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Specialist Survey Report

Assessment of impacts on birds: proposed  
water pipeline through Rietvlei Nature  
Reserve and Bronberg Conservation Area.

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## Report Information

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### Declaration

This survey was conducted in my capacity as an independent specialist. I have no financial or other interests in the proposed project.

**Date of report:** 5 December 2008

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## Executive Summary

- The proposed pipeline runs through two protected areas, namely Rietvlei Nature Reserve (RNR) and Bronberg Conservation Area (BCA). RNR consists of grassland and aquatic biomes, whereas BCA consists of highly disturbed woodland.
  - Avian diversity along the proposed route through the centre of RNR is high, and includes nesting sites for the threatened African Grass-owl. Diversity along the alternate route along the eastern boundary of RNR is lower. Diversity along the proposed route in BCA is moderate.
  - Impacts associated with the construction of the proposed pipeline in RNR and BCA will involve habitat loss, and disturbance resulting from the presence of construction workers and vehicles. Post-construction impacts are likely to be minimal.
  - The pipeline should follow the alternate route along the eastern boundary of RNR, since this will minimize the severity of construction-related impacts.
  - Construction activities at both sites must be restricted to a narrow strip along the pipeline route, and steps should be taken to ensure that construction workers disturb the area as little as possible.
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## **i. Introduction**

This report summarizes my assessment of the impacts on birds of the proposed Benoni-Mamelodi water pipeline where it runs through two conservation areas, namely the Rietvlei Nature Reserve and the Bronberg Conservation Area. In Rietvlei Nature Reserve, I assessed two alternate routes. The first runs through the centre of the reserve, and the second route runs along the firebreak along the reserve's eastern boundary, immediately adjacent to the Pretoria-Delmas road (Figure 1).

## **ii. Background**

Rietvlei Nature Reserve, located southeast of Pretoria, consists predominantly of Highveld grassland, together with several dams, marshy areas and drainage lines that provide various open water and wetland habitats. The reserve holds several bird species endemic to South Africa, as well as number of species of conservation significance, such as the African Grass-owl (*Tyto capensis*). The Bronberg Conservation Area is located on the Bronberg range in eastern Pretoria, and at the site of the proposed pipeline consists of highly disturbed vegetation with large numbers of aliens, including pines and black wattles.

Little information is available on the post-construction impacts of pipelines on bird communities, and virtually all the data that do exist concern leaks from oil or gas pipelines (e.g., Bachert 1994, Gurde and Sbert 2007, American Petroleum Institute 2005). The major impacts of the proposed pipeline through Rietvlei Nature Reserve and the Bronberg Conservation Area are likely to occur during the construction phase.

## **iii. Predictive methods**

The impacts of the proposed development on birds were assessed using several methods:

- 1) Bird species potentially occurring in the vicinity of the routes for the proposed pipeline were obtained from the Atlas of Southern African Birds (Harrison et al. 1997).
- 2) During a visit to the sites on 20 November 2008, I assessed the species of birds occurring in the vicinity of the proposed development and estimated their approximate densities by conducting point count and transect sampling, following the methods described in Ralph et al. (1993).
- 3) In view of the limited scope of the survey, I have applied the precautionary principle, and listed species that were not encountered during my survey but which I expect to occur at this site on the basis of habitat characteristics, and which have previously been recorded here.
- 4) Impacts of the proposed project were assessed using relevant scientific literature, together with published information on the ecology and behaviour of species encountered at the site.
- 5) Species of conservation concern were identified using the Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland (Barnes 2000).
- 6) The nature, severity, duration, and probability of impacts of the proposed development were assessed following criteria drawn from the EIA Regulations, published by the Department of Environmental Affairs and

Tourism (April 1998) in terms of the Environmental Conservation Act No. 73 of 1989.



**Figure 1.** Rietvlei Nature Reserve, showing the proposed pipeline route through the centre of the reserve (pink line), and the alternate route along the firebreak on the reserve's eastern boundary (green line). The two marshy areas that are most sensitive to construction-related disturbance are indicated in red.

### Uncertainties and gaps in baseline knowledge

- 1) Bird species occurring along the routes of the proposed pipeline were intensively assessed during a 1-day period, and the possibility exists that rarer species in the area were not encountered due to the short time spent on site.
- 2) Expectations of other species occurring in the area are based, in part, on the Southern African Bird Atlas Project, conducted between 1986 and 1997. However, species ranges are not static, but fluctuate through time in response to factors such as climate change. The possibility thus exists that some species have recently moved into the area, or conversely, no longer occur there.
- 3) The behaviour and ecology of birds, like other organisms, is not completely predictable. The overall impacts of the proposed project can reliably be predicted on the basis on impacts observed elsewhere, but it is important to appreciate that specific, and sometimes subtle, local factors can modify interactions between birds and human activities.

## **iv. Assessment of avifauna along the proposed routes**

### Rietvlei Nature Reserve

Avian diversity in Rietvlei Nature Reserve is relatively high, and I recorded 90 species during the survey (Appendix 1). Birds occurring along the proposed pipeline route through the centre of the reserve include species associated with grassland as well as aquatic habitats. Common grassland species include Helmeted Guineafowl, Black-shouldered Kite, Diderik Cuckoo, Northern Black Korhaan, Banded Martin, Zitting Cisticola and African Pipit. In addition, several grassland species of conservation significance have been recorded in the quarter-degree square (QDS) within which Rietvlei is located, including Blue Korhaan (near-threatened), White-bellied Korhaan (vulnerable), Secretarybird (near-threatened), and Lesser Kestrel (vulnerable).

The marshy areas and aquatic habitats (Figure 1,2) hold a variety of species, including Yellow-billed Duck, Blacksmith Lapwing, Little Bittern, Whiskered Tern, Sacred Ibis, African Reed-warbler, Lesser Swamp-warbler and Levillant's Cisticola. Threatened species recorded in the QDS, and potentially occurring in Rietvlei, include Corncrake (near-threatened), Black Stork (near-threatened), Black-winged Pratincole (near-threatened), Blue Crane (vulnerable), Caspian Tern (near-threatened), Greater Painted-snipe (near-threatened). Of particular relevance is the presence of African Grass-owl nesting sites along the proposed route at 25°52'59"S 28°17'38"E (Figure 1), where the existing pipeline crosses a wetland. This species is of significant conservation concern, with the southern African population decreasing and becoming increasingly fragmented, largely due to habitat degradation. (Hockey et al. 2005). The southern African population is currently estimated at < 5,000 individuals, and the species is listed as "Vulnerable" (Barnes 2000).

Avian diversity along the alternate route that runs along the eastern boundary of the reserve is significantly lower than the route through the middle of the reserve, reflecting the higher disturbance levels and lower habitat diversity along this route.

### Bronberg Conservation Area

Avian diversity in the Bronberg Conservation Area is moderate, with 32 species recorded during the survey (Appendix 2). Common species include Black Cuckoo,





**Figure 2. Marshy and aquatic habitats along proposed pipeline route through middle of Rietvlei Nature Reserve**

Little Swift, Diderik Cuckoo, Karoo Thrush, Southern Masked-Weaver and Cape Sparrow. No species of conservation concern were observed, although several near-threatened species could potentially occur in the area, namely Peregrine Falcon (near-threatened) and Lanner Falcon (near-threatened).



## **v. Impacts of the proposed project**

### **Rietvlei Nature Reserve**

The construction of the pipeline will result in several impacts on local bird communities. My assessment of the severity of impacts assumes that the mitigation measures listed in section vii below are put in place.

- Habitat loss associated with the digging of a trench and movement of vehicles. For the proposed route through the centre of the reserve, the overall severity of this impact will be low in grassland areas, but medium in the marshy areas. The proximity of African Grass-owl nest sites to the proposed route means that the impact on this species will be medium to high, since the construction will destroy nesting habitat. With regards to the alternate route along the eastern boundary of the reserve, the impact of habitat loss will be very low to negligible along the entire route, since construction will take place along an existing firebreak.
- Disturbance associated with the presence of construction workers and vehicles. For the proposed route through the centre of the reserve, the overall severity of this impact will be low in grassland areas, but low to medium in marshy areas. For African Grass-owls, the severity of this impact will be medium to high. If the alternate route along the eastern boundary is used, the severity of this impact will be very low, since construction activities will occur along an existing firebreak.
- Post-construction impacts of the pipeline are expected to be very low to negligible along both routes.

### **Bronberg Conservation Area**

- The severity of habitat loss along the proposed pipeline route will be very low, particularly in view of the fact that the area has already been cleared (presumably for the construction of the existing pipeline), and the high proportion of non-native vegetation.
- The presence of construction workers and vehicles will result in an impact of low severity
- Post-construction impacts of the pipeline are expected to be very low to negligible.

## **vi. Route recommendation – Rietvlei Nature Reserve**

In view of the presence of African Grass-owl breeding sites along the proposed route that runs through the centre of the reserve, and the marshy areas that would be affected, the alternate route along the eastern boundary must be used. This route will minimize the severity of habitat loss and disturbance to local bird communities.

## vi. Mitigation

- The spatial extent of construction activities must be minimized by restricting them to a narrow corridor along the pipeline route.
- Construction of the pipeline through Rietvlei Nature Reserve and Bronberg Conservation Area must take place in winter, so as to minimize disturbance to migrants and breeding birds.
- All construction personnel involved must be alerted to the fact that they are working in conserved areas, and educated with regards to the sensitivity of the areas. Littering must be prevented. Any negative impact on local bird populations, such as the illegal hunting of gamebirds (e.g., Swainson's Spurfowl, Helmeted Guineafowl), must be prevented.

## vii. References

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**Appendix 1a. Species recorded along proposed pipeline routes in Rietvlei Nature Reserve during survey on 20 November 2008. All common names follow Hockey et al. (2005). All species for which status is not provided are currently classified "least concern".**

Common Name	Scientific Name	Status
African Black Swift	<i>Apus barbatus</i>	
African Darter	<i>Anhinga rufa</i>	
African Palm-Swift	<i>Cypsiurus parvus</i>	
African Pipit	<i>Anthus cinnamomeus</i>	
African Purple Swamphen	<i>Porphyrio madagascariensis</i>	
African Reed-Warbler	<i>Acrocephalus baeticatus</i>	
African Sacred Ibis	<i>Threskiornis aethiopicus</i>	
African Snipe	<i>Gallinago nigripennis</i>	
African Stonechat	<i>Saxicola torquatus</i>	
African Wattled Lapwing	<i>Vanellus senegallus</i>	
Ant-eating Chat	<i>Myrmecocichla formicivora</i>	
Banded Martin	<i>Riparia cincta</i>	
Barn Swallow	<i>Hirundo rustica</i>	
Black-crowned Tchagra	<i>Tchagra senegalus</i>	
Black-headed Heron	<i>Ardea melanocephala</i>	
Black-shouldered Kite	<i>Elanus caeruleus</i>	
Blacksmith Lapwing	<i>Vanellus armatus</i>	
Black-throated Canary	<i>Crithagra atrogularis</i>	
Black-winged Stilt	<i>Himantopus himantopus</i>	
Brown-throated Martin	<i>Riparia paludicola</i>	
Burchell's Coucal	<i>Centropus burchellii</i>	
Cape Glossy Starling	<i>Lamprotornis nitens</i>	
Cape Grassbird	<i>Sphenoeacus afer</i>	
Cape Longclaw	<i>Macronyx capensis</i>	
Cape Robin-Chat	<i>Cossypha caffra</i>	
Cape Sparrow	<i>Passer melanurus</i>	
Cape Turtle-Dove	<i>Streptopelia capicola</i>	
Cape Wagtail	<i>Motacilla capensis</i>	
Cape Weaver	<i>Ploceus capensis</i>	
Cape White-eye	<i>Zosterops virens</i>	
Capped Wheatear	<i>Oenanthe pileata</i>	
Cardinal Woodpecker	<i>Dendropicos fuscescens</i>	
Cattle Egret	<i>Bubulcus ibis</i>	
Cloud Cisticola	<i>Cisticola textrix</i>	
Common Fiscal	<i>Lanius collaris</i>	
Common Moorhen	<i>Gallinula chloropus</i>	

Common Myna	<i>Acridotheres tristis</i>
Common Ostrich	<i>Struthio camelus</i>
Common Waxbill	<i>Estrilda astrild</i>
Crested Barbet	<i>Trachyphonus vaillantii</i>
Crowned Lapwing	<i>Vanellus coronatus</i>
Dark-capped Bulbul	<i>Pycnonotus tricolor</i>
Desert Cisticola	<i>Cisticola aridulus</i>
Diderick Cuckoo	<i>Chrysococcyx caprius</i>
Egyptian Goose	<i>Alopochen aegyptiaca</i>
European Bee-eater	<i>Merops apiaster</i>
Glossy Ibis	<i>Plegadis falcinellus</i>
Goliath Heron	<i>Ardea goliath</i>
Greater Striped Swallow	<i>Hirundo cucullata</i>
Green-backed Heron	<i>Butorides striata</i>
Hadedda Ibis	<i>Bostrychia hagedash</i>
Hamerkop	<i>Scopus umbretta</i>
Helmeted Guineafowl	<i>Numida meleagris</i>
Karoo Thrush	<i>Turdus smithi</i>
Lesser Swamp-Warbler	<i>Acrocephalus gracilirostris</i>
Levaillant's Cisticola	<i>Cisticola tinniens</i>
Little Bittern	<i>Ixobrychus minutus</i>
Little Egret	<i>Egretta garzetta</i>
Little Grebe	<i>Tachybaptus ruficollis</i>
Little Swift	<i>Apus affinis</i>
Long-tailed Widowbird	<i>Euplectes progne</i>
Neddicky	<i>Cisticola fulvicapilla</i>
Northern Black Korhaan	<i>Afrotis afraoides</i>
Pearl-breasted Swallow	<i>Hirundo dimidiata</i>
Pied Crow	<i>Corvus albus</i>
Pied Starling	<i>Spreo bicolor</i>
Pin-tailed Whydah	<i>Vidua macroura</i>
Red-billed Teal	<i>Anas erythrorhyncha</i>
Red-collared Widowbird	<i>Euplectes ardens</i>
Red-knobbed Coot	<i>Fulica cristata</i>
Red-throated Wryneck	<i>Jynx ruficollis</i>
Reed Cormorant	<i>Phalacrocorax africanus</i>
Rufous-naped Lark	<i>Mirafra africana</i>
Sand Martin	<i>Riparia riparia</i>
Southern Masked-Weaver	<i>Ploceus velatus</i>
Southern Red Bishop	<i>Euplectes orix</i>
Speckled Mousebird	<i>Colius striatus</i>
Spotted Thick-knee	<i>Burhinus capensis</i>

Swainson's Spurfowl	<i>Pternistis swainsonii</i>
Tawny-flanked Prinia	<i>Prinia subflava</i>
Whiskered Tern	<i>Chlidonias hybrida</i>
White-breasted Cormorant	<i>Phalacrocorax lucidus</i>
White-rumped Swift	<i>Apus caffer</i>
White-throated Swallow	<i>Hirundo albigularis</i>
White-winged Widowbird	<i>Euplectes albonotatus</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Wood Sandpiper	<i>Tringa glareola</i>
Yellow-billed Duck	<i>Anas undulata</i>
Zitting Cisticola	<i>Cisticola juncidis</i>

**Appendix 1b. Additional species possibly occurring along proposed pipeline routes in Rietvlei Nature Reserve, extracted from the South African Bird Atlas database (Harrison et al. 1997). All common names follow Hockey et al. (2005). All species for which status is not provided are currently classified “least concern”.**

Common name	Scientific name	Status
Abdim's Stork	<i>Ciconia abdimii</i>	
African Black Duck	<i>Anas sparsa</i>	
African Fish-Eagle	<i>Haliaeetus vocifer</i>	
African Grass-Owl	<i>Tyto capensis</i>	Vulnerable
African Hoopoe	<i>Upupa africana</i>	
African Jacana	<i>Actophilornis africanus</i>	
African Marsh-Harrier	<i>Circus ranivorus</i>	
African Pied Wagtail	<i>Motacilla aguimp</i>	
African Quailfinch	<i>Ortygospiza atricollis</i>	
African Rail	<i>Rallus caerulescens</i>	
African Spoonbill	<i>Platalea alba</i>	
Amethyst Sunbird	<i>Chalcomitra amethystina</i>	
Black Crake	<i>Amaurornis flavirostris</i>	
Black Heron	<i>Egretta ardesiaca</i>	
Black Kite	<i>Milvus migrans</i>	
Black Stork	<i>Ciconia nigra</i>	Near threatened
Black-chested Prinia	<i>Prinia flavicans</i>	
Black-chested Snake-Eagle	<i>Circaetus pectoralis</i>	
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	
Black-necked Grebe	<i>Podiceps nigricollis</i>	
Black-winged Pratincole	<i>Glareola nordmanni</i>	Near threatened
Blue Crane	<i>Anthropoides paradiseus</i>	Vulnerable
Blue Korhaan	<i>Eupodotis caerulescens</i>	Near threatened
Bokmakierie	<i>Telophorus zeylonus</i>	
Brown Snake-Eagle	<i>Circaetus cinereus</i>	
Brown-backed Honeybird	<i>Prodotiscus regulus</i>	
Brown-hooded Kingfisher	<i>Halcyon albiventris</i>	
Buffy Pipit	<i>Anthus vaalensis</i>	
Cape Crow	<i>Corvus capensis</i>	
Cape Shoveler	<i>Anas smithii</i>	
Cape Teal	<i>Anas capensis</i>	
Caspian Plover	<i>Charadrius asiaticus</i>	
Caspian Tern	<i>Sterna caspia</i>	Near threatened
Chestnut-backed Sparrowlark	<i>Eremopterix leucotis</i>	
Comb Duck	<i>Sarkidiornis melanotos</i>	
Common Greenshank	<i>Tringa nebularia</i>	

Common House-Martin	<i>Delichon urbicum</i>	
Common Quail	<i>Coturnix coturnix</i>	
Common Ringed Plover	<i>Charadrius hiaticula</i>	
Common Sandpiper	<i>Actitis hypoleucos</i>	
Coqui Francolin	<i>Peliperdix coqui</i>	
Corn Crane	<i>Crex crex</i>	Near threatened
Cuckoo Finch	<i>Anomalospiza imberbis</i>	
Eastern Clapper Lark	<i>Mirafra fasciolata</i>	
Eastern Long-billed Lark	<i>Certhilauda semitorquata</i>	
Eurasian Hobby	<i>Falco subbuteo</i>	
Familiar Chat	<i>Cercomela familiaris</i>	
Fulvous Duck	<i>Dendrocygna bicolor</i>	
Giant Kingfisher	<i>Megaceryle maximus</i>	
Goliath Heron	<i>Ardea goliath</i>	
Great Crested Grebe	<i>Podiceps cristatus</i>	
Great Egret	<i>Egretta alba</i>	
Great Reed-Warbler	<i>Acrocephalus arundinaceus</i>	
Greater Flamingo	<i>Phoenicopterus ruber</i>	Near threatened
Greater Painted-snipe	<i>Rostratula benghalensis</i>	Near threatened
Grey-headed Gull	<i>Larus cirrocephalus</i>	
Horus Swift	<i>Apus horus</i>	
Hottentot Teal	<i>Anas hottentota</i>	
Kittlitz's Plover	<i>Charadrius pecuarius</i>	
Kurrichane Buttonquail	<i>Turnix sylvaticus</i>	
Lanner Falcon	<i>Falco biarmicus</i>	Near threatened
Laughing Dove	<i>Streptopelia senegalensis</i>	
Lazy Cisticola	<i>Cisticola aberrans</i>	
Lesser Kestrel	<i>Falco naumanni</i>	Vulnerable
Little Bee-eater	<i>Merops pusillus</i>	
Little Rush-Warbler	<i>Bradypterus baboecala</i>	
Little Stint	<i>Calidris minuta</i>	
Long-billed Pipit	<i>Anthus similis</i>	
Maccoa Duck	<i>Oxyura maccoa</i>	
Malachite Kingfisher	<i>Alcedo cristata</i>	
Malachite Sunbird	<i>Nectarinia famosa</i>	
Marsh Owl	<i>Asio capensis</i>	
Marsh Sandpiper	<i>Tringa stagnatilis</i>	
Marsh Warbler	<i>Acrocephalus palustris</i>	
Melodious Lark	<i>Mirafra cheniana</i>	
Monotonous Lark	<i>Mirafra passerina</i>	
Mountain Wheatear	<i>Oenanthe monticola</i>	
Orange River Francolin	<i>Scleroptila levaillantoides</i>	



Orange-breasted Waxbill	<i>Amandava subflava</i>	
Osprey	<i>Pandion haliaetus</i>	
Pied Avocet	<i>Recurvirostra avosetta</i>	
Pied Kingfisher	<i>Ceryle rudis</i>	
Plain-backed Pipit	<i>Anthus leucophrys</i>	
Purple Heron	<i>Ardea purpurea</i>	
Red-billed Quelea	<i>Quelea quelea</i>	
Red-capped Lark	<i>Calandrella cinerea</i>	
Red-chested Flufftail	<i>Sarothrura rufa</i>	
Red-eyed Dove	<i>Streptopelia semitorquata</i>	
Red-throated Wryneck	<i>Jynx ruficollis</i>	
Red-winged Francolin	<i>Scleroptila levaillantii</i>	
Ruff	<i>Philomachus pugnax</i>	
Secretarybird	<i>Sagittarius serpentarius</i>	Near threatened
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	
South African Cliff-Swallow	<i>Hirundo spilodera</i>	
Southern Boubou	<i>Laniarius ferrugineus</i>	
Southern Pochard	<i>Netta erythrophthalma</i>	
Spike-heeled Lark	<i>Chersomanes albofasciata</i>	
Spotted Eagle-Owl	<i>Bubo africanus</i>	
Spotted Thick-knee	<i>Burhinus capensis</i>	
Squacco Heron	<i>Ardeola ralloides</i>	
Three-banded Plover	<i>Charadrius tricollaris</i>	
Wailing Cisticola	<i>Cisticola lais</i>	
Wattled Starling	<i>Creatophora cinerea</i>	
White Stork	<i>Ciconia ciconia</i>	
White-backed Duck	<i>Thalassornis leuconotus</i>	
White-bellied Korhaan	<i>Eupodotis senegalensis</i>	Vulnerable
White-bellied Sunbird	<i>Cinnyris talatala</i>	
White-faced Duck	<i>Dendrocygna viduata</i>	
White-fronted Bee-eater	<i>Merops bullockoides</i>	
White-winged Tern	<i>Chlidonias leucopterus</i>	
Wing-snapping Cisticola	<i>Cisticola ayresii</i>	
Yellow Bishop	<i>Euplectes capensis</i>	
Yellow Wagtail	<i>Motacilla flava</i>	
Yellow-billed Egret	<i>Egretta intermedia</i>	
Yellow-crowned Bishop	<i>Euplectes afer</i>	

**Appendix 2a. Species recorded along proposed pipeline routes in Bronberg Conservation Area during survey on 20 November 2008. All common names follow Hockey et al. (2005). All species for which status is not provided are currently classified “least concern”.**

Common name	Scientific name	Status
African Firefinch	<i>Lagonosticta rubricata</i>	
Amethyst Sunbird	<i>Chalcomitra amethystina</i>	
Barn Swallow	<i>Hirundo rustica</i>	
Bar-throated Apalis	<i>Apalis thoracica</i>	
Black Cuckoo	<i>Cuculus clamosus</i>	
Black-backed Puffback	<i>Dryoscopus cubla</i>	
Black-throated Canary	<i>Crithagra atrogularis</i>	
Bronze Mannikin	<i>Spermestes cucullatus</i>	
Cape Robin-Chat	<i>Cossypha caffra</i>	
Cape Sparrow	<i>Passer melamurus</i>	
Cape Turtle-Dove	<i>Streptopelia capicola</i>	
Cape White-eye	<i>Zosterops virens</i>	
Cinnamon-breasted Bunting	<i>Emberiza tahapisi</i>	
Common Waxbill	<i>Estrilda astrild</i>	
Dark-capped Bulbul	<i>Pycnonotus tricolor</i>	
Diderick Cuckoo	<i>Chrysococcyx caprius</i>	
Greater Striped Swallow	<i>Hirundo cucullata</i>	
Grey Go-away-bird	<i>Corythaixoides concolor</i>	
Karoo Thrush	<i>Turdus smithi</i>	
Kurrichane Thrush	<i>Turdus libonyanus</i>	
Laughing Dove	<i>Streptopelia senegalensis</i>	
Little Swift	<i>Apus affinis</i>	
Long-billed Crombec	<i>Sylvietta rufescens</i>	
Neddicky	<i>Cisticola fulvicapilla</i>	
Red-chested Cuckoo	<i>Cuculus solitarius</i>	
Red-eyed Dove	<i>Streptopelia semitorquata</i>	
Southern Boubou	<i>Laniarius ferrugineus</i>	
Southern Masked-Weaver	<i>Ploceus velatus</i>	
Speckled Mousebird	<i>Colius striatus</i>	
Streaky-headed Seedeater	<i>Crithagra gularis</i>	
Striped Pipit	<i>Anthus lineiventris</i>	
Tawny-flanked Prinia	<i>Prinia subflava</i>	

**Appendix 2b. Additional species possibly occurring along proposed pipeline routes in Bronberg Conservation Area, extracted from the South African Bird Atlas database (Harrison et al. 1997). All common names follow Hockey et al. (2005). All species for which status is not provided are currently classified “least concern”.**

Common Name	Scientific name	Status
African Black Swift	<i>Apus barbatus</i>	
African Crake	<i>Creccopsis egregia</i>	
African Cuckoo Hawk	<i>Aviceda cuculoides</i>	
African Firefinch	<i>Lagonosticta rubricata</i>	
African Green-Pigeon	<i>Treron calvus</i>	
African Grey Hornbill	<i>Tockus nasutus</i>	
African Hawk-Eagle	<i>Aquila spilogaster</i>	
African Hoopoe	<i>Upupa africana</i>	
African Olive-Pigeon	<i>Columba arquatrix</i>	
African Palm-Swift	<i>Cypsiurus parvus</i>	
African Paradise-Flycatcher	<i>Terpsiphone viridis</i>	
African Pied Wagtail	<i>Motacilla aguimp</i>	
African Pipit	<i>Anthus cinnamomeus</i>	
African Pygmy-Kingfisher	<i>Ispidina picta</i>	
African Quailfinch	<i>Ortygospiza atricollis</i>	
African Reed-Warbler	<i>Acrocephalus baeticatus</i>	
African Sacred Ibis	<i>Threskiornis aethiopicus</i>	
African Scops-Owl	<i>Otus senegalensis</i>	
Alpine Swift	<i>Tachymarptis melba</i>	
Arrow-marked Babbler	<i>Turdoides jardineii</i>	
Banded Martin	<i>Riparia cincta</i>	
Barn Owl	<i>Tyto alba</i>	
Bearded Woodpecker	<i>Dendropicos namaquus</i>	
Black Cuckooshrike	<i>Campephaga flava</i>	
Black Kite	<i>Milvus migrans</i>	
Black Sparrowhawk	<i>Accipiter melanoleucus</i>	
Black Stork	<i>Ciconia nigra</i>	Near threatened
Black-backed Puffback	<i>Dryoscopus cubla</i>	
Black-chested Prinia	<i>Prinia flavicans</i>	
Black-chested Snake-Eagle	<i>Circaetus pectoralis</i>	
Black-collared Barbet	<i>Lybius torquatus</i>	
Black-crowned Tchagra	<i>Tchagra senegalus</i>	
Black-headed Heron	<i>Ardea melanocephala</i>	
Black-headed Oriole	<i>Oriolus larvatus</i>	
Black-shouldered Kite	<i>Elanus caeruleus</i>	
Blue Waxbill	<i>Uraeginthus angolensis</i>	

Bokmakierie	<i>Telophorus zeylonus</i>	
Bronze Mannikin	<i>Spermestes cucullatus</i>	
Bronze-winged Courser	<i>Rhinoptilus chalcopterus</i>	
Brown Snake-Eagle	<i>Circaetus cinereus</i>	
Brown-backed Honeybird	<i>Prodotiscus regulus</i>	
Brown-crowned Tchagra	<i>Tchagra australis</i>	
Brown-hooded Kingfisher	<i>Halcyon albiventris</i>	
Brown-throated Martin	<i>Riparia paludicola</i>	
Burchell's Coucal	<i>Centropus burchellii</i>	
Burnt-necked Eremomela	<i>Eremomela usticollis</i>	
Bushveld Pipit	<i>Anthus caffer</i>	
Cape Bunting	<i>Emberiza capensis</i>	
Cape Eagle-Owl	<i>Bubo capensis</i>	
Cape Glossy Starling	<i>Lamprotornis nitens</i>	
Cape Grassbird	<i>Sphenoeacus afer</i>	
Cape Longclaw	<i>Macronyx capensis</i>	
Cape Rock-Thrush	<i>Monticola rupestris</i>	
Cape Sparrow	<i>Passer melanurus</i>	
Cape Wagtail	<i>Motacilla capensis</i>	
Cape Weaver	<i>Ploceus capensis</i>	
Cape White-eye	<i>Zosterops virens</i>	
Cardinal Woodpecker	<i>Dendropicos fuscescens</i>	
Cattle Egret	<i>Bubulcus ibis</i>	
Chinspot Batis	<i>Batis molitor</i>	
Cinnamon-breasted Bunting	<i>Emberiza tahapisi</i>	
Common Fiscal	<i>Lanius collaris</i>	
Common House-Martin	<i>Delichon urbicum</i>	
Common Myna	<i>Acridotheres tristis</i>	
Common Quail	<i>Coturnix coturnix</i>	
Common Scimitarbill	<i>Rhinopomastus cyanomelas</i>	
Common Waxbill	<i>Estrilda astrild</i>	
Common Whitethroat	<i>Sylvia communis</i>	
Coqui Francolin	<i>Peliperdix coqui</i>	
Corn Crake	<i>Crex crex</i>	Near threatened
Crested Barbet	<i>Trachyphonus vaillantii</i>	
Crested Francolin	<i>Dendroperdix sephaena</i>	
Crowned Lapwing	<i>Vanellus coronatus</i>	
Cuckoo Finch	<i>Anomalospiza imberbis</i>	
Cut-throat Finch	<i>Amadina fasciata</i>	
Dark-capped Bulbul	<i>Pycnonotus tricolor</i>	
Dusky Indigobird	<i>Vidua funerea</i>	
Dwarf Bittern	<i>Ixobrychus sturmii</i>	

Eastern Clapper Lark	<i>Mirafra fasciolata</i>	
Emerald-spotted Wood-Dove	<i>Turtur chalcospilos</i>	
European Bee-eater	<i>Merops apiaster</i>	
European Honey-Buzzard	<i>Pernis apivorus</i>	
European Nightjar	<i>Caprimulgus europaeus</i>	
Familiar Chat	<i>Cercomela familiaris</i>	
Fiery-necked Nightjar	<i>Caprimulgus pectoralis</i>	
Fiscal Flycatcher	<i>Sigelus silens</i>	
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>	
Freckled Nightjar	<i>Caprimulgus tristigma</i>	
Gabar Goshawk	<i>Melierax gabar</i>	
Garden Warbler	<i>Sylvia borin</i>	
Golden-tailed Woodpecker	<i>Campethera abingoni</i>	
Great Reed-Warbler	<i>Acrocephalus arundinaceus</i>	
Great Sparrow	<i>Passer motitensis</i>	
Greater Double-collared Sunbird	<i>Cinnyris afer</i>	
Greater Honeyguide	<i>Indicator indicator</i>	
Greater Striped Swallow	<i>Hirundo cucullata</i>	
Green Wood-Hoopoe	<i>Phoeniculus purpureus</i>	
Green-backed Heron	<i>Butorides striata</i>	
Green-winged Pytilia	<i>Pytilia melba</i>	
Grey-backed Camaroptera	<i>Camaroptera brevicaudata</i>	
Grey-headed Bush-Shrike	<i>Malaconotus blanchoti</i>	
Groundscraper Thrush	<i>Psophocichla litsitsirupa</i>	
Hadedda Ibis	<i>Bostrychia hagedash</i>	
Helmeted Guineafowl	<i>Numida meleagris</i>	
Horus Swift	<i>Apus horus</i>	
House Sparrow	<i>Passer domesticus</i>	
Icterine Warbler	<i>Hippolais icterina</i>	
Jacobin Cuckoo	<i>Clamator jacobinus</i>	
Jameson's Firefinch	<i>Lagonosticta rhodopareia</i>	
Klaas's Cuckoo	<i>Chrysococcyx klaas</i>	
Kurrichane Buttonquail	<i>Turnix sylvaticus</i>	
Lanner Falcon	<i>Falco biarmicus</i>	Near threatened
Lesser Grey Shrike	<i>Lanius minor</i>	
Lesser Honeyguide	<i>Indicator minor</i>	
Lesser Masked-Weaver	<i>Ploceus intermedius</i>	
Lesser Striped Swallow	<i>Hirundo abyssinica</i>	
Levaillant's Cisticola	<i>Cisticola tinniens</i>	
Levaillant's Cuckoo	<i>Clamator levaillantii</i>	
Little Bee-eater	<i>Merops pusillus</i>	
Little Sparrowhawk	<i>Accipiter minullus</i>	

Southern Grey-headed Sparrow	<i>Passer diffusus</i>
Southern Red Bishop	<i>Euplectes orix</i>
Southern White-crowned Shrike	<i>Eurocephalus anguitimens</i>
Southern White-faced Scops-Owl	<i>Ptilopsis granti</i>
Speckled Mousebird	<i>Colius striatus</i>
Speckled Pigeon	<i>Columba guinea</i>
Spotted Eagle-Owl	<i>Bubo africanus</i>
Spotted Flycatcher	<i>Muscicapa striata</i>
Spotted Thick-knee	<i>Burhinus capensis</i>
Steppe Buzzard	<i>Buteo vulpinus</i>
Striped Kingfisher	<i>Halcyon chelicuti</i>
Swainson's Spurfowl	<i>Pternistis swainsonii</i>
Thick-billed Weaver	<i>Amblyospiza albifrons</i>
Verreaux's Eagle	<i>Aquila verreauxii</i>
Verreaux's Eagle-Owl	<i>Bubo lacteus</i>
Village Indigobird	<i>Vidua chalybeata</i>
Village Weaver	<i>Ploceus cucullatus</i>
Violet-backed Starling	<i>Cinnyricinclus leucogaster</i>
Wahlberg's Eagle	<i>Aquila wahlbergi</i>
Wattled Starling	<i>Creatophora cinerea</i>
White-bellied Sunbird	<i>Cinnyris talatala</i>
White-browed Scrub-Robin	<i>Cercotrichas leucophrys</i>
White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>
White-crested Helmet-Shrike	<i>Prionops plumatus</i>
White-fronted Bee-eater	<i>Merops bullockoides</i>
White-rumped Swift	<i>Apus caffer</i>
White-throated Robin-Chat	<i>Cossypha humeralis</i>
White-throated Swallow	<i>Hirundo albigularis</i>
White-winged Widowbird	<i>Euplectes albonotatus</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Woodland Kingfisher	<i>Halcyon senegalensis</i>
Yellow-bellied Eremomela	<i>Eremomela icteropygialis</i>
Yellow-crowned Bishop	<i>Euplectes afer</i>
Yellow-fronted Tinkerbird	<i>Pogoniulus chrysocomus</i>
Yellow-throated Petronia	<i>Petronia superciliaris</i>





Little Swift	<i>Apus affinis</i>	
Long-tailed Paradise-Whydah	<i>Vidua paradisaea</i>	
Marico Sunbird	<i>Cinnyris mariquensis</i>	
Marsh Owl	<i>Asio capensis</i>	
Marsh Warbler	<i>Acrocephalus palustris</i>	
	<i>Thamnolaea</i>	
Mocking Cliff-Chat	<i>cinnamomeiventris</i>	
Mountain Wheatear	<i>Oenanthe monticola</i>	
Namaqua Dove	<i>Oena capensis</i>	
Orange-breasted Bush-Shrike	<i>Telophorus sulfureopectus</i>	
Orange-breasted Waxbill	<i>Amandava subflava</i>	
Ovambo Sparrowhawk	<i>Accipiter ovampensis</i>	
Pearl-breasted Swallow	<i>Hirundo dimidiata</i>	
Pearl-spotted Owllet	<i>Glaucidium perlatum</i>	
Peregrine Falcon	<i>Falco peregrinus</i>	Near threatened
Pied Crow	<i>Corvus albus</i>	
Pied Starling	<i>Spreo bicolor</i>	
Pin-tailed Whydah	<i>Vidua macroura</i>	
Purple Indigobird	<i>Vidua purpurascens</i>	
Rattling Cisticola	<i>Cisticola chiniana</i>	
Red-backed Shrike	<i>Lanius collurio</i>	
Red-billed Firefinch	<i>Lagonosticta senegala</i>	
Red-chested Flufftail	<i>Sarothrura rufa</i>	
Red-collared Widowbird	<i>Euplectes ardens</i>	
Red-faced Mousebird	<i>Urocolius indicus</i>	
Red-headed Finch	<i>Amadina erythrocephala</i>	
Red-throated Wryneck	<i>Jynx ruficollis</i>	
Red-winged Starling	<i>Onychognathus morio</i>	
Rock Kestrel	<i>Falco rupicolus</i>	
Rock Martin	<i>Hirundo fuligula</i>	
Rufous-cheeked Nightjar	<i>Caprimulgus rufigena</i>	
Rufous-naped Lark	<i>Mirafra africana</i>	
Sabota Lark	<i>Calendulauda sabota</i>	
Sand Martin	<i>Riparia riparia</i>	
Shaft-tailed Whydah	<i>Vidua regia</i>	
Shelley's Francolin	<i>Scleroptila shelleyi</i>	
Shikra	<i>Accipiter badius</i>	
Short-toed Rock-Thrush	<i>Monticola brevipes</i>	
South African Cliff-Swallow	<i>Hirundo spilodera</i>	
Southern Black Flycatcher	<i>Melaenornis pammelaina</i>	
Southern Black Tit	<i>Parus niger</i>	
Southern Boubou	<i>Laniarius ferrugineus</i>	

