



# NEOM – ENVIRONMENTAL GUIDELINE

نيوم NEOM

## Interim Waste Management




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### Document History

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### Approvals

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## ENVIRONMENTAL GUIDELINE – INTERIM WASTE MANAGEMENT

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### 1 EXECUTIVE SUMMARY

This guideline was developed by NEOM Environment the authority for NEOM's environmental quality policies and procedures, which include waste management regulations comprising framework, policy, guidelines, procedures, standards and requirements for NEOM and a related monitoring and reporting program to ensure compliance with the set guideline and targets.

NEOM is in progress of receiving existing municipality waste services and legacy waste facilities from the Base Economy Authorities. This document sets out the interim guideline for the handover and interim management of existing waste management assets and operations of the current communities inclusive of present NEOM waste producing activities (Project development / construction) to NEOM until the future strategy for waste assets and management according to NEOM vision and according to its Founding Law is in place and can be implemented.

### 2 INTRODUCTION

Sustainability and the highest environmental quality (EQ) standards are part of the core visions of NEOM, and each party involved in the project shares the responsibility for achieving targets related to environmental quality and sustainability.

NEOM Environment is responsible for developing NEOM's environmental quality policies and procedures, establishing NEOM-wide environmental quality and sustainability targets (and performance measures), and providing overarching compliance auditing and reporting for NEOM at a corporate level.

This NEOM Environmental Guideline is part of the NEOM-wide EQ Standard. It will be reviewed and updated, as and when required. This guideline is intended to reduce the environmental impacts of Waste Management to air quality, environment and human health.

NEOM aims at developing the World's first truly Circular Economy (CE), achieving nothing less than a net zero carbon emissions combination of the most sustainably efficient industries. In this context Waste Management that adheres to Circular Economy Principles is a mandatory prerequisite.

This means that NEOM follows a Cradle to Cradle approach and aims to phase out Waste wherever possible. Waste is seen as a Resource to be recirculated in its Economy. NEOM is aiming to be Climate Positive by 2030. In order to achieve this objective, NEOM is implementing regulatory controls to manage Greenhouse Gas (GHG) emissions across all industrial activities, the Waste Management sector being included.

This guidance is based on the principles depicted by the waste management hierarchy and life cycle approach (LCA). LCA and the waste hierarchy consider that integrated waste management system is environmentally effective and economically affordable. This approach will consider a combination of reduction in the amount of waste generated, reuse or recycling of the waste, including resource recovery, treating the waste using best available technology and disposal in a sanitary landfill, only when waste cannot be otherwise managed.

In the following the most important waste management principles that NEOM Environment would request to be taken into consideration related to handover and operations of existing municipality functions and legacy waste management shall be listed as guidance.

**This guideline does not apply to future NEOM developments.** Guidance related to design, construction / establishment, operation, commissioning and de-commissioning of future waste management and related to future NEOM developments will be added at a later stage.

This guideline shall be implemented on all NEOM legacy and current Base Economy waste sites to limit respective environmental impacts to the strict minimum.

### 3 GUIDELINE OBJECTIVES

The primary objectives of this guideline are the following:

- Optimize the handover and operations of existing municipality waste services and legacy waste facilities from the Base Economy Authorities;
- Give interim guidance as to Waste Management of existing Waste streams until the final Waste Strategy is developed and implemented;
- Ensure the waste is handled appropriately and receives the correct treatment to protect human health and the environment;
- Minimize potential pollution risks posed by legacy waste and to improve resource recovery where possible; and
- Ensure legal requirements are adequately addressed and covered.

The implementation of interim waste management practices should consider and address the following:

- Protection of human health and wellbeing; and
- Protection of the environment.

The key objective of this guideline is not to form the ‘final basis of best practice’ for waste management for NEOM, but to provide a set of performance guidelines and a pathway in achieving the highest possible standard for dealing with municipal legacy waste issues.

Optimization of planning for most innovative future Waste Management Facilities and Waste Management Procedures shall be addressed as a next step in an alteration to this guideline, once legacy issues have been adequately addressed.

#### 4 KEY STAKEHOLDERS / ROLES AND RESPONSIBILITIES

The key stakeholders with roles and responsibilities related to this guideline are set out as follows:

##### NEOM Environment

NEOM Environment has the responsibility to set the respective waste management regulations comprising framework, policy, guidelines, procedures, standards and requirements for NEOM and shall establish a monitoring and reporting program that ensures compliance with the set guideline and targets.

##### NEOM Waste Department – Operations

The Waste Department has the responsibility to ensure that their respective areas of operation follow the requirements outlined in this document and that each service provider involved with municipality waste collection and disposal activities and legacy waste collection, transport and disposal is aware of the guideline, related procedures and understands the importance of adherence to them.

The Waste Department will appoint a position (e.g. Waste Director) responsible to oversee, monitor and audit their operations and services for compliance with this guideline. The Waste Department may appoint external service providers to perform municipal waste collection, disposal and legacy waste collection, transport and disposal.

##### Legacy and current Waste Management Service Provider / Operator

All external service providers are required to understand and comply with the requirements identified within this guideline and related procedures. An external service provider must ensure its compliance with all applicable legislation, policy, standards and guidelines in place as at the date of execution of this guideline and amended from time to time.

The external service provider is responsible for the day-to-day delivery and performance of waste collections and dump operation services.

#### 5 LEGISLATION AND STANDARDS

The general approach to remediation of legacy dump sites and management of the wastes removed, is one of site and wastes characterization followed by selection of appropriate handling, transport, treatment and disposal methods aligned to dealing with wastes as far up the Waste Management Hierarchy (WMH) as is practical. The level of the WMH at which the different wastes are managed and ultimately disposed of will be largely governed by the availability of disposal routes for reducing, recovery, treatment and disposal of wastes. For

clarity, NEOM requires the Waste Department / Service Provider to fully justify where in the WMH wastes are to be managed in their pre-works planning and submit these to NEOM Environment for approval before works commence.

All present dump sites up and until the Waste department has installed and commissioned a fully new WM-system are considered to be Legacy Waste sites. The Works required to remediate the Legacy Wastes consist of removal of materials from two different types of areas in the following categories:

- Areas where wastes have been dumped or 'fly-tipped'; and
- Areas where continuous and regular wastes have been deposited.

Additionally, the works comprise the safe disposal of the above waste categories and their management within the remaining dump sites (see annex A).

Current Waste Streams must be managed at interim stage up and until NEOM Waste Management is in place by making use of the Legacy Waste disposal sites. Legacy Sewage constitutes an extra type of liquid waste that would need to be safely hauled into operational Sewage Treatment Plants. Once this has been done further Sewage Management would be dealt with by others (NEOM Water Sector) and isn't part of this Guidelines.

It should be noted that other factors such as how long the wastes have been in situ, or whether they are combined with or in the vicinity of any liquid wastes, will also affect the approach of their removal. It is also acknowledged that there will be sites that may be reasonably classified as either of the above categories but the intention is that they are dealt with on a case by case basis with the level of approach based on assessment of risk to the environment of disturbing, handling, transporting, treating and disposing of the wastes. The requirement of this guidance note is that a more enhanced level of management and control is applied to sites and wastes that pose more risk.

The overarching approach must follow the Precautionary Principle in terms of potential harm to the environment but also the identification and appropriate controls being applied for hazardous wastes or by-products that may have hazardous properties.

The following PME / GAMEP (Presidency of Meteorology and Environment / General Authority for Meteorology and Environmental Protection) Environmental Standards must be applied to all works carried out to remediate the legacy waste areas in NEOM, as a minimum. The guidance documents listed further down offered as International Best Practice must be followed for the more complex and higher risk sites.

- a. GAMEP Standards:
  - Waste Classification;
  - Waste Acceptance Criteria;
  - Waste Regulatory Control and Compliance
  - Waste Handling and Storage;
  - Waste Training and Assessment of Technical Competence of Operators; and
  - Waste Transportation.

- b. Best Practice Guidance for Legacy Waste sites:
  - Fly – tipped waste:
    - A visual inspection to be undertaken prior to commencement of fly tipped material removal and transport;
    - Running of a specific human / health risk assessment;
    - All potentially hazardous waste to be disposed by a licensed transporter to a licensed facility, all other materials can be disposed in controlled and tracked manner to the existing dump (landfill) sites.
  - Other Legacy waste sites:
    - Run intrusive investigations to validate the extent of waste and determine the capping depth and composition.
    - Investigations would need to include characterizing the nature and extent of existing contamination (if any) and feeding into conceptual site model to manage environmental risks.
  - The Service Provider must have full regard to the NEOM Construction Environmental Management Plan (CEMP) and Operational Management Plan (OEMP) Template and Guidance which contain all applicable local and international environmental standards along with guidance on applicable activities that will likely be utilized in these works such as Site Clearance, Loading, Hauling, Brownfield remediation.

## 6 WASTE MANAGEMENT

- a. Legacy approach and site history
  - Legacy operational services and assets:
 

Across the NEOM region waste has been informally and illegally dumped for many years. NEOM has completed a preliminary study to estimate the baseline conditions (location, quantity, nature and distribution of dumped wastes). A methodology was devised which involved studying of satellite imagery to identify “Suspect Tip Areas” (STAs). The search was targeted to <15km from population centers and <100m from road infrastructure. Over one hundred and fifty STAs were identified and recorded on to a database. These STAs occupied an area of land over 3 million m<sup>2</sup> presenting an estimated 1.5 to 3 million m<sup>3</sup> of informally tipped (dumped) waste materials. Currently at least three main dump sites (landfill sites) are operational, being Magna, Ras Al-Sheikh Humaid and Sharma dumpsites (refer to Annex A for location details). Additional sites may also be identified in further investigations. Three sewage holding lagoons are operated at the Ras Al-Sheikh dumpsite.

This guideline requires to collect, transport, dispose and remediate the STAs of Legacy Waste throughout NEOM to the currently identified main dump sites (landfill sites) or future Nominated Waste Facilities.

All Waste Treatment facilities shall have an environmental Permit and be licensed accordingly for Operation.

All Waste shall be treated within NEOM using respectively licensed transporter and licensed disposal facilities.

The Service Provider shall not dispose of Legacy Waste at any other location than the nominated Facility prescribed by the Waste Department unless the Waste Department has agreed otherwise.
  - Environmental Impact of Legacy Waste:
 

Legacy wastes have been collected and kept for years at some barren land or a place dedicated for Landfill (an area to dump solid waste) without proper site preparation (e.g. lining etc.).

Legacy wastes not only occupy large space, but also become a breeding ground for pathogens, flies, mal-odors and generation of leachate, which may lead to water contamination.

Legacy wastes also contribute to generation of greenhouse gases and pose risk of uncontrollable fire.

Legacy wastes were often deposited in landfills or illegal dumpsites that can release potential pollutants to the surrounding environment. Such 'legacy landfill' sites are a concern in coastal areas or near wadis where they are likely to be affected by increased flooding, greater erosion and more extreme cycles of wetting and drying. Managing such environmental issues is of critical importance

#### b. Waste types

Preliminary site inspections identified that the Legacy and current Waste generally consists of the following seven types of waste materials:

- Construction and demolition debris:
  - Building materials (brick, concrete, tarmacadam/ bitumen, tiles etc.);
  - Natural rock / aggregate (from foundation excavation etc.);
- Domestic wastes (paper, card, bottles, cans, plastic, kitchen waste etc.);
- Furniture, appliances etc.;
- Tires, timber, vegetation (palm trees);
- Scrap yards (vehicles / car bodies etc.);
- Animal carcasses, soiled bedding; and
- Hazardous Wastes.

#### c. Legacy Sewage

Legacy Sewage constitutes an extra type of liquid waste that would need to be safely hauled into operational sewage Treatment Plants. Once this has been done further Sewage Management will be dealt with by others (NEOM – Water Sector) and isn't part of this Guidelines.

#### d. Handover of Legacy Operations

So far, the concerned Waste Management and operation has been handled by the Municipalities and is scheduled to be handed over to NEOM Waste Department. The Handover should be sanctioned by a respective MoU and guided by this present Guidelines.

#### e. Management of waste streams

The Service Provider shall utilize its best endeavors to segregate the Legacy Base Economy and current Waste to minimize waste disposal (to the tip face) at the nominated Facility location, i.e. transport where possible complete loads of tires, scrap metals, etc. and disposal of tires to tire stockpile area, metals to scrap metals segregation area, etc.

The Service Provider shall isolate any hazardous wastes that cannot be lawfully disposed of to a nominated Facility and seek approval from the Waste Department for the transportation and disposal to another facility/location (to be approved by

NEOM) that can lawfully accept the waste for disposal. The Service Provider must be able to substantiate any claim for the collection, transportation and disposal of a hazardous material, such as but not limited to identification by a suitably qualified person, the type of hazardous waste, the weight and or volume.

- Activity Based Management Plan
- In order to manage the daily operations of the Dump/ Landfill sites so to minimise environmental harm and impacts The Service Provider shall:
  - Establish a specific Legacy Waste Remediation Works Activity Based Management Plan which must be written submitted and approved before any works may commence;
  - Perform the Services in a manner that always ensures NEOM's compliance with the nominated Authority approvals; and
  - Develop a written plan that provides guidance to Personnel on the operation of the Nominated Facilities (Activity Based Management Plan).
- The Service Provider shall ensure that the activity-based management plan and associated work procedures addresses each of the following:
  - Environmental commitments;
  - Description of the equipment, activity and purpose of operation;
  - Description of the Nominated Facilities and surrounding environment including site dimensions, land tenure, designated areas such as stockpiles and loading areas, location of sensitive areas;
  - Identification and disposal of any prohibited Waste and special Wastes;
  - Identification of environmental issues, potential environmental impacts and control measures for:
    - Fire management:
      - Lighting of any fires of any nature at the Waste Facilities or sites is not permitted under any circumstances.
      - No smoking is allowed within the Waste Facilities or sites.
      - A fire & safety management plan is required to be developed and implemented at all facilities and dump sites.
    - Dust management:
      - Dust suppression on access roads of the Waste Facilities or sites may be required at such times and frequencies as are necessary during each day to minimize the generation of dust.
      - Potable water and/ or leachate is not allowed to be used for the purposes of dust suppression.
    - Odor management:
      - Targeted mitigation and appropriate control measures must be implemented where risk assessment and wastes / site characterization indicate that there will be odor impacts.
    - Stormwater and Leachate management:
      - Where risk assessment and wastes / site characterization indicate that leachate may be present, targeted mitigation and appropriate control measures must be implemented;
      - Stormwater protection control measures must also be put in place if deemed necessary by risk assessment (e.g. if works occurring during a rainy season or for a time period where stormwater impact risks are present).
    - Noise management:
      - Where risk assessment of the works program indicates that there will be noise impacts on local receptors, targeted mitigation and appropriate control measures must be implemented.

- Landfill Gas:
  - Where risk assessment and wastes / site characterization indicate that there will be landfill gas present, targeted mitigation and appropriate control measures must be implemented.
- Any other matter the Service Providers Nominated Facility risk assessment identifies as a medium to high risk.
  - Contingency plans and emergency procedures for non-routine situations;
  - Organizational structure and responsibility relating to the Contract;
  - Details of staff training;
  - Record keeping methods;
  - A weigh scale station including weigh scale management software and transaction recording is required at each waste management facility and dump site to accurately record any waste disposal.
  - Provision for continuous improvement and periodic review of environmental performance; and
  - Any other matters required by the NEOM.

f. Planning for landfill and dump site decommissioning and remediation

All landfill sites shall be decommissioned and remediated based on an After-use Plan agreed with local authorities and NEOM Environment and Waste Operations in accordance with the needs of local communities. The large geographic footprint of landfills and their proximity to existing infrastructure can potentially make them locations for further (regenerative) land-use.

Efficient waste management and a health risk elimination strategy are requested.

Biodiversity enhancement and conservation management plan requirements shall be considered at remediation sites to reestablish direct connection to nature conservation areas after use.

NEOM aims to achieve a positive impact on the biodiversity value at all decommissioned sites after use.

g. Implementation Closure Plan

All landfill sites that cease operations shall be closed based on a Closure Plan agreed with local authorities and NEOM Environment and Operations in accordance with the regulatory requirements. Implementation of Closure Plans require Environment Department approval. Decommissioning of Legacy dump sites shall be completed within two (2) years from the date of handover from the Municipalities to NEOM Waste Department.

h. Post closure management

Post closure management of all landfill sites that stopped operations shall be agreed with local authorities and NEOM Environment and Operations in accordance with the After-Use Plan and regulatory requirements.

i. Service providers

Municipality waste collection services (municipal solid waste) includes both domestic and commercial premises.

Service providers and their respective staff members are required to hold the necessary licenses or competency certificates.

The Service Provider shall develop, implement and manage the Services in accordance with NEOM's Environmental Management System.

j. Monitoring and reporting

Monitor and report on quantity and type of waste removed disposed, treated (weight logs...) according to PME & cited Best Practice guidance sections on record keeping.

The Service Provider shall be responsible for obtaining true and accurate records of waste material disposed of (weighbridge).

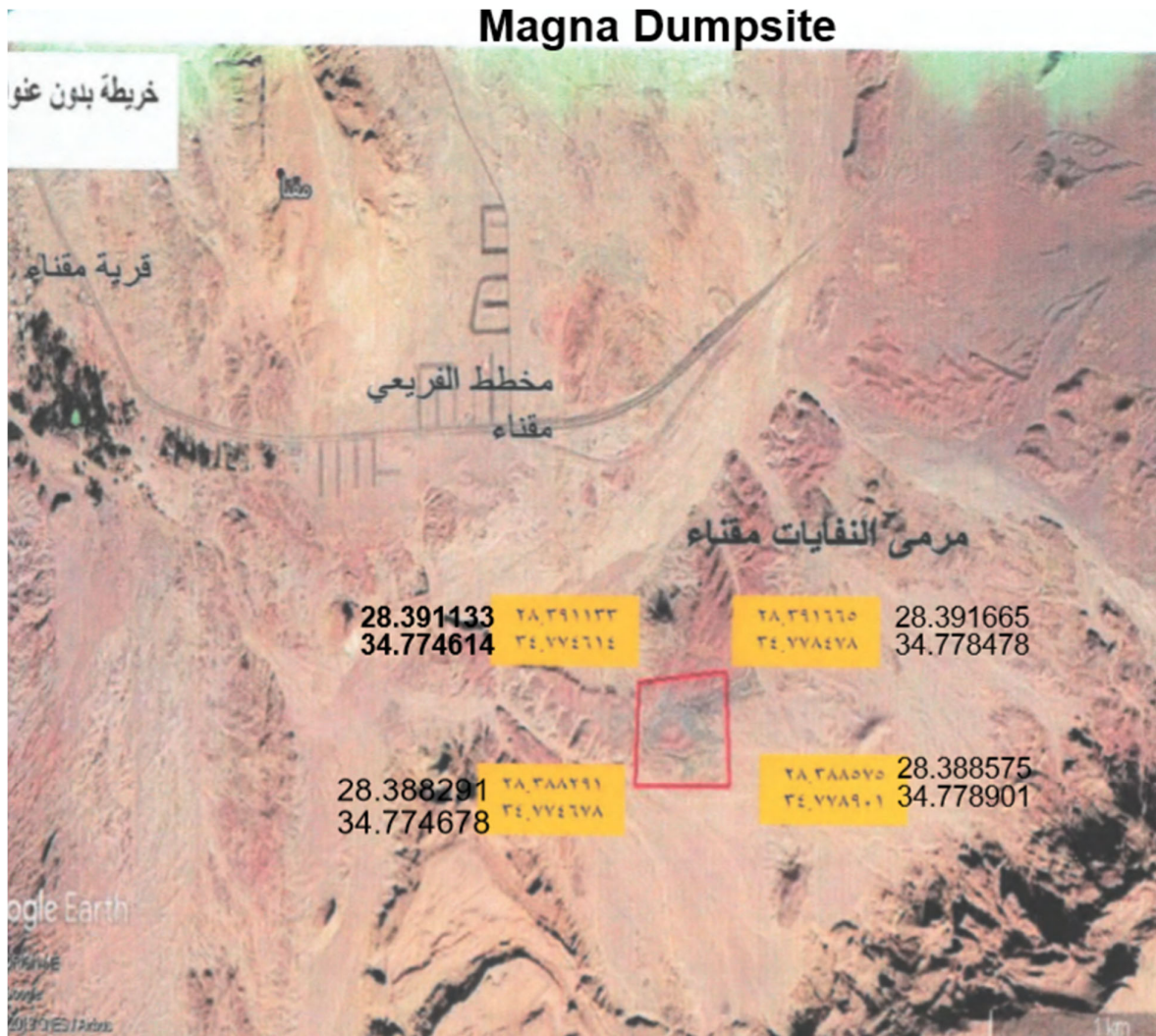
The Operator/ Service Provider shall provide pre, during and post collection photographic evidence.

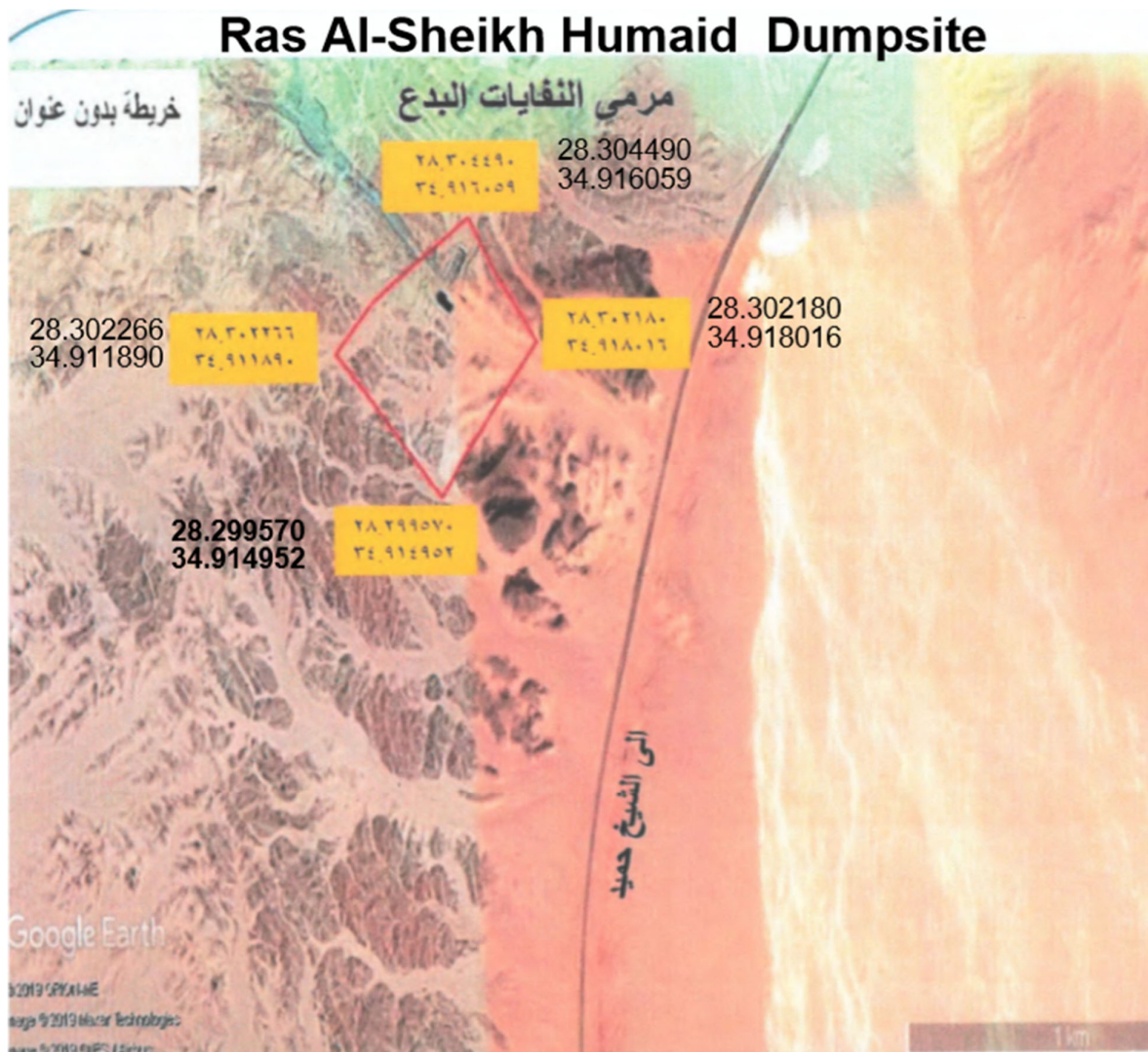
On a final and general note, NEOM Environment requires that continuous application of a preventive environmental strategy is incorporated into processes, products and services in order to increase efficiency and reduce hazards for people and the environment. The following important elements for effective environmental controls and reduction of emissions are required in order to continue operation of existing waste facilities:

- Implement a pollution prevention program;
- Management, maintenance and commissioning procedures;
- Environmental training for all staff levels;
- Inspection and audit regime;
- Environmental incidents and complaints process;
- Emergency response plan and procedure;
- Ongoing monitoring, measurement and reporting on compliance with environmental procedures and emissions; and
- Continuous improvement of operating & management procedures and reduction of the environmental (Carbon) footprint.

ANNEXURE A  
Nominated Landfill Facility Locations

## Magna Dumpsite





## Sharma Dumpsite



**Location Coordinates**  
**28.079435**  
**35.305617**

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# NEOM - ENVIRONMENTAL GUIDELINE - Interim Waste Management Rev01 28June2020

Final Audit Report

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