

Invasive Alien Plant Management

- The purpose of the invasive alien management plan is:
 - to ensure that alien plants do not become established on site;
 - to ensure that alien plant species do not become dominant in all or parts of the landscape;
 - to implement a monitoring programme to detect the presence of alien plant species as well as to monitor the success of the alien management plan.
- Responsible persons

Effective management of alien plant species during the construction and operational phases of the project will be dependent on a number of project personnel. These are listed below:

➤ **The Developer**

This refers to the project proponent, Eskom. They will be responsible for the following:

- Ensure that the requirements set out in this management plan are adhered to and implemented;
- Allocate the responsibilities assigned to the Environmental Control Officer (ECO) to an independent suitably qualified individual prior to the start of construction activities on site; and
- Provide all principal contractors working on the project with a copy of this management plan as part of tender contract documentation to allow the contractors to cost for its requirements within their respective construction contracts.

➤ **The Environmental Control Officer (ECO)**

The ECO is responsible for monitoring and verifying the implementation of the management plan during the construction phases of the project. To effectively implement the management plan, the ECO must be aware of the findings, mitigation measures and conclusions of the Final EIA Report, the Environmental Authorisation, and this management plan.

➤ **The Contractor**

The contractor, being any directly appointed company or individual undertaking the implementation of works, will be responsible for complying with the management plan at all times during the construction phase.

- Current invasive alien species on sites

All species listed in the table below include *Lantana camara*, *Melia azedarach*, *Opuntia ficus-indica*, *Ricinus communis*, *Argemone mexicana*, *Arundo donax* and *Solanum maritimum* will have to be controlled. The proposed construction of powerline and substation will likely introduce disturbance

into this landscape that may promote conditions that will lead to the introduction and/or spread of invasive alien species.

- Control Guidelines

- Prevention

A prevention strategy should be considered and established, including regular surveys and monitoring for invasive alien plants, effective rehabilitation of disturbed areas and prevention of unnecessary disturbance of natural areas. Prevention could also include measures such as washing the working parts and wheels of earth-moving equipment prior to it being brought onto site, visual walk-through surveys every three months.

- Early identification and eradication

Keeping up to date on which weeds are an immediate threat to the site is important, but efforts should be planned to update this information on a regular basis. When new Invasive Alien Plant Species are spotted an immediate response of locating the site for future monitoring and either hand-pulling the weeds or an application of a suitable herbicide should be planned. It is, however, better to monitor regularly and act swiftly than to allow invasive alien plants to become established on site.

- Containment and control

If any alien invasive plants are found to become established on site, action plans for their control should be developed, depending on the size of the infestations, budgets, manpower considerations and time. Appropriate registered chemicals and other possible control agents should be considered in the action plans for each site/species. The key is to ensure that no invasions get out of control.

Alien invasive control methods

There are various means of managing invasive alien plants. These include mechanical, chemical and biological control.

- Mechanical control

This entails damaging or removing the plant by physical action. Different techniques could be used, e.g. uprooting, felling, slashing, mowing, ringbarking or bark stripping. This control option is only really feasible in sparse infestations or on small scale, and for controlling species that do not coppice after cutting. Species that tend to coppice need to have the cut stumps or coppice growth treated with herbicides following the mechanical treatment. Mechanical control is labour intensive and therefore expensive, and could cause severe soil disturbance and erosion. For the current project, hand-pulling or manual removal using hand tools (in this case cut stumping) will be the most appropriate methods since there are no existing dense stands of invasive alien plants.

- Chemical control

Chemical control should only be used as a last resort, since it is hazardous for natural vegetation. It should not be necessary if regular monitoring is undertaken, which should be effective for controlling invasive alien plants. Chemical control involves the use of registered herbicides to kill the target weed. Managers and herbicide operators must have a basic understanding of how herbicides function. The use of inappropriate herbicides and the incorrect use of the appropriate herbicides are wasteful, expensive practices and often do more harm than good, especially when working close to watercourses. Some herbicides can quickly contaminate fresh water and/or be transported downstream where they may remain active in the ecosystem.

Contractors using herbicides are required to have a permit according to Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act No. 36 of 1947). Herbicides are either classified as selective or non-selective. Selective herbicides are usually specific to a particular group of plants, e.g. those specified for use on broad leaf plants, but should not kill narrow-leaf plants such as grasses. Non-selective herbicides can kill any plant that they come into contact with and are therefore not suitable for use in areas where indigenous vegetation is present.

Chemical application techniques include foliar (leaf) application, stem applications (basal stem, total frill, stem injections) and stump applications (cut stump, total stump, scrape and paint).

➤ Biological control

Biological weed control consists in the use of natural enemies to reduce the vigour or reproductive potential of an invasive alien plant. Biological control agents include insects, mites, and micro-organisms such as fungi or bacteria. They usually attack specific parts of the plant, either the reproductive organs directly (flower buds, flowers or fruit) or the seeds after they have dropped. The stress caused by the biological control agent may kill a plant outright or it might impact on the plants reproductive capacity. In certain instances, the reproductive capacity is reduced to zero and the population is effectively sterilized. All of these outcomes will help to reduce the spread of the species. To obtain biocontrol agents, provincial representatives of the Working for Water Programme or the Directorate: Land Use and Soil Management (LUSM), Department of Agriculture, Forestry and Fisheries (DAFF) can be contacted.

- Alien invasive Plant management plan

The following management actions are aimed at reducing soil disturbance during the construction and operational phases of the development, as well as reducing the likelihood that alien species will be brought onto site or otherwise encouraged.

Action	Frequency
The ECO is to provide permission prior to any vegetation being cleared for development	Daily

Clearing of vegetation should be undertaken as the work front progresses – mass clearing should not occur unless the cleared areas are to be prepared immediately afterwards.	Weekly
Cleared areas that have become invaded can be sprayed with appropriate herbicides provided that these products are of such a nature that breaks down on contact with the soil. Residual herbicides should not be used	Weekly
Although organic matter is frequently used to encourage regrowth of vegetation on cleared areas, no foreign material for this purpose should be brought onto site.	Weekly
Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. (Particular attention must be paid to imported material such as building sand or dirty earth-moving equipment.)	Weekly
Alien vegetation regrowth on areas disturbed by construction must be controlled throughout the entire site	Monthly
The alien plant removal and control method guidelines should adhere to best-practice for the species involved. Such information can be obtained from the DWAF Working for Water website and also http://invasives.org.za/	Monthly
Pesticides may not be used. Herbicides may be used to control listed alien weeds and invaders only.	Monthly
Where areas of natural vegetation have been disturbed by construction activities, revegetation with indigenous, locally occurring species should take place where the natural vegetation is slow to recover or where repeated invasion has taken place following disturbance.	Biannually, but revegetation should take place at the start of the rainy season