

	PLAN	Matimba Power Station
-----------------------------------------------------------------------------------	-------------	-----------------------

Title: **Invasive species control plan for Matimba Power Station**

Document Identifier: **PN/246/001**

Alternative Reference Number: **N/A**

Area of Applicability: **Matimba Power Station**

Functional Area Applicability: **Risk and Assurance**

Revision: **1**

Total Pages: **19**

Next Review Date: **October 2023**

Disclosure Classification: **Controlled Disclosure**

Compiled by	Functional Responsibility	Authorized by
		 P.P
M Sinthumule Officer Environmental Management	MC Mamabolo Manager Environmental Management	CO Mabotja (General Manager)
Date: 2020-10-29	Date: 29/10/2020	Date: 2020-10-30

Content

	Page
1. Introduction	3
2. Supporting Clauses	3
2.1 Purpose	3
2.2 Scope	3
2.3 Applicability	3
2.4 Normative/Informative References.....	4
2.4.1 Normative.....	4
2.4.2 Informative	4
2.5 Definitions.....	5
2.6 Abbreviations.....	5
2.7 Roles and Responsibilities	5
2.7.1 Support Services Manager	5
2.7.2 Pest Control Operator	6
2.7.3 Horticulture supervisor	6
2.7.4 Environmental officer	6
2.8 Process for Monitoring	6
3. Document Content.....	7
3.1 Maps of the management unit compartments.....	7
3.2 Tables of listed invasive species	7
3.3 Describing the prioritization	8
3.3.1: Extent of current invasions in compartment A (Power Station).....	10
3.4 Transportation and disposal of treated/uprooted species	11
3.5 Reporting on the efficacy of previous control or eradication measures	12
3.6 Methods used historically	13
3.7 Target and timelines for the plan.....	15
4. Record(s).....	18
5. Acceptance	18
6. Revisions	19
7. Development Team	19
8. Acknowledgements	19

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

1. Introduction

Matimba Power Station has two Farms, namely Grootestryd 465LQ on which the power station is built, and Zwartwater 507LQ on which the Ash dump is situated. There is also a servitude registered across the farm Hanglip 508LQ which has the ash conveyor over it and which is maintained by Matimba.

Various invader plant identification and control programmes were carried out in the past between 2004 and 2010 which appear to have had a very positive impact on the current density of invader population. A total of 17 707 plants were controlled during this 7 year period.

2. Supporting Clauses

2.1 Purpose

- To control the invader plant populations on Matimba Power station, prevent spreading to neighbouring farms etc.
- To implement a monitoring programme to detect the presence of alien plant species as well as to monitor the success of the alien control plan

2.2 Scope

Matimba Power Station controls 3 land parcels namely Compartment A (Power Station), Compartment B (Ash Dump) and Compartment C: Ash Conveyor Servitude – Over Hanglip 508 LQ (200 ha)

2.3 Applicability

<p><i>NOTE: Mark appropriate block/s with a "X"</i></p> <p><i>(Select at least one)</i></p>	All	Head of department	Head of function	Head of section	Administration	Auxiliary	Civil	Control & Instrument	Electrical	Mechanical	Projects	Support	Training	Shifts	Other (Specify):
	Matimba Staff	X													
Operating															
Maintenance															
Engineering															
Risk Management															
Human Resources															

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

Finance															
Production															
Contractors															

2.4 Normative/Informative References

2.4.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] ISO 14001 Environmental Management system
- [3] National Environmental Management Act No. 107 of 1998
- [4] National Environmental Management: Biodiversity Act No. 10 of 2004
- [5] *National Environmental Management: Biodiversity Act, 2004 - Alien And Invasive Species Lists, 2016*
- [6] National Heritage Resources Act No. 25 of 1999
- [7] National Water Act No 36 Of 1998
- [8] Fertilizer, Farm Feeds, Agricultural Remedies Act(Act No.36 Of 1947
- [9] Occupational Health and Safety Act No 85 of 1993

2.4.2 Informative

- [10] Environmental Incident Management Procedure: 240-133087117
- [11] 32-727 Eskom ,Safety Health ,Environment And Quality Policy
- [12] The management of servitudes to minimise environmental impact :PA/246/014
- [13] Management of waste in Matimba Power Station :PS244/001

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

2.5 Definitions

Definition	Explanation
Biodiversity	is the variety of all living things; the different plants, animals and micro-organisms, the genetic information they contain and the ecosystems they form
Environment	Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelationships (ISO 14001).
Indigenous plant	It is defined as native to a given region or ecosystem as a result of natural processes
Invader plants	“Invasive alien species are species introduced deliberately or unintentionally outside their natural habitats where they have the ability to establish themselves, invade, out-compete natives and take over the new environments Invasive plants are alien species that show a tendency to spread out of control.
Protected species	A species of animal or plant which it is forbidden by the law to be harm or destroy

2.6 Abbreviations

Abbreviation	Explanation
IPCR	Invader Plan Control Register
PCO	Pest Control Operator

2.7 Roles and Responsibilities

2.7.1 Support Services Manager

- Ensure that the requirements set out in this management plan are adhered to and implemented
- Responsible for communicating and monitoring the implementation of this plan.
- Ensure that clear and open communication is maintained between Environmental department and Horticulture section so that any change in status, change in target populations, or change in planned actions, are communicated effectively and timeously.
- Ensure annual records of plant control is archived, and used for reporting in each updated invader plan
- Ensure the herbicides are stored in a dedicated storeroom that complies with national occupational health and safety standards.

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

2.7.2 Pest Control Operator

- Responsible for keeping records of chemical used as well as recording the number of plants controlled.
- Obtain the material safety data sheet from the supplier of herbicides and ensure that is discussed with other employees

2.7.3 Horticulture supervisor

- Is responsible for recording the number of plants controlled in each population.
- These records should be given through to the Environmental Department on a monthly basis to be recorded in the Invader Plant Control Register (IPCR).
- Is responsible for the physical control methods applied to plant populations.
- Ensure the control register is updated as required with problem species when new species are noted.
- Ensure the chemical store is always locked to prevent herbicides to get into the wrong hands.

2.7.4 Environmental officer

- Ensure reporting to the authorities is done annually.
- Ensure that the control register is updated as required with problem species when new species are noted during the six-monthly monitoring.

2.8 Process for Monitoring

A six –monthly monitoring should be done aiming to catch invasive alien plant species shortly after they arrive in the project area, and plants controlled should be reported six- monthly in the invader register. On-going control and management of invasions on disturbed areas (specifically at the ash dump) should be carried out during June to September or throughout the year.

CONTROLLED DISCLOSURE

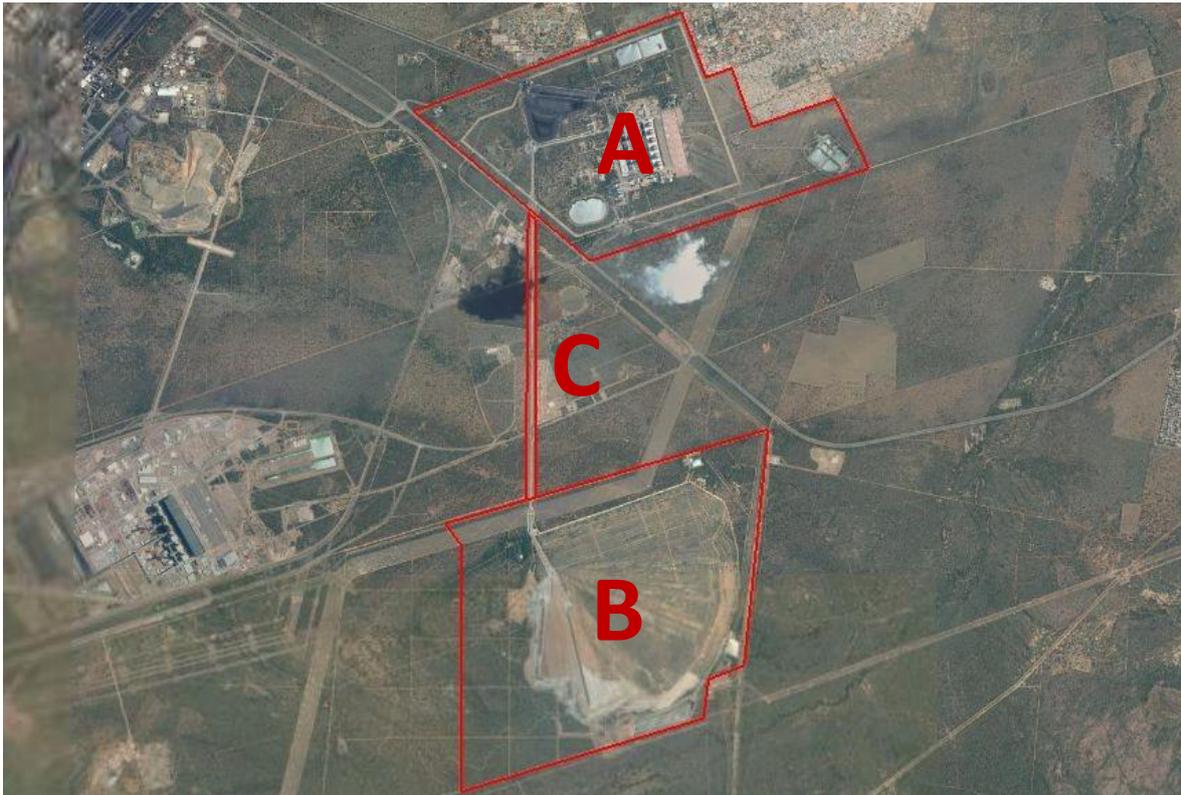
When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

3. Document Content

3.1 Maps of the management unit compartments

Maps of the management unit compartments in the land under the control of the Organ of State



Map 3.1: Matimba Power Station Land Parcels and Servitude [Scale1:75000]

- Compartment A: Power Station – Grootestryd 465 LQ Rem (634 ha)
- Compartment B: Ash Dump – Portion of Zwartwater 507LQ (922 ha)
- Compartment C: Ash Conveyor Servitude – Over Hanglip 508 LQ (200 ha)

3.2 Tables of listed invasive species

Tables of listed invasive species in each management unit compartment

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

Group	Species Name	Common Name	NEMBA Category	Estimated % Cover	Prioritization (/10)	Risk Of Invasion
Plant	<i>Tecoma stans</i>	Yellow bells	1(b)	<1%	High (8)	Low
Plants	<i>Jacaranda mimosifolia</i> <i>D.Don</i>	Jacaranda	1(b)	<1%	Medium	Low
Plants	<i>Ricinus communis L.</i>	Castor Oil	2	<1%	Medium	Low

Table 1 The listed invasive species in the management unit compartment A (Power station)

Group	Species name	Common name	NEMBA Category	Estimated coverage	Prioritization (/10)	Risk of invasion
Plants	<i>Solanum</i>	Silver leaf bitter apple	1(b)	1%	Medium (6)	Low
Plants	<i>Nicotiana glauca</i>	Wild tobacco	1(b)	<10%	High (9)	Low
Plants	<i>Pennisetum setaceum</i>	Fountain grass	1(b)	<3%	High (7)	Medium

Table 2 The listed invasive species in the management unit compartment B (Ash dump):

Table 3.2.3: The Listed Invasive Species in Management Unit Compartment C (Conveyor Servitude):

Group	Species name	Common name	NEMBA Category	Estimated coverage	Prioritization (/10)	Risk of invasion
N/A	N/A	N/A	N/A	N/A	N/A	N/A

No clearing has been done since 2010. Currently the potential for runaway invasion exists on the Wild tobacco invasion on the Ash Dump, though it may be localised, or spread along access roads. This is the highest priority invasion to address on these land parcels.

Next, the Yellow bells invasion in the Power Station should be addressed. The third priority would be the fountain grass invasion at the Ash Dump due to its proximity to the South Westerly boundary and the localised South Westerly winds which may drive the invasion towards neighbouring properties.

3.3 Describing the prioritization

Describing the prioritization of the land parcels in the management units compartments

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

Matimba Power Station is situated in the Limpopo Sweet Bushveld (SVcb 19) National Vegetation Type. This is not a Threatened Ecosystem. No Critically Endangered or Endangered Ecosystems are present or in the vicinity. The area does however fall within the Matlabas/Mokolo Sub – Water Management Area. This makes the land parcels more sensitive environmentally in terms of Invader species.

The weight of the ash dump is causing localised underground water to be pushed to the surface through the collapsing sands at lower points in the landscape. This has led to localised artificial wetlands along sections of the front face of the advancing ash dump.

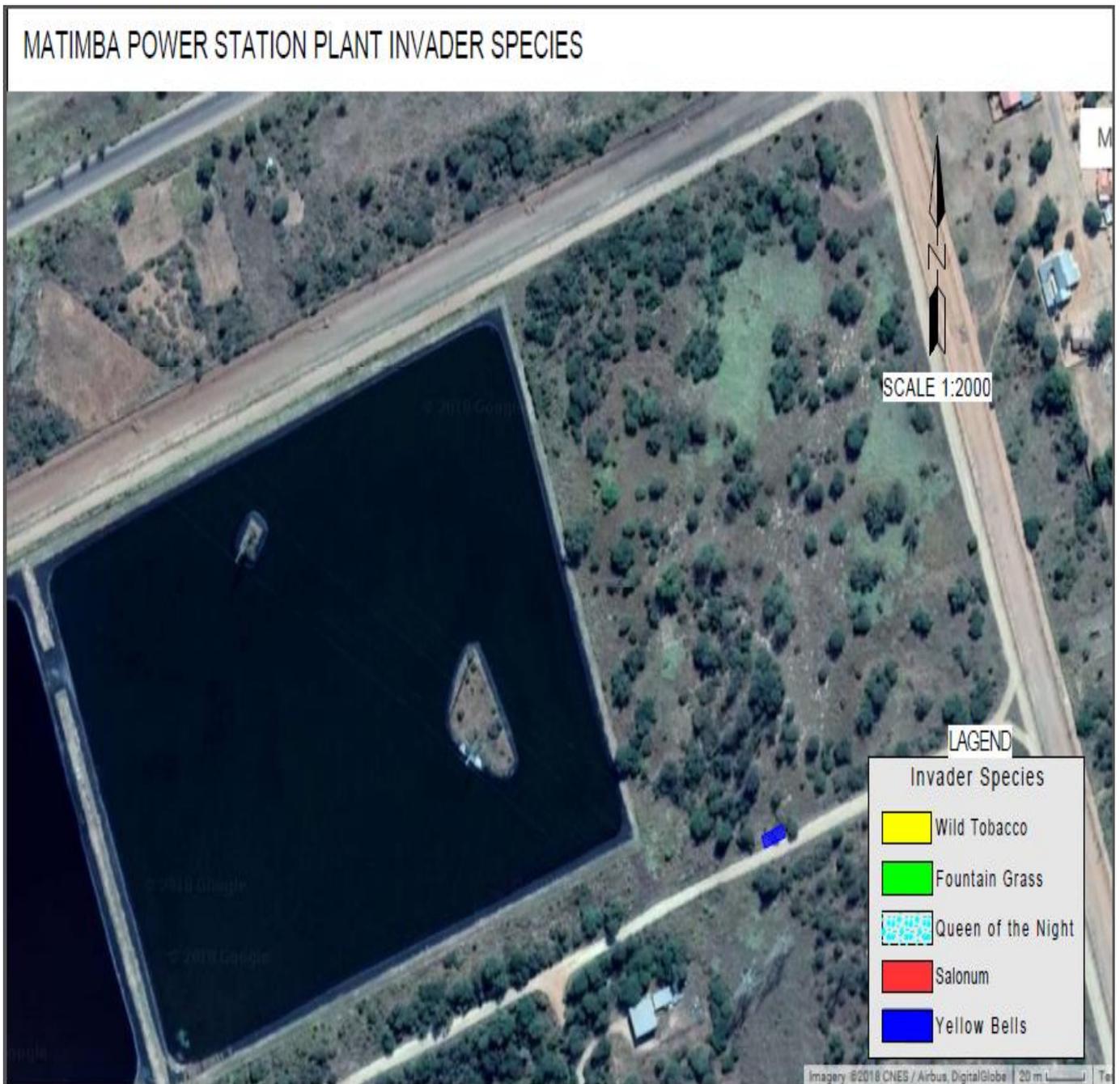
These artificial wetlands are not recognised or mapped by SANBI at this point. No other riparian zones are present. No forest patches are present. No NPAES (National Protected Area Expansion Strategy: Focus Areas) are in the vicinity.

None of the Top 12 Invader species occurs on the land parcels at present. No Category 1a plants are found on this land.

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

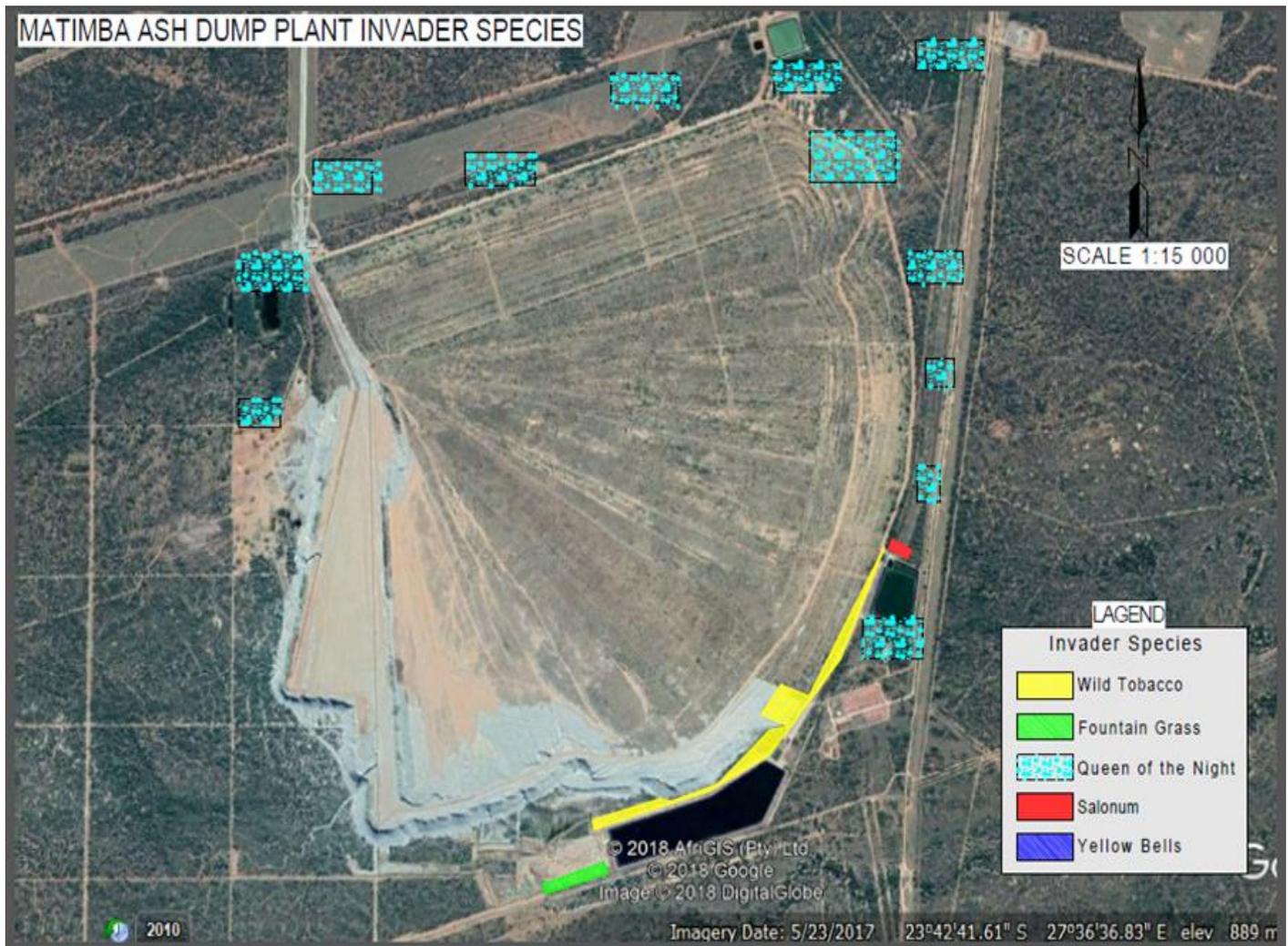


3.3.1: Extent of current invasions in compartment A (Power Station)

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.



3.3.2: Extent of current invasions in compartment B (Ash dump)

3.4 Transportation and disposal of treated/uprooted species

Treated or uprooted plants should not be loaded, transported and/or disposed anywhere except at the area where it was treated to avoid spread of seeds.

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

3.5 Reporting on the efficacy of previous control or eradication measures

Table 3.5.1: History of past control of Listed Invasive Species in the Land Parcel

Group	Species name	Common name	Past control efforts	Nature of records
Plant	<i>Agave sisalina</i>	Sisal	199 plants controlled between 2004 and 2010	IPCR
	<i>Arundo donax</i>	Giant reed	65 m2 controlled during 2005/2006	IPCR
	<i>Canna indica</i>	Indian shot	9 plants controlled 2004	IPCR
	<i>Cereus jamacaru</i>	Queen of the night	772 plants controlled over 7 years	IPCR
	<i>Jacaranda mimosifolia</i>	Jacaranda	1 tree cut and removed in 2004	IPCR
	<i>Lantana spp.</i>	Lantana	1 sqm removed in 2004	IPCR
	<i>Melia azedarach</i>	Seringa	545 plants controlled over 7 years	IPCR
	<i>Morus alba</i>	Mulberry	12 plants removed 2009/2010	IPCR
	<i>Nephrolepis exaltata</i>	Sword fern	17m2 removed 2004 to 2006	IPCR
	<i>Nicotiana glauca</i>	Wild tobacco	571 plants removed between 2005 and 2010	IPCR
	<i>Opuntia ficus-indica</i>	Prickly pear	182 plants controlled over 7 years	IPCR
<i>Pennisetum setaceum</i>	Fountain grass	23 plants controlled in 2004/2005	IPCR	

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

	<i>Ricinus communis</i>	Castor-oil plant	91 plants treated between 2005 and 2010	IPCR
	<i>Tecoma stans</i>	Yellow bells	15175 plants cut and treated over 7 years	IPCR
	<i>Thevetia peruviana</i>	Yellow oleander	44 plants removed in 2004	IPCR

3.6 Methods used historically

Seringa, Wild tobacco and Yellow bells – Stumps were cut to about 400mm above the ground and immediately treated with a herbicide and diesel mix (a blue or red dye was included in the herbicide to check treatment and effective coverage of stems). All germinating seeds and coppices were given a foliar spray with herbicides before reaching 1000mm in height.

Castor-oil plants – Full cover foliar spray used.

Queen of the night, Prickly pear and Sisal – Sprayed with concentrated herbicide direct to stems and leaves. No plants were disturbed or uprooted, cut or chopped or moved as this leads to further invasion.

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

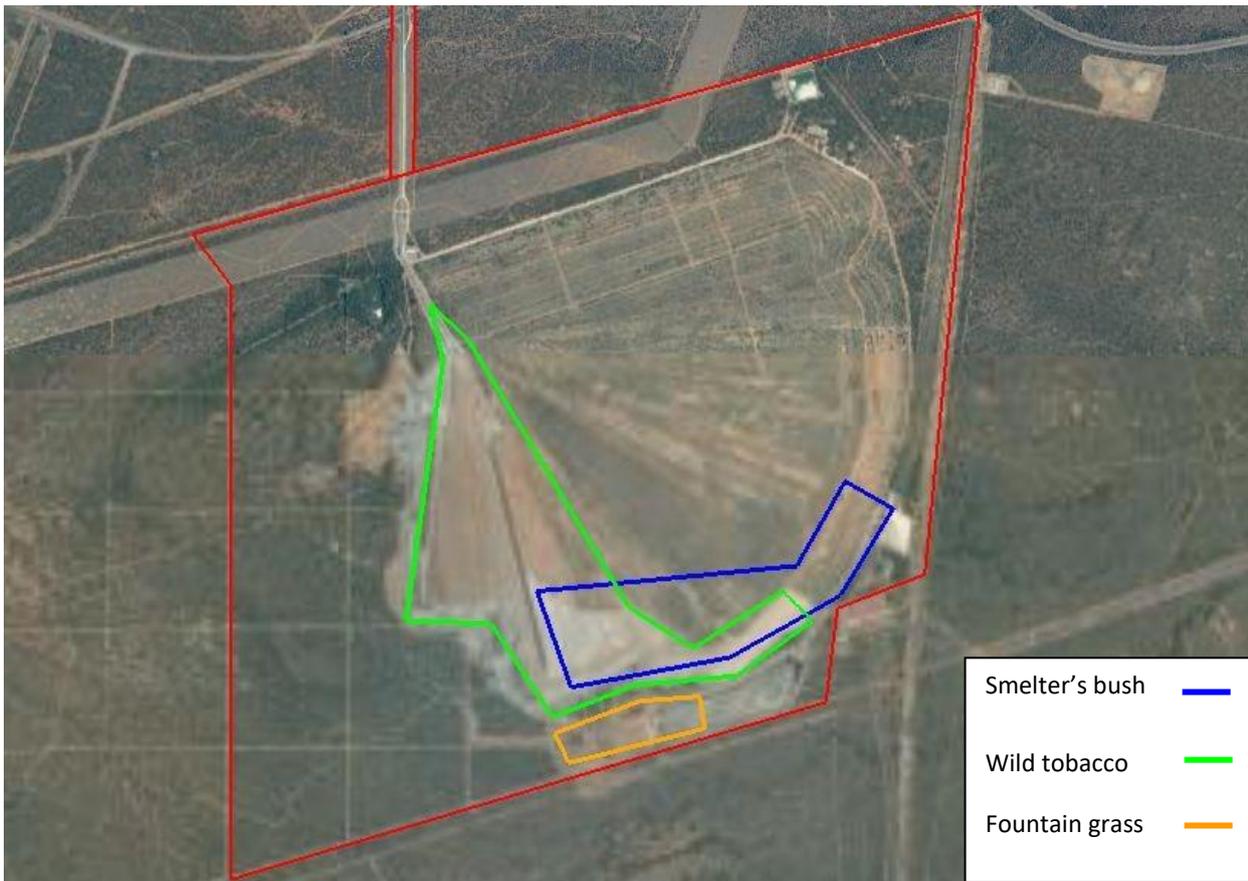


Map 2: State of invasions (2016/2017) of Compartment A (Power Station)

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.



Map 3: State of invasions (2016/2017) of Compartment B (Ash dump)

Smelter's bush, at compartment B (ash dump), rubber vine and wild tobacco at compartment A (power station) were all cleared during 2016/2017 financial year. Plants were cut or chopped and not moved to avoid further invasion. Stumps and all germinating seeds were treated with herbicides to avoid regrowth

3.7 Target and timelines for the plan

Table 3.7.1 SMART goals for the control of Listed Invasive Species in the Management Unit Compartment:

Group	Species name	Common name	Target date	Measurable goal	Assignable goal	Realistic goal	Time-bound goal
Plants	<i>Cereus jamacaru</i>	Queen of the night	June2020/2021	An Effective control method needs to be found for this species	Work to be done through Horticulture employees or contractors. Monitoring and reporting to be done by	Industrial herbicides to be applied to this species, and results monitored for effective control	First application to be applied by March 2020. Weekly monitoring of results for a month. If no success, apply different industrial herbicide and

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

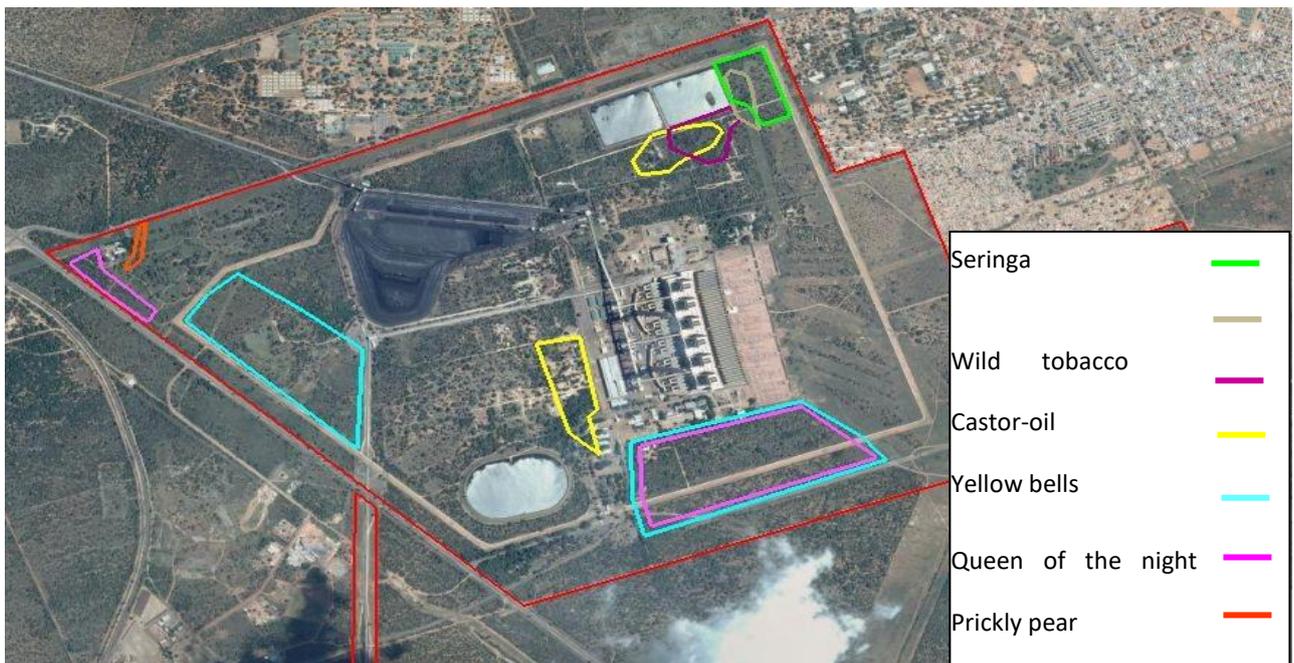
					Environmental Personnel.		monitor results, etc. Record effective treatment and continue to use this when plants noticed. Close monitoring of this invasion would be required. At least 3-monthly monitoring to be done.
	<i>Nicotiana glauca</i>	Wild tobacco	2021/2023 Restrict the occurrence of this species to the active civil works and ash dump areas	Initial control of plants outside of the areas mentioned.	Work to be done through Horticulture employees or contractors. Monitoring and reporting to be done by Environmental Personnel.	All plants outside of the civil works and ash dump working face to be cut to 100mm and the stump treated with herbicide and diesel by Sep 2019. Follow up spray with industrial herbicide to be done every March and September for regrowth, coppicing and seedlings.	To be monitored on an at least six monthly basis to ensure successful containment of the species and eventual destruction at end of life of ash dump. This species will require management and control over at least a thirty year period.
	<i>Tecoma stans</i>	Yellow bells	2019/2020 This species has proved extremely explosive in its invasion in the recent past, but the circumstances appear to have changed since a nearby dam was lined, probably removing at least some of the conditions for unrestricted growth. Long term monitoring and control strategy.	Initially all alone standing plants must be tackled, and then in the second season, all small clumps of these plants should be tackled. In the third season. 2019, all cleared areas should be checked and treated for regrowth. Season's four and five should be used to tackle the main invasion	Work to be done through Horticulture employees or contractors. Monitoring and reporting to be done by Environmental Personnel. Change the strategy based on monitoring results and either slow down or speed up the strategy to ensure containment as far as possible.	It is very important to return at least every six months for follow up treatments, otherwise the germinating seedlings get too big, and cannot be controlled with a foliar spray.	The dynamics of this invasion may have changed due to drier soil conditions which could upset the seedbed or the germination rate. This invasion was particularly aggressive and would also have required an ongoing and continuous effort to contain.
	<i>Pennisetum setaceum</i>	Fountain grass	2019/2021 Restrict invasions to new civil works areas.	All plants to be sprayed with industrial herbicide during first season.	Work to be done through Horticulture employees or contractors. Monitoring and reporting to be done by	All plants noted during monitoring to be treated within 3 months of being	New invasions to be reported and treated as and when they occur.

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

					Environmental Personnel.	noted.	
	<i>Solanum elaeagnifolium</i>	Silver-leaf bitter apple	2019/2020 Clear this invasive species as soon as possible to avoid spread. All patches close to the water source	All plant to be to be uprooted and all cleared areas should be checked and treated for regrowth.	Work to be done through Horticulture employees or contractors.	All plant noted during monitoring to be treated within 6 month of being noted	2019/2020
	<i>Jacaranda mimosifolia</i> <i>a D.Don</i>	Jacaranda	2021	All plant to be to be uprooted and all cleared areas should be checked and treated for regrowth.	Work to be done through Horticulture employees or contractors.	All plant noted during monitoring to be treated within 6 month of being noted	All work to completed by 2021 year end
	<i>Ricinus communis</i> <i>L.</i>	Castor Oil		All plant to be to be uprooted and all cleared areas should be checked and treated for regrowth.	Work to be done through Horticulture employees or contractors.	All plant noted during monitoring to be treated within 6 month of being noted	All work to completed by 2021 year end

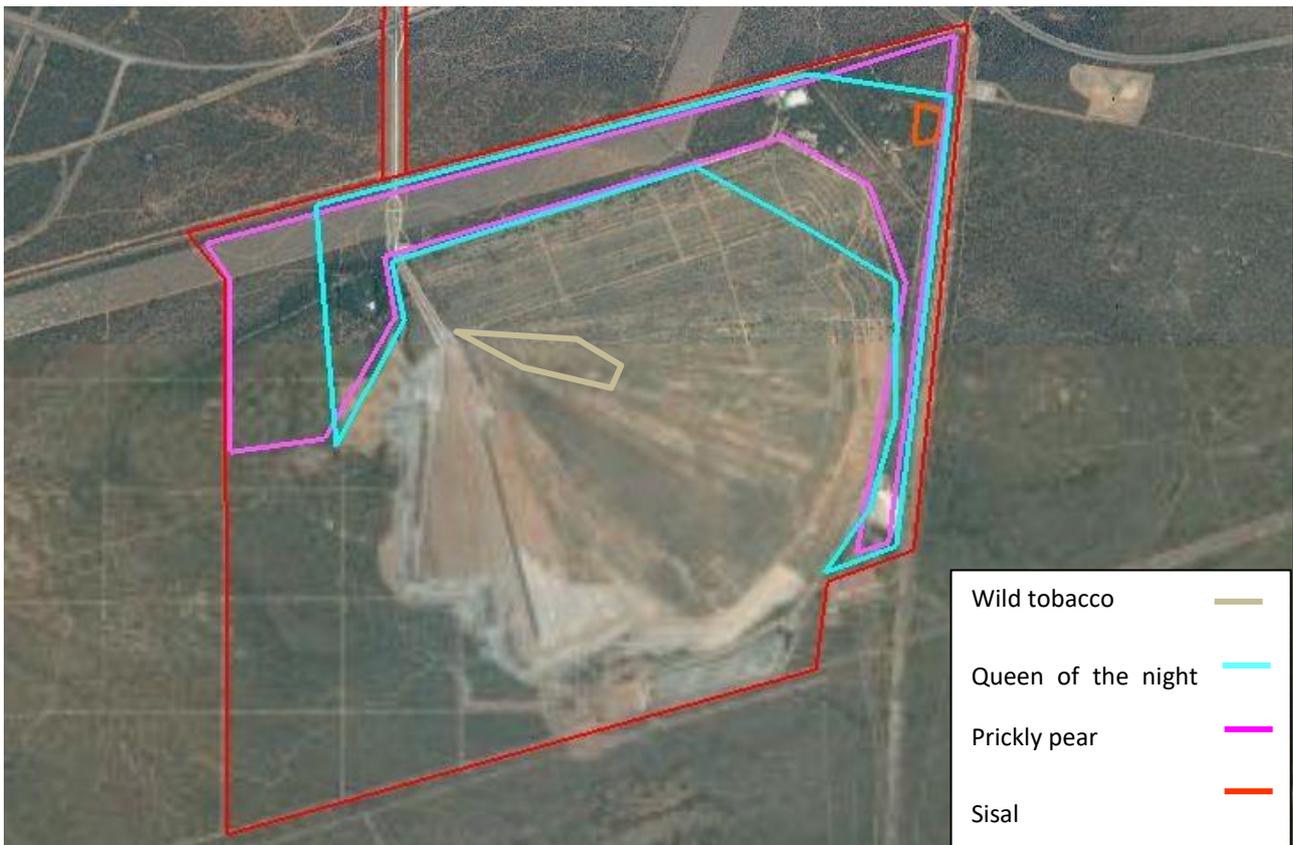


Map .1: Historic state of Invasion (2005) of Compartment A (Power Station) [Scale 1: 34 000]

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.



Map 2: Historic state of Invasion (2005) of Compartment B (Ash Dump) [Scale 1: 32 500]

4. Record(s)

N/A

5. Acceptance

This document has been seen and accepted by:

Name	Designation
MC Mamabolo	Manager Environmental Management
L Mthimkhulu	Manager Operating Support
A Mashiane	Acting Support Services Manager
M Sinthumule	Officer Environmental Management
H Ramahlare	Officer Environmental Management
E Mocke	Officer Environmental Management

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.

6. Revisions

Date	Rev.	Compiler	Remarks
March 2019	1	SS Sebola	Original
October 2020	2	M Sinthumule	New updates: 2.4.1, 3.2, 3.7

7. Development Team

The following people were involved in the development of this document:

- Shandukani Sebola

8. Acknowledgements

- Mpolokeng Mampane
- Gundo Mathoho
- Inba Pillay
- Alan Bosman

CONTROLLED DISCLOSURE

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd.