ECOLOGICAL ASSESSMENT
PROPOSED ESTABLISHMENT AND OPERATION OF A SEWAGE TREATMENT PACKAGE PLANT AT HEALDTOWN COMPREHENSIVE SCHOOL, FORT BEAUFORT, EASTERN CAPE PROVINCE OF SOUTH AFRICA

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PROJECT TEAM

Prof Roy Allen Lubke *(Ecological study leader and report production)*
Professor Lubke has been involved with the study and research of the vegetation in the Eastern Cape over the last 30 years, specialising in coastal systems. He has also worked in the Western Cape and Kwa-Zulu Natal and thus has a fuller understanding of South African coastal vegetation and systems. He has also worked on Environmental Impact assessments in Mozambique, Kenya and Madagascar and has consulting experience in Malawi and Angola. Professor Lubke has had extensive experience in environmental projects especially ecological impacts and sensitivity of the environment, due to biodiversity and species rarity and vegetation and habitat sensitivity.

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Sam holds a BSc in Zoology and Ichthyology as well as a BSc (Hons) in Zoology. She is currently employed as an Environmental Consultant at Coastal and Environmental Services, working and assisting on various environmental projects. Sam also provides general assistance with regard to administration, co-ordination, budget control, public participation, proposal writing, report production and field work.

1. INTRODUCTION

Coastal & Environmental Services (CES) has studied the sites of the proposed Healdtown Comprehensive School WWTW on a visit to the site on 6 January 2011. Information was collected on the plants and all available information for the environment for the ecological assessment for the proposed site. This report is divided up into further sections, namely:

- Section 2 describes the formulated Terms of Reference,
- Section 3 describes the Ecological Environment,
- Section 4 provides the Conclusions and Recommendations.

2. TERMS OF REFERENCE

The objectives of this report are as follows:

- Present an account of the current status in the affected area.
- A habitat survey to determine what rare, vulnerable, endangered or critically endangered species of plants and animals may be found on the study site. Species of such a nature will be known as Species of Special Concern (SSC).
- A species list of the plants that were found on site and what species would be expected to occur there, even if not necessarily seen.
- Recommendations with regards to each site. The study must identify the most and least preferred site (if applicable).

3. THE ECOLOGICAL ENVIRONMENT

3.1 Introduction

The site at Healdtown Comprehensive School is much modified and the ecological report provided here is thus based on existing issues rather than the natural environment as it would have been before the school was built.

Method statement

The area was thoroughly examined and all plant species were recorded. There were many alien species on the site some of these being invasive.

3.2 Vegetation and Floristics

3.2.1 Introduction

An account of the vegetation and flora of this region is given in Mucina and Rutherford (2006). However, these are both general accounts of the vegetation of the whole region and there is no specific phytosociological study for this specific site or area.

Mucina and Rutherford (2006) is a SANBI managed project to map the vegetation of South Africa, Lesotho, and Swaziland. The project was contracted through DEAT, and resulted in a book. The Mucina and Rutherford (2006) book includes a general introduction to each

biome, followed by descriptions for each vegetation type in the Biome. According to Mucina and Rutherford (2006) the sites would have fallen within the Bisho Thornveld with Eastern Cape Escarpment Thicket surrounding in the valleys and extending up the escarpment to the Amatola Mountains.

The only vegetation type of concern is the Bisho Thornveld, which is a savanna found on undulating slopes and valleys. This open savanna is dominated by the sweet thorn tree (*Acacia karroo*) and in the climax state rooigras or *Themeda triandra.* A number of other grasses and herbs are present in the savanna and there is a tendency for thicket woody species to invade into the savanna.

3.2.2 Floristics and Plants of special concern

The site had been heavily grazed so that few natural plants could be recorded. Approximately 70 plants were recorded but no species of special concern were found (Appendix 1).

3.2.3 Alien Invasive Plant species

Invasion of exotic alien vegetation is a serious situation and present alien species and possible future invasions need to be controlled. The alien species observed on the site are listed below (Table 3-1).

Table 3-1: List of alien plant species found on the site

Species	Common name	Site	Potential invader species
Cestrum laevigatum	Ink berry	B	YES
Cotoneaster sp	Cotoneaster	B	YES
Jacaranda mimosifolia	Jacaranda	B	NO
Lantana camara	Lantana or tickberry	A	YES
Melia azedarach	Syringa	B	YES
Opuntia aurantiaca	Jointed cactus	A	YES
Opuntia ficus-indica	Prickly pear	A	YES
Plantago lanceolata		B	NO
Senna didymobotrya	Peanut butter cassia	B	YES
Senna occidentalis	Stinking weed	B	YES
Solanum sp.		A	YES

Site B is more heavily invaded by woody aliens. Much of the area is being invaded by small saplings of *Senna occidentalis* (Stinking weed) spreading from mature trees over 3 m tall. This species is of particular concern as it is not listed as an invader in the Eastern Cape.

3.2.4 Vegetation

No detailed sampling of the sites was undertaken as the vegetation of the two sites was very uniform and highly modified. The vegetation of the two sites is described below:

Site A
This site is adjacent to the road and is flat to slightly sloping to the SSW of about 1 degree. It is an old lawned area that has been invaded by indigenous grasses and herbs as well as some weeds (Table 3-1). The site had been heavily grazed by cattle and donkeys. There were birds in the trees but little evidence of other indigenous animals,

Site B

This site is an old garden and is surrounded by planted trees such as an oak, syringa and cassias and with paths and flower beds laid out. There were many potential and invading alien woody species on this site (Table 3-1). About 15% of the site is covered with trees or shrubs and a 90% cover of herbs and grasses.

5.3 Terrestrial Fauna

In general, there is a lack of pristine terrestrial habitats in the region. This means that the terrestrial fauna has been severely impacted by previous human activity, particularly the loss of vegetation (particularly from cultivation or overgrazing), invasion of alien vegetation, and local extinction of large mammals. There were a number of birds of the thicket and savanna in the area and the presence of mole rats but little else of significance in the animals present in the region.

4. CONCLUSIONS AND RECOMMENDATIONS

On the basis of this study we have noted the following:

- The sites are in degraded Bisho Thornveld.
- Site A is on a slight slope in a prominent position the region with little possibility of concealing the site. The vegetation is degraded grassland or open lawns.
- Site B is in an old garden with paths and flower beds laid out. It is on a slight slope and surrounded by trees. It is the preferred site on the basis of ecology.
- There are no species of special concern on either site.
- It is unlikely that the loss of small areas such as proposed will be of any consequence in the lost of species of special concern.
- There would be a VERY LOW impact in the loss of vegetation, plants and animal habitat and species due to the small size of the development.
- There is a slightly higher impact of invasion of alien plants (MODERATE) but this could be reduced to LOW if they are cleared during and after development.
- There are more critical issues in placement of the site, such as the visual aspects.

It is therefore recommended that:

- Site B is the preferred site for the WWTW.
- Attention should be paid to drains and drainage in the construction and operational phase.
- Alien plants should be removed from the site and care should be taken that any introduced aliens that come in with the machinery during construction are removed.
- The existing trees, such as the oak, *Celtis africana,* and the shrubs should be maintained on the site as far as possible to conceal the treatment plant.
- Care should be taken to prevent fires during construction.

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APPENDIX 1: LIST OF PLANT SPECIES IN THE REGION

A= species at site A
B= species at site B
S= species on the evaporation pans site

	LIST OF PLANTS	SPECIES AT SITE
	ANGIOSPERMAE	
	MONOCOTYLEDONAE	
	POACEAE (KEW Numbers)	
107	*Paspalumdilatatum*Poir.	B
116	*Panicum*sp.	
197	*Helictotrichonhirtulum*(Steud.) Schweick.	S,A
262	*Aristidajunciformis*Trin. &Rupr.	S,A,B
274	*Tragus berteronianus*Schult.	S
283	Sporobolus africanus (Poir.) Robyns & Tournay	S
286	*Eragrostisracemosa*(Thunb.) Steud.	S
286	*Eragrostisobtuse* Munro ex Fical. &Hiern.	S
296	C*ynodondactylon*(L.) Pers.	S,A,B
	COMMELINACEAE (0893)	
896	*Commelinaafricana*L.	A
	ASPHODELACEAE	
1026	*Aloe ferox*Mill.	S,A
	ASPARAGACEAE	
1113	*Asparagus africanus*	S,A
	ORCHIDACEAE (1407)	
	Orcidaceae sp. indet	A
	DICOTYLEDONAE	
	FAGACEAE	
1893	*Quercusrobur L.*	B
	ULMACEAE	
1898	*Celtisafricana* Burm.f.	B
	CHENOPODIACEAE	
2226	*Exomismicrophylla*(Thunb.) Aell.	A
	BRASSICACEAE	
2883	*Lepidiumafricanum*(Burm. F.) DC.	S.B
	ROSACEAE	
3333	*Cotoneaster*sp.	B
	FABACEAE (3436)	
3447	*Acacia karroo* Hayne	S,A,B
3536	*Sennadidymobotrya*(Fresen.) Irwin &Barneby	B
	Sennaoccidentalis(L.) Link	B
	OXALIDACEAE	
3936	*Oxalis pes-caprae*L.	S

	PTAEROXYLACEAE	
4157	*Ptaeroxylonobliquum* (Thunb.) Radlk	A
	MELIACEAE	
4175	*Meliaazedarach*L.	S,B
	ANACARDIACEAE	
4582	*Schinismolle*L.	B
	CELASTRACEAE (4618)	
4626	*Maytenusheterophylla*(Eckl. &Zeyhr.)N.K.B.Robson	S,B
	VITACEAE	
4918	*Cyphostemma cirrhosum(Thunb.) Descoings ex Wild & Drum*	A
	MALVACEAE (4980)	
4983	*Abutilon sonneratianum*(cav.) Sweet	S,A
4998	*Sidadregei*Burtt Davy	S,A,B
	STERCULIACEAE	
5056	*Hermanniaamoena*Dinter ex M. Holtzhammer	S,A
	CACTACEAE	
5417	*Opuntiaficus-indica*(L.) Mill.	S,A
	*Opuntiaaurantiaca*Lindl.	S,A
	Opuntiaimbricata(Haw.) DC.	S
	MYRTACEAE	
5598	*Ecalyptus*sp.	S
	APIACEAE (5893)	
5894	*Centellaasiatica*(L.) Urb.	S
	PLUMBAGINACEAE	
6343	*Plumbagoauriculata* Lam.	S,A
	SALVADORACEAE	
6444	*Azimatetracantha*Lam.	A,B
	BORAGINACEAE	
7100	*Myosotis*sp.	
	VERBENACEAE (7138)	
7138	*Verbenaofficinalis*L.	S,B
7144	*Lantana camara*L.	S,A,B
7145	*Lipiajavanica*(Burm. f.) Spreng.	S
	LAMIACEAE	
7212	*Teucriumtritidum*Retz.	S,A,B
	Lamiaceaesp.indet.	A
	SOLANACEAE	
7379	*Lyciumafrum*L.	S,A
7407	*Solanum* sp.	
7420	*Cestrum laevigatum*Schlechtd.	B
	SELAGINACEAE	
7568	*Selagocorymbosa*L.	S
	BIGONIACEAE	
7725	*Jacaranda mimosifolia*D.Don.	B

	PLATAGINACEAE	
8116	*Plantagolanceolata*L.	A,B
	RUBIACEAE (8116)	
8464	*Richardiabrasiliensis*Gomes	S
8283	*Randiarudis*E.Mey. exHarv.	S,A
	CAMPANULACEAE (8644)	
8668	*Wahlenbergia sp.*	S,A
	ASTERACEAE (8729)	
8919	*Feliciamuricata*(Thunb.) Nees	S
8930	*Chrysocomaciliata*L.	S
9432	*Arctotis*sp.	S,A,B
9434	*Gazania*sp.	S