

# **TRANSNET NATIONAL PORTS AUTHORITY STANDARD ENVIRONMENTAL SPECIFICATION FOR CONSTRUCTION AND MAINTENANCE WORKS IN THE PORT OF DURBAN**

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## 1. Purpose

This environmental specification describes the minimum standards for environmental management to which contractors and sub-contractors in the Port of Durban must comply with. It is a generic standard for use across all construction and maintenance works within TNPA.

This document must be read in conjunction with TNPA's Health and Safety Specification.

## 2. Scope

This standard applies to Contractors that work on site under the authority of TNPA.

## 3. Definitions

<b>Fauna</b>	Means a group of animals specific to a certain region or time period
<b>Flora</b>	Means a group of plants specific to a certain region or time period
<b>General waste</b>	Means waste that does not pose an immediate hazard or threat to health or to the environment, and includes- (a) domestic waste; (b) building and demolition waste; (c) business waste; (d) inert waste; or (e) any waste classified as non-hazardous waste in terms of NEMWA, 59 of 2008.
<b>Hazardous waste</b>	Means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.
<b>Method statement</b>	Means a written submission by the Contractor to the Engineer in response to this Specification or a request by the Engineer, setting out the equipment, plant, materials, labour and method the Contractor proposes using to carry out an activity identified by this Specification or the Engineer when requesting the Method Statement, in such detail that the Engineer is able to assess whether the Contractor's proposal is in accordance with this Specification and/ or will produce results in accordance with this Specification.

<b>Natural Vegetation</b>	Means all existing species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site.
<b>Sensitive area</b>	Means any area that is denoted as sensitive by this Specification due to its particular attributes, which could include the presence of rare or endangered vegetation, the presence of heritage resources (e.g. archaeological artefact or graves), the presence of a unique natural feature, the presence of a watercourse or water body, the presence of steep slopes.
<b>Solid waste</b>	Means all solid waste, including construction debris, chemical waste, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
<b>Spoil</b>	Means excavated material which is unsuitable for use as material in the Works or is material which is surplus to the requirements of the Works.
<b>Topsoil</b>	Means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility appearance, structure, agricultural potential, fertility and composition of the soil.
<b>Waste</b>	Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes. Waste or a portion of waste ceases to be a waste only once the waste is, or has been re-used, recycled or recovered.
<b>Watercourse</b>	means - a) a river or spring; b) a natural channel in which water flows regularly or intermittently;

- c) a wetland, lake or dam into which, or from which, water flows; and
- d) any collection of water gazetted by the National Water Act, 36 of 1998 as a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

**Wetland**

Means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

## **4. Standards for Environmental Management**

The Contractor shall identify the potential environmental impacts that may occur as a result of his/her activities and accordingly prepare separate Method Statements describing how each of these impacts will be prevented or managed so that the standards set out in this document are achieved. These method statements will be prepared in accordance with the requirements set out in the TNPA EMP guideline.

**The Contractor shall comply with the specifications described below.**

### **4.1 Site Planning and Establishment**

The Contractor shall establish his construction camps, offices, workshops, staff accommodation and any other facilities on the site in a manner that does not adversely affect the environment. These facilities must not be sited in close proximity to sensitive areas.

#### **4.1.1 Site plan**

Before the onset of construction, the Contractor shall submit to the TNPA Project Manager/TNPA Environmental Specialist for his/her approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the Contractor proposes to put in place.

The Site Plan must as a minimum include but not necessarily be limited to:

- Detailed layout of the construction works areas including access roads, site offices, material laydown areas, temporary stockpile areas and parking areas
- Detailed locality and layout of all waste storage and handling facilities for litter, kitchen refuse and workshop-derived effluents
- Proposed areas for the stockpiling of topsoil and excavated spoil material
- Demarcation of the construction footprint including areas not to be disturbed by the development
- Location of sewage and sanitary facilities at the site offices and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of the Project Manager.

The site offices should not be sited in close proximity to steep areas. It is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles be located as far away as possible from any watercourse. Should this not be possible, approval for the location of these facilities must be granted by the TNPA Environmental Officer.

#### **4.1.2 Identification and establishment of suitable access routes/roads**

Existing access routes to the construction/works areas must be used as far as possible. The building of access roads must be restricted to within the development footprint to prevent unnecessary disturbance of the surrounding environment. Access tracks must be maintained in a good condition at all times during construction to minimise erosion and dust generation.

#### **4.1.3 Demarcation of site limits**

Prior to the commencement of construction, the actual site to be developed must be clearly demarcated by means of highly visible barriers such as fences and orange snow netting. Vegetation within the demarcated zone may be cleared. Disturbance of vegetation outside of the demarcated development footprint is not permitted.

All plant, material and equipment required for construction must be located within the designated areas. Laydown areas must be clearly demarcated within the site limits. No activities are allowed outside of the demarcated development footprint.

#### **4.1.4 Eating Areas**

The Contractor is responsible for providing temporary shade areas within the works area to ensure that workers do not leave the site to eat during working hours. Refuse bags must be provided at all established eating areas and when full it should be disposed as required by Section 3.3.

#### **4.1.5 Effluent Management**

All effluent water from site shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water courses or the bay.

### **4.2 Sewage and Sanitation**

The Contractor is responsible for providing adequate sanitary facilities to all workers on site and for enforcing the proper use of these facilities. Safe and effective sewage treatment will require one of the following sewage handling methods: VIP toilets on trailers, or the use of chemical toilets which are supplied and maintained by a suitably qualified sub-contractor. The type of sewage treatment will depend on the location of the site and the surrounding land uses, the duration of the contract and proximity (availability) of providers of chemical toilets. Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of open areas (i.e. the veldt) shall not, under any circumstances, be allowed. For projects of high mobility a mobile toilet facility will be made available by the Contractor.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed outside areas susceptible to flooding and high winds. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such facilities in a clean, orderly and hygienic condition to the satisfaction of the TNPA Project Manager.

The Contractor shall ensure that there are separate toilet facilities for male and females on site at a ratio of one facility for every 10 employees.

### 4.3 Waste Management

The contractor is to ensure that all waste generated during construction and maintenance activities of facilities is managed in accordance with the provisions of waste management hierarchy. Waste is grouped into “general” or “hazardous”, depending on its characteristics. The classification determines handling methods and the ultimate disposal of the material.

General waste to be expected during construction includes the following:

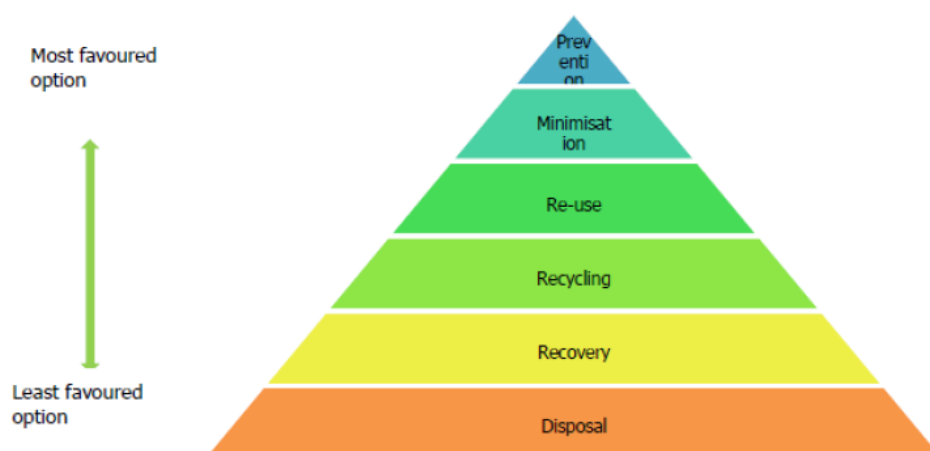
- Trash (waste paper, plastics, cardboard, etc.) and food waste from offices, warehouses and construction personnel.
- Uncontaminated construction debris such as used wood and scrap metal.
- Uncontaminated soil and non-hazardous rubble from excavation or demolition

The Contractor shall classify all wastes expected to be generated during the construction period.

Examples of waste that can be generated during construction and maintenance activities on site are indicated in the following table:

**TABLE 2: EXAMPLE OF CONSTRUCTION WASTE CLASSIFICATION**

WASTE	CLASSIFICATION	
	HAZARDOUS	GENERAL
Aerosol containers	X	
Batteries, light bulbs, circuit boards, etc.	X	X
Clean soil		X
Construction debris contaminated by oil or organic compounds	X	
Domestic waste		X
Empty drums (depends on prior use)	X	X
Empty paint and coating containers		X
Explosive waste	X	
PCB waste	X	
Rubble (not contaminated by oil or organic compounds)		X
Waste Cable		X
Waste plastic		X
Waste paint and/or solvent	X	
Waste oil	X	
Waste concrete		X
Waste containing fibrous asbestos	X	
Waste timber		X
Sewerage sludge	X	
Scrap metal		X
Chemically-derived sanitary waste	X	



**FIGURE 1: THE WASTE MANAGEMENT HIERARCHY**  
(Transnet Environmental Risk Management strategy and Framework, 2015:42)

- |                                   |   |
|-----------------------------------|---|
| <b>1. Avoidance/Prevention:</b>   | Using goods in a manner that minimises their waste components.  |
| <b>2. Reduction/Minimisation:</b> | Reduction of the quantity and toxicity of waste generated during construction.  |
| <b>3. Re-use:</b>                 | Removing an article from a waste stream for use in a similar or different purpose without changing its form or properties |
| <b>4. Recycling:</b>              | separating articles from a waste stream and processing them as products or raw materials.                                 |
| <b>5. Recovery:</b>               | Reclaiming particular components or materials, or using the waste as a fuel.  |
| <b>6. Treatment:</b>              | Processing of waste by changing its form or properties in order to reduce toxicity and quantity.                          |
| <b>7. Disposal:</b>               | Burial, deposit, discharge, abandoning or release of waste.   |

The Contractor's Environmental Officer will work in conjunction with the Contractor's construction safety and industrial hygiene personnel to create a Hazardous Materials Management Program. This program will establish the necessary protocol for proper handling and removal of hazardous materials on the site.



The Contractor shall manage GENERAL WASTE that is anticipated to be generated by operations as follows:

- Determine if waste is non-hazardous and obtain containers for waste storage.
- Notify waste hauler when container is full so that it can be removed and replaced with an empty.
- No littering is allowed on site. In the event where staff mobility is high, refuse bags will be made available by the Contractor.
- Provide documentary evidence of proper disposal of waste .

The Contractor shall recycle GENERAL WASTE (as far as practically possible) that is anticipated to be generated by its operations as follows:

- Obtain and label recycling containers for the following (whichever relevant) and locate them within temporary office building and trailers:
  - Office Waste;
  - Aluminum;
  - Steel;
  - Glass;
  - Ferrous Metals;
  - Non Ferrous Metals; and
  - Waste Timber
- Establish recycled material collection schedule.
- Arrange for full bins to be hauled away.

Spent batteries, circuit boards, and bulbs, require separate storage, special collection and handling.

No burning, burying or dumping of waste of any kind will be permitted.

The Contractor shall quantify all waste disposed of, whether general or hazardous (including waste disposed of by any sub-contractors) and keep record of these quantities on site.

#### **4.4 Workshops, equipment maintenance and storage**

All vehicles and equipment must be kept in good working order to maximise efficiency and minimise pollution. Maintenance, including washing and refuelling of plant on site must be done at designated locations at workshop areas. These designated areas must be agreed with the TNPA Project Manager and TNPA Environmental Specialist. The Contractor must ensure that no contamination of soil or vegetation occurs around workshops and plant maintenance facilities. All machinery servicing areas must be bunded. Drip trays should be used to collect used oil, lubricants and other during maintenance. Drip trays must be provided for all stationary plant. Washing of equipment should be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities must be provided.

#### **4.5 Vehicle and Equipment Refuelling**

##### **4.5.1 Stationary/Designated Refuelling**

No vehicles or machines shall be serviced or refuelled on site except at designated and approved servicing or refuelling locations. No oil or lubricant changes shall be made except at designate locations, or in case of breakdown or emergency repair. The Contractor shall store fuel and oil at a secure area, which shall be bunded to contain 110% of the total volume within the bund and designed with an impervious layer or liner or paved surface to prevent spillage from entering the ground.

The Contractor shall provide details of its proposed fuel storage and fuelling facility to the TNPA Environmental Specialist for approval. The design and operation must comply with all applicable legislation including, the National Water Act, (Act 36 of 1998), the Hazardous Substances Act, (Act 15 of 1973), the Environmental Conservation Act, (Act 73 of 1989), National Environmental Management Act, (Act 107 of 1998), and the Occupational Health and Safety Act, (Act 85 of 1993), mainly the Construction - and Hazardous Chemical Substances Regulations.

#### **4.5.2 Mobile Refuelling**

In certain circumstances, the refuelling of vehicles or equipment in a designated area is not a viable/practicable option and refuelling has to be done from a tank, truck or container moved around on site. In such circumstances, the Contractor may request approval from the Project Manager to conduct mobile refuelling subject to the following control measures:

- Secondary containment equipment shall be in place. This equipment shall be sized to contain the most likely volume of fuel that could be spilled during transfer.
- Absorbent pads or drip trays are to be placed around the fuel inlet prior to dispensing.
- Mobile refueling units are to be operated by a designated competent person.
- The transfer of fuel must be stopped prior to overflowing. Fuel tanks or refueling equipment on vehicles may only be filled to 90% carrying capacity.
- Mobile fuelling tanks must be stored in an area where they are not susceptible to collisions. The fuel storage area must be located away from drainage channels.
- Mobile refueling operations shall not take place within 15 meter of any residential buildings, or 7.5 meter from other structures, property lines, public ways or combustible storage.
- All mobile refueling tanks are to be properly labelled and fire extinguishers shall be located near the fuel storage areas. These extinguishers must be of a suitable type and size.

#### **4.6 Spill Response**

The Contractor shall have adequate spill response materials/equipment on site which must be aligned with the volumes of hazardous substances used on site and the risk of pollution to sensitive environmental attributes.

The Contractor shall provide the TNPA Project Manager and TNPA Environmental Specialist with a spill response plan that will include but not limited to the following:

- Measures to immediately stop any leaks of hydrocarbons or chemicals.
- Measures to prevent spills or leaks.
- Containment strategy for spill on water and on land
- Measures to stop and prevent spills from entering stormwater drains.
- Site Remediation
- Measures to prevent a spill from contaminating groundwater or the bay.
- Recovery of the spilled product
- Disposal of contaminated material

#### **4.7 Spray Painting and Sandblasting**

Spray painting and sandblasting should be kept to a minimum. All painting should, as far as practicable, be done before equipment and material is brought on site. A Method Statement shall be submitted to the TNPA Environmental Specialist for approval.

#### **4.8 Air Quality Management**

The contractor shall ensure that suitable measures are put in place to prevent atmospheric pollution from the following sources:

- -Dust
- -Chemical emissions
- -Vehicle emissions
- -Fugitive and point source emissions

Measures to prevent atmospheric pollution must be included in the contractors Air Quality Control Method Statement.

#### **4.9 Stormwater Management**

The Contractor shall be aware that, apart from runoff from overburden emplacements and stock piles, stormwater can also be contaminated from batch plants, workshops, vehicle wash-down pads, etc., and that contaminants during construction may include hydrocarbons from fuels and lubricants, sewerage from employee ablutions and excess fertiliser from rehabilitated areas, etc.

The Contractor shall take note that discharges to controlled waters such as the sea, estuary, rivers, and groundwater or to sewerage systems are controlled under South African Water Legislation. Contractor shall ensure compliance with water quality guidelines concerning stormwater and effluent discharge.

The following specific measures are required:

- Temporary drainage must be established on site during the construction period until permanent drainage is in place. Contractors are responsible for maintaining the temporary drainage in their areas. Contractors must provide secondary drainage that prevents erosion.
- Contractors must employ good housekeeping in their areas to prevent contamination of stormwater.
- The Contractor shall clear stagnant water.
- The Contractor shall ensure that no contaminated surface water flows off-site as a result of Contractor operations. Silt traps shall be constructed to ensure retention of silt on site and cut-off ditches shall be constructed to ensure no runoff from the site except at points where silt traps are provided. The Contractor shall be responsible for checking and maintaining all silt traps for the duration of the project.
- If applicable, the Contractor shall be responsible for collection, management, and containment within the site boundaries of all dewatering from all general site preparation activities. The dewatering water shall be contained within the site boundaries by sequentially pumping or routing water to and from sub-areas within the site as the construction activities proceed.

- Where possible, on-site drainage shall be accomplished through gravity flow. The surface drainage system shall consist of mild overland slopes, ditches, and culverts.

#### **4.10 Erosion Control**

Both structural and non-structural (vegetative) erosion control measures will be designed, implemented, and properly maintained in accordance with best management practices which will include the following:

- Scheduling of activities to minimise the amount of disturbed area at any one time
- Implementation of re-vegetation as early as feasible
- Limiting construction traffic and/or avoidance thereof on access roads and areas to be graded to the extent feasible at drainage ditches
- Compacting loose soil as soon as possible after excavation, grading, or filling
- Using silt fences, geo-textiles, temporary rip-rap, soil stabilisation with gravel, diversionary berms or swales, small sedimentation basins, and gravelled roads to minimise transport of sediment
- Implementing the erosion and sedimentation control plan and ensuring that construction personnel are familiar with and adhere to it
- Managing runoff during construction.
- The Contractor shall be responsible for checking and maintaining all erosion and sedimentation controls.

#### **4.11 Noise Management**

The contractor shall ensure compliance with all applicable legislation concerning noise and the South African Bureau of Standards recommended code of practice, SANS 10103:2004

#### **4.12 Archaeological Sites**

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the engineer of such a discovery. The contractor shall immediately notify the TNPA Project Manager and Environmental Specialist. Work may only resume once clearance is given in writing by TNPA.

#### **4.13 Fire prevention**

Fires shall only be allowed in facilities or equipment specially constructed for this purpose.

#### **4.14 Water Protection and Management**

No water shall be abstracted from any water course, river or estuary without the permission of the Project Manager and TNPA Environmental Specialist.

#### **4.15 Protection of Fauna and the collection of firewood**

On no account shall any hunting or fishing activity of any kind be allowed. This includes the setting of traps, or the killing of any animal or bird caught in construction works.

On no account shall any animal, reptile or bird of any sort be killed. This specifically includes snakes or other creatures considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled person should be summoned to remove the creature from the site. Consideration should be given to selection and nomination of such a person prior to site establishment.

#### **4.16 Environmental Awareness Training**

An Environmental Awareness Program is considered a necessary part of the Environmental Management Plan for the Project. Training of the appropriate construction personnel will help ensure that all environmental regulations and requirements are followed which must be defined in the relevant Method Statement to be prepared by the Contractor.

Objectives of environmental awareness training are:

- Environmental Management – protecting the environment from the effects of construction by making personnel aware of sensitive environmental resources.
- Regulatory compliance – complying with requirements contained in project – specific permit conditions, also complying with requirements in regional and local regulations.
- Problem recognition and communication – training personnel to recognise potential environmental problems, i.e. spills, and communicate the problem to the proper person for solution.
- Liability control - non-compliance with regulatory requirements can lead to personal and corporate liability.

All individuals on the Project construction site will need to have a minimum awareness of environmental requirements and responsibilities. However, not all need to have the same degree of awareness. The required degree of knowledge is greatest for personnel in the Safety, Health, and Environmental Sections and the least for the manual personnel.

The Contractor shall present environmental awareness programmes on a weekly/bi-monthly basis (depending on project requirements) and keep record of all the environmental related training of the personnel.

#### **4.17 Handling and Batching of Concrete and Cement**

Concrete batching shall only be conducted in demarcated areas which have been approved by the TNPA Project Manager. Such areas shall be fitted with a containment facility for the collection of cement-laden water. This facility shall be bunded and have an impermeable surface protection so as to prevent soil and groundwater contamination. Drainage of the collection facility will be separated from any infrastructure that contains clean surface runoff.

The batching facility will not be placed in areas prone to floods or the generation of stagnant water. Access to the facility will be controlled so as to minimise potential environmental impacts.

Hand mixing of cement and concrete shall be done on mortarboards and/or within the bunded area with impermeable surface or concrete slab. Bulk and bagged cement and concrete additives shall be stored in an appropriate facility at least 10m away from any watercourses, gullies and drains.

Waste water collected in the containment facility shall be left to evaporate. The Contractor shall monitor water levels to prevent overflows from the facility. Water can be pumped into sealed drums for temporary storage and must be disposed of as liquid hazardous waste.

All concrete washing equipment, such as shovels, mixer drums, concrete chutes, etc. shall be done within a TNPA approved washout facility. Water used for washing shall be restricted as far as practically possible.

Ready-mix concrete trucks are not allowed to wash out anywhere other than in an area designated and approved by the TNPA Project Manager for this purpose. The Contractor shall periodically clean out hardened concrete from the wash-out facility or concrete mixer, which can either be reused or disposed of as per accepted waste management procedures. Empty cement and bags, if temporarily stored on site, must be collected and stored in weatherproof containers. Used cement bags may not be used for any other purpose and must be disposed of on a regular basis in accordance with the Contractor's solid waste management system. Concrete and cement or any solid waste materials containing concrete and cement will be disposed of at a registered disposal facility.

#### **4.18 Stockpiling, Soil Management and Protection of Flora**

Clearance of vegetation shall be restricted to that which is required to facilitate the execution of the works. Stockpiling may only take place in designated areas indicated on the approved site layout plan. Sensitive areas shall be avoided in this regard. The Contractor shall measure the extent of all areas cleared for construction purposes and keep this figure updated.

Any area to be used for stockpiling or material laydown shall be stripped of all topsoil. Vegetation clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible. The detail of vegetation clearing shall be subject to the Project Manager's approval and shall occur in consultation with the TNPA Environmental Specialist. Stockpiles must be positioned in areas sheltered from the wind prevent erosion and dispersion of loose materials. Stockpiled soil shall be protected by adequate erosion-control measures. Soil stockpiles shall be located away from drainage lines, watercourses and areas of temporary inundation. Stockpiles (excluding ballast stockpiles) shall not exceed 2m in height unless otherwise permitted by TNPA.

Topsoil shall be stockpiled separately from other materials and kept moist. Excavated subsoil, where not contaminated, must be used for backfilling and topsoil for landscaping and rehabilitation of disturbed areas. No vegetation located outside the construction site shall be destroyed or damaged. As far as is reasonably practicable, existing roads must be used for access to site and right of way. Before site clearance takes place, vegetation surveys will be conducted and protected species identified. No protected plant species shall be removed without written consent from the relevant authorities. The development of new embankments or fill areas must be undertaken in consultation with the TNPA Environmental Specialist.

No dumping of solid waste or refuse shall not be allowed within or adjacent to areas of natural vegetation. The Contractor shall identify and eradicate all declared alien and invasive plant species occurring on the construction site.

#### **4.19 Traffic Management**

Vehicles are not permitted to leave access roads.

Turning of vehicles should only take place within a clearly demarcated "turn area" located within the approved construction footprint. The contractor must co-ordinate the loading and offloading of material during the construction phase so as to ensure that vehicular movement is in one direction only at any one time and that side-tracks are not created on the site. Vehicles should only be parked within designated parking areas as demarcated on the site layout plan.

#### **4.20 Transportation of Materials**

The Contractor is responsible for ensuring that all suppliers and delivery drivers are aware of procedures and restrictions (e.g. no-go areas) in terms of the EMP and this Specification. Material must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover to prevent spillage from the vehicles. The Contractor will be held responsible for any clean-up required as a result of a spillage from vehicles.

#### **4.21 Borrow Pits and Quarries**

The contractor shall make use of commercial suppliers for all rock and sand raw materials. The Contractor shall ensure that any supplier is in possession of the required permit/license and keep record of the quantity of material supplied.

#### **4.22 Social and Labour Issues**

The Contractor shall keep records of the identity of all staff. Under no circumstances shall the Contractors engage in formal discussions with landowners without prior consent by the Project Manager. No activity on private property shall be allowed without written consent by the relevant landowner and TNPA Project Manager/TNPA Environmental Specialist. Any damage to private property caused by the Contractor during the construction period shall be repaired to the satisfaction of the TNPA Project Manager.

The Contractor shall keep record of any complaint raised during the construction period relating to the Contractor's activities.

#### **4.23 Energy Management**

The Contractor shall measure and keep updated records of the following:

- Electricity consumption
- Fuel consumption

#### **4.24 Handling, Storage and Management of Hazardous Substances**

All hazardous materials/substances shall be stored in a secured, designated area that is fenced, bunded and has restricted entry. All storage shall take place using suitable containers to the approval of the TNPA Project Manager.

No possible spillages or accumulated stormwater within this bunded area will be allowed to be flushed from the bund into the surrounding area. All fluids accumulated within the bunded area shall be removed and disposed of in accordance with all legal requirements.

Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure.

The Contractor must provide an inventory detailing the hazardous substances that are to be used during construction, as well as the storage, handling and disposal procedures for each substance. Emergency procedures in the event of misuse or spillage that might negatively affect the environment must be specified. Information on each hazardous substance will be available to all persons on site in the form of Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS). Training and education about the proper use, handling, and disposal of the material will be provided to all workers handling the material. The Contractor's Environmental Officer must be informed of all

activities that involve the use of hazardous substances to facilitate prompt response in the event of a spill or release.

#### **4.25 Housekeeping**

The Contractor must ensure proper housekeeping of the site for the duration of the project. Materials will be stored in a neat and tidy manner in designated areas as per the approved site layout plan.

#### **4.26 Rehabilitation**

Contractors shall rehabilitate the entire site upon completion of work. A rehabilitation plan shall be submitted to the Project Manager for approval at least one week before completion. The following are critical issues to be included in the rehabilitation plan:

- Details of soil preparation procedures including proposed fertilisers or other chemicals being considered for use.
- A list of the plant species that will be used in the rehabilitation process. Note that these should all be indigenous species, and preferably species that are endemic to the area. The assistance of an appropriately qualified botanist should be sought in developing this list
- Procedures for watering the planted areas (frequency of watering, methodology proposed etc).
- An indication of the monitoring procedures that will be put in place to ensure the successful establishment of the plants (duration and frequency of monitoring, proposed criteria for declaring rehabilitation as being successful).
- Procedures for the prevention of the establishment and spread of alien invasive species.

### **5. Records**

All documents generated in terms of this procedure will be classed as records and retained for the life of the project for handover to TNPA.