WA WATER CORPORATION PROPOSED SOUTHERN SEAWATER DESALINATION PLANT: COMMONWEALTH PUBLIC ENVIRONMENT REPORT
EPBC AVIFAUNA ISSUES – DESKTOP REVIEW

1 INTRODUCTION

The proposed Southern Seawater Desalination Plant (SSDP) will produce around 50 GL of potable water per annum, with the potential to increase to 100 GL/year. Construction work is anticipated to commence in 2009, with operations commencing in 2011. The WAWC has identified Binningup as the preferred site of the new desalination plant, based on a range of social, environmental, technical and economic factors.

The WA Environmental Protection Authority (EPA) has allocated a 'Public Environmental Review (PER)' level of assessment for the project, under the WA *Environment Protection Act 1986*. On 21 April 2008 the PER was released for public comment for an eight week period, with submissions closing on 16 June 2008.

In parallel with the WA assessment process, the WAWC has also undertaken an assessment of the proposed activity under the terms of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). An EPBC Act Referral was submitted to the Commonwealth Department of the Environment, Heritage, Water and the Arts (DEWHA). Subsequently, DEWHA has issued guidelines for a Public Environment Report, within which is a list of environmental issues and specific flora and fauna (including migratory shorebirds and marine avifauna) which have been identified as of distinct interest to the Commonwealth.

As a result of the Commonwealth assessment requirements, it was incumbent upon the WAWC to draft and submit for DEWHA review and assessment a cPER which conforms with the Commonwealth's requirements. These requirements are promulgated in DEWHA's *Guidelines for the Content of a Draft Public Environment Report (PER): The Development of the Southern Seawater Desalination Project, Binningup, WA (Reference: No. 2008/4173).*

WAWC commissioned URS to prepare the cPER and as part of that process a gap analysis of the WA State PER (i.e. sPER), was undertaken to identify potential gaps and deficiencies in the existing SSDP information in the context of DEWHA's specific concerns. The gaps identified that are the subject of this desktop review (EPBC Act related avifauna issues) are:

Migratory bird species listed under JAMBA, CAMBA and ROKAMBA
Prepare a summary and risk assessment in the context of EPBC Act significance criteria by reviewing information on the migratory bird species listed under the international agreements, Japanese Australia Migratory Bird Agreement (JAMBA), Chinese Australia Migratory Bird Agreement (CAMBA) and the Republic of Korea Australia Migratory Bird Agreement (ROKAMBA). It was also considered that information was needed on migratory birds in the context of potential disturbance, or otherwise, to beach and nearby wetlands, particularly Peel-Yalgorup Ramsar wetland.

EPBC Listed Marine Avifauna
Prepare a summary and risk assessment for marine avifauna (e.g. seabirds etc) in terms of EPBC Act significance criteria.

2 REVIEW METHODOLOGY

The literature review included a range of data sources that were accessed to develop sufficient understanding of the EPBC Act listed marine avifauna and migratory species that may be in the area in order to assess likely impacts from the proposed SSDP. The review placed emphasis on the distribution and range of applicable EPBC Act and JAMBA/CAMBA/ROKAMBA listed species, taking into account factors such as:

- seasonal variation (or migratory behaviour) of the presence (or otherwise) of these species
- habitats and life cycle requirements of listed species
- habitats potentially affected by the proposed SSDP and associated works
- known significant sites for migratory species in the region (e.g. Peel-Yalgorup system, Vasse-Wonnerup wetland system).

In addition to existing information available from work done to-date by the WAWC for the proposed SSDP (i.e. sPER, EPBC Act referral etc), a range of literature sources and databases were reviewed to generate a list of relevant avifauna that may occur in the local region and obtain information on the factors listed above. These include:

- EPBC Act databases
- International agreements such as RAMSAR and the migratory birds agreements (JAMBA/CAMBA/ROKAMBA)
- Ramsar Sites Database Service operated by Wetlands International (www.wetlands.org/RSDB).
- Wetlands International reviews and updates of important sites for migratory shorebirds in Australia (i.e. sites determined from analysis of data from locations throughout the East Asian-Australasian Flyway).
- Information and species distribution maps provided by Storr and Johnstone 1988, Johnstone and Storr 1998 and the Handbook of Australian, New Zealand and Antarctic Birds (HANZAB).
- Specific references related to the status of migratory shorebirds (Straw 1997) and seabirds (Ross *et al*. 1996).

3 RELEVANT LEGISLATIVE POLICY AND INTERNATIONAL AGREEMENTS/CONVENTIONS

3.1 Environment Protection and Biodiversity Conservation Act 1999

The conservation status of avifauna species is assessed under the Commonwealth EPBC Act. The significance levels for fauna used in the EPBC Act are those recommended by the International Union for the Conservation of Nature and Natural Resources (IUCN 2001). There are six parts to the EPBC Act covering species that are extinct, extinct in the wild, critically endangered, vulnerable and conservation dependent. Migratory and listed marine species are also included under the EPBC Act. Avifauna species included under international agreements are formally recognised under Commonwealth legislation. The EPBC Act also lists migratory species that are recognised under international treaties such as those made between Australia and Japan (JAMBA), China (CAMBA) and the Republic of Korea (ROKAMBA).

3.2 Migratory Bird International Agreements

A range of migratory bird species are listed under bilateral international agreements concerning the protection of migratory shorebirds and their habitats (JAMBA/CAMBA/ROKAMBA). These agreements list terrestrial, water and shorebirds species which migrate between Australia and the respective other countries. The majority of listed species are shorebirds which are associated with saline wetlands and coastal shorelines. To complete their annual migration, shorebirds are dependent on intermediate staging sites where they can replenish the fat reserves needed to power them further in their migration. The East Asian-Australasian Flyway is the term used to describe the migration routes and the network of sites along it that are used by migrating shorebirds.

The East Asian - Australasian Shorebird Site Network is a network of both sites and people supported by governments and non-government organisations. Wetlands, which support 20,000 or more shorebirds or 1% of the flyway population of a migratory shorebird species or subspecies, are eligible to join the Shorebird Site Network. Managers of sites are encouraged under the Asia-Pacific Migratory Waterbird Conservation Strategy 2001-2005 and the Shorebird Action Plan, to establish a local advisory or liaison group and develop management plans. Such activities help to gain support for the effective management of these sites for shorebird conservation.

Wetlands International reviews and updates maps of internationally important sites for migratory shorebirds in Australia. This work links to the recent analysis of data throughout the East Asian-Australasian Flyway to reassess minimum population estimates and apply this to shorebird count data. By this process, 125 sites of international importance to migratory shorebirds have been identified in Australia.

3.3 Ramsar Convention

Australia is a signatory to the Ramsar Convention which provides for the designation of wetlands of international significance and encourages their wise use for the benefit of nature conservation. This international agreement has been further strengthened in Australia because 'the ecological character of declared Ramsar wetlands' is considered a Matter of National Environmental Significance under the EPBC Act. The convention encourages the designation of sites containing representative, rare or unique wetland types, or that are important for conserving biological diversity to the List of Wetlands of International Importance (Ramsar sites). The convention employs "Special Criteria Based on Waterfowl for Identifying Wetlands of International Importance". Using these criteria a wetland should be considered internationally important if it regularly supports > 20,000 waterbirds or 1% of the individuals in a population of one species or subspecies of waterbird (this includes migratory shorebirds).

Australia currently has 64 Ramsar sites which cover a total of approximately 7.3 million hectares. Australia seeks to protect these wetlands through a range of activities including appropriate legislation and policy frameworks, development and implementation of site management plans, and community education and awareness programs. The Ramsar sites include wetlands occurring within marine, coastal, inland and man-made settings and encompass a divesre array of wetland types or habitats which are recognised as being important to birds for reasons including:

- Support rare/endangered species
- Support an outstanding range of bird species
- Breeding or roosting area for waterbirds
- Staging area for migratory waterbird species
- Waterbird wintering/non-breeding/dry season area
- Supports endemic bird species

4 ASSESSMENT OF LISTED SPECIES THAT MAY POTENTIALLY OCCUR WITHIN THE REGION

The attached table summarises those species listed under the EPBC Act and migratory bird agreements that may potentially occur with the local region and adjacent coastal or oceanic waters. Their potential for occurrence was determined by:

- EPBC Act listed: conducting a 2 km radius search of the EPBC database (i.e. 2 km radius from the SSDP site); and

- Migratory Bird Agreement Species: viewing distribution maps and other reference sources to ascertain a particular species has been recorded from the Swan Coastal Plain and adjacent offshore waters.

An assessment of the likelihood for these species to occur within areas potentially influenced by the proposed SSDP and aspects related to their habitat requirements, life cycle and migratory behaviour is summarised below on the basis of groups of species with similar habitat requirements and behaviour patterns.

4.1 Seabirds

The term 'Seabirds' is generally used to collectively describe those bird species which spend a substantial part of their life foraging and breeding in the marine environments. Birds considered to be seabirds include gulls, terns, albatrosses, petrels, shearwaters, cormorants, gannets and boobies. The majority of these birds feed in coastal and oceanic waters and many migrate beyond Australian waters to feed and breed. Most species tend to forage on their own, though large feeding flocks will gather at rich or passing food sources. Squid, fish and krill are common food sources. Seabirds breed in colonies on remote islands and the WA DEC database on seabird breeding locations has not identified any breeding sites in the vicinity of the Binningup area and there is no potential for the SSDP to affect seabird breeding.

Fifteen species of seabird were identified as possibly occurring in the area (see Table 1). These were composed of 10 species of oceanic seabirds and five species of seabirds (terns) that may also feed in nearshore coastal waters and possibly make temporary landfall on the shoreline for resting/roosting purposes.

The oceanic seabirds (Giant Petrels, Albatross, Shearwaters, Skuas) range from rare to common visitors to waters off the south-west Western Australian coast and usually only beach washed dead specimens of these species are recorded as reaching the shoreline (typically after winter storms). Breeding sites for the Petrel and Albatross species are mostly in remote sub-Antarctic and Antarctic islands (e.g. Falklands east to Macquarie Island) as well as a few islands off Tasmania (Ross, *et. al.* 1993). Recovery of birds (mostly beach washed) along the WA coastline have included birds banded as nestlings from many distant locations such as the Orkney and Shetland Islands, Crozet Islands and South Georgia (Storr & Johnstone 1988).

The Shearwater species are known to breed on some islands along the south west and southern coast of Western Australia and the breeding locations for these species are:

- Wedge-tailed Shearwater: mostly breeds in tropical and subtropical islands with Rottnest and Carnac Islands being the southern-most localities.

- Fleshy-footed Shearwater: breeds in temporate islands in the southern Indian Ocean and the south-west Pacific. In WA it breeds on at least 40 islands along the south coast from Cape Leeuwin to east of Esperance (Daw Island).

- Short-tailed Shearwater: Breeds on temperate islands off the south coast of Australia. In WA breeding occurs on six islands in the Recherche Archipelago, east of Esperance.

The Wedge-tailed and Fleshy-footed shearwaters are also long-distance migrants out of Western Australia in their non-breeding season and the local breeding populations of these species make trans-equatorial migrations into the northern Indian Ocean during winter months (Johnstone & Storr 1998).

Due to the vast feeding ranges of oceanic seabird species and remote breeding locations it is extremely unlikely that the SSDP will result in any impact to those species.

Five species of tern may occur along the coast adjacent to the project site. Caspian and Crested Terns are the most common of the tern species in the south-west and is expected they would be present in nearshore marine waters and estuaries in the area. There is the potential for these species to use the sandy beaches between Bunbury and Mandurah (including the Binningup area) as a temporary resting/roosting site. The limited extent of disturbance to beach habitat from the SSDP project is unlikely to cause any significant disruption to the terns temporary use of the beach, particularly when considering the extent of similar habitat available along this section of coast and current recreational use of the beach and associated disturbance from uncontrolled four wheel drive and dog access and other pressures (as noted in Section 2.1.2 of the sPER). The terns listed in Table 1 all have extensive distribution ranges including the north and east Indian Ocean and western Pacific Ocean. Breeding localities for the three tern species (Crested, Caspian, Bridled Tern) known to regularly breed along the south-west WA coast include offshore islands such as those in the Lancelin area, the Rottnest Island to Safety Bay area and near Cape Leeuwin which are well beyond any potential zone of influence from the SSDP.

The White-winged Black Tern is an irregular visitor (September to May) to south-west WA where it may occur in large flocks. Its habitat preference in the Swan Coastal Plain is mainly freshwater lakes and swamps, occasionally estuaries, samphire and short-grass flats and lucerne fields (attracted to emerging dragonflies and swarming grasshoppers). Breeds in east Europe and north and central Asia (Johnstone & Storr 1998).

The Common Tern (*Sterna hirundo hirundo*) breeds in North America, Europe, North Africa and western Asia and is only a very rare visitor to the lower west coast of WA. It is a common moderately common to common along the northern WA coast (north of Carnarvon).

4.2 Migratory Shorebirds

Each year millions of shorebirds migrate between their northern hemisphere breeding areas in the Russian Far East, northern China and Alaska to as far south as Australia and New Zealand. The birds breed during the northern hemisphere summer and then move to the southern hemisphere localities during the non-breeding season. In Australia, large flocks of shorebirds arrive in October and feed mainly on small invertebrate fauna such as polychaete worms and small bivalves living in tidal mudflats and sandflats. In Western Australia, the Kimberley-Pilbara coast represents a major wintering area for shorebirds and it is estimated that for some species (e.g. Great Knot), up to 70-80% of the total world population spends its non-breeding season on that section of coast, hence the region is of worldwide importance (Johnstone & Storr 1998). In April, shorebirds birds fly from their Australian feeding grounds and return to breeding grounds in the northern hemisphere tundra. Some species of shorebird weighing as little as 30 g may migrate 25,000 km annually and some species may fly more than 6,000 km non-stop.

Table 1 lists 28 species of migratory shorebirds that may potentially occur in the local region (Swan Coastal Plain). Recorded occurrence of these species on the Swan Coastal Plain varies from being rarely recorded (vagrants such as the Long-toed Stint) to regular seasonal visitors (e.g. Bar-tailed Godwit, Common Greenshank and Red-necked Stint). Important migratory shorebird sites on the Swan Coastal Plain in the south-west of WA include the Peel-Yalgorup and Vasse-Wonnerup wetland systems which have extensive areas of feeding habitat for shorebirds (i.e. invertebrate rich sandflats/mudflats, estuarine and freshwater wetlands). More information on these sites is provided in Section 5.

The habitats that occur within the SSDP site (narrow sandy beach, dunes, coastal woodland and a degraded wetland or seasonally wet paddock) are unlikely to support significant shorebird populations or be considered as an important site within the network of wetland sites within the Swan Coastal Plain.

A few species of shorebirds (Little Whimbrel and Oriental Practincole) are considered to be aberrant 'grassland' waders that pefer dry grasslands and floodplains in northern WA coastal areas. These species usually stay within the tropical zone and are highly nomadic, responding to local thunderstorms and cylconic rains. Both these species are vagrant or scarce visitors to south-west WA.

4.3 Other Species

A few other species not included in the above seabird or migratory shorebird groupings may potentially occur in the area - these consist of 4 species of waterbirds (egrets/ibis), one species of raptor (White-bellied Sea Eagle) the Rainbow Bee-eater and the Fork-tailed Swift. The status of these species are either "migratory" (EPBC) and/or are listed under the migratory bird agreements.

Four waterbird species are birds listed on the JAMBA could occur in the survey area: Great Egret, Cattle Egret, Glossy Ibis and Eastern Reef Egret. Great Egret is common and widespread throughout Australia (except deserts) where it forages in aquatic habitats for fish, amphibians and invertebrates. The Cattle Egret is considered an irregular, mainly autumn visitor to the South-West and may be observed mainly in wet pasture in the company of livestock (Johnstone and Storr 1998). The Glossy Ibis is increasing on the Swan Coastal Plain and may be observed in and adjacent to freshwater lakes and other wetland areas. Given the degraded nature of the wetland within the wetland portion of the SSDP site (refer Section 5.4.4 of the sPER) it is unlikely that the site contains important habitat for the above waterbird species or supports breeding sites (e.g. tall *Melaleuca* trees above water). These species are highly mobile, that, if disturbed, are capable of finding other sites unassisted. There is sufficient suitable habitat present outside the development area and it is unlikely that the project will have any significant impact on these species.

Eastern Reef Egret is unlikely to occur in the vicinity of the project area. It is uncommon in the South-West where it mostly confined to islands (e.g. Rottnest, Carnac, Garden, Penguin) and rocky parts of mainland coast opposite them and is scarce or absent elsewhere (Johnstone & Storr 1998). In addition, its preferred habitat (tidal reef, mudflats, rocky shores) does not occur in the vicinity of the SSDP site. There is no reef habitat in the area in which marine structures associated SSDP will be built and therefore no potential for the project to affect these species.

The White-bellied Sea Eagle was identified by the EPBC Act database 2 km radius search, however, it is noted by Johnstone and Storr (1998) that while this species has been recorded from most of the WA coastline it does not occur on the lower west and south-west, between Peel Inlet and Wilson Inlet (this includes the Binningup area).

The Fork-tailed Swift (*Micropus pacificus*), is listed in the migratory bird agreements and may be observed flying overhead, often ahead of storm fronts. However, this bird rarely lands in Australia. This species is a migrant from Asia with arrival and departure times that are similar to the migratory shorebirds.

The Rainbow Bee-eater is a breeding migrant to the south-west during the September to April period where it is scarce to very common in the Darling Range and heavily wooded parts of the South-West (Johnstone & Storr 1998). During winter months it occurs in northern Australia (north of Gascoyne River in WA) and Indonesia. This species is likely to be in the local area during the spring and summer and was recorded from within the Banksia and Tuart vegetation types on the DDSP site (360 Environmental 2008). The Rainbow Bee-eater is often seen perching on telephone wires, fences and dead trees for where it makes shorts dashes to catch passing insects. It burrows into sand to form a nest, often at the margins of roads and tracks. If construction activities take place in spring and summer, it could potentially disrupt breeding of these species (360 Environmental 2008). During its annual southward migration to south-west WA, the Rainbow Bee-eater has a wide distribution and is a commonly

recorded species which is highly mobile and if disturbed, is capable of finding other refugia or foraging sites. Sufficient suitable habitat is present outside the development area to support displaced animals and it is unlikely that the proposed development will significantly impact on this species.

5 Ramsar Wetlands and Sites of International Importance to Migratory Shorebirds

Within the wider region there are two wetland systems that are designated under the Ramsar Convention as being wetlands on international significance. These sites are also recognised as being internationally important for migratory shorebirds within the East Asian - Australasian Shorebird Site Network. A brief summary of these two wetland systems is given below together with an assessment of the likelihood of the SSDP affecting these sites. More detail regarding their site characteristics significance and waterbird/shorebird significance and/or abundance is provided in that attached Appendix.

Peel-Yalgorup System

This Ramsar wetland site incorporates the largest and most diverse estuarine complex in south west Australia (Peel-Harvey Catchment Council 2008). Divided into three subsystems, The Peel-Harvey Estuary System and the Yalgorup Lakes System (including Lake Preston) lie approximately 2 km apart, and the Lake McLarty System which includes Lake McLarty and Lake Mealup lies to the east of the Peel-Harvey System (Australian Nature Conservation Agency 1996).

The Peel-Harvey Estuary is located immediately southwest of Mandurah and includes the Peel inlet (7500 ha) and the Harvey Estuary (5000 ha). The system has both tidal inflow from the Indian Ocean and river inflow from the Harvey, Murray and Serpentine Rivers as well as seven main drain systems entering the site. The Peel Inlet and Harvey Estuary differ in water chemistry, especially nutrients. The site has ecological value as the principal migration stop over and drought refuge area for migrating waterbirds area in south west Australia. The Peel Inlet and Harvey Estuary comprise the most important area for waterbirds in south west Australia. It regularly supports more than 20, 000 waterbirds each year and have had in excess of 150, 000 birds recorded at one time. The system regularly hosts over 1% of the populations of at lest 6 migratory shorebird species including the Red-necked Avocet, Red-necked Stint, Red-capped Plover, Banded Stilt, Caspian Tern and Fairy Tern (Peel-Harvey Catchment Council 2008).

The Yalgorup Lakes system is located southeast of the Peel Harvey System and approximately 25 km north of Bunbury. This 5600 ha wetland is comprised of two parallel lakes, Lake Clifton (1800 ha) and Lake Preston (3150 ha), with a series of smaller lakes between. All lakes are supplied principally by fresh groundwater and direct precipitation although some minor drains enter Lake Preston. The lakes are all saline due to long term concentration of salt by evaporation and no outflow from the system. Waterbird composition of the Yalgorup Lakes system consists of 40 recorded species, ten listed under treaties; including 15 shorebirds and four gulls and terns. 10,000 Australian Shelduck gather annually at Lake Clifton and/or Lake Preston. Eight species of migratory shorebird occur, most of them irregularly; only the Red-necked Stint occurs in significant numbers, with up to 380 individuals recorded at Lake Preston (Australian Nature Conservation Agency 1996). A maximum of 4000 birds were recorded at Lake Preston in 1999 (Wetlands International 2008).

The Peel-Yalgorup System Ramsar site is an extensive wetland system. The SSDP site is located 2 km south from the southern end of Lake Preston - this representing the southern limit of the Peel-Yalgorup System Ramsar site which extends some 50 km further to the north. The construction and operation of the SSDP is not expected to impinge on the ecological

value of this Ramsar site (in particular Lake Preston) or modify the ecological processes (e.g. water flows) that maintain the system.

Vasse-Wonnerup Wetlands System

The Vasse-Wonnerup Wetland System is located immediately north-east of Busselton and is 1000 ha in size comprising the Vasse and Wonnerup Estuaries and their seasonally inundated floodplains. The site is used as a compensating basin for discharge from four rivers. Inflow comes from the Vasse River, and Ludlow River. The estuaries are seasonal, apart from small pools in the deepest parts of the channels. This system is unique in Western Australia as it is an example of formerly estuarine basins now functioning as seasonal brackish lakes.

The Vasse-Wonnerup Wetland System is a major migration stop-over for a high diversity of waterbirds such as the Long-toed Stint and Wood Sandpiper and post-breeding refuge for the Black-winged Stilt. It is also a major breeding area for the Black Swan (*Cygnus atratus*) as well as a number of species of duck (Australian Nature Conservation Agency 1996). The Curlew Sandpiper was recorded in numbers of 2500 in 1993, and Sharp-tailed Sandpiper recoded in numbers of up to 2300 in 1993 (Wetlands International).

The SSDP site is located approximately 60 km north-east of Vasse-Wonnerup Ramsar site and the construction and operation of the desalination plant has no potential to adversely affect this important wetland area.

6 References

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