conflict, especially in rural areas. Water scarcity has also been described as one of the major causes of the ongoing civil war<sup>18</sup>. This is also true for the urban context, where increased water scarcity could potentially cause local level conflict.<sup>19</sup>

#### **5.2.5 Sites of archeological and cultural interest**

Both camps are located in already developed areas where the presence of any archeological and cultural sites of specific interest is highly unlikely with the exception of local religious centers including places of worship and graveyards.

### **5.3 Ecological Environment**

An ecological assessment has been performed, based on desk top studies and consultations with key informants, in parallel to the main environmental impact assessment<sup>20</sup> (the full document is found in Appendix 3). The purpose of the ecological assessment was to provide information on the ecology in the region occupied by AMISOM with special emphasis on ecologically sensitive species.

The terrestrial ecological environment is comparable between the bases with minor differences in both flora and fauna.

#### **5.3.1 Flora**

The sites are characterized by low density shrub and grassland vegetation inhabiting the predominantly sandy substratum, typically found in coastal habitats in the region. Although no endangered grass or scrub species are present, they still serve an important role in stabilizing the sand dunes and preventing sand migration. Scattered large to medium sized

trees are also present at both sites. The dominant tree species in the area are Neem tree, Doum palm, *Azadirachta indica* and *Cassia siamea*. The trees serve to provide an important shelter for birds. The Neem tree and Doum palm also have some local significance.

### **5.3.2 Fauna**

There is expected to be a low diversity of terrestrial fauna at the sites due to an absence of abundant grass and shrub habitats.

### **5.3.3 Sensitive environments**

#### **Terrestrial environment**

One issue of major ecological and environmental concern on a national level in Somalia is deforestation related to the production and exportation of charcoal. Charcoal represents one of Somalia's most valuable exports. Although not directly linked to potential local effects on the population of trees at any of the base sites, a contribution to this trade by the use of charcoal as a fuel at the bases could affect populations elsewhere. Effects linked to deforestation and competition of timber resources has been reported to be open conflict between clans in Somalia, involving shoot-outs and mine laying, as well as environmental damage<sup>21</sup>

#### **Marine environment**

Marine environments especially sensitive to impact found along the Somali coast include mangrove forests, coral reefs, beaches as well as seaweed and seagrass beds, all of which provide essential habitats to an array of species and are therefore of direct importance to sustain the aquatic biodiversity along the coast.

The habitats identified to be in the zone of impact from UNSOA activity include coral reefs and beaches as these habitats are found in close proximity to the airport base. The main localities of mangroves as well as seaweed and seagrass beds are more prominent at a considerable distance to the south and north of Mogadishu (several hundred kilometers) and therefore not considered directly threatened by the activities assessed in this report.

The values of healthy coral reefs are numerous. Besides the obvious ecological value of coral reef habitats in that they sustain a high biodiversity of marine organisms and are highly productive in terms of demersal and pelagic fish species, the rock-like structure of coral reefs serve as a natural wave breaker. The rigid, wave-resisting structure of coral reefs therefore

modifies the physical environment, thus creating a wide variety of associated depositional movements.

The coral reefs on the coast of Somalia have suffered significant natural disturbances in the past, including that caused by the recent tsunami in 2004. There could also be a significant damage to the coral reefs as a result of land run-off waste and pollutants, debris, soil, and organic matter particularly near coastal towns, especially Mogadishu. Due to an absence of national institutions, there are no mechanisms to assess the damage to corals by natural hydrological related disasters and human induced activity, and no current plans for their protection could be identified. This emphasizes their current vulnerability and the need to ensure efforts are made to limit any further damage until a full assessment of their current state has been made.

AMISOM's increase in operational activity including the development of the two new bases, although located at a significant distance inland (see figure 4), could contribute to possible disturbance of marine ecosystems. This is due to an estimated increase in logistical activities in, or near, the coastal zone including additional movements of both personnel and equipment/materials between bases and from the harbor (through which all supplies are channeled) as well as the possible use of natural resources as construction materials during development.

The coastal and marine environments in Somalia have been subjected to a variety of pressures lately from several sources, including:

- erosion,
- oil pollution
- waste dumping (including hazardous waste)
- human settlements
- discharge from municipal wastewater due to lack of proper water and sanitation facilities.

The coastal environment in Somalia is also threatened by natural processes occurring such as the 2004 tsunami and the effects of climate change; growing subsistence needs of the population; and increased economic exploitation. The negative impact of these factors is particularly severe close to major urban areas such as Mogadishu where they are concentrated and the risk for cumulative effects is increased.

### **5.3.4 Endangered species**

The coastal environment of Somalia is the habitat for at least three endangered marine species of fauna (excluding coral which has been described above as a habitat rather than a separate species of fauna), the Green turtle, Hawksbill turtle and Dugong. The exact location and state of current populations of either species along the shoreline of Mogadishu could not be confirmed due to a lack of current documented information and studies. The presence of endangered species of turtle is of a particular concern due to the fact that they use beaches for reproductive purposes (burying of eggs in the sand) which is a habitat in close proximity to UNSOA activities. This puts them at risk during certain activities such as sand excavation for construction purposes and heavy vehicular movement on the beach.

## **6 Assessment of impacts and proposed mitigation measures**

### **6.1 Assessment methodology**

The initial identification of activities with a potential to have a significant impact on the local physical, human and ecological environment was performed using a screening matrix, see template 1 in Appendix 1. In this process several criteria were used to allow the significance of each impact to be assessed, including but not limited to: extent, frequency, duration, reversibility, reparability and scale.

The impacts identified during the initial screening were then subject to an extended, more thorough, evaluation. This evaluation included establishment of a rating, on a 1 – 10 scale, for each impact in terms of the level of its significance and the probability of it occurring. In order to make systematic assessments of the significance and probability, templates with defined scales were used, see template 5 in Appendix 1.

This individual rating of each criterion was then followed by a matrix-based assessment where they were weighed against each other to retrieve a final estimation based on local circumstance, see template 6 in Appendix 1.

The result of this assessment is an individual scoring of each impact allowing for comparability between activities (useful when prioritizing mitigation efforts). The assessment of the impacts from each activity is then followed by initial recommendations on mitigation efforts, adapted to local conditions, which are considered necessary to reduce the estimated impact from each activity to an acceptable level.

An additional important aspect, which has been registered during the assessment process, is the quality and/or reliability of the data used during the assessment. The scale ranged from

“no data” (cannot be assessed) to verified on site (high confidence level), see template 7 in Appendix 1. The confidence in the assessment results is directly dependant on the quality/reliability level of the data, which could be retrieved, and this should be taken into consideration when the results from the assessment, presented below, are reviewed. As none of the sites in Mogadishu could be accessed and subjected to on-site studies during the assessment process, the quality and/or reliability of the data used are generally low.

The results of the assessment process are presented in the summary table below.

## 6.2 Assessment results

IMPACTS FROM MOGADISHU AMISOM BASES							
Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
HAZMAT MANAGEMENT	Fuel storage	Lack of spill management facilities at fuel storage sites and filling stations creates a risk for spillage to contaminate subsurface soils and migrate to ground water. An estimated shallow water table at the site elevates risks.	9	6	VERY HIGH	+	<p>All tanks used for POL storage and fuel dispensers should be placed above ground on impermeable and bunded bases with separate drainage arrangements (see below). Spill prevention kits must be made readily accessible, and training in how to use them provided to all personnel.</p> <p>There should also be protection installed against vehicle collisions.</p>
	Handling of goods	Containers used during shipping of goods will contain HAZMAT. The containers (especially during sea transports) have been observed to be in poor condition, often corroded and with signs of physical damage. There have also been observations of fluids leaking from the containers, suggesting a risk for spillage of hazardous substances during transport, on/off loading and storage.	7	4	ELEVATED	++	<p>All goods containing HAZMAT should be stored at a designated HAZMAT storage area conforming to UN specifications.</p> <p>It must also be ensured that proper storage containers designated for Hazmat and POL products are used within the main freight containers during transport and storage.</p> <p>Spill prevention kits must be made readily accessible at all locations where HAZMAT is being stored (main storage area, workshops etc.), and training in how to use them provided to all personnel.</p>

IMPACTS FROM MOGADISHU AMISOM BASES							
Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
WATER SUPPLY	Water resources	The water demand of the bases is estimated to be high compared to ancillary activities and the local recharge rate. Both bases are located in the zone of impact of extensive salt water intrusion caused by already existing over extraction. The bases can potentially contribute significantly to increased levels of salt water intrusion which can affect the bases own water supply as well as the water supply used by the local population. Decreasing availability and increased prices on safe/palatable water might force people (mainly women and children) to seek water of lower quality in potentially unsafe regions. Decreased access might also be a source of social conflict, especially due to an estimated increasing population of IDPs in areas neighboring both bases. Affecting the value/profitability of unpalatable water may have a negative impact on the business of local water vendors which are currently the main distributors of water to the local population. The demand of both bases and of the local population is estimated to increase which further elevates the risks implied.	8	8	VERY HIGH	+	The sustainable yield of the bore hole must be established followed by ongoing monitoring of both ground water levels and quality to detect signs of increasing salinity and decreasing availability. Water conservation, recycling and re-use as well as sensitization measures should be implemented when/where applicable to minimize/avoid wasteful use. Alternative sources of supply should be evaluated.
		Liquid waste management	Septic supernatant	The local ground water table is estimated to be shallow and permeability high. There is therefore a risk that the septic supernatant water, contaminated by fecal matter, which is infiltrated through soakaways, will pollute the ground water aquifer. This will put settlements located immediately adjacent to, and downstream of, the base at risks.	8	7	VERY HIGH
	Sludge removal	Sludge currently being buried poses a direct risk to local water abstraction points in close proximity to the burial site (same as for septic supernatant).		8	7	VERY HIGH	+

IMPACTS FROM MOGADISHU AMISOM BASES							
Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
	Pit latrines	Pit latrines are currently being used to dispose of the majority of human waste at both camps. There is therefore a risk of contaminating the ground water aquifer. This will put settlements located immediately adjacent to and downstream of the base at risks.	8	7	VERY HIGH	+	Same as above.
LIQUID WASTE MANAGEMENT	Drainage/ surface water run-off	Storm water, vehicle washing waste water etc. which has passed over the site, potentially carrying contaminants, is currently allowed to infiltrate on-site without control and pre-treatment. This could result in contaminated run-off water possibly contaminating the ground water and surface water sources off-base potentially used by the local population. Insufficient drainage could also result in ponding of water creating breeding sites for mosquitoes with a subsequent risk for spreading water based diseases such as malaria.	8	7	VERY HIGH	+	<p>Drainage of the site should be done in a way that prevents ponding of water.</p> <p>All the effluents generated should be identified and quantified and designated areas should be appointed for vehicle washing etc. Processes such as slow sand-filtration, percolation, etc. for collected storm water should be implemented where applicable.</p> <p>At a minimum interceptor tanks should be installed for collecting run-off from particularly sensitive activities such as storage areas for chemical products and waste, vehicle washing, lubrication and/or fueling areas. Interceptor tanks should be designed to include oil/water separation as well as a settlement basin, to allow silt, pollutants and rubbish to settle/float out before run-off from the site is discharged outside the camp perimeters. As a secondary precaution the drainage channel should also have containment facilities to allow for spills to be collected in the form of a lined gully. The possibility of distributing the vehicle washing waste water and wastewater from the laundry to the intended WWTPs (Wastewater Treatment Plant) should also be evaluated. Alternatively a separate treatment facility should be provided for.</p>

**IMPACTS FROM MOGADISHU AMISOM BASES**

Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
<b>SOLID WASTE MANAGEMENT</b>	<b>Segregation</b>	The nature of the activities at the bases as well as the lack of waste segregation routines creates an evident risk that hazardous waste is present in the solid waste stream. This poses both a health risk to the personnel handling the waste as well as creating increased risks of ground and surface water pollution when land filled.	8	7	<b>VERY HIGH</b>	+	<p>Hazardous wastes should be segregated out by providing separate collection containers and educating the personnel on how to identify hazardous materials. The separated hazardous waste should be temporarily stored in the HAZMAT storage area and co-shipped with other hazmat for final treatment/disposal at accredited facilities in Nairobi.</p> <p>It is recommended that a UN employee is appointed as a waste coordinator to understand the waste streams arising from the base operations. The coordinator would also be responsible for ensuring that hazardous and non-hazardous wastes are sorted and stored in separate areas.</p>
	<b>Segregation</b>	Biodegradable waste being co-disposed with the general waste stream will elevate the production of leachate and gas with increased risks of pollution of the ground water. The production of landfill gas might also become a security risk if proper ventilation is not provided.	6	5	<b>ELEVATED</b>	+	All disposal sites should be provided with lining and the leachate collected and treated in the WWTP. The landfill should be properly ventilated to allow gas to escape. Possibilities to keep the biodegradable waste stream separate and treating it using composting could be evaluated if/where applicable. The resulting compost could be used as landfill cover material for the resulting waste stream (reduces the need to import such material).
	<b>Disposal</b>	The waste stream to be land filled will contain biodegradable waste i.e. food waste. If sanitary conditions are not provided this food waste will attract, and allow vectors to multiply, potentially spreading disease. This poses a significant health threat to both base personnel as well as to the local population. As IDP settlements, in which the sanitary conditions can be expected to be of a very low standard and where a presence of disease, spread by vectors, is likely, are located in direct proximity to the bases, the risk associated to this issue is elevated.	8	5	<b>HIGH</b>	+	All landfill/dump sites in which food waste is disposed of must be provided with daily cover (sanitary landfill). To prevent vectors from being attracted to and multiply on the site. All collection and storage bins/containers used for food waste must also be provided with lids preventing vectors from gaining access.

IMPACTS FROM MOGADISHU AMISOM BASES							
Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
SOLID WASTE MANAGEMENT	Burning	The solid waste stream in both camps has also been reported to be burned. A description of the facilities in which this takes place was not provided. If proper flue gas treatment and bi-product disposal is not provided this can be a significant health risks to both base camp personnel and the local population. This is of special concern due to an identified lack of segregation of hazardous material before final disposal.	7	7	VERY HIGH	+	All hazardous waste must be segregated from the main solid waste stream prior to final disposal. Proper incineration facilities operating at sufficient temperatures to properly combust flue gases and reduce bi-product volumes should be provided for.
	Construction/ demolition waste.	The development of both bases will include construction and/or demolition which potentially can result in the generation of large quantities of waste. Demolition waste can be potentially hazardous, e.g. containing asbestos, putting both workers, the environment, and the local population at risk if not properly managed.	4	4	LOW	+	An analysis of the types and hazard level of the waste which will be generated mainly during demolition work of current facilities should be done prior to any such activities being started. An evaluation on suitable disposal sites and possibilities of recycling waste fractions (e.g. in bastions etc.) should be evaluated.

IMPACTS FROM MOGADISHU AMISOM BASES

Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
HAZARDOUS WASTE MANAGEMENT	Management	The relatively large volume of hazardous waste, including that which will have to be separated from the bases own waste streams, will be stored on-site prior to it being transported back to Kenya for final treatment. There are no current safe storage areas for this waste making this a significant risk for contamination of soils, groundwater and surface water courses during transport, on/off loading and storage.	9	7	VERY HIGH	+++	<p>All hazardous waste should be stored at a designated HAZMAT storage area, located far from any main drains, conforming to UN specifications (impermeable bases, bunding, fencing and ideally also have a covering to protect from sunlight and prevent pollution migration caused by storm water run-off).</p> <p>Hazardous waste stored at the HAZMAT storage area should be segregated into common themes (e.g. oily wastes, batteries, paints etc) and not mixed.</p> <p>Care should be taken to follow requirements stipulated in the Basel convention on the transboundary movements of hazardous waste when such waste components are shipped back to Kenya for final treatment/disposal.</p> <p>It must also be ensured that proper storage containers designated for Hazmat and POL products are used within main freight containers during transport and storage.</p> <p>Spill prevention kits must be made readily accessible at all locations where HAZMAT is being stored as well as during transport, and training in how to use them provided to all personnel including drivers.</p> <p>Prepare a spill response plan, to establish the procedures to be followed in the event of a spill. Identify the emergency response members and establish their roles, resources, and concerns. The plan should be distributed to key personnel identified in advance with chemical accident management responsibilities.</p>

IMPACTS FROM MOGADISHU AMISOM BASES							
Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
VEHICLE MOVEMENTS	Noise and vibrations on-base	High levels of lorry movements, especially in on/off loading areas, result in increased health risks for base personnel working in close proximity for extended periods of time.	3	4	LOW	+	Introduce efforts to reduce empty driving, e.g. through on-base restrictions.
	Traffic security	The access route to the bases passes through densely populated residential areas to which the AMISOM activity will significantly contribute in heavy traffic loads. This will therefore also affect the current traffic safety situation in these areas. The transport of hazardous material increases such risks.	5	5	ELEVATED		Further assessment of the receiving environment along, and the condition of, the access route is recommended. It is also recommended that properly maintained vehicles and trained operators are contracted.
	Biodiversity and endangered species	Vehicular movement on beaches could seriously damage nests used by certain endangered species of turtle for reproductive purposes.	8	5	HIGH	+	If accessed for recreational purposes the beach should be accessed on foot only as this will not harm nest sites to the same extent. Restrictions in vehicular movements on beaches should be introduced and information about the possible presence of endangered species spread.
ENERGY SUPPLY	Natural resources	The bases are currently using charcoal to supply a substantial part of their fuel needs for cooking. They therefore contribute to a critical situation of deforestation in Somalia which is having very detrimental environmental effects. As the AMISOM contribution to this trade is of a relatively small scale the significance of the impact is reduced but is still to be regarded as important.	6	5	HIGH	+	Efforts to phase out charcoal in favor of other fuels should be implemented immediately.

IMPACTS FROM MOGADISHU AMISOM BASES							
Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
IMPORT OF MATERIALS/EARTH MOVEMENT	Biodiversity and endangered species/Fauna	Any excavation of sand from beaches, including the use of heavy machinery and vehicles during such activities, could seriously damage or destroy nests used by endangered species of turtle for reproductive purposes. The removal of grass and shrubs of beach fringes to excavate sand could also result in increased erosion surface/storm water run-off levels and increased pollution of marine ecosystems including coral reefs.	8	5	HIGH	+	The excavation of sand from beaches should be prohibited and instead sourced from less sensitive sites elsewhere. The source of sand supplied by local contractors should be investigated.
	Socio-economic	The camp activities could lead to new job opportunities for men (see below) but leave out women.	5	5	ELEVATED	+	In order to involve the local society as much as possible (men and women) and to create new job opportunities it is recommended that an action plan is created for this particular purpose. If possible there should be special focus on the recruitment of women. In order to evaluate these aspects in detail more information from the field is needed.
LAND USE	Land use	The upgrade of both bases will require an extension of the security perimeter and the installation of security barriers (e.g. bastions). This will result in people currently living directly next to or within the current perimeter having to be relocated. This poses evident risk to these people because of the current security situation and dire living conditions.	5	3	LOW	+	Efforts should be made to ensure that people having to be relocated can do so safely (consideration should be given to the local security situation).
OTHER	Recreational activities	During recreational activities such as swimming at the beach, there is a risk for coral, which is very sensitive to being touched or stepped on, to be critically damaged.	5	5	ELEVATED	+	If possible recreational activities such as swimming should be done away from areas inhabited by coral. Information about the sensitivity of coral and the importance of not subjecting it to touching or trampling should be provided prior to arranging any such activities.

**IMPACTS RELATED TO THE MOGADISHU AMISOM AIRPORT BASE AND THE MARINE ENVIRONMENT**

Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
<b>VEHICLE MOVEMENTS</b>	<b>Boat movements</b>	Increased boat movements can cause destruction of fragile coral reef species resulting in death and loss of biodiversity through boat anchorage, possible oil spills/leakages, increased sedimentation (by water churning).	5	3	LOW	+	Reduce boat traffic and anchoring to the extent possible in sensitive areas.
<b>LAND USE</b>	<b>Site clearance</b>	Site clearance from base expansion might loosen soil sediments which may enter the marine environment via run-off caused by storm water with possible smothering of corals and sea grasses (if present). The presence of the airport strip separating the base from direct access to the shoreline might reduce the probability of sediments reaching shore. Risks are elevated due to the possibility of flash floods and the possibility of high intensity rains, especially in any of the two rainy seasons (see climate info under paragraph 5.1.1 above).	6	6	HIGH	-	No data on the drainage arrangement or the topography of the airport site could be sourced for this assessment. General mitigation efforts if conditions are unfavorable would however include stabilization of the exposed slope surfaces through re-vegetation and/or concrete impoundments. Site clearing should also be phased with consideration of the rainy seasons. Regular monitoring to detect potential cave-ins and local drainage mechanisms is also recommended.
<b>WASTE MANAGEMENT</b>	<b>Solid waste management, collection and storage</b>	Solid waste generated during both construction and operation of the base may be released and spread to the marine environment (e.g. by wind) with possible adverse impacts to the respective habitats if not properly collected and stored. Plastics (soft plastics) pose a significant risk to turtles, which are known to mistake them for jellyfish, which is part of their normal diet, causing them to suffocate and die. This effect is elevated due to there being endangered species of turtle in the waters outside Mogadishu.	5	5	ELEVATED	+	All waste, soft plastics especially (as they are easily spread by wind and most easily mistaken for jellyfish) should be collected and stored in sealed bins to prevent them from ending up in the sea. This includes frequent covering of any waste disposal sites.

**IMPACTS RELATED TO THE MOGADISHU AMISOM AIRPORT BASE AND THE MARINE ENVIRONMENT**

Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
<b>WASTE MANAGEMENT</b>	<b>Hazardous waste management, segregation.</b>	<p>The nature of the activities at the bases as well as the lack of waste segregation routines creates an evident risk that hazardous waste is present in the solid waste stream. This poses both a health risk to the personnel handling the waste as well as creating increased risks of ground and surface water pollution when land filled.</p>			<b>VERY HIGH</b>	+	<p>Hazardous wastes should be segregated out by providing separate collection containers and educating the personnel on how to identify hazardous materials. The separated hazardous waste should be temporarily stored in the HAZMAT storage area and co-shipped with other hazmat for final treatment/disposal at accredited facilities in Nairobi.</p>
		<p>There is also information that the waste is planned to be land filled in a disposal site in very close proximity to the sea shore. Although stated to be constructed to UNSOA standards, the risks implied are considered very high due to the sea shore being classified as a very sensitive environment and because it would be located right at the groundwater/seawater interface where permeability of the soil also has been identified to be very high. This puts the marine ecosystem at significant risk.</p>	9	7			<p>It is recommended that a UN employee is appointed as a waste coordinator to understand the waste streams arising from the base operations, the coordinator would also be responsible for ensuring that hazardous and non-hazardous wastes are sorted and stored in separate areas.</p> <p>An alternative disposal site for the waste is strongly recommended to be sourced even if improved routines for waste stream management are introduced, the engineered standard for the landfill is high (including lining and daily covering as well as leachate and gas collection and treatment), and stringent monitoring of especially the ground water is introduced. A breach in the containment and release of contaminants would have to be immediately taken care of due to its location. This would be very resource intensive and costly.</p>

**IMPACTS RELATED TO THE MOGADISHU AMISOM AIRPORT BASE AND THE MARINE ENVIRONMENT**

Activity		Description of impact	S	P	Impact rating without mitigation	Quality/reliability of data	Recommendations/Mitigation
<b>WASTE MANAGEMENT</b>	<b>Segregation</b>	Biodegradable waste being co-disposed with the general waste stream will elevate the production of leachate and gas with increased risks of pollution of the ground water. The production of landfill gas might also become a security risk if proper ventilation is not provided.	6	5	ELEVATED	+	See above.  All disposal sites should be provided with lining and the leachate collected and treated in the WWTP. The landfill should be properly ventilated to allow gas to escape. Possibilities to keep the biodegradable waste stream separate and treating it using composting could be evaluated if/where applicable. The resulting compost could be used as landfill cover material for the resulting waste stream (reduces the need to import such material).
	<b>Liquid waste management</b>	Sewage and water effluents, if not properly treated prior to disposal, might cause pollution of the marine environment resulting in death and loss of biodiversity; eutrophication and alteration of ecosystem balance. See previous section on impacts from liquid waste for further details.	6	5	ELEVATED	+	See previous section on impacts from liquid waste for further details on mitigations and recommendations on how to limit impact.

IMPACTS RELATED TO SITE LIQUIDATION OF ALL SITES							
Activity	Description of impact	S	P	Impact rating without mitigation	Quality Reliability of data	Recommendations / Mitigation	
<b>SITE LIQUIDATION</b>	Remediation	Any personnel involved with the site remediation process could be posing possible health risk if not properly trained and equipped.	6	5	ELEVATED	-	Any personnel involved with the site remediation must be given proper instructions and equipment ensuring work safety, including safe handling of contaminated material and safe digging in the area.
	Infrastructure decommissioning	If a situation occurs where there is no expressed interest in taking over parts of the mission infrastructure this could pose a potential environmental and/or health risk if not safely decommissioned and the site restored to its original condition. Some considerations of particular importance are included in the recommendations to the right.	6	5	ELEVATED	-	Developed water sources should, if not handed over to local authorities, be de-commissioned by infilling with impermeable materials such as clay (bentonite) to avoid them becoming potential access routes for contamination.  Drainage installed on sites not handed over to local authorities will have to be decommissioned incl. restoring original drainage patterns of the site by replacing soil cover and replanting of vegetation etc. to avoid problems with flooding, stagnant water and erosion.  Developed waste water treatment systems should, if not handed over to local authorities, be decommissioned and waste removed and receive proper treatment
	Infrastructure hand-over	Infrastructure handed over to local authorities could become a health or environmental risk if not properly operated or maintained.	6	5	ELEVATED	-	Ensure that any hand-over of infrastructure to local authorities is preceded with proper documentation and training, as well as adapted to local capabilities, concerning their operation and maintenance so as to avoid them from becoming a health or environmental risk
	Elimination of Environmental Hazards	Remediation and removal of identified health and environmental hazards could pose a risk if the process is not properly planned and organized.	6	5	ELEVATED	-	Based on the findings of the Environmental Liquidation Survey and before any actions are carried out a Close Out Plan should be developed with a description of the methodologies to adopt for safe removal of any remaining environmental hazards.
	Socio-economic opportunities	Liquidation of the base could result in a negative socio-economic impacts due to loss of job opportunities for local population.	6	5	ELEVATED	-	During the liquidation make sure to include socio-economic aspects such as continued job opportunities in the local society. Special effort should be put on including women.

**IMPACTS FROM MOGADISHU AMISOM BASES (POSITIVE EFFECTS)**

<b>POSITIVE EFFECTS</b>	<b>Health/safety/security</b>	<p>The bases are currently providing the local community with safe drinking water as well as some basic medical care as part of efforts to provide humanitarian assistance. The AMISOM presence also protects humanitarian relief shipments making sure that it reaches the beneficiaries. This will have a local positive impact on residents in settlements surrounding the base as well as fostering good relations with the local community. The presence of the camp will also likely improve the general security situation in settlements surrounding the base.</p> <p>The planned expansions of the infrastructure on the bases will improve the security, living quality and conditions of the AMISOM forces ultimately increasing their ability to perform and succeed in achieving the overall goal of the operation.</p>
	<b>Socio-economic</b>	<p>The possibility of employment may bring local population closer to the base and create additional opportunities. Local equipment and services are already being purchased for UNSOA projects.</p> <p>Locals sell a variety of cheap products to the troops</p>
	<b>HAZMAT/Waste management</b>	<p>The planned developments of the bases will increase the ability, if suggested mitigations are implemented as recommended, to better manage solid, liquid and hazardous wastes during the operation, with subsequent reductions of threat to the local environment.</p>

## **7 Conclusions and recommendations**

It was found in the assessment that both proposed sites are located in, and near, areas which are environmentally sensitive. Both are located on top of a vulnerable aquifer, used as an important local source of potable water. There are also sensitive marine ecosystems along the shoreline.

With proposed mitigation efforts however both alternative sites would be acceptable.

### **7.1 Main findings**

The main issues of environmental concern relating to the establishment of the new AMISOM bases in Mogadishu include:

#### **HAZMAT management**

An inevitable consequence of troop deployment is the transportation, use and subsequent storage of materials considered hazardous to health and the environment if handled improperly. The main environmental concern is preventing these from entering the environment through leaks and spills.

In order to detect any current storage or spills of potentially hazardous substances and associated contamination, an environmental baseline study of the sites should be performed. Such study should be conducted prior to commencing AMISOM activities that could alter the baseline conditions. This baseline study would also help to identify any changes in the environmental condition of the site if continuously updated. Such data could also be used as supporting evidence in any future unfounded liability claims.

#### **Landfill at Airport site**

At the Airport site, waste is planned to be land filled at a disposal site in very close proximity to the seashore. Although stated to be constructed to UNSOA standards, the risks implied are considered very high due to the sea shore being classified as a very sensitive environment and because it would be located right at the groundwater/seawater interface where permeability of the soil also has been identified to be very high. This puts the marine ecosystem at significant risk.

An alternative disposal site for the waste is strongly recommended to be sourced even if improved routines for waste stream management are introduced; the engineered standard for the landfill is high (including lining and daily covering as well as leachate and gas collection and treatment).

### **Increased ground water abstraction**

The water resources in the region are “stressed” due to over abstraction and low recharge rates causing salt water intrusion that threatens urban water supply. The comparatively large water demand of the bases compared to the demand of adjacent users has the potential to exacerbate the situation and thereby threaten the long term sustainability of the operation by risking negative impacts on local socioeconomics, and health and safety as well as a possibility to start new or fuel current social conflicts over water resources.

Serious measures should also be taken to reduce consumption - all communal areas should be fitted with low flow mechanisms; water efficient equipment should be used; and efforts made to recycle grey water and harvest rainwater.

### **Sanitary waste disposal**

There is a risk for fecal pollution of ground water sources, through soakaway infiltration from pit latrines, buried septic sludge and septic supernatant water. The issue is of particular concern due to the risk of contamination of water supplying the settlements adjacent to the sites. If not properly covered, sludge as well as biodegradable waste disposed of at camps will allow vectors to multiply, potentially spreading disease.

If not properly treated prior to disposal, sewage and water effluents at the Airport base, may cause serious pollution to the marine environment resulting in death and loss of biodiversity; eutrophication and alteration of ecosystem balance, especially due to the presence of sensitive coral habitats. At this location the risk of a significant impact is considered to be very high.

Efforts should be made to adapt the design of latrines and soakaways so that possible pathogenic contamination of local water supplies is limited. Location is also an important aspect where pit latrines as well as sludge disposal sites should be located downhill and as far away as possible from any local water sources to allow for pathogen die off.

## **Site drainage**

There are currently only minimal drainage arrangements in place to deal with potentially contaminated surface water run-off, including storm water and vehicle washing wastewater, allowing contaminants to infiltrate the ground without control and pre-treatment. This could result in contamination of ground water and surface water sources off-base used by the local population. Insufficient or poorly designed and maintained drainage could also result in ponding of water creating breeding sites for mosquitoes with a subsequent risk for disease spreading such as malaria. Increased surface water run-off due to reduced ground permeability caused by compaction of soils and an increase in impermeable surfaces such as roofs, hardstands and roads as well as reduced retention of water by the clearing of vegetation could also lead to damage to local infrastructure such as drainage systems, roads and building foundations due to flooding, erosion and transportation of debris.

If not properly treated prior to disposal, water effluents at the Airport base may cause serious pollution of the marine environment resulting in death and loss of biodiversity; eutrophication, smothering of coral and alteration of ecosystem balance (especially due to the presence of sensitive habitats).

Drainage of the site should be done in a way that prevents ponding of water. All the effluents generated should be identified and quantified and designated areas should be appointed for vehicle washing and maintenance. Processes such as slow sand-filtration percolation should be implemented where applicable.

## **Import of materials/natural resources**

Discussions with observers indicate that the current troop population compliment conventional messing facilities with the use of local cooking techniques including the use of charcoal, presumably procured locally within Mogadishu. Charcoal production results in deforestation and is energy intensive, producing significant emissions that reduce air quality both to the local population and the user.

The use of charcoal should be prohibited for use by the troops. Adequate provisions are provided for troops in the form of temporary cooking arrangement as well as messing facilities – these should be enforced. Put quite simply there is no excuse for troops to procuring charcoal supporting an industry that encourages local deforestation in an area that is vulnerable to exploitation.

### **Import of materials/earth movement**

Any excavation of sand from beaches, including the use of heavy machinery and vehicles during such activities, could seriously damage or destroy nests used by endangered species of turtle for reproductive purposes. The removal of grass and scrubs of beach fringes to excavate sand could also result in increased levels of erosion and surface/storm water runoff as well as increased pollution levels with a detrimental effect on marine ecosystems including coral.

The excavation of sand from beaches should be prohibited and instead sourced from less sensitive sites elsewhere. Restrictions in vehicular movements on beaches should be introduced and information about the possible presence of endangered species spread. If used for recreational purposes the beach should be accessed on foot only as this will not harm nest sites to the same extent.

## 8. Appendices

### Appendix 1: EIA Templates

#### Template 1: EIA screening checklist

<b>SCREENING CHECKLIST</b>			
DATE:		ASSESSOR NAME:	
		CONTACT INFO:	
SITE NAME/ACTIVITY:		GRID:	
<b>HUMAN ENVIRONMENT</b>			
<p><b>Question: Will the activity involve actions which will cause changes to the human environment or socio-economic conditions in or around the project site?</b></p> <p><b>(POSITIVE AND NEGATIVE EFFECTS/IMPACTS SHOULD BE CONSIDERED WHERE APPROPRIATE)</b></p> <p>IMPORTANT - Consider all distinguishable groups in the society during an assessment on the influence from the indicated factors listed below e.g. can they be affected in different ways? Groups of special interest include women, children, elderly as well as social and ethnic groups of local importance/significance.</p>			
GENERIC	YES/ NO/?	Comment	Is the effect likely to be significant?
<b>DEMOGRAPHICS</b>			
Will the activity cause any changes in the demography on or around the project site? (i.e. influxes of people, induced development and/or re-location of people)			
<b>Economy, living standards and labor</b>			
Will the activity affect the local lifestyle of the people living on or around the project site?			
Will the activity affect housing conditions on or around the project site?			
Will the activity/project affect the local economy and labor conditions/employment levels and quality of employment?			

Material assets			
Will the activity affect the access to or availability of material assets on or around the project area? (e.g. reduced fuel availability due to increased demand or increased access due to improved infrastructure and transport routes)			
Will the activity result in any loss of material assets on or around the project area?			
Health/safety/security			
Will the project have the potential to negatively impact the conflict? (e.g. by reducing the accessibility to natural resources etc.)			
Will the activity involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?			
Will the quality or toxicity of air, water, foodstuffs and other products consumed by humans be affected by the activity?			
Will there be any risk of accidents during construction or operation of the project, which could affect human health or the environment?			
Is the project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present health/safety or security concerns?			
Will the activity affect the occurrence or distribution of disease causing vectors including insects on or around the project area?			
Will the activity affect the vulnerability of individuals, communities or populations (e.g. to disease or the general security situation)?			
Will the activity affect the individuals' sense of personal security on or around the project site?			
Land use, community infrastructure and services (incl. transport)			
Are there existing land uses on or around the location e.g. homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the activity?			

Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the activity?			
Are there any plans for future land uses on or around the location which could be affected by the project?			
Will the activity result in the development, closure or diversion of transport routes leading to changes in traffic movements? (roads, river crossings etc)			
Will the activity affect the infrastructural capacity in or around the project site? (water, sewerage, power generation and transmission, telecommunications, waste disposal)			
Will the activity result in increased transports of materials and people?			
Will the activity affect the access to social institutions?			
<b>Land ownership</b>			
Will the activity affect land ownership issues on or around the project site?			
<b>Sites of archeological and cultural interest</b>			
Are there any areas on or around the location which are protected under international or national or local legislation for their archeological, historic or cultural value/importance, which could be affected by the activity?			
<b>Social issues</b>			
Will the activity affect the cohesion and identity of any communities on or around the project site?			
Will the activity in any way affect minority right on or around the project site?			

<b>PHYSICAL ENVIRONMENT</b>			
<p><b>Question: Will the activity involve actions which will cause physical changes in or around the project site?</b></p> <p><b>(POSITIVE AND NEGATIVE EFFECTS/IMPACTS SHOULD BE CONSIDERED WHERE APPROPRIATE)</b></p>			
GENERIC	YES/NO/?	Comment	Is the effect likely to be significant?

NATURAL RESOURCES			
Will the activity require natural resources such as land, water, materials or energy? (especially non-renewable or scarce resources)			
Are there any areas on or around the location which contain important, high quality or scarce resources such as land, groundwater, surface water, forest/timber, energy, agricultural productivity, fisheries, tourism, minerals and aggregates, which would be affected by the project? (Either through direct use or through indirect impacts such as pollution)			
CLIMATE			
Will the activity have the potential to effect the atmospheric environment including microclimate and local and larger scale climatic conditions?			
Will the activity generate large amounts of GHG? (e.g. excessive transports)			
DRAINAGE			
Will the activity alter the topography in the area affecting the drainage conditions?			
Will the activity alter the land surface conditions e.g. compaction of the soil, introduction of new surface materials such as paved roads or roofs with drainage arrangements subsequently affecting the current drainage conditions?			
Will the activity affect current water bodies in a way that could alter drainage conditions?			

Will the activity have the potential to alter the drainage conditions in a way that could cause or increase pollution levels in water sources (increased run-off carrying pollutants, erosion etc.)?			
Could the activity cause altered drainage conditions, which would alter the local hydrological conditions (quantity, levels and flows)?			
<b>LANDSCAPE</b>			
Will the activity require significant clearance of existing land, vegetation and buildings?			
Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the activity?			
Is the project/activity in a location where it is likely to be highly visible to many people?			
Is the project located in a previously undeveloped area where there will be loss of green field land?			
<b>SURFACE WATER</b>			
Are there any surface water sources on or around the location of the activity which could be affected?			
Is there a risk of the activity releasing any pollutants, hazardous or toxic substances to surface water sources? (including the nutrient status and eutrophication as well as acidification)			

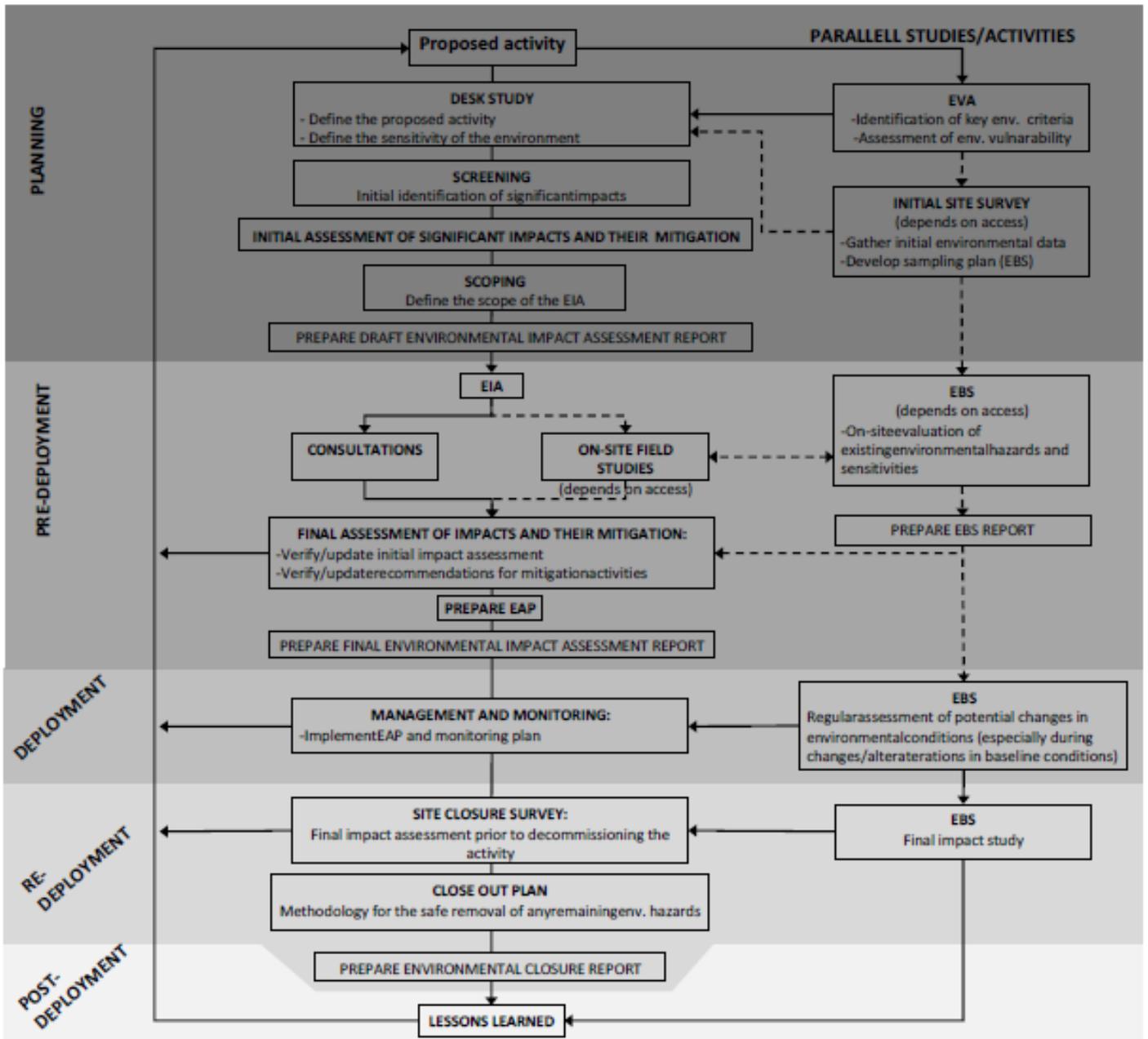
Will the activity have the potential to alter the hydrology (quantity, levels and flows) of any water courses on or around the project location? (Abstraction, civil works such as river/stream crossings etc.)			
<b>GROUND WATER</b>			
Are there any ground water sources on or around the project location which could be affected by the activity?			
Is there a risk of the activity releasing any pollutants, hazardous or toxic substances to ground water sources?			
Will the activity have the potential to alter the hydrology (quantity, levels and flows) of any aquifers on or around the project location? (Abstraction, civil works affecting drainage and groundwater flows etc.)			
<b>SOILS</b>			
Is there a risk of the activity releasing any pollutants, hazardous or toxic substances to soils/land? (including acidification)			
Will the activity alter the quantity, depths, humidity, stability or erodibility of soils on or around the activity?			
Will the activity in any other way affect the geology or ground conditions on or around the project area?			
<b>AIR QUALITY</b>			
Is there a risk of the activity releasing any pollutants, hazardous or toxic/noxious substances which would affect the local air quality?			

WASTE			
Will the activity generate any waste? (solid, liquid, hazardous)			
NOISE AND VIBRATION			
Will the activity cause noise and vibration?			

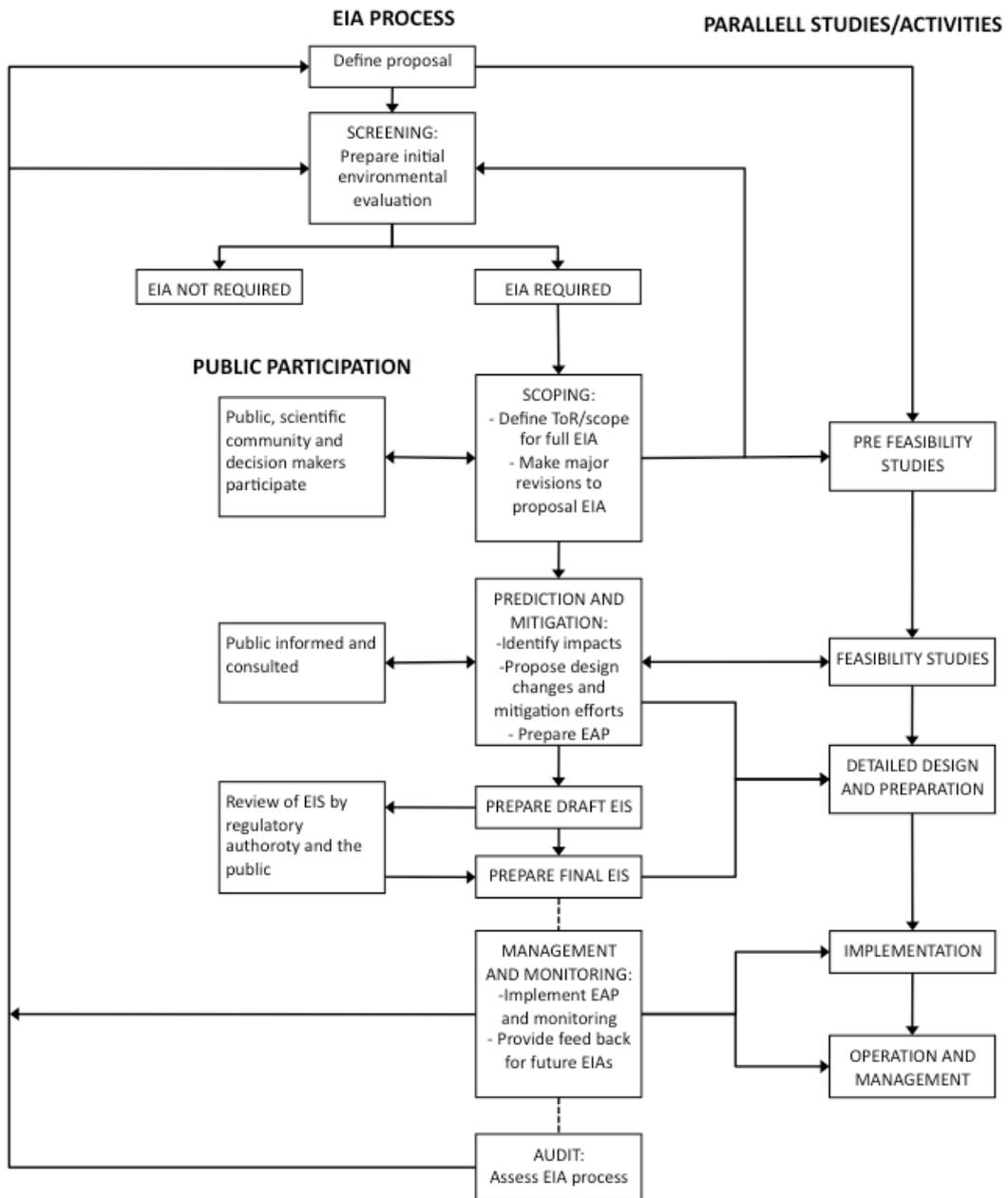
BIOLOGICAL ENVIRONMENT			
<p><b>Question: Will the activity involve actions which will cause changes to the biological environment in or around the project site?</b></p> <p><b>(POSITIVE AND NEGATIVE EFFECTS/IMPACTS SHOULD BE CONSIDERED WHERE APPROPRIATE)</b></p>			
GENERIC	YES/NO/?	Comment	Is the effect likely to be significant?
<b>PROTECTED RESERVES AND SENSITIVE AREAS</b>			
Are there any areas on or around the location which are protected under international or national or local legislation for their ecological value, which could be affected by the activity?			
Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. wetlands, watercourses or other waterbodies, mountains, forests or woodlands, which could be affected by the activity?			
<b>BIODIVERSITY AND ENDANGERED SPECIES</b>			
Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the activity?			
Will the activity result in a loss of native species or genetic diversity on or around the project site?			
<b>FLORA</b>			
Will the activity affect the productivity of any natural systems concerning flora on or			

around the project site?			
Will the activity result in the introduction of any alien species?			
FAUNA			
Will the activity affect the productivity of any natural systems concerning fauna on or around the project site?			
Will the activity result in the introduction of any alien species?			

Template 2 – Adapted EIA process for conflict and crisis situations



Template 3 – Flowchart illustrating conventional/traditional EIA process



Template 4: EIA report format

<b>EIA REPORT FORMAT</b>	
<b>CONTENT</b>	<b>DESCRIPTION</b>
<b>1. Executive summary</b>	Non-technical, for lay public. Include identified high and very high significance impacts from the impact table incl. recommendations and mitigations.
<b>2. Introduction</b> 2.1 Background 2.2 Objective 2.3 Methodology 2.4 Scope	This section should include a brief description of limitations associated to conducting an EIA in conflict or post-conflict settings.
<b>3. General description of the activity</b>	This section should include a brief and concise description of the activity intended to be undertaken.
<b>4. Description of activity</b> 4.1 Alternative 1... 4.1.1 Site location 4.1.2 Site layout 4.1.3 Buildings/facilities 4.1.4 Power supply 4.1.5 Water supply 4.1.6 Waste generation/disposal 4.1.7 Sources of pollution 4.1.8 Emissions 4.1.9 Noise and vibrations 4.2 Alternative 2... (if several alternatives are given)...	The "No-Go" alternative refers to the option of not introducing the planned activity. This will include the description of the baseline conditions to which development activities will be compared in the successive description of one or preferably several options.
<b>5. Description of the receiving environment</b>	If there is no significant or identifiable difference in the environments between the sites they can be described in one section only.

<p>5.1 Alternative 1</p> <p>5.1.1 Physical environment</p> <p>5.1.1.1 Climate</p> <p>5.1.1.2 Geology, soils and drainage</p> <p>5.1.1.3 Existing contamination</p> <p>5.1.1.4 Water resources</p> <p>5.1.1.5 Noise</p> <p>5.1.1.6 Air quality</p> <p>5.2.1 Human environment</p> <p>5.2.1.1 Demographics</p> <p>5.2.2.1 Land-use, community infrastructure and services</p> <p>5.2.2.1 Sites of archeological and cultural interest</p> <p>5.3.1 Ecological environment</p> <p>5.3.1.1 Flora</p> <p>5.3.1.2 Fauna</p> <p>5.3.1.3 Sensitive environments</p> <p>5.3.1.4 Endangered species</p> <p>5.2 Alternative 2...</p>	
<p><b>6. Assessment of impacts and proposed mitigation efforts</b></p>	<p>A table documenting the results of the initial assessment would preferably be included in this section, see figure 10 for an example</p>
<p><b>7. Conclusions and recommendations</b></p>	
<p><b>8. References</b></p>	
<p><b>9. Appendices</b></p>	

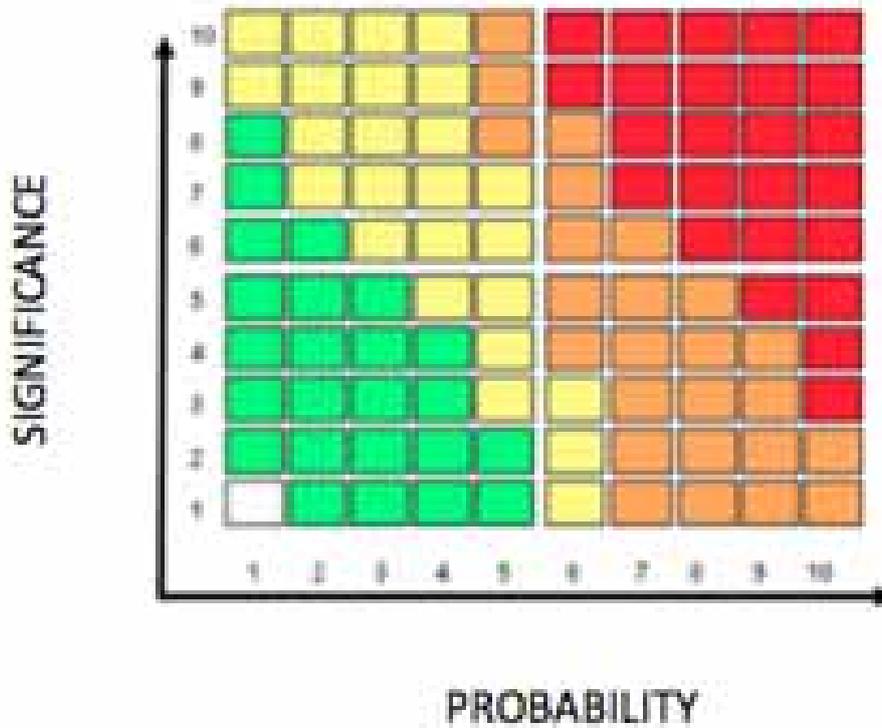
Template 5: Criteria for determining significance and probability

IMPACT PROBABILITY ASSESSMENT SCALE		
Probability level	Definition	Rate level
<b>Very high</b>	Will occur on a regular basis during the operational lifetime of the activity	<b>(9-10)</b>
<b>High</b>	Will likely occur several times in the operational lifetime of the activity	<b>(7-8)</b>
<b>Elevated</b>	Will likely occur under special and relatively rare circumstances during the operational lifetime of the activity	<b>(5-6)</b>
<b>Low</b>	Will probably not or very rarely occur during the operational lifetime of the activity	<b>(3-4)</b>
<b>None</b>	Will most likely not occur during the operational lifetime of the activity	<b>(1-2)</b>

IMPACT SIGNIFICANCE ASSESSMENT SCALE		
Significance level	Definition	Rate level
<b>Very high</b>	<ul style="list-style-type: none"> <li>- A large number of people can be negatively affected by the activity</li> <li>- A large number of receptors can be seriously affected (flora, fauna with importance to the local or regional population)</li> <li>- Especially sensitive/valuable receptors can be seriously affected</li> <li>- The impact caused by the contribution from the activity is out of scale with the accumulated total impact from other already established adjacent and comparable activities (including if no other contributors are present).</li> <li>- The impact is continuous</li> <li>- The impact is permanent</li> <li>- The impact is irreversible</li> <li>- The impact will have a large geographic distribution</li> <li>- The activity can impact or cause significant conflict</li> </ul>	<b>(9-10)</b>
<b>High</b>	<ul style="list-style-type: none"> <li>- People can be seriously affected by the activity</li> <li>- Several receptors can be affected (flora, fauna not without significance to the local/regional population)</li> <li>- Especially sensitive/valuable receptors can be affected</li> <li>- The scale/extent of the activity's contribution to the total impact from adjacent and comparable activities is significant.</li> <li>- The effect is very frequent or continuous</li> <li>- The impact cannot without a significant input of resources be reversed</li> <li>- The impact can during certain circumstance spread to a larger geographic area</li> <li>- The activity could, during certain circumstance, impact or cause conflict</li> </ul>	<b>(7-8)</b>

<p><b>Elevated</b></p>	<ul style="list-style-type: none"> <li>- People can be negatively affected by the activity</li> <li>- Several receptors can be affected (flora, fauna – but no receptors of special sensitivity and/or value to the local/regional population)</li> <li>- The scale/extent of the activity's contribution to the total impact is noticeable if compared to the total impact from adjacent and comparable activities.</li> <li>- The impact/effect can at times be frequent</li> <li>- The impact cannot without additional resource input be reversed (e.g. managed by the ecosystem itself within a reasonable time span)</li> <li>- The impact can only under exceptional circumstance affect a geographical area larger than "local"</li> <li>- Will not impact or cause conflict</li> </ul>	<p><b>(5-6)</b></p>
<p><b>Low</b></p>	<ul style="list-style-type: none"> <li>- No people are affected to a significant extent</li> <li>- Only a very limited number of receptors are affected (e.g. not affecting a local population)</li> <li>- The scale/extent of the activity's contribution to the total impact is not or seldom noticeable when compared to the total effect from other/similar adjacent activities.</li> <li>- The impact is intermittent and not frequent</li> <li>- The impact is temporary and reversible without resource input (i.e. self-reparable within a reasonable time span after having occurred)</li> <li>- The impact is local only.</li> </ul>	<p><b>(3-4)</b></p>
<p><b>None</b></p>	<ul style="list-style-type: none"> <li>- Only occasional impact on individual, non-significant, receptors</li> <li>- The impact is very temporary and quickly self-repaired</li> </ul>	<p><b>(1-2)</b></p>

Template 6: Significance/Probability matrix



Template 7: Scales for determining reliability of data

QUALITY/RELIABILITY OF DATA	
LEVEL	SYMBOL
NO DATA	-
LIMITED	+
GOOD	++
VERIFIED ON-SITE	+++

**Appendix 2: Initial screening checklist of significant/in-significant environmental impacts AMISOM Camps**

The table has been filled in using “-” if the impact is significant and negative, “+” if the impact is significant and positive (or both, +/-), “N” if the impact is not significant (or not applicable) and “?” if the significance of the impact is uncertain.

Cumulative impacts: This box has been ticked if two or more activities are predicted to cause a significant negative impact on one resource, and thus have been marked with “-“, or “?” (if the impact is unknown it has been assumed to have a significant negative impact until data saying otherwise can be collected)

Impacts on human environment and socio-economics								
Resource	Demographics	Economy, living standards and labor	Material assets	Health/ safety/ security	Land use, community infrastructure and services (incl. transport)	Land ownership	Sites of archeological and cultural interest	Social issues
Activities								
<b>Construction phase</b>								
Site clearance	N	N	N	N	N	N	N	N
Earth moving	N	N	N	N	N	N	N	N
Laying foundations	N	N	N	N	N	N	N	N
Vehicle movements/equip. operation	N	N	N	I	N	N	N	N
Import materials	N	N	N	N	N	N	N	N
Temporary facilities	N	N	N	N	N	N	N	N
Energy supply	N	N	N	N	N	N	N	N
Water supply	N	I	N	I	+/+	N	N	I
Solid waste management	N	N	N	I	N	N	N	N
Liquid waste management	N	N	N	I	N	N	N	N
HAZMAT Management	N	N	N	I	N	N	N	N
Access arrangements/roads	N	N	N	N	N	N	N	N
Surface water run-off management	N	N	N	N	N	N	N	N
Demolition	N	N	N	N	N	N	N	N
General presence of activity	N	N	N	N	I	N	N	N
<b>Operational phase</b>								
Energy supply	N	N	N	N	N	N	N	N
Water supply	N	I	N	I	+/+	N	N	I
Solid waste management	N	N	N	I	N	N	N	N
Liquid waste management	N	N	N	I	N	N	N	N
HAZMAT Management	N	N	N	I	N	N	N	N
Access arrangements/roads	N	N	N	N	N	N	N	N
Vehicle movements/operation	N	N	N	N	N	N	N	N
Surface water run-off management	N	N	N	I	N	N	N	N
Other facilities	N	N	N	N	N	N	N	N
General presence of activity	N	+/+	N	I	I	N	N	+/+

Impacts on physical environment								
Resource	Natural resources (other than water)	Climate	Drainage	Landscape	Surface water	Ground water	Soils	Air
Activities								
<b>Construction phase</b>								
Site clearance	N	N	I	N	N	N	I	I
Earth moving	N	N	I	N	N	N	I	I
Lay foundations	N	N	I	N	N	N	N	N
Vehicle movements/equip. operation	N	N	N	N	N	N	N	I
Import materials	I	N	N	N	N	N	N	N
Temporary facilities	N	N	N	N	N	N	N	N
Energy supply	N	N	N	N	N	N	N	I
Water supply	N	N	N	N	N	I	N	N
Solid waste management	N	N	N	N	N	I	I	I
Liquidwaste management	N	N	I	N	N	I	I	N
HAZMAT Management	N	N	N	N	N	I	I	N
Access arrangements/roads	N	N	I	N	N	N	N	N
Surface water run-off management	N	N	I	N	N	N	N	N
Demolition	N	N	N	N	N	N	N	N
<b>Operationalphase</b>								
Energy supply	I	N	N	N	N	N	N	N
Water supply	N	N	N	N	N	I	N	N
Solid waste management	N	N	N	N	I	I	I	I
Liquid waste management	N	N	I	N	I	I	N	N
HAZMAT Management	N	N	N	N	I	I	I	N
Access arrangements/roads	N	N	N	N	N	N	N	N
Vehicle movements/equip. operation	N	N	N	N	N	N	N	N
Surface water run-off management	N	N	I	N	I	I	N	N
Other facilities	N	N	N	N	N	N	N	N

Impacts on ecological environment				
Resource	Protected reserves and sensitive areas	Biodiversity and endangered Species	Flora	Fauna
Activities				
<b>Construction phase</b>				
Site clearance	N	?	?	?
Earth moving	I	?	?	?
Lay foundations	N	N	N	N
Vehicle movements/equip. operation	I	I	N	I
Import materials	I	?	?	?
Temporary facilities	N	N	N	N
Energy supply	N	N	N	N
Water supply	N	N	N	N
Solid waste management	N	?	?	?
Liquid waste management	N	N	N	N
HAZMAT Management	N	?	?	?
Access arrangements/roads	N	N	N	N
Surface water run-off management	I	I	N	I
Demolition	N	N	N	N
<b>Operational phase</b>				
Energy supply	N	I	I	I
Water supply	N	?	?	?
Solid waste management	N	?	?	?
Liquid waste management	N	N	N	N
HAZMAT Management	N	?	?	?
Access arrangements/roads	N	N	N	N
Vehicle movements/equip. operation	I	I	N	I
Surface water run-off management	I	I	I	I
Other facilities	N	N	N	N

**Appendix 3: Ecological baseline assessment report, AMISOM operations Mogadishu, Somalia.**

Ecological baseline assessment report, AMISOM  
operations Mogadishu, Somalia.  
August 2010



**By: James M. Mwaluma**  
**Kenya Marine & Fisheries Research Institute,**

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## **1.0 Introduction**

The African Union Mission in Somalia (AMISOM) is an active, regional peacekeeping mission operated by the African Union with the approval of the United Nations in Somalia. AMISOM is mandated to support transitional governmental structures, implement a national security plan, train the Somali security forces, and to assist in creating a secure environment for the delivery of humanitarian aid.

### **1.1 Background and need for the project**

The current AMISOM operation in Mogadishu employs a significant number of troops spread over three camps, the principal one being in the vicinity of the airport. Over the coming years it is intended to increase troop size to about 10,000 based in the airport but set to expand to the old University complex. The troops will be full time regular army AMISOM contingents with 6 month tour of duty with provisions supplied by air and sea, thus the need for expansion.

### **1.2 Location of the study area**

The proposed location of the projects is on two sites (Fig. 1).

- The Old University complex
- Mogadishu airport adjacent to the main runway

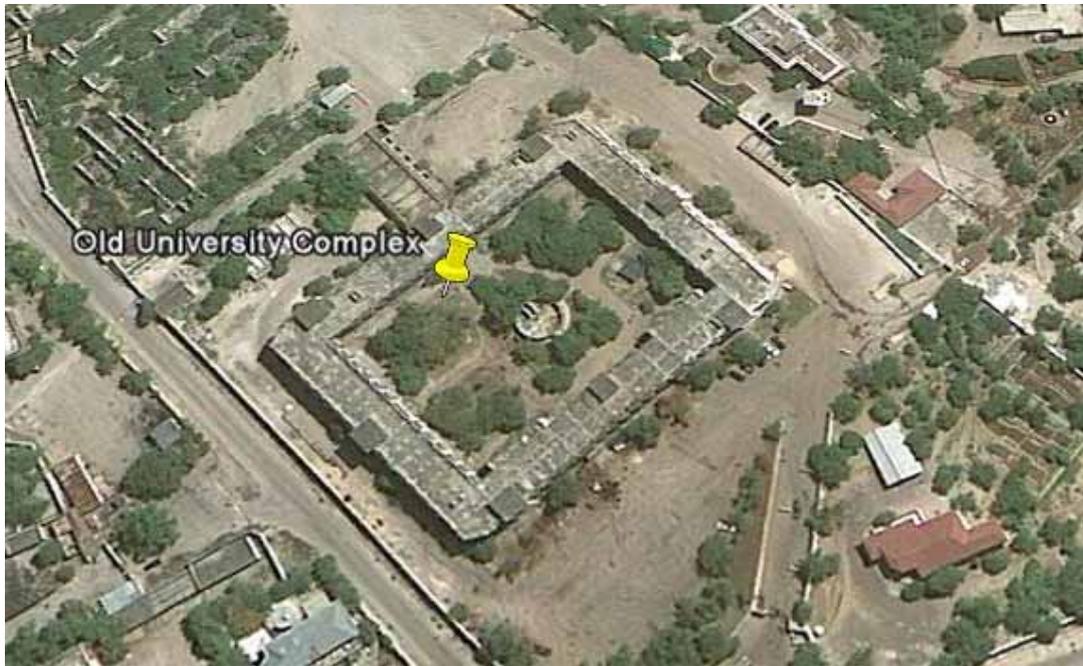


Fig. 1 The proposed sites for development of AMISOM bases in Mogadishu.  
(Modified from Google image 2010)

### **1.3 Objectives of the ecological baseline assessment**

It is a requirement under the UN protocols that an environmental impact assessment be done to assess levels of sensitivity of the receiving environment at risk for any proposed development activity, which in this case is the construction and development of new supply bases, for increased troops and support staff over two sites in Mogadishu.

Given the conflict nature prevalent in certain parts of Mogadishu, it was agreed that the conventional process of an environmental Impact assessment be reduced to providing information that can be realistically implemented into existing and proposed activities.

The objective of the assessment therefore is to provide an ecological assessment of the existing site and proposed sites, with special emphasis on ecologically sensitive species.

The specific objectives were;

- A review of the likely existing baseline biodiversity within the location of the proposed and existing camps (flora and fauna)
- A review of the marine environment in the location of the airport site with special emphasis on the sensitive species and why they are sensitive.
- Describe the potential environmental impacts of the proposed activities
- Propose detailed mitigation measures

### **1.5 Key project features**

The key project features include the following;

- Construction of new buildings
- Construction of new roads
- Development of new supply bases
- Possible recreational use of the beach and recreational fishing
- Increased air movements
- Increased boat movements

### **1.6 Study approach**

- Review of literature (books and published papers) on flora and fauna existing in Somalia and in similar habitats in Kenya.

- Electronic mail used to access site maps, images of plants and tree species in Mogadishu and around the study sites.
- Using reports, web-based information and consultation of other relevant resource persons

## **2.0 National policy and legislative framework**

There are no comprehensive policies or national/regional or local plans for development or allocation of marine or coastal, land and water resources in Somalia (UNEP 1987). Policy decisions concerning the allocation of physical resources and scarce development funds are therefore based on the success of competing sectoral claims and the donor assisted projects promoted by the different agencies (UNEP 1987). The co-ordination and integration of development is thus carried out by regional councils presided over by district commissioners and regional governors. The administrative structure of the regions and districts includes commissioners and regional governors. The absence of policy based upon adequate resource and environmental assessments, lack of manpower skills and the heavy dependence on foreign assistance leads to a piecemeal approach to resource management and development planning (UNEP 1987)

## **3.0 Climate**

The occurrence of rainfall in Somalia is subject to the movement of the sun back and forth across the equator twice a year. The south-west monsoon which blows from May to September brings in the long rains (Known locally as *Gu*) and marks the beginning of the short rains (known locally as *Dhair*) and the cool winter season. During summer when it is not raining, a strong hot wind (known locally as *Kharif*) blows and desiccates the land causing considerable amount of sand erosion (Sommerlatte and Umar 2000). Whereas in most parts of Somalia, there is a distinct bimodal distribution of rainfall, the coastal plains experience rain mainly during the winter month from November to May (Sommerlatte and Umar 2000)

## **4.0 Soil characteristics of study area**

The study area lies within the coastal belt of Somalia. The sandy dunes of the coastal area are made of arenosols (FAO-SWALIM 2009). The soils close to the coast are pure loose

marine sand, These soils are not useful for agricultural purposes due to the high rainfall variability (both seasonal and annual), flooding hazard, low soil fertility (alkaline soils) and/or high soda content in the soil (FAO-SWALIM 2009). The communities of the coastal area have been identified as coastal and sub-coastal semi-desert grassland and shrubland (White 1983).

## **5.0 Review of the likely descriptions of flora and fauna in proposed sites**

The following is a review of the likely flora and fauna found on both the proposed and existing sites based on data gathered and technical ecological background from literature and expertise opinion.

### **5.1 Terrestrial flora**

The terrestrial flora at both sites is poor and diversity low due to the hot conditions prevailing year-round, along with periodic monsoon winds and irregular rainfall. The terrestrial flora at the proposed old University complex is predominantly composed of scattered large to medium sized trees mainly distributed in middle and central parts of the site (Fig. 1). Other vegetation is scanty scrub vegetation dotted with few grassland communities. The airport site comprises of large to medium sized trees largely distributed around the edges of the compound forming a somewhat fence around the compound (Fig. 1). Scrub and grassland vegetation species typical of coastal habitats were found inhabiting the predominantly sandy substratum.

#### **5.1.1 Grasses**

Grass species inhabiting the old University compound include *Cynodon dactylon*, *Cyperus grandibulbosus* and *Halopylum mucronatum* (Table 1) where their distribution was occasional. In the airport site dominant grass species were *Cyperus grandibulbosus*, *Halopylum mucronatum*, *Cynodon dactylon*, *Sporobolus brockmanii* and *Dactyloctenium scindicum*. These are grasses are typical of coastal sandy habitats and serve an important role of stabilizing the sand dunes (Musila 2005). The grasses are however not listed as endangered in the IUCN redlist.

### 5.1.2 Trees

Trees species at both sites included Neem trees *Azadirachta indica*, *Cassia siamea* *Albizia gummifera*, *Acacia nilotica*, *Dobera glabra* and the Doum palm *Hyphaene compressa* (Table 1). Dominant tree species at both sites were Neem tree *Azadirachta indica* and *Cassia siamea*. The trees serve to provide an important shelter and for the birds, but are however not listed as endangered in the IUCN redlist. The Neem tree and Doum palm however have some local significance.

### 5.1.3 Shrubs

Common shrubs species existing in the old University compound were *Calotropis procera*, *Cleome tenella* and *Phyllanthus reticulatus* (Table 1). At the airport site, dominant shrub species associated were *Calotropis procera*, *Tephrosia purpurea*, *Cordia somalensis*, *Ipomea pes caprae*, *Cleome tenella* and *Azima tetraacantha* (Table 1). No endangered species of shrubs was found at both sites.

Table 1: Species list of plants and animals in proposed sites

### Old University complex site

Species common name	Species scientific name	DAFOR Rating	Protected species status
<b>Grasses</b>			
	<i>Cynodon dactylon</i>	O	Not threatened
	<i>Cyperus grandibulbosus</i>	O	Not threatened
	<i>Halopylum mucronatum</i>	O	Not threatened
<b>Palms</b>			
	<i>Hyphaene compressa</i>	R	Not threatened
<b>Trees</b>			
Peacock flower	<i>Albizia gummifera.</i>	R	Not threatened
Kassod tree	<i>Cassia siamea</i>	A	Not threatened
Neem tree	<i>Azadirachta indica</i>	D	Not threatened
	<i>Acacia nilotica</i>	O	
<b>Shrub</b>			
	<i>Calotropis procera</i>	O	Not threatened
	<i>Cleome tenella</i>	O	Not threatened
	<i>Phyllanthus reticulatus</i>	R	Not threatened
<b>Insects</b>			
Field grasshoppers	<i>Chorthippus brunneus</i>	R	Not threatened
Sulphurs	<i>Colias sp.</i>	F	Not threatened
<b>Reptiles</b>			
Dwarf gecko	<i>Lygodactylus keniensis</i>	F	Not threatened
Red headed agama	<i>Agama Agama</i>	F	Not threatened

### Airport compound site

Species common name	Species scientific name	DAFOR Rating	Protected species status
<b>Grasses</b>			
	<i>Halopyrum mucronatum</i>	F	Not threatened
	<i>Cyperus grandibulbosus</i>	A	Not threatened
	<i>Cynodon dactylon</i>	F	Not threatened
	<i>Sporobolus brockmanii</i>	O	Not threatened
	<i>Dactyloctenium scindicum</i>	O	Not threatened
<b>Trees</b>			
Peacock flower	<i>Albizia gummifera.</i>	R	Not threatened
Kassod tree	<i>Cassia siamea</i>	A	Not threatened
Neem tree	<i>Azadirachta indica</i>	D	Not threatened
	<i>Acacia nilotica.</i>	O	Not threatened
Mikah	<i>Dobera glabra</i>	R	Not threatened
<b>Shrub</b>			
Rooster tree	<i>Calotropis procera</i>	O	Not Threatened
Ahuhu	<i>Tephrosia purpurea</i>	O	Not threatened
	<i>Cordia somalensis</i>	O	Not threatened
Goat's foot	<i>Ipomea pes caprae</i>	O	Not threatened
	<i>Cleome tenella</i>	F	Not threatened
	<i>Azima tetracantha</i>	O	Not threatened
<b>Insects</b>			
Field grasshoppers	<i>Chorthippus brunneus</i>	R	Not threatened
Sulphurs	<i>Colias sp.</i>	F	Not threatened
<b>Reptiles</b>			
Red headed agama	<i>Agama Agama</i>	F	Not threatened
Dwarf gecko	<i>Lygodactylus keniensis</i>	F	Not threatened

DAFOR Scale of abundance: Dominant (D) 80-100%, Abundant (A) 60-79 %, Frequent (F) 40-59%, Occasional (O) 20-39%, Rare (R) 0-19%

## **5.2 Terrestrial fauna**

Low diversity of terrestrial fauna was found at both sites due to absence of abundant grass and shrub habitats. Few grassland fauna like grasshopper *Chorthippius brunneus* and butterfly *Colias* sp. (Sulphers) were common at both sites. (Table 1). Other insect species were none of these species are listed as endangered in the IUCN Red list of endangered species. Among the reptiles, the dwarf gecko and red headed agama lizards were common at both sites. The two species are however not listed in the IUCN red list

## **6.0 Review of the marine environment in the location of the airport site**

The arid to semi arid nature of the Somali current climate results in limited and highly variable flows of nutrients from land based sources to the marine environment. This contributes to the generally low levels of primary productivity of the continental shelf on the north coast and southern coast (UNEP 1987).

The monsoonal regime also has a direct bearing on primary production in Somalia. The southwest monsoon generates upwelling of cold nutrient rich from May to August. This upwelling can be highly variable and can create extreme variation in the marine environment and its ability to support living marine resources. Nevertheless this region is one of the richest in the world in primary production with high densities of demersal and pelagic fish stocks (UNEP 1987). However, limited data survey available for demersal fish stocks throughout continental shelf area presents serious difficulty in estimation of sustainable levels.

Coral reef fish species form the basis for a major part of the fisheries production in southern Somalia. However there are no definitive surveys of either the coral ecosystems or the stocks of fin fish and shellfish they support (UNEP 1987). Many of the current and proposed fisheries projects are highly dependent on inshore fish stocks, however the majority of available data relates to offshore stocks. There is lack of reliable information on the abundance of demersal stocks in inshore areas and information available indicates declining demersal fish resources. Apart from concerns over demersal fish stocks, turtles and lobsters, there are currently no major problems associated with the marine environment or the sustained production of marine resources

(UNEP 1987). Somalia produces about 900 metric tonnes of mollusks and crustaceans and 20,000 metric tonnes of marine fish. Somali waters have high potential for fishing and studies carried out by Fisheries and Marine resource ministry indicate that there were a large number of foreign vessels illegally fishing in Somali waters and others causing serious pollution problems via toxic discharge. The coastal environment of Somalia contains habitats for three endangered marine species, the Green turtle, Hawksbill turtle and Dugong. Although none of these species appear to be directly hunted, turtles are caught as a by-product of fishing activity. Due to the large numbers caught, there is reason to believe that they could be overexploited (UNEP 1987).

The coastal and marine environments in Somalia have been subjected to a variety of pressures including:

- erosion,
- oil pollution
- waste dumps
- human settlements
- discharge from municipal waste water due to lack of proper water and sanitation facilities.

The issue of dumping in Somalia is contentious as it raises issues of violation of international treaties relating to export of hazardous waste and ethically questionable to negotiate a hazardous contract with a factionised government (UNEP 2005). The impact of tsunami stirred up waste deposits along the beaches causing considerable health problems and contamination of groundwater (UNEP 2005).

## **7.0 Sensitive species in the marine environment**

The coastal environment in Somalia is threatened by naturally occurring processes, growing subsistence needs of the population and increased economic exploitation (UNEP 1987). Along the coast, the following sensitive species have been identified to be likely impacted by the proposed activities, especially the site located adjacent to the sea.

## **7.1 Mangroves**

One of the major sensitive species in the marine environment are mangroves because they receive nutrients from both land and sea. Mangrove forests are home to a rich assortment of wildlife, such as birds and many aquatic species. They are natural buffers that shelter coastal communities and wildlife from storms and waves, such as tsunamis. Mangroves are critical for conservation of biological diversity and also play an ecological role that of providing nursery and habitat for fish juveniles and other crustaceans. The patches of mangroves in Somalia play a vital role in reducing shoreline erosion.

The patches of mangroves forests once common in the horn of Africa and extreme south of Somalia at Kismaayo near the Kenyan border are now degraded (UNEP 2005). One of the major factors has been overexploitation for firewood and construction, which has lead to sedimentation and excessive nutrient loading to the marine environment. Overall the regenerative capacity of the mangroves system may have declined considerably and the ability to provide fishing grounds for fish mollusks and crustaceans could have dramatically reduced as a result of uncontrolled harvesting and oil pollution (UNEP 2005).

## **7.2 Coral reefs**

Somalia has excellent fringing and patches of coral reefs along the Gulf of Aden and southern Somalia near the Kenyan Border which are highly biodiverse. (Schleyer and Baldwin 1999; UNEP 2005) The rock-like structure of coral reefs serve as a natural water break; physical barrier near the ocean's surface that breaks waves offshore and dissipates most of their force before they reach the land. Therefore, they have the capacity to create rigid, wave-resisting structures that modify their physical environment, thus creating a wide variety of associated depositional movements. Coral reef habitats sustain a high biodiversity of marine organisms and are highly productive in terms of demersal and pelagic fish species (Schleyer and Baldwin 1999).

The coral reefs have suffered natural disturbances in the past, including those caused by the recent tsunami (UNEP 2005) which could have reduced some of the corals to rubble. There could also be a significant damage to the coral reefs as a result of land runoff wastes and pollutants, debris, soil, and organic matter particularly those near the coastal

town of Kisimaayo and Mogadishu (UNEP 2005). Due to absence of national institutions, there are no mechanisms to assess the damage to corals by natural hydrological related disasters and human induced activity, and plans for their protection (UNEP 2005)

### **7.3 Seagrass beds**

Seagrass meadows are the other like potentially sensitive species to be encountered in the marine environment; they play both environmental and ecological roles. They are found predominantly in sandy and muddy areas where their roots can penetrate and provide easy anchorage (UNEP, 1998). The seagrasses act as a nursery ground for many species of reef and deep sea fish thus ensuring a wide range of biodiversity of organisms. They protect the coastlines by weakening wave action and provide stability to the dunes at the beaches. Without sea grass beds, many marine species humans harvest would be lost, as would the lower levels of the food chain. The major threat to seagrass meadows comes from excessive sedimentation of shallow coastal waters resulting from land based sources (UNEP 1998).

### **7.4 Seaweeds**

The green seaweeds are found in shallow water where they are able to make the best use of sunlight and grow better than other species. Brown seaweeds are more robust and tend to grow larger than the greens, they are found in intermediate depths below the low tide mark and in deeper lagoon pools and channels (UNEP 1998), typically attached to rock or other firm surfaces. Red seaweeds are adapted to living in deeper waters, shallow rock pools and dimly lit caves (UNEP 1998). Ecological role of seaweeds is that they are primary producers in intertidal, shallow, and deep subtidal reefs, as well as providing food and shelter for fish, mollusks and crustaceans (UNEP 1998). Main threats to seaweeds come from introduced invasive species and pollution.

### **7.5 Marine turtles**

Other sensitive marine species like found in coastal Somalia are marine turtle. They play an important role in the marine environment by eating sea grass. Sea grass needs to be constantly cut short to help it grow across the sea floor. Sea turtles act as grazing animals that cut the grass short and help maintain the health of the sea grass beds. Sea

turtles use beaches and the lower dunes to nest and lay their eggs. Dune vegetation is able to grow and become stronger with the presence of nutrients from turtle eggs, unhatched nests, eggs and trapped hatchlings. As the dune vegetation grows stronger and healthier, the health of the entire beach/dune ecosystem becomes better. Stronger vegetation and root systems helps to hold the sand in the dunes and helps protect the beach from erosion. All species of sea turtles are listed as threatened or endangered. The leatherback, Kemp's Ridley, and hawksbill turtles are critically endangered (Martinez 2000; 2008). The Olive Ridley and green turtles are endangered, and the loggerhead is threatened. The flatback's conservation status is unclear due to lack of data.

Major threats to sea turtles worldwide include;

- Fisheries by catch
- Trade in eggs and meat
- Beach development is another area which threatens sea turtles
- Climate change may also cause a threat to sea turtles. Since sand temperature at nesting beaches defines the sex of a turtle while developing in the egg, there is concern that rising temperatures may produce too many females

In Somalia green turtle nesting occurs along much of Somalia's coastline Leatherback turtles have been used as an important food source by coastal people in Somalia. However, fisheries by-catch is the main threat to marine turtles in Somalia. Other threats include;

- Exploitation of nesting females for meat
- Egg collection
- Agricultural/urban/tourism development
- Artificial lighting (causes disorientation during egg laying)
- Coastal erosion (destroys nesting habitat)
- Vehicles (destroys nesting habitat)
- Sand mining (destroys nesting habitat)
- Natural threats/predation (high temperatures affect sex)
- Marine littering (turtles get choked by plastic, often confusing it with jellyfish)

## **7.6 Sea Birds**

Sea and shore birds are important marine-based ecological indicators. They normally utilize the coastal area as a feeding and roosting site as well as migration sites.

Common species sited feeding in the northern Somali coast include the Crested terns, Saunders little terns, Gull-billed terns, and White-eyed terns (Schleyer and Baldwin 1999). Other species common at sea included Sooty gulls, Herring gulls, Sandwich terns and Bridled terns. Waders and shore birds like the Greater flamingos, Redshanks, Terek sandpipers, Reef herons, Crab plovers, Sanderlings, Whimbrels and Ring Plovers were also reported (Schleyer and Baldwin 1999). In southern Somalia no comprehensive study of birds has been carried out, but it is possible that some of these species will be common along the beach.

## **7.7 Cetaceans**

Small cetaceans have been reported in waters off Somaliland (Schleyer and Baldwin 1999). The majority of sightings were recorded in offshore waters, species being common dolphins (*Delphinus delphis*) and spinner dolphins (*Stenella longirostris*). Other two species recorded include indo-pacific humpback dolphin (*Sousa chinensis*) and bottlenose dolphin (*Tursiops aduncus*) (Schleyer and Baldwin 1999).

Understanding of the role of marine mammals in marine ecosystems is important because it provides a context within which to evaluate the potential impact of their predation on prey populations and community structure, and the impact of variation in prey populations, of harvesting by humans, and environmental change on the dynamics of marine mammals (Bowen 1997). This understanding in turn can help foster the rational discussion of the conservation and management of marine mammals (Bowen 1997).

## **8.0 Potential Impacts and mitigation measures**

In the light of baseline data gathered, and technical ecological background from literature and expertise opinion, the evaluation of the potential impacts of the proposed activities associated with the increase of troops and support staff in both sites is hereby evaluated, and mitigation measures proposed.

### **8.1 Construction phase**

#### **8.1.1 Increase of construction of new buildings**

*Nature of impact* –Vegetation will be physically removed from the surface with consequential destruction of the infauna and epifauna during construction;

*Extent* – Local;

*Significance* – Low, due to absence of any threatened and endangered species;

*Mitigation* – Not necessary.

### **8.1.2 Construction of new roads**

*Nature of impact* –Vegetation will be physically removed from the surface with consequential destruction of the infauna and epifauna during construction; air pollution resulting from dust particles.

*Extent* – Local;

*Significance* – Low, due to absence of any threatened and endangered species;

*Mitigation* – Not necessary, dust suppression through sprinkling.

### **8.1.3 Development of new supply bases/removal of economic tree vegetation**

*Nature of impact* –Neem trees, *Azadiracta indica* and *Cassia siameca* will be cleared to pave way for construction of buildings, offices and roads.

*Extent* – Local;

*Significance* – Low, due to presence of very few stands of such trees;

*Mitigation* – Include as many important trees as possible in the design during construction. Landscaping should be done to include a few trees once the construction is finalised.

### **8.1.4 Erosion and/or caving-in of surficial sediments (terrestrial areas)**

*Nature of impact* –loosened soil sediment from construction site may enter the marine environment via run-off caused by storm water with possible smothering of corals and seagrasses

*Extent* – Local;

*Significance* – High, due to proximity of the marine environment;

*Mitigation* – stabilization of the exposed slope surfaces through vegetating and concrete impoundments, phasing of activities with consideration of rainy season, Regular monitoring to detect potential cave-ins.

#### **8.1.5 Flash floods and storm water hazards**

*Nature of impact:* downstream water quality and contamination of marine environment;

*Extent:* medium, effect is in the adjacent maritime area;

*Significance:* High due to proximity to marine environment;

*Mitigation:* Careful phasing of activities with consideration of rainy seasons, implementation of control devices (drainage, silt fencing, soak-away, berms etc). Construction monitoring and maintenance of site drainage mechanisms.

#### **8.1.6 Solid waste hazards**

*Nature of impact:* Hazardous and non-hazardous construction site solid waste may be released to air, soil and the marine environment with possible adverse impacts to the respective habitats;

*Extent:* medium, possibility of being propagated beyond construction site into to the marine environment especially for site located at the airport site

*Significance:* High possibility of entering the marine environment;

*Mitigation:* Utilise techniques for preventing and controlling non-hazardous and hazardous construction site solid waste, including:

- Establishing a waste management hierarchy that considers prevention, reduction, reuse, recovery, recycling, removal and finally disposal of wastes.
- Avoiding or minimizing the generation waste materials, as far as practicable

- Where waste generation cannot be avoided but has been minimized, recovering and reusing waste
- Where waste cannot be recovered or reused, treating, destroying, and disposing of it in an environmentally sound manner
- Ensuring compliance with applicable local and international regulations

### **8.1.7 Air /noise pollution**

*Nature of impact:* Potential air and noise pollution may arise from vehicle movement during construction

*Extent:* local

*Significance:* Low due to exclusivity of site

*Mitigation:* Potential air quality impacts can be alleviated by practical measures, such as use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, use of low noise construction plants and equipment where possible, use of noise barriers/enclosure for noisy equipments/activities are suggested to be considered.

## **8.2 Operational phase**

### **8.2.1 Increased air movements**

*Nature of impact:* Air and noise pollution (increased CO<sub>2</sub> emissions), disturbance of sea and shore birds

*Extent:* medium local;

*Significance:* High, may result in alteration of migration routes and habitats of sea and shore birds

*Mitigation:* Scheduling and minimising air activities.

### **8.2.2 Increased boat movements**

*Nature of impact:* Possible destruction of fragile coral reef species resulting in death and loss of biodiversity through; boat anchorage, possible oil spills/leakages, increased sedimentation (by water churning). Disturbance of marine mammals (cetaceans-dolphins) in offshore waters

*Extent:* medium, mainly in the surrounding of the facility;

*Significance:* High may result in loss of endangered species;

*Mitigation:* Minimizing boat movements in sensitive areas e.g. coral and seagrass zones and marine mammal habitats. Avoidance of boat anchorage in coral zones, avoidance of oil spillage in the marine areas, administer stringent waste disposal systems to prevent littering in the marine environment

### **8.2.3 Increased vehicular movements**

*Nature of impact:* Increase in movement of trucks, buses for staff from operational facility resulting in increased noise levels and gaseous emissions (CO<sub>2</sub>)

*Extent:* medium;

*Significance:* Not significant

*Mitigation:* Ensure proper maintenance of vehicles, improve quality local roads.

### **8.2.4 Sewerage and wastewater effluent**

*Nature of impact:* Sewage and water effluents may be dumped into the sea causing pollution of the marine environment-resulting in death and loss of biodiversity; eutrophication and alteration of ecosystem balance.

*Extent:* Local;

*Significance:* High;

*Mitigation:* Use of sewage treatment plants, septic tanks and disposal of waste water to cesspits. Ensure waste is stored in a manner that prevents the commingling or contact between incompatible wastes, and allows for inspection between containers to monitor leaks or spills. Providing portable spill containment and cleanup equipment on site and training in the equipment deployment.

### **8.2.5 Recreational use of the beach and recreational fishing**

*Nature of impact* –littering, trampling of corals, seagrasses during diving, snorkeling or fishing, disturbing the pristine marine environment, thus natural habitat loss of organisms. Disturbance of possible turtle nesting sites,

*Extent* – Local;

*Significance* – High due to proximity to the marine environment;

*Mitigation* – Avoid trampling or touching of corals, use appropriate fishing gear that does not damage corals or avoid beach seining. Avoid boat anchorage on near/on corals. Dispose litter in appropriate way to avoid entry into marine environment. Avoid turtle nesting sites at the beaches

### **8.2.6 Air pollution/noise**

*Nature of impact:* Air pollution resulting from vehicular and air transport at the sites may potentially generate dust and other air pollutants. Possible air quality impacts arising from fugitive dust, measurable as TSP (Total Suspended Particulates) and RSP (Respirable Suspended Particulates) are anticipated;

*Extent:* Local;

*Significance:* Medium localized;

*Mitigation:* Appropriate scheduling of activities, proper servicing of dust suppression through sprinkling. Use of dust filters in constructed facilities.

### **8.2.7 Land /waste contamination**

*Nature of Impact:* Wastes generated by the sites, land waste, workforce waste

*Extent:* Local;

*Significance:* Low, localized.

*Mitigation:* The wastes and contaminated materials generated from the site require proper treatment, handling, storage and transportation and disposal away from the site and the marine environment.

### **8.2.8 Soil erosion**

*Nature of Impact:* Soil erosion may occur due to exposed surfaces devoid of vegetation likely to erode to the nearby marine ecosystem causing sedimentation;

*Extent:* Local, but may extend to the marine environment and other areas;

*Significance:* High may impact the marine environment;

*Mitigation:* Re-vegetate and rehabilitate the site by growing of trees and grass cover. Construction of berms on the seaward side to reduce levels of sedimentation via runoff

## **9.0 Summary of impacts**

This study summarises the overall potential impacts associated with the increase in troops and expansion of the camp as follows

### **Construction phase**

- Increase of construction of new buildings
- Construction of new roads
- Development of new supply bases/removal of economic tree vegetation
- Flash floods and storm water hazards
- Solid waste hazards
- Air /noise pollution

### **Operational phase**

- Increased air movements
- Increased boat movements
- Increased vehicular movements

- Sewerage and wastewater effluent
- Recreational use of the beach and recreational fishing
- Air pollution
- Land /waste contamination
- Soil erosion

## **10.0 Conclusions and Recommendations**

This environmental ecological assessment has recognized the potential impacts such as removal of plant vegetation will have no profound effect on the biodiversity of plants and animals at the site due to low biodiversity encountered, and that none of the plants and animals are listed as rare, threatened or endangered in the IUCN red list. The assessment found that the priority environmental issues of concern include removal of vegetation, air/noise pollution, soil erosion, waste water management, nature and landscape conservation, protection of coastal areas and the marine pollution.

The overall recommendation of this ecological and impact assessment study for the potential impacts associated with the increase in troops and expansion of the camp will make available the infrastructure needed to deal with the impacts associated with construction and operation of the bases. The potential impacts and wastes associated with the activity will be reduced to minimum levels with the safeguards mentioned put in place.

This ecological impact assessment finds no issues of concern about the proposed project that are negative neither to the environment. The gains to be acquired from its implementation are very manifest and therefore the project proposal should be supported.

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**Appendix 4: Basel Convention notification and movement document**

**Revised notification and movement documents for the control of transboundary movement of hazardous wastes and instructions for completing these documents**



**21. Specific conditions on consenting to the movement document or reasons for objecting**

(1) Required by the Basel Convention

(2) In the case of an R12/R13 or D13-D15 operation, also attach corresponding information on any subsequent R12/R13 or D13-D15 facilities and on the subsequent R1-R11 or D1-D12 facilit(y)ies when required

(3) To be completed for movements within the OECD area and only if B(ii) applies

(4) Attach detailed list if multiple shipments

(5) See list of abbreviations and codes on the next page

(6) Attach details if necessary

(7) Attach list if more than one

(8) If required by national legislation

(9) If applicable under the OECD Decision

## List of abbreviations and codes used in the notification document

<b>DISPOSAL OPERATIONS (block 11)</b>		
D1	Deposit into or onto land, (e.g., landfill, etc.)	
D2	Land treatment, (e.g., biodegradation of liquid or sludgy discards in soils, etc.)	
D3	Deep injection, (e.g., injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.)	
D4	Surface impoundment, (e.g., placement of liquid or sludge discards into pits, ponds or lagoons, etc.)	
D5	Specially engineered landfill, (e.g., placement into lined discrete cells which are capped and isolated from one another and the environment, etc.)	
D6	Release into a water body except seas/oceans	
D7	Release into seas/oceans including sea-bed insertion	
D8	Biological treatment not specified elsewhere in this list which results in final compounds or mixtures which are discarded by means of any of the operations in this list	
D9	Physico-chemical treatment not specified elsewhere in this list which results in final compounds or mixtures which are discarded by means of any of the operations in this list (e.g., evaporation, drying, calcination, etc.)	
D10	Incineration on land	
D11	Incineration at sea	
D12	Permanent storage, (e.g., emplacement of containers in a mine, etc.)	
D13	Blending or mixing prior to submission to any of the operations in this list	
D14	Repackaging prior to submission to any of the operations in this list	
D15	Storage pending any of the operations in this list	
<b>RECOVERY OPERATIONS (block 11)</b>		
R1	Use as a fuel (other than in direct incineration) or other means to generate energy (Basel/OECD) - Use principally as a fuel or other means to generate energy (EU)	
R2	Solvent reclamation/regeneration	
R3	Recycling/reclamation of organic substances which are not used as solvents	
R4	Recycling/reclamation of metals and metal compounds	
R5	Recycling/reclamation of other inorganic materials	
R6	Regeneration of acids or bases	
R7	Recovery of components used for pollution abatement	
R8	Recovery of components from catalysts	
R9	Used oil re-refining or other reuses of previously used oil	
R10	Land treatment resulting in benefit to agriculture or ecological improvement	
R11	Uses of residual materials obtained from any of the operations numbered R1-R10	
R12	Exchange of wastes for submission to any of the operations numbered R1-R11	
R13	Accumulation of material intended for any operation in this list.	
<b>PACKAGING TYPES (block 7)</b>	<b>H-CODE AND UN CLASS (block 14)</b>	
1. Drum	UN Class	H-code
2. Wooden barrel		Characteristics
3. Jerrican	1	H1
4. Box	3	H3
5. Bag	4.1	H4.1
6. Composite packaging	4.2	H4.2
7. Pressure receptacle	4.3	H4.3
8. Bulk		Substances or wastes liable to spontaneous combustion
9. Other (specify)		Substances or wastes which, in contact with water, emit flammable gases
<b>MEANS OF TRANSPORT (block 8)</b>	5.1	H5.1
R = Road	5.2	H5.2
T = Train/rail	6.1	H6.1
S = Sea	6.2	H6.2
A = Air	8	H8
W = Inland waterways	9	H10
<b>PHYSICAL CHARACTERISTICS (block 13)</b>	9	H11
1. Powdery/powder	9	H12
2. Solid	9	H13
3. Viscous/paste		Ecotoxic
4. Sludgy		Capable, by any means, after disposal of yielding another material, e. g., leachate, which possesses any of the characteristics listed above
5. Liquid		
6. Gaseous		
7. Other (specify)		

Further information, in particular related to waste identification (block 14), i.e. on Basel Annexes VIII and IX codes, OECD codes and Y-codes, can be found in a Guidance/Instruction Manual available from the OECD and the Secretariat of the Basel Convention.

## Movement document for transboundary movements/shipments of waste

<b>1. Corresponding to notification No:</b>		<b>2. Serial/total number of shipments:</b> /	
<b>3. Exporter - notifier</b> Registration No: Name: Address: Contact person: Tel: Fax: E-mail:		<b>4. Importer - consignee</b> Registration No: Name: Address: Contact person: Tel: Fax: E-mail:	
<b>5. Actual quantity:</b> Tonnes (Mg): m <sup>3</sup> :		<b>6. Actual date of shipment:</b>	
<b>7. Packaging</b> Type(s) (1): Special handling requirements: (2) Yes: <input type="checkbox"/> No: <input type="checkbox"/>		Number of packages: Yes: <input type="checkbox"/> No: <input type="checkbox"/>	
<b>8.(a) 1<sup>st</sup> Carrier (3):</b> Registration No: Name: Address: Tel: Fax: E-mail:		<b>8.(b) 2<sup>nd</sup> Carrier:</b> Registration No: Name: Address: Tel: Fax: E-mail:	<b>8.(c) Last Carrier:</b> Registration No: Name: Address: Tel: Fax: E-mail:
----- <i>To be completed by carrier's representative</i> -----			
Means of transport (1): Date of transfer: Signature:		Means of transport (1): Date of transfer: Signature:	Means of transport (1): Date of transfer: Signature:
<b>9. Waste generator(s) - producer(s) (4;5;6):</b> Registration No: Name: Address: Contact person: Tel: Fax: E-mail: Site of generation (2):		<b>12. Designation and composition of the waste (2):</b>	
<b>10. Disposal facility</b> <input type="checkbox"/> <b>or recovery facility</b> <input type="checkbox"/>		<b>13. Physical characteristics (1):</b>	
Registration No: Name: Address: Contact person: Tel: Fax: E-mail: Actual site of disposal/recovery (2)		<b>14. Waste identification (fill in relevant codes)</b> (i) Basel Annex VIII (or IX if applicable): (ii) OECD code (if different from (i)): (iii) EC list of wastes: (iv) National code in country of export: (v) National code in country of import: (vi) Other (specify): (vii) Y-code: (viii) H-code (1): (ix) UN class (1): (x) UN Number: (xi) UN Shipping name: (xii) Customs code(s) (HS):	
<b>11. Disposal/recovery operation(s)</b> D-code / R-code (1):			
<b>15. Exporter's - notifier's / generator's - producer's (4) declaration:</b> I certify that the above information is complete and correct to my best knowledge. I also certify that legally enforceable written contractual obligations have been entered into, that any applicable insurance or other financial guarantee is in force covering the transboundary movement and that all necessary consents have been received from the competent authorities of the countries concerned. Name: Date: Signature:			
<b>16. For use by any person involved in the transboundary movement in case additional information is required</b>			
<b>17. Shipment received by importer - consignee (if not facility):</b>		Date: Name: Signature:	
<b>TO BE COMPLETED BY DISPOSAL / RECOVERY FACILITY</b>			
<b>18. Shipment received at disposal facility</b> <input type="checkbox"/> <b>or recovery facility</b> <input type="checkbox"/>		<b>19. I certify that the disposal/recovery of the waste described above has been completed.</b>	
Date of reception: Quantity received: Tonnes (Mg): Approximate date of disposal/recovery: Disposal/recovery operation (1): Name: Date: Signature:		Accepted: <input type="checkbox"/> Rejected*: <input type="checkbox"/> m <sup>3</sup> : *immediately contact competent authorities Name: Date: Signature and stamp:	

(1) See list of abbreviations and codes on the next page

(2) Attach details if necessary

(3) If more than 3 carriers, attach information as required in blocks 8 (a,b,c).

(4) Required by the Basel Convention

(5) Attach list if more than one

(6) If required by national legislation

FOR USE BY CUSTOMS OFFICES (if required by national legislation)			
<b>20. Country of export - dispatch or customs office of exit</b> The waste described in this movement document left the country on: Signature:  Stamp:	<b>21. Country of import - destination or customs office of entry</b> The waste described in this movement document entered the country on: Signature:  Stamp:		
<b>22. Stamps of customs offices of transit countries</b>			
Name of country: Entry:	Exit:	Name of country: Entry:	Exit:
Name of country: Entry:	Exit:	Name of country: Entry:	Exit:

### List of Abbreviations and Codes Used in the Movement Document

<b>DISPOSAL OPERATIONS (block 11)</b> D1 Deposit into or onto land, (e.g., landfill, etc.) D2 Land treatment, (e.g. biodegradation of liquid or sludgy discards in soils, etc.) D3 Deep injection, (e.g., injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.) D4 Surface impoundment, (e.g., placement of liquid or sludge discards into pits, ponds or lagoons, etc.) D5 Specially engineered landfill, (e.g., placement into lined discrete cells which are capped and isolated from one another and the environment), etc. D6 Release into a water body except seas/oceans D7 Release into seas/oceans including sea-bed insertion D8 Biological treatment not specified elsewhere in this list which results in final compounds or mixtures which are discarded by means of any of the operations in this list D9 Physico-chemical treatment not specified elsewhere in this list which results in final compounds or mixtures which are discarded by means of any of the operations in this list (e.g., evaporation, drying, calcination, etc.) D10 Incineration on land D11 Incineration at sea D12 Permanent storage, (e.g., emplacement of containers in a mine, etc.) D13 Blending or mixing prior to submission to any of the operations in this list D14 Repackaging prior to submission to any of the operations in this list D15 Storage pending any of the operations in this list	<b>RECOVERY OPERATIONS (block 11)</b> R1 Use as a fuel (other than in direct incineration) or other means to generate energy (Basel/OECD) - Use principally as a fuel or other means to generate energy (EU) R2 Solvent reclamation/regeneration R3 Recycling/reclamation of organic substances which are not used as solvents R4 Recycling/reclamation of metals and metal compounds R5 Recycling/reclamation of other inorganic materials R6 Regeneration of acids or bases R7 Recovery of components used for pollution abatement R8 Recovery of components from catalysts R9 Used oil re-refining or other reuses of previously used oil R10 Land treatment resulting in benefit to agriculture or ecological improvement R11 Uses of residual materials obtained from any of the operations numbered R1-R10 R12 Exchange of wastes for submission to any of the operations numbered R1-R11 R13 Accumulation of material intended for any operation in this list																																													
<b>PACKAGING TYPES (block 7)</b> 1. Drum 2. Wooden barrel 3. Jerrican 4. Box 5. Bag 6. Composite packaging 7. Pressure receptacle 8. Bulk 9. Other (specify)	<b>H-CODE AND UN CLASS (block 14)</b> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">UN class</th> <th style="text-align: left;">H-code</th> <th style="text-align: left;">Characteristics</th> </tr> </thead> <tbody> <tr><td>1</td><td>H1</td><td>Explosive</td></tr> <tr><td>3</td><td>H3</td><td>Flammable liquids</td></tr> <tr><td>4.1</td><td>H4.1</td><td>Flammable solids</td></tr> <tr><td>4.2</td><td>H4.2</td><td>Substances or wastes liable to spontaneous combustion</td></tr> <tr><td>4.3</td><td>H4.3</td><td>Substances or wastes which, in contact with water, emit flammable gases</td></tr> <tr><td>5.1</td><td>H5.1</td><td>Oxidizing</td></tr> <tr><td>5.2</td><td>H5.2</td><td>Organic peroxides</td></tr> <tr><td>6.1</td><td>H6.1</td><td>Poisonous (acute)</td></tr> <tr><td>6.2</td><td>H6.2</td><td>Infectious substances</td></tr> <tr><td>8</td><td>H8</td><td>Corrosives</td></tr> <tr><td>9</td><td>H10</td><td>Liberation of toxic gases in contact with air or water</td></tr> <tr><td>9</td><td>H11</td><td>Toxic (delayed or chronic)</td></tr> <tr><td>9</td><td>H12</td><td>Ecotoxic</td></tr> <tr><td>9</td><td>H13</td><td>Capable, by any means, after disposal of yielding another material, e. g., leachate, which possesses any of the characteristics listed above</td></tr> </tbody> </table>	UN class	H-code	Characteristics	1	H1	Explosive	3	H3	Flammable liquids	4.1	H4.1	Flammable solids	4.2	H4.2	Substances or wastes liable to spontaneous combustion	4.3	H4.3	Substances or wastes which, in contact with water, emit flammable gases	5.1	H5.1	Oxidizing	5.2	H5.2	Organic peroxides	6.1	H6.1	Poisonous (acute)	6.2	H6.2	Infectious substances	8	H8	Corrosives	9	H10	Liberation of toxic gases in contact with air or water	9	H11	Toxic (delayed or chronic)	9	H12	Ecotoxic	9	H13	Capable, by any means, after disposal of yielding another material, e. g., leachate, which possesses any of the characteristics listed above
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<b>MEANS OF TRANSPORT (block 8)</b> R = Road                      A = Air T = Train/rail                W = Inland waterways S = Sea																																														
<b>PHYSICAL CHARACTERISTICS (block 13)</b> 1. Powdery / powder            5. Liquid 2. Solid                            6. Gaseous 3. Viscous / paste                7. Other (specify) 4. Sludgy																																														

Further information, in particular related to waste identification (block 14), i.e. on Basel Annexes VIII and IX codes, OECD codes and Y-codes, can be found in a Guidance/Instruction Manual available from the OECD and the Secretariat of the Basel Convention.

# Instructions for completing the notification and movement documents

## I. Introduction

1. International instruments have been established to control export and import of wastes which may pose a risk or a hazard to human health and the environment. The two such instruments with the greatest influence are the Basel Convention,<sup>1</sup> whose secretariat is administered by the United Nations Environment Programme (UNEP), and the Organisation for Economic Co-operation and Development (OECD) Council Decision C(2001)107/FINAL (hereinafter “the OECD Decision”).<sup>2</sup> Member States of the European Union are also obliged to comply with a European Community Regulation.<sup>3</sup> The Basel Convention and the European Community Regulation concern international movements of waste, whether destined for disposal or recovery, whereas the OECD Decision only concerns movements of wastes destined for recovery operations within the OECD area. All of the instruments operate subject to a range of administrative controls by the Parties implementing them.

2. The present instructions provide the necessary explanations for completing the notification and movement documents. Both documents are compatible with the three instruments mentioned above, since they take into account the specific requirements set out in the Basel Convention, the OECD Decision and the European Community Regulation. Because the documents have been made broad enough to cover all three instruments, however, not all blocks in the document will be applicable to all of the instruments and it therefore may not be necessary to complete all of the blocks in a given case. Any specific requirements relating to only one control system have been indicated with the use of footnotes. It is also possible that national implementing legislation may use terminology that differs from that adopted in the Basel Convention and the OECD Decision. For example, the term “shipment” is used in the European Community Regulation instead of “movement” and the titles of the notification and movement documents therefore reflect this variation by employing the term “movement/shipment”.

3. The documents include both the term “disposal” and “recovery”, because the terms are defined differently in the three instruments. The European Community Regulation and the OECD Decision use the term “disposal” to refer to disposal operations listed in Annex IV.A of the Basel Convention and Appendix 5.A of the OECD Decision and “recovery” for recovery operations listed in Annex IV.B of the Basel Convention and Appendix 5.B of the OECD Decision. In the Basel Convention itself, however, the term “disposal” is used to refer to both disposal and recovery operations.

4. The competent national authorities in each state of export will be responsible for providing and issuing the notification and movement documents (in both paper and electronic versions). When doing so, they will use a numbering system, which allows a particular consignment of waste to be traced. The numbering system should be prefixed with the country code that can be found in the ISO standard 3166 abbreviation list.

5. Countries may wish to issue the documents in a paper size format that conforms to their national standards (normally ISO A4, as recommended by the United Nations). In order to facilitate their use internationally, however, and to take into account the difference between ISO A4 and the paper size used in North America, the frame size of the forms should not be greater than 183 x 262 mm with margins aligned at the top and the left side of the paper.

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<sup>1</sup> Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 22 March 1989. See [www.basel.int](http://www.basel.int).

<sup>2</sup> Decision C(2001)107/FINAL of the OECD Council, concerning the revision of Decision C(92)39/FINAL on the control of transboundary movements of waste destined for recovery operations; the former decision is a consolidation of texts adopted by the Council on 14 June 2001 and on 28 February 2002 (with amendments). See [http://www.oecd.org/department/0,2688,en\\_2649\\_34397\\_1\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/department/0,2688,en_2649_34397_1_1_1_1_1,00.html)

<sup>3</sup> Currently in force is Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community (Official Journal of the European Communities No. L30, 6.2.1993 (with amendments)). It will be repealed with effect from 12 July 2007, when Regulation (EC) No 1013/2006 on shipments of waste (Official Journal No. L190, 12.7.2006), will apply. See <http://europa.eu.int/comm/environment/waste/shipments/index.htm>.

## II. Purpose of the notification and movement documents

6. The notification document is intended to provide the competent authorities of countries concerned with the information they need to assess the acceptability of proposed waste movements. The document includes space for the competent authorities to acknowledge receipt of the notification and, where required, to consent in writing to a proposed movement.

7. The movement document is intended to travel with a consignment of waste at all times from the moment it leaves the waste generator to its arrival at a disposal or recovery facility in another country. Each person who takes charge of a transboundary movement is to sign the movement document either upon delivery or receipt of the wastes in question. Space is provided in the document for detailed information on all carriers of the consignment. There are also spaces in the movement document for recording passage of the consignment through the customs offices of all countries concerned (while not strictly required by applicable international instruments, national legislation in some countries requires such procedures, as well as information to ensure proper control over movement). Finally, the document is to be used by the relevant disposal or recovery facility to certify that the waste has been received and that the recovery or disposal operation has been completed.

## III. General requirements

8. Those filling out printed copies of the documents should use typescript or block capitals in permanent ink throughout. Signatures should always be written in permanent ink and the name of the authorized representative should accompany the signature in capital letters. In the event of a minor mistake, for example the use of the wrong code for a waste, a correction can be made with the approval of the competent authorities. The new text must be marked and signed or stamped, and the date of the modification must be noted. For major changes or corrections, a new form must be completed.

9. The forms have also been designed to be easily completed electronically. Where this is done, appropriate security measures should be taken against any misuse of the forms. Any changes made to a completed form with the approval of the competent authorities should be visible. When using electronic forms transmitted by e-mail, a digital signature is necessary.

10. To simplify translation, the documents require a code, rather than text, for the completion of several blocks. Where text is required, however, it must be in a language acceptable to the competent authorities in the country of import and, where required, to the other concerned authorities.

11. A six digit format should be used to indicate the date. For example, 29 January 2006 should be shown as 29.01.06 (Day.Month.Year).

12. Where it is necessary to add annexes or attachments to the documents providing additional information, each attachment should include the reference number of the relevant document and cite the block to which it relates.

## IV. Specific instructions for completing the notification document

13. The exporter or the competent authority of the State of export, as appropriate, is to complete blocks 1–18 (except the notification number in block 3). The waste generator, where practicable, should also sign in block 17.

14. **Blocks 1 and 2:** Provide the registration number (where applicable), full name, address (including the name of the country), telephone and fax numbers (including the country code) and e-mail address of the exporter or the competent authority of the State of export, as appropriate, and importer,<sup>4</sup> and also the name of a contact person responsible for the shipment. The phone and fax numbers and the e-mail address should facilitate contact of all relevant persons at any time regarding an incident during shipment.

15. Normally, the importer would be the disposal or recovery facility given in block 10. In some cases, however, the importer may be another person, for example a recognized trader, a dealer, a broker, or a corporate body, such as the headquarters or mailing address of the receiving disposal or recovery facility in block 10. In order to act as an importer, a recognized trader, dealer, broker or corporate body must be under the jurisdiction of the country of import and possess or have some other form of legal control over the waste at the moment the shipment arrives in the country of import. In such cases,

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<sup>4</sup> In the European Community, the terms notifier and consignee are used instead of exporter and importer.

information relating to the recognized trader, dealer, broker or corporate body should be completed in block 2.

16. **Block 3:** When issuing a notification document, a competent authority will, according to its own system, provide an identification number which will be printed in this block (see paragraph 4 above). The appropriate boxes should be ticked to indicate:

(a) Whether the notification covers one shipment (single notification) or multiple shipments (general notification);

(b) Whether the waste being shipped is destined for disposal (which, as noted in paragraphs 1 and 3 above, is possible in the case of a shipment falling within the ambit of the Basel Convention or the European Community Regulation but not one within the ambit of the OECD Decision) or for recovery; and

(c) Whether the waste being shipped is destined for a facility which has been granted a pre-consent for receiving certain wastes subject to the Amber control procedure in accordance with case 2 of the “Functioning of the Amber Control Procedure” (see chapter II, section D of the OECD Decision).

17. **Blocks 4, 5 and 6:** For single or multiple shipments, give the number of shipments in block 4 and the intended date of a single shipment or, for multiple shipments, the dates of the first and last shipments, in block 6. In block 5, give the weight in tonnes (1 megagram (Mg) or 1,000 kg) or volume in cubic metres (1,000 litres) of the waste. Other units of the metric system, such as kilograms or litres, are also acceptable; when used, the unit of measure should be indicated and the unit in the document should be crossed out. Some countries may always require the weight to be quoted. For multiple shipments, the total quantity shipped must not exceed the quantity declared in block 5. The intended period of time for movements in block 6 may not exceed one year, with the exception of multiple shipments to pre-consented recovery facilities that fall under the OECD Decision (see paragraph 16 (c)), for which the intended period of time may not exceed three years. In the case of multiple shipments, the Basel Convention requires the expected dates or the expected frequency and the estimated quantity of each shipment to be quoted in blocks 5 and 6 or attached in an annex. Where a competent authority issues a written consent to the movement and the validity period of that consent in block 20 differs from the period indicated in block 6, the decision of the competent authority overrides the information in block 6.

18. **Block 7:** Types of packaging should be indicated using the codes provided in the list of abbreviations and codes attached to the notification document. If special handling precautions are required, such as those required by producers’ handling instructions for employees, health and safety information, including information on dealing with spillage, and transport emergency cards, tick the appropriate box and attach the information in an annex.

19. **Block 8:** Provide the following necessary information on the carrier or carriers involved in the shipment: registration number (where applicable), full name, address (including the name of the country), telephone and fax numbers (including the country code), e-mail address and the name of a contact person responsible for the shipment. If more than one carrier is involved, append to the notification document a complete list giving the required information for each carrier. Where the transport is organized by a forwarding agent, the agent’s details should be given in block 8 and the respective information on actual carriers should be provided in an annex. Means of transport should be indicated using the abbreviations provided in the list of abbreviations and codes attached to the notification document.

20. **Block 9:** Provide the required information on the generator of the waste. This information is required under the Basel Convention and many countries may require it under their national legislation.<sup>5</sup> Such information is not required, however, for movements of wastes destined for recovery under the OECD Decision. The registration number of the generator should be given where applicable. If the exporter is the generator of the waste then write “Same as block 1”. If the waste has been produced by more than one generator, write “See attached list” and append a list providing the requested information for each generator. Where the generator is not known, give the name of the person in possession or control of such wastes. The definition of “generator” used in the Basel Convention provides that in instances where the true generator of the waste is not known, the generator is deemed to be the person who is in possession or control of the waste. Also provide information on the process by which the waste was generated and the site of generation. Some countries may accept that information on the generator be given in a separate annex which would only be available to the competent authorities.

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<sup>5</sup> In the European Community, the term “producer” is used instead of “generator”.

21. **Block 10:** Give the required information on the destination of the shipment by first ticking the appropriate type of facility: either disposal or recovery. The registration number should be given where applicable. If the disposer or recoverer is also the importer, state here "Same as block 2". If the disposal or recovery operation is a D13–D15 or R12 or R13 operation (according to the definitions of operations set out in the list of abbreviations and codes attached to the notification document), the facility performing the operation should be mentioned in block 10, as well as the location where the operation will be performed. In such a case, corresponding information on the subsequent facility or facilities, where any subsequent R12/R13 or D13–D15 operation and the D1–D12 or R1–R11 operation or operations takes or take place or may take place should be provided in an annex. Provide the information on the actual site of disposal or recovery if it is different from the address of the facility.

22. **Block 11:** Indicate the type of recovery or disposal operation by the using R-codes or D-codes provided in the list of abbreviations and codes attached to the notification document.<sup>6</sup> The OECD Decision only covers transboundary movements of wastes destined for recovery operations (R-codes) within the OECD area. If the disposal or recovery operation is a D13–D15 or R12 or R13 operation, corresponding information on the subsequent operations (any R12/R13 or D13–D15 as well as D1–D12 or R1–R11) should be provided in an annex. Also indicate the technology to be employed. Specify also the reason for export (this is not required, however, by the OECD Decision).

23. **Block 12:** Give the name or names by which the material is commonly known or the commercial name and the names of its major constituents (in terms of quantity and/or hazard) and their relative concentrations (expressed as a percentage), if known. In the case of a mixture of wastes, provide the same information for the different fractions and indicate which fractions are destined for recovery. A chemical analysis of the composition of the waste may be required in accordance with national legislation. Attach further information in an annex if necessary.

24. **Block 13:** Indicate physical characteristics of the waste at normal temperatures and pressures by using the codes provided in the list of abbreviations and codes attached to the notification document.

25. **Block 14:** State the code that identifies the waste according to the system adopted under the Basel Convention (under subheading (i) in block 14) and, where applicable, the systems adopted in the OECD Decision (under subheading (ii)) and other accepted classification systems (under subheadings (iii) to (xii)). According to the OECD Decision, only one waste code (from either the Basel or OECD systems) should be given, except in the case of mixtures of wastes for which no individual entry exists. In such a case, the code of each fraction of the waste should be provided in order of importance (in an annex if necessary).

(a) **Subheading (i):** Basel Convention Annex VIII codes should be used for wastes that are subject to control under the Basel Convention and the OECD Decision (see Part I of Appendix 4 in the OECD Decision); Basel Annex IX codes should be used for wastes that are not usually subject to control under the Basel Convention and the OECD Decision but which, for a specific reason such as contamination by hazardous substances or different classification according to national regulations, are subject to such control (see Part I of Appendix 3 in the OECD Decision). Basel Annexes VIII and IX can be found in the text of the Basel Convention as well as in the Instruction Manual available from the Secretariat of the Basel Convention. If a waste is not listed in Annexes VIII or IX of the Basel Convention, insert "not listed".

(b) **Subheading (ii):** OECD member countries should use OECD codes for wastes listed in Part II of Appendices 3 and 4 of the OECD Decision, i.e., wastes that have no equivalent listing in the Basel Convention or that have a different level of control under the OECD Decision from the one required by the Basel Convention. If a waste is not listed in Part II of Appendices 3 and 4 of the OECD Decision, insert "not listed".

(c) **Subheading (iii):** European Union Member States should use the codes included in the European Community list of wastes (see Commission Decision 2000/532/EC as amended).<sup>7</sup>

(d) **Subheadings (iv) and (v):** Where applicable, national identification codes used in the country of export and, if known, in the country of import should be used.

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<sup>6</sup> In the European Community Regulation, the definition of operation R1 in the list of abbreviations is different from that used in the Basel Convention and the OECD Decision; both wordings are therefore provided. There are other editorial differences between the terminology used in the European Community and that used in the Basel Convention and the OECD Decision, which are not contained in the list of abbreviations.

<sup>7</sup> See [http://europa.eu.int/eur-lex/en/consleg/main/2000/en\\_2000D0532\\_index.html](http://europa.eu.int/eur-lex/en/consleg/main/2000/en_2000D0532_index.html).

- (e) **Subheading (vi):** If useful or required by the relevant competent authorities, add here any other code or additional information that would facilitate the identification of the waste.
- (f) **Subheading (vii):** State the appropriate Y-code or Y-codes according to the “Categories of wastes to be controlled” (see Annex I of the Basel Convention and Appendix 1 of the OECD Decision), or according to the “Categories of wastes requiring special consideration” given in Annex II of the Basel Convention (see Appendix 2 of the Basel Instruction Manual), if it or they exist(s). Y-codes are not required by the OECD Decision except where the waste shipment falls under one of the two “Categories requiring special consideration” under the Basel Convention (Y46 and Y47 or Annex II wastes), in which case the Basel Y-code should be indicated.
- (g) **Subheading (viii):** If applicable, state here the appropriate H-code or H-codes, i.e., the codes indicating the hazardous characteristics exhibited by the waste (see the list of abbreviations and codes attached to the notification document).
- (h) **Subheading (ix):** If applicable, state here the United Nations class or classes which indicate the hazardous characteristics of the waste according to the United Nations classification (see the list of abbreviations and codes attached to the notification document) and are required to comply with international rules for the transport of hazardous materials (see the United Nations Recommendations on the Transport of Dangerous Goods. Model Regulations (Orange Book), latest edition).<sup>8</sup>
- (i) **Subheadings (x and xi):** If applicable, state here the appropriate United Nations number or numbers and United Nations shipping name or names. These are used to identify the waste according to the United Nations classification system and are required to comply with international rules for transport of hazardous materials (see the United Nations Recommendations on the Transport of Dangerous Goods. Model Regulations (Orange Book), latest edition).<sup>8</sup>
- (j) **Subheading (xii):** If applicable, state here customs code or codes, which allow identification of the waste by customs offices (see the list of codes and commodities in the “Harmonized commodity description and coding system” produced by the World Customs Organization).
26. **Block 15:** The Basel Convention uses the term “States”, whereas the OECD Decision uses “Member countries” and the European Community Regulation uses “Member States”. On line (a) of block 15, provide the name of the countries or States of export, transit and import or the codes for each country or State by using the ISO standard 3166 abbreviations.<sup>9</sup> On line (b), provide the code number of the respective competent authority for each country if required by the national legislation of that country and on line (c) insert the name of the border crossing or port and, where applicable, the customs office code number as the point of entry to or exit from a particular country. For transit countries give the information in line (c) for points of entry and exit. If more than three transit countries are involved in a particular movement, attach the appropriate information in an annex.
27. **Block 16:** This block should be completed for movements involving entering, passing through or leaving Member States of the European Union.
28. **Block 17:** Each copy of the notification document is to be signed and dated by the exporter (or by the recognized trader, dealer or broker if acting as an exporter) or the competent authority of the State of export, as appropriate, before being forwarded to the competent authorities of the countries concerned. Under the Basel Convention, the waste generator is also required to sign the declaration; it is noted that this may not be practicable in cases where there are several generators (definitions regarding practicability may be contained in national legislation). Further, where the generator is not known, the person in possession or control of the waste should sign. Some countries may require that the declaration also certify the existence of insurance against liability for damage to third parties. Some countries may require proof of insurance or other financial guarantees and a contract to accompany the notification document.
29. **Block 18:** Indicate the number of annexes containing any additional information supplied with the notification document (see blocks 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 20 or 21). Each annex must include a reference to the notification number to which it relates, which is indicated in the corner of block 3.

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<sup>8</sup> See <http://www.unece.org/trans/danger/danger.htm>.

<sup>9</sup> In the European Community, the terms “dispatch” and “destination” are used instead of “export” and “import”.

30. **Block 19:** This block is for use by the competent authority to acknowledge receipt of the notification. Under the Basel Convention, the competent authority or authorities of the country or countries of import (where applicable) and transit issue such an acknowledgement. Under the OECD Decision, the competent authority of the country of import issues the acknowledgement. Some countries may, according to their national legislation, require that the competent authority of the country of export also issues an acknowledgement.

31. **Blocks 20 and 21:** Block 20 is for use by competent authorities of any country concerned when providing a written consent to a transboundary movement of waste. The Basel Convention (except if a country has decided not to require written consent with regard to transit and has informed the other Parties thereof in accordance with Article 6(4)) of the Basel Convention) and certain countries always require a written consent whereas the OECD Decision does not require a written consent. Indicate the name of the country (or its code by using the ISO standard 3166 abbreviations), the date on which the consent is provided and the date on which it expires. If the movement is subject to specific conditions, the competent authority in question should tick the appropriate box and specify the conditions in block 21 or in an annex to the notification document. If a competent authority wishes to object to the movement it should do so by writing "OBJECTION" in block 20. Block 21, or a separate letter, may then be used to explain the reasons for the objection.

## V. Specific instructions for completing the movement document

32. The exporter or the competent authority of the State of export, as appropriate, is to complete blocks 2–16, except the means of transport, the date of transfer and the signature, which appear in blocks 8 (a) to 8 (c) and which are to be completed by the carrier or its representative. The importer is to complete block 17 in the event that it is not the disposer or recoverer and it takes charge of a shipment of waste after it arrives in the country of import.

33. **Block 1:** Enter the notification number of the consignment. This is copied from block 3 in the notification document.

34. **Block 2:** For a general notification for multiple shipments, enter the serial number of the shipment and the total intended number of shipments indicated in block 4 in the notification document. (for example, write "4" and "11" for the fourth shipment out of eleven intended shipments under the general notification in question). In the case of a single notification, enter 1/1.

35. **Blocks 3 and 4:** Reproduce the same information on the exporter or the competent authority of the State of export, as appropriate, and importer as given in blocks 1 and 2 in the notification document.

36. **Block 5:** Give the actual weight in tonnes (1 megagram (Mg) or 1,000 kg) or volume in cubic metres (1,000 litres) of the waste. Other units of the metric system, such as kilograms or litres, are also acceptable; when used, the unit of measure should be indicated and the unit in the form should be crossed out. Some countries may always require the weight to be quoted. Attach, wherever possible, copies of weighbridge tickets.

37. **Block 6:** Enter the date when the shipment actually starts. The starting dates of all shipments should be within the validity period issued by the competent authorities. Where the different competent authorities involved have granted different validity periods, the shipment or shipments may only take place in the time period during which the consents of all competent authorities are simultaneously valid.

38. **Block 7:** Types of packaging should be indicated using the codes provided in the list of abbreviations and codes attached to the movement document. If special handling precautions are required, such as those prescribed by producers' handling instructions for employees, health and safety information, including information on dealing with spillage, and transport emergency cards, tick the appropriate box and attach the information in an annex. Also enter the number of packages making up the consignment.

39. **Blocks 8 (a), (b) and (c):** Enter the registration number (where applicable), name, address (including the name of the country), telephone and fax numbers (including the country code) and e-mail address of each actual carrier. When more than three carriers are involved, appropriate information on each carrier should be attached to the movement document. When transport is organized by a forwarding agent, the agent's details should be given in block 8 and the information on each carrier should be provided in an annex. The means of transport, the date of transfer and a signature should be provided by the carrier or carrier's representative taking possession of the consignment. A copy of the signed movement document is to be retained by the exporter. Upon each successive transfer of the consignment, the new carrier or carrier's representative taking possession of the consignment will have

to comply with the same request and also sign the document. A copy of the signed document is to be retained by the previous carrier.

40. **Block 9:** Reproduce the information given in block 9 of the notification document.

41. **Blocks 10 and 11:** Reproduce the information given in blocks 10 and 11 in the notification document. If the disposer or recoverer is also the importer, write in block 10: "Same as block 4". If the disposal or recovery operation is a D13–D15 or R12 or R13 operation (according to the definitions of operations set out in the list of abbreviations and codes attached to the movement document), the information on the facility performing the operation provided in block 10 is sufficient. No further information on any subsequent facilities performing R12/R13 or D13–D15 operations and the subsequent facility(ies) performing the D1–D12 or R1–R11 operation(s) needs to be included in the movement document.

42. **Blocks 12, 13 and 14:** Reproduce the information given in blocks 12, 13 and 14 in the notification document.

43. **Block 15:** At the time of shipment, the exporter (or the recognized trader or dealer or broker if acting as an exporter) or the competent authority of the State of export, as appropriate, or the generator of the waste according to the Basel Convention, shall sign and date the movement document. Some countries may require copies or originals of the notification document containing the written consent, including any conditions, of the competent authorities concerned to be enclosed with the movement document.

44. **Block 16:** This block can be used by any person involved in a transboundary movement (exporter or the competent authority of the State of export, as appropriate, importer, any competent authority, carrier) in specific cases where more detailed information is required by national legislation concerning a particular item (for instance information on the port where a transfer to another transport mode occurs, the number of containers and their identification number, or additional proof or stamps indicating that the movement has been approved by the competent authorities).

45. **Block 17:** This block is to be completed by the importer in the event that it is not the disposer or recoverer and in case the importer takes charge of the waste after the shipment arrives in the country of import.

46. **Block 18:** This block is to be completed by the authorized representative of the disposal or recovery facility upon receipt of the waste consignment. Tick the box of the appropriate type of facility. With regard to the quantity received, please refer to the specific instructions on block 5 (paragraph 36). A signed copy of the movement document is given to the last carrier. If the shipment is rejected for any reason, the representative of the disposal or recovery facility must immediately contact his or her competent authority. Under the OECD Decision, signed copies of the movement document must be sent within three working days to the exporter and the competent authority in the countries concerned (with the exception of those OECD transit countries which have informed the OECD Secretariat that they do not wish to receive such copies of the movement document). The original movement document shall be retained by the disposal or recovery facility.

47. Receipt of the waste consignment must be certified by any facility performing any disposal or recovery operation, including any D13–D15 or R12 or R13 operation. A facility performing any D13–D15 or R12/R13 operation or a D1–D12 or R1–11 operation subsequent to a D13–D15 or R12 or R13 operation in the same country, is not, however, required to certify receipt of the consignment from the D13–D15 or R12 or R13 facility. Thus, block 18 does not need to be used for the final receipt of the consignment in such a case. Indicate also the type of disposal or recovery operation by using the list of abbreviations and codes attached to the movement document and the approximate date by which the disposal or recovery of waste will be completed (this is not required by the OECD Decision).

48. **Block 19:** This block is to be completed by the disposer or recoverer to certify the completion of the disposal or recovery of the waste. Under the Basel Convention, signed copies of the document with block 19 completed should be sent to the exporter and competent authorities of the country of export. Under the OECD Decision, signed copies of the movement document with block 19 completed should be sent to the exporter and competent authorities of the countries of export and import as soon as possible, but no later than 30 days after the completion of the recovery and no later than one calendar year following the receipt of the waste. For disposal or recovery operations D13–D15 or R12 or R13, the information on the facility performing such an operation provided in block 10 is sufficient, and no further information on any subsequent facilities performing R12/R13 or D13–D15 operations and the subsequent facility(ies) performing the D1–D12 or R1–R11 operation(s) need be included in the movement document.

49. The disposal or recovery of waste must be certified by any facility performing any disposal or recovery operation, including a D13–D15 or R12 or R13 operation. Therefore, a facility performing any D13–D15 or R12/R13 operation or a D1–D12 or R1–R11 operation, subsequent to a D13–D15 or R12 or R13 operation in the same country, should not use block 19 to certify the recovery or disposal of the waste, since this block will already have been completed by the D13–D15 or R12 or R13 facility. The means of certifying disposal or recovery in this particular case must be ascertained by each country.

50. **Blocks 20, 21 and 22:** Not required by the Basel Convention or by the OECD Decision. The blocks may be used for control by customs offices at the borders of country of export, transit and import if so required by national legislation.

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## Appendix 5 - Endnotes

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- <sup>1</sup> *Water Resources of Somalia*. Somalia Water and Land Information Management: Nairobi, Kenya. [http://www.faoswalim.org/ftp/Water\\_Reports/Cleared/W-11%20Water%20Resources%20of%20Somalia.pdf](http://www.faoswalim.org/ftp/Water_Reports/Cleared/W-11%20Water%20Resources%20of%20Somalia.pdf) (Accessed 30 July 2010)
- <sup>2</sup> SWALIM (2010) *The Somalia climate archive*. Somalia Water and Land Information Management: Nairobi, Kenya. [http://www.faoswalim.org/thematic\\_areas/water/climate/somalia\\_climate\\_archive](http://www.faoswalim.org/thematic_areas/water/climate/somalia_climate_archive) (Accessed 30 September 2010)
- <sup>3</sup> SCWE (2000) *Need for Managing and Developing Water for Peace and Prosperity in Somalia-Constraints and Opportunities*. Somali Centre for Water and Environment: Stockholm, Sweden
- <sup>4</sup> ICRC (1998) *In a town scarred by war*. International Committee of the Red Cross: Geneva, Switzerland. <http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/57JPL5>. (Accessed 23 July 2010)
- <sup>5</sup> Adapted from ICRC (1998) *In a town scarred by war*. International Committee of the Red Cross: Geneva, Switzerland. <http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/57JPL5>. (Accessed 23 July 2010)
- <sup>6</sup> <http://www.unhcr.org/cgi-bin/texis/vtx/page?page=49e483ad6>
- <sup>7</sup> <http://www.unhcr.org/cgi-bin/texis/vtx/page?page=49e483ad6>
- <sup>8</sup> UNHCR (2007) *IDP Settlements in Mogadishu*. United Nations High Commission for Refugees: Nairobi, Kenya
- <sup>9</sup> [http://www.depha.org/unhcr/Somalia/Maps/UrbanIDPs/SOM\\_Mog\\_IDP\\_Settlements\\_A1LC\\_4May07.pdf](http://www.depha.org/unhcr/Somalia/Maps/UrbanIDPs/SOM_Mog_IDP_Settlements_A1LC_4May07.pdf) (Accessed 28 July 2010)
- <sup>10</sup> Official census 1975.
- <sup>11</sup> UNHCR (2009) *More than 40,000 Somalis return to Mogadishu despite renewed fighting*. United Nations High Commission for Refugees: Nairobi, Kenya <http://www.unhcr.org/4b791eb09.html> (27 July 2010)
- <sup>12</sup> UNHCR (2010) *Somalia Population Movement Tracking: Mogadishu Dashboard, since 1 February 2010*. United Nations High Commission for Refugees: Nairobi, Kenya <http://www.unhcr.org/49a8070b2.html>. (27 July 2010)
- <sup>13</sup> <https://www.cia.gov/library/publications/the-world-factbook/geos/so.html>
- <sup>14</sup> <http://www.unhcr.org/cgi-bin/texis/vtx/page?page=49e483ad6>
- <sup>15</sup> Hull C., Eriksson M., Mac Dermott J., Rudén F., Waleij A. (2009) *Managing unintended Consequences of Peace Support Operations*. FOI-R—2916-SE. Stockholm, Sweden
- <sup>16</sup> SCWE (2000) *Need for Managing and Developing Water for Peace and Prosperity in Somalia-Constraints and Opportunities*. Somali Centre for Water and Environment: Stockholm, Sweden
- <sup>17</sup> InsideSomalia (2009) *How to get water delivered in Mogadishu after 18 years of war*. <http://insidesomalia.org/200907071491/News/Environment/How-to-get-water-delivered-in-Mogadishu-after-18-years-of-war.html> (Accessed 28 July 2010)
- <sup>18</sup> SCWE (2000) *Need for Managing and Developing Water for Peace and Prosperity in Somalia-Constraints and Opportunities*. Somali Centre for Water and Environment: Stockholm, Sweden

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<sup>19</sup> UNEP (2005) *The State of the Environment in Somalia - A Desk Study*. United Nations Environmental Programme: Geneva, Switzerland.

[http://www.unep.org/DEPI/programmes/Somalia\\_Final.pdf](http://www.unep.org/DEPI/programmes/Somalia_Final.pdf) (Accessed 23 July 2010)

<sup>20</sup> Mogadishu ecology baseline assessment report, AMISOM operations Mogadishu, Somalia, August 2010

<sup>21</sup> UNEP (2005) *The State of the Environment in Somalia - A Desk Study*. United Nations Environmental Programme: Geneva, Switzerland.

[http://www.unep.org/DEPI/programmes/Somalia\\_Final.pdf](http://www.unep.org/DEPI/programmes/Somalia_Final.pdf) (Accessed 23 July 2010)

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