Environment Protection Authority

Proposed licence fee structure under the Environment Protection Act 1993 for the operation of desalination plants that discharge waste to inland waters and land

Public consultation

EPA South Australia

Proposed licence fee structure under the *Environment Protection Act 1993* for the operation of desalination plants that discharge waste to inland waters and land

Public consultation

The EPA seeks your views regarding the proposed licence fee structure under the *Environment Protection Act 1993* for the operation of desalination plants that discharge waste to inland waters and land. This consultation paper may also be obtained from its website. Comments are required to be submitted by 31 March 2012.

Specific matters the EPA seeks your views about include the following:

- The principles upon which the proposed fee structure is based
- The proposed fee structure including fee reductions for periods when plants are non-operational and for improved environmental management
- Proposed pollutant discharge load calculation methodology
- Proposed transitional and commencement arrangements.

All submissions received by the EPA during the consultation period will be acknowledged and treated as public documents unless provided in confidence, subject to the requirements of the *Freedom of Information Act 1991*, and may be quoted in EPA reports. Comments may be forwarded by mail, facsimile or email to:

Project Manager, Desalination Licensing
Environment Protection Authority
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Email: epainfo@epa.sa.gov.au (mark subject as 'Desalination Licensing'). Emailed submissions are preferred.
Website: www.epa.sa.gov.au

Nếu cần thông ngôn viên, xin quý vị gọi cho Dịch Vụ Thông Phiên Dịch (TIS Toàn Quốc) qua số 131 450 và nhờ họ gọi cho Environment Protection Authority qua số (08) 8204 1920.

ប្រសិនបើលោកអ្នកត្រូវការជំនួយដើម្បីឲ្យបានយល់អំពីព្រឹត្តិបត្រនេះ សូមទូរស័ព្ទលេខ 131 450 ក្នុងអម្ដុងពេលម៉ោងធ្វើការ រួចស្នើសុំជួបអ្នកបកប្រែភាសាខ្មែរមួយរូប ហើយប្រាប់ឲ្យគេទូរស័ព្ទលេខ 8204 1920។

ISBN 978-1-921495-26-7

February 2012

Disclaimer

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

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Consequently, the South Australian Government has approved significant reforms to licensing requirements regarding desalination under the *Environment Protection Act 1993* (the Act). This includes requiring licensing of desalination plants that discharge waste to land and plants discharging waste that does not contain chemical additives. It is intended that the new licensing requirements will apply to plants with a production capacity of greater than 200 kilolitres (kL) per day.

Licensing allows the Environment Protection Authority to specify conditions of operation such as requirements to implement measures to prevent or minimise pollution. These reforms will commence after an associated licence fee structure has been approved by the government.

The proposed fee structure reflects the environmental impacts of desalination and associated costs of regulating this activity via licensing under the *Environment Protection Act 1993*. Like other licence fees, the proposed fee structure is made up of three parts. These are a flat minimum fee of $55.50, environment management fees, and pollutant load based fees if discharges exceed specified levels. Key features of the proposed fee structure are summarised as follows:

- Environment management fees are to be based on waste discharge volumes.
- Discharges of up to two megalitres (ML) per year would not be subject to environment management fees. This recognises that there may be times when plants are not in commercial use, and are only periodically operational for essential maintenance.
- Fee discounts would be provided for plants that discharge waste to wastewater lagoons constructed with HDPE plastic lining or alternative EPA approved lining, and are equipped with leak detection systems.
- Annual environment management fees for plants that discharge waste to inland waters or clay lined wastewater lagoons would range from $2,344 for small plants, up to $7,032 for plants that discharge more than 500 ML of waste per year. Assuming year-round full capacity operations, it is estimated that total annual fees (ie including the flat minimum fee) for known existing plants in this category would range from $2,400 to $3,572.
- Annual environment management fees for plants that discharge waste to wastewater lagoons constructed with HDPE lining or EPA approved alternatives would range from $1,172 for small plants, up to $5,860 for plants that discharge more than 500 megalitres of waste per year. Assuming year round full capacity operations, it is estimated that total annual fees (ie including the flat minimum fee) for known existing plants in this category would range from $1,228 to $2,400.
- Under the existing licensing system pollutant load fees apply to a number of water pollutants if discharges exceed specified levels. Reflecting the toxicity of concentrated salt to aquatic organisms, livestock and poultry, a salt pollution load fee of 50 cents per tonne is also proposed for discharges to inland waters that have an ambient salinity of up to 13,000 milligrams per litre (mg/L). However, there are no known existing desalination plants with a production capacity of greater than 200 kL/day that would be subject to these load fees.

In order to provide sufficient time for operators of desalination plants who will be affected by these reforms to prepare for the new licensing requirements, it is proposed that they will commence six months after their finalisation and all affected parties would be notified by the EPA.

Operators of desalination plants that are currently not licensed under the Act, but will require a licence as a result of these reforms, will need to submit a licence application. The current application fee is $173. However, operators of desalination

plants that are currently licensed under the Act will automatically be licensed under the new regulatory arrangements and will not be required to apply for a new licence.

1 Introduction

Desalination is a key element of the water security plan for South Australia *Water for Good*. Desalination is increasingly being used for a variety of purposes, including the supply of potable water for irrigation and industrial purposes.

The water security plan recognises that there are environmental issues associated with desalination and notes that the disposal of brine (ie wastewater containing high concentrations of dissolved salt) is a key issue that requires comprehensive management. Consequently, the Government has approved significant reforms to licensing requirements regarding desalination under the *Environment Protection Act 1993* (the Act).

These reforms are summarised as follows:

- Desalination is to become a specific activity subject to licensing under the Act.
- Licensing requirements will be extended to include plants that discharge waste[1] to land, plants discharging waste that does not contain chemical additives, and also networks of small plants which desalinate water underground that are within close proximity of each other (ie one km^2).
- These requirements will apply to plants discharging waste to wastewater treatment systems that are not licensed under the Act, but not plants where all waste is discharged to licensed sewage treatment works, licensed community wastewater management systems, and licensed industrial wastewater treatment facilities.
- Desalination plants currently licensed under activity 8(7) of the Act, 'Discharges to Marine and Inland Waters', will instead be licensed under the newly prescribed activity of water desalination.

It is intended that these licensing requirements will apply to individual plants with a production capacity of greater than 200 kilolitres (kL) per day, and networks of plants which desalinate water underground that have a combined production capacity of greater than 200 kL/day.

Licensing allows the Environment Protection Authority (EPA) to specify conditions of operation such as requirements to implement measures to prevent or minimise pollution.

As a consequence of these reforms, Schedule 22–Activities of Major Environmental Significance under the *Development Regulations* 1993 will also be amended. This will result in more desalination plants being subject to approval requirements under the *Development Act 1993*. This will help ensure that desalination plants are constructed and operated in a way that minimises environmental risk.

These reforms also necessitate the development of an associated licence fee structure for desalination in the *Environment Protection Regulations 2009* (the Regulations). The new licensing requirements will commence after an associated licence fee structure has been approved by the government.

It is the matter of an appropriate licence fee structure that is the subject of consultation. This document discusses proposed licence fees for desalination plants that discharge waste to inland waters or land. It also discusses the EPA's policy regarding requirements to install high density polyethylene lining (HDPE) lining and leak detection monitoring at wastewater lagoons. Proposed licence fees for desalination plants that discharge waste to marine waters are discussed in a separate consultation paper.

However, before the proposed fees are discussed, the following provides a summary of environmental issues that have necessitated the reforms to licensing requirements.

[1] Waste is broadly defined in the Act to include any discarded, rejected, abandoned, unwanted or surplus matter.

2 Environmental issues

Large areas of South Australia already face significant salinity problems that are likely to worsen in the absence of rigorous environmental management. For example, both the Angas Bremer region and Northern Adelaide Plains (refer to Figure 1) are important growing areas for SA's food and wine industries that already have salinity problems and where desalination is widely used. Reflecting the fact that the water resources of these areas are under stress, they are also designated as 'prescribed wells areas', in order to regulate water usage.

The following discussion regarding these problems indicates that while desalination has not been a major contributing factor, sound environmental management is required to ensure that it does not exacerbate problems, and also undermines other environmental measures that are being implemented by both government and business. Examples of these measures include more efficient water use and the installation of high density polyethylene lining (HDPE) at wastewater lagoons to prevent leakage. Enhanced regulation of desalination under the Act is therefore part of the solution to managing salinity.

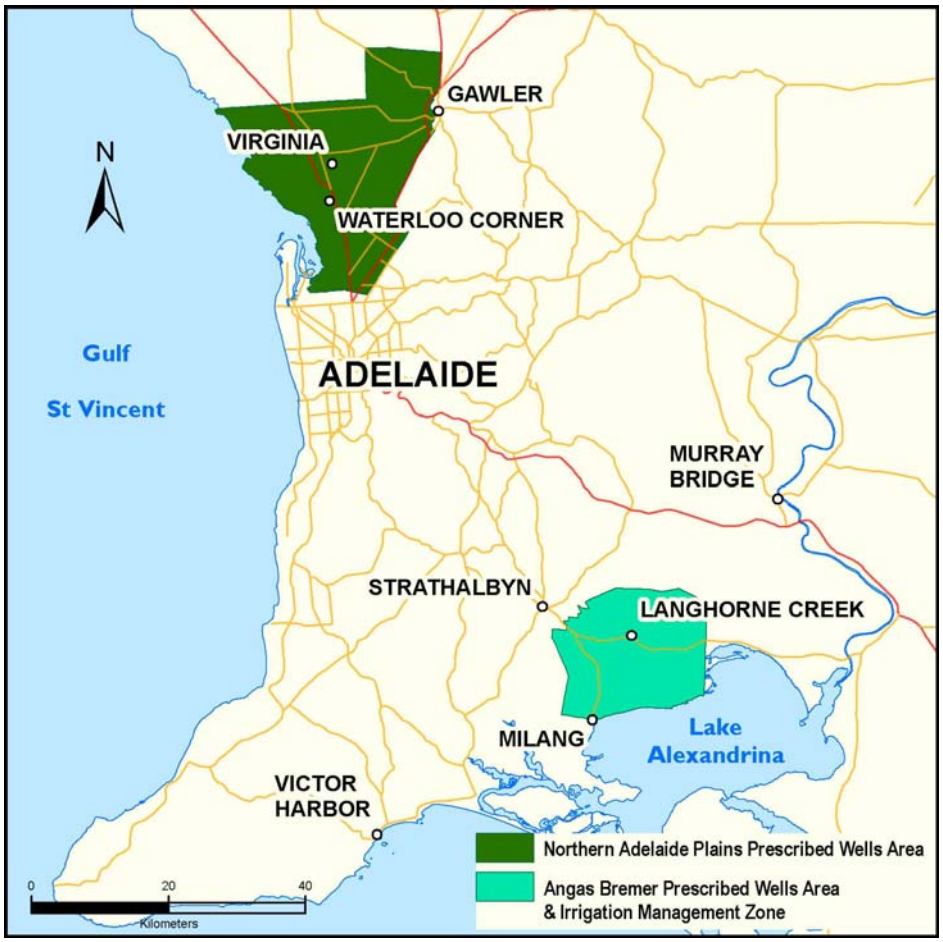

Figure 1 Angas Bremer and Northern Adelaide Plains[2]

2.1 Angas Bremer region

The Angas Bremer region has been irrigated using groundwater for many years. Unsustainable extraction of groundwater has resulted in high quality water in the Murray Group Limestone Aquifer, which is the main source of irrigation supplies, being replaced by lateral inflows of saline groundwater and downward leakage of saline water from the overlying Quaternary Aquifer.

[2] Source: EPA.

The condition of these aquifers is highlighted in a report prepared by the Department of Water, Land and Biodiversity Conservation in 2007[3]. The Quaternary Aquifer is generally highly saline with good quality water only found within narrow zones along the Angas and Bremer Rivers during flooding and also laterally from the Mount Lofty Ranges. Salinity levels in this aquifer are illustrated in Figure 2.

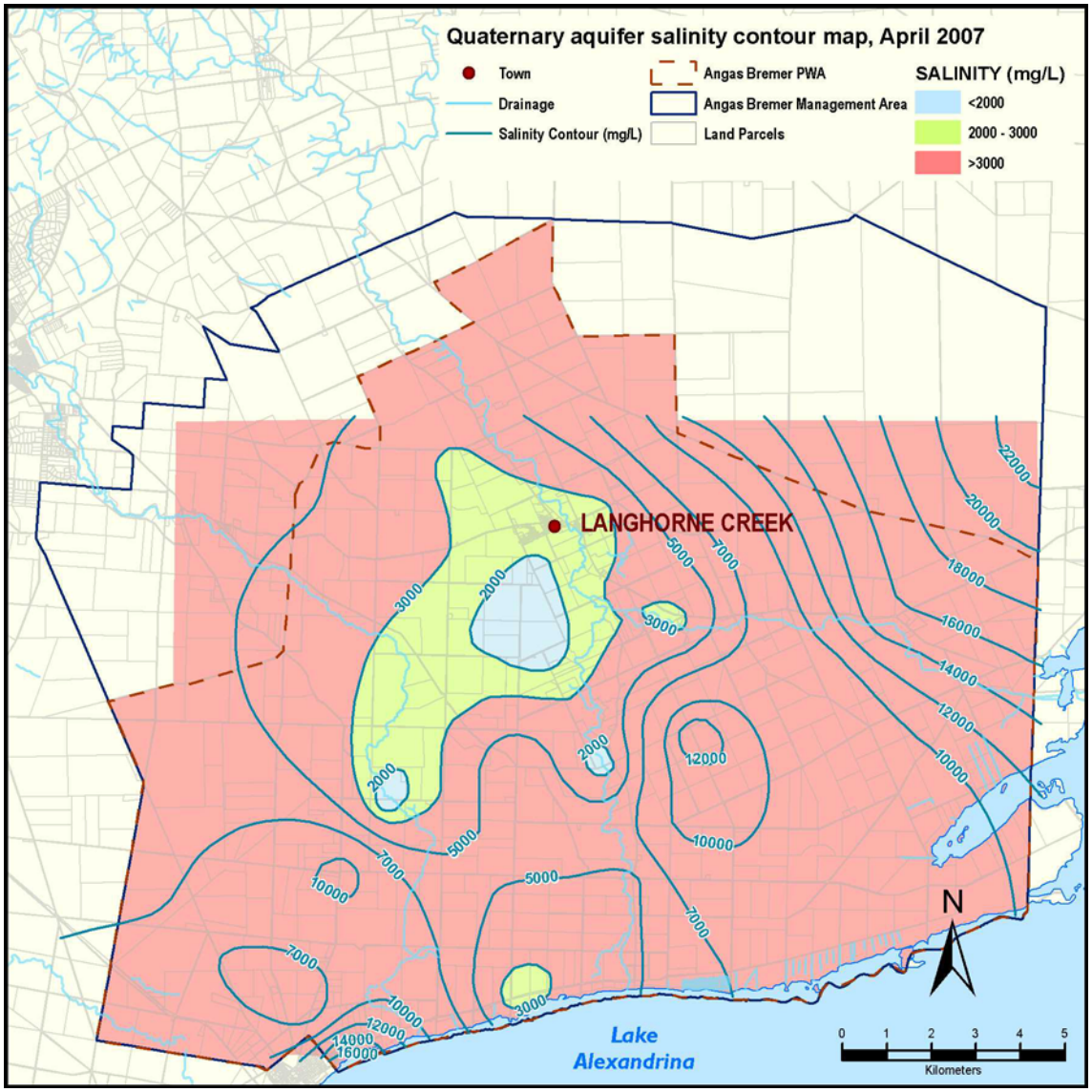

Figure 2 Salinity in the Quaternary Aquifer[4]

In the case of the Murray Group Limestone Aquifer, suitable quality water is also limited to relatively narrow zones parallel to the Angas and Bremer Rivers, where salinity ranges from 1,500–3,000 mg/L. Towards the margins of the region, salinity can exceed 10,000 mg/L (as illustrated in Figure 3). Salinity in this aquifer in the vineyard areas of the region is on average about 2,500 mg/L, which is well above the salt tolerance of vines. Various studies show that increased salinity has drastic effects on vine performance, including reduced yields and plant growth[5].

[3] Zulfic D and SR Barnett 2007, *Angas Bremer PWA–Groundwater Status Report 2007,* Department of Water, Land and Biodiversity Conservation, DWLBC Report 2007/27, Adelaide.

[4] Source: Department of Water, Land and Biodiversity Conservation 2007, *Angas Bremer PWA–Groundwater Status Report*.

[5] Lanyon DM, Cass A and D Hansen 2004, *The effect of soil properties on vine performance,* CSIRO Land and Water Technical Report No. 34/04.

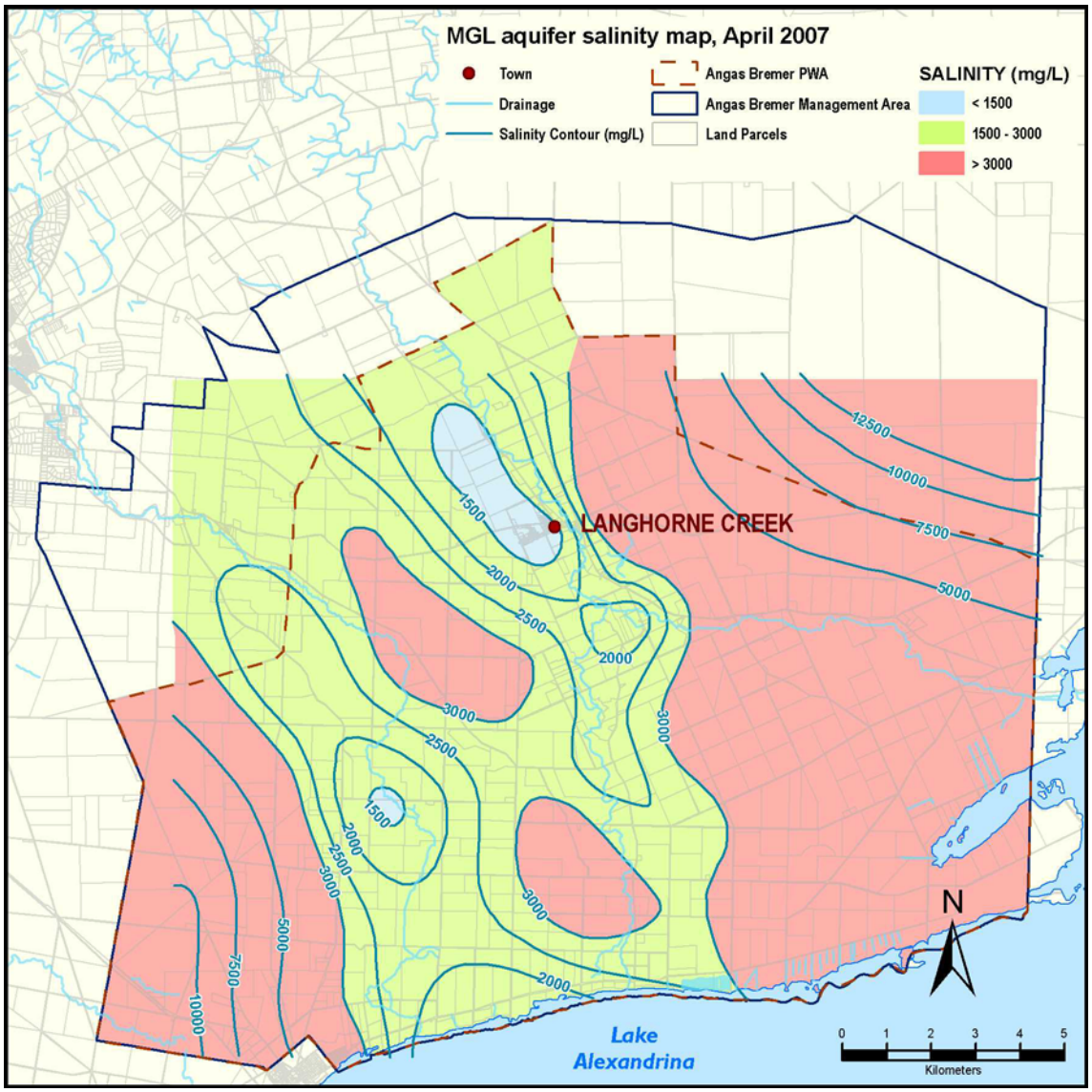

Figure 3 Salinity in Murray Group Limestone Aquifer [6]

Rising salinity and increased availability of water from Lake Alexandrina (and more recently from the River Murray) led to a significant reduction in the use of groundwater. However, the recent drought which restricted use of water from Lake Alexandrina has resulted in desalination of groundwater being undertaken in order to ensure ongoing supplies of suitable water to prevent further disruption to agri-business which has also caused adverse flow-on effects in the region. This includes preventing a re-occurrence of grapes being rejected by winemakers due to excessive salt content[7].

Unregulated desalination waste disposal practices could result in leaching of concentrated salts, nutrients and water treatment chemicals into the soils and aquifers of the region. This also has adverse implications for the salinity problems facing the Lower Lakes, as the general direction of groundwater flow in the area is towards Lake Alexandrina in a southeasterly direction.

While the recent commissioning of the irrigation pipeline from the River Murray at Jervois to the Angas Bremer and Currency Creek areas has increased security of water supply, it is understood that a number of irrigators intend to maintain their desalination plants to ensure water supply, particularly under future drought conditions.

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6 Source: Department of Water, Land and Biodiversity Conservation 2007, *Angas Bremer PWA–Groundwater Status Report*.

7 Pers comm

2.2 Northern Adelaide Plains horticultural area

The horticultural areas of the Northern Adelaide Plains are also facing a salinity threat due to a variety of factors including the following:

- Over-extraction from aquifers that previously held high quality water which has resulted in lateral flows of more saline groundwater into these aquifers.
- Irrigation using water containing elevated salt and nutrient levels from the Bolivar wastewater treatment plant and from deeper aquifers which have contributed to rising water tables.
- Leaking dams and ponds.

A recently completed review of watertable trends in the Virginia Irrigation Area for the Adelaide Mount Lofty Ranges Natural Resources Management Board by Rural Solutions SA further highlights the salinity issues facing the area[8]. Key findings of this study are summarised as follows.

- Watertables are within the critical depth (ie 0–2 metres) of developing soil salinity at about 40% of monitoring sites, with salinity apparent in depressions and low-lying areas around these sites.
- There is a looming salinity risk in areas where the watertable is currently greater than two metres from the surface but showing a steadily rising trend.

The extent of the salinity risk in this area is illustrated in Figure 4[9]. This map highlights that a significant area of the western side of the region faces a high salinity risk, whilst a substantial area of the region faces a moderate risk of increased salinisation. This threatens the viability of salt intolerant horticultural crops and orchards in the area.

Whilst a shallow watertable drainage system has been established to help overcome some localised salinity problems, the widespread nature of rising saline groundwater in the area will necessitate further works to mitigate impacts on existing and proposed horticultural and urban development projects. Within this context, desalination of groundwater and water from the Bolivar wastewater treatment plant is being used more extensively to provide suitable water supplies for horticulture, including hydroponic cropping. However, this increases the importance of ensuring that desalination waste, which in this area also includes increased concentrations of nutrients, does not enter aquifers or creeks and further exacerbate local salinity and nutrient problems, and also nutrient problems in Gulf St Vincent.

[8] Henschke C 2011, *Review of Shallow Watertable Trends. Virginia Irrigation Area, South Australia*, Prepared by Rural Solutions SA for the Adelaide Mount Lofty Ranges NRM Board.

[9] Henschke C and S Wright 2007, *Virginia Irrigation Area–Review of Shallow Watertable Trends,* Department of Water, Land and Biodiversity Conservation, Adelaide.

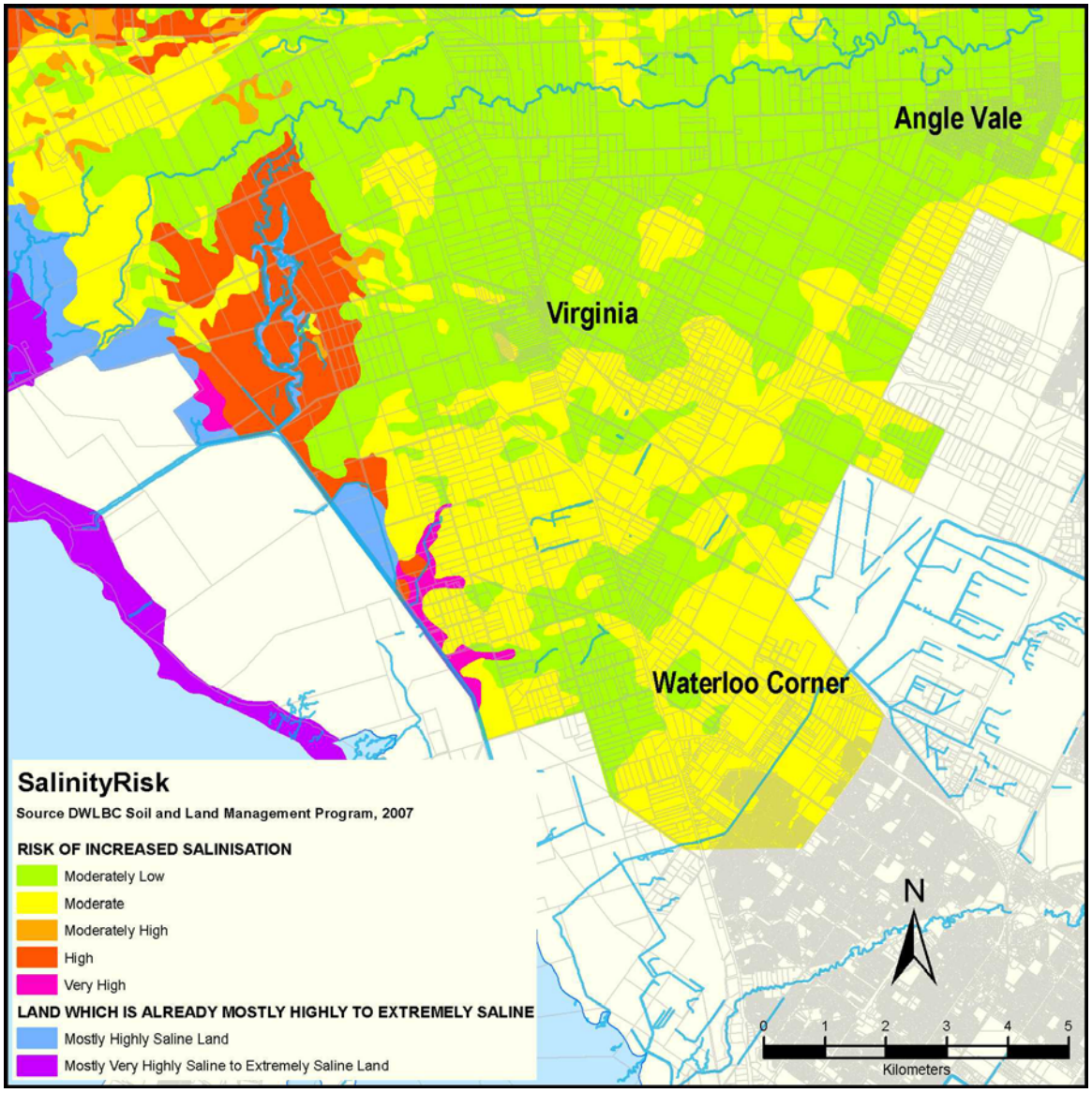

Figure 4 Salinity risk in the Northern Adelaide Plains

2.3 Inland waters

Scientific evidence also highlights the dangers of salinity to aquatic organisms. Key findings from scientific research are summarised as follows[10]:

- There is no clear threshold for loss of species due to increased salinity as there is invariably a loss of sensitive species and replacement with saline tolerant species as salt levels increase. This includes frogs, fish, zooplankton, macro-invertebrates, algae and plants.

[10] Hart BT, Bailey RH, Edwards K, McMahon A, Meredith L and K Swadling 1991, 'A review of salt sensitivity of the Australian freshwater biota', *Hydrobiologia* 210, pp 105–144.

Kefford BJ, Marchant R, Schafer RB, Metzeling L, Dunlop JE, Choy SC and P Goonan 2011, 'The definition of species richness used by species sensitivity distributions approximates observed effects of salinity in stream macroinvertebrates', *Environmental Pollution* 159, pp 302–310.

ANZECC & ARMCANZ 2000, *Australian and New Zealand Water Quality Guidelines for Fresh and Marine Waters*, Australian and New Zealand Environment and Conservation Council and Agricultural and Resource Management Council of Australia and New Zealand, Canberra, Australia.

Nielsen DL, Brock MA, Vogel M and R Petrie 2008, 'From fresh to saline: a comparison of zooplankton and plant communities developing under a gradient of salinity with communities developing under constant salinity levels', *Marine and Freshwater Research* 59, pp 549–559.

- For most aquatic species, their eggs, larvae and juveniles are more sensitive to toxicants such as salt than adults, and more sensitive species are unable to survive once salinity approaches and exceeds 1,000 mg/L.
- Few freshwater plants and animals are able to survive once the salinity of natural streams and wetlands exceeds about 5,000 mg/L. Similar concerns exist regarding small animals such as crustaceans, beetles and worms that live in groundwater.
- In general, studies have shown that the minimum scale of salinity change that is likely to result in adverse effects on sensitive species is in the range of a 5–10% increase from ambient levels.

Consequently, discharges of wastewater from desalination plants that have a salinity of about 2,000–10,000 mg/L, or higher, pose a high risk of causing environmental harm to sensitive species in inland waters, particularly if the receiving environment is naturally fresher than the salinity of the waste. This risk applies to surface and groundwater systems across South Australia that could receive desalination waste through direct discharge, overland flow or leakage through soils to underlying aquifers.

Disposal of desalination waste to more saline waters also has the potential to degrade the environment by increasing salt loads, thereby preventing plants and animals that would normally inhabit these water bodies after rainfall from establishing themselves when salinity levels would normally be lower.

2.4 Livestock and poultry

Salinisation of water supplies also has implications for livestock and poultry. As Table 1 illustrates, whilst sheep can maintain their condition even when reliant on water with a salinity of up to 13,000 mg/L, the salt tolerance of other farm animals is much lower. Consequently, increased salinity can have a significant impact on the productivity of livestock and poultry farming.

Table 1 Salt tolerance of livestock and poultry (in mg/L of total dissolved solids)

Animal	Maximum concentration for healthy growth	Maximum concentration to maintain condition	Maximum concentration tolerated
Sheep	6,000	13,000	*
Beef cattle	4,000	5,000	10,000
Dairy cattle	3,000	4,000	6,000
Horses	4,000	6,000	7,000
Pigs	2,000	3,000	4,000
Poultry	2,000	3,000	3,500

* Maximum level depends on type of feed available eg saltbush vs greenfeed.

Source: Primary Industries and Resources SA, *Livestock Water Supplies Fact Sheet,* 01/07.

3 Proposed licence fee structure

The proposed fee structure is based on the principles of 'user pays' and 'polluter pays' as applies to all existing licensed activities under the Act. Like other licence fees, the proposed fee structure is made up of three parts. These are a flat minimum fee, environment management fees and potentially in the case of some licensees, pollutant load based fees. The proposed fees would be subject to annual adjustment in line with inflation.

3.1 Flat minimum fee

The annual flat minimum fee of $55.50 covers the minimum paperwork that is common to all licences regardless of the nature of the activity undertaken.

3.2 Environment management fees

Together with the flat minimum fee, these fees reflect the regulatory effort required to manage licensed activities. Proposed annual environment management fees for desalination plants that discharge waste to inland waters and land are summarised in Table 2 and discussed as follows:

- Fees are to be based on the volume of waste discharged.
- Fees can be reduced if HDPE lining or alternative lining approved by the EPA, and leak detection systems are installed at wastewater lagoons in recognition of improved environmental management.
- Discharges of up to 2 ML/yr would not be subject to environment management fees. This recognises that there may be times when plants are not in commercial use, and are only periodically operational for essential maintenance. In these situations, the EPA's regulatory effort would be minimal and consequently, only the flat minimum fee would be charged. This provides operators with a low-cost option for maintaining a licence when they are not commercially operational thereby avoiding the inconvenience and cost of applying for a licence each time a plant is to be used commercially.

Table 2 Proposed annual environment management fees for desalination plants where waste is discharged to inland waters or land

Discharge to inland waters or land*	Up to 2 ML/yr	> 2–50 ML/yr	> 50–500 ML/yr	> 500 ML/yr
Inland waters and wastewater lagoons constructed with compacted clay and other permeable materials and no leak detection	$0	$2,344	$3,516	$7,032
Wastewater lagoons constructed with HDPE lining or alternate approved lining and leak detection	$0	$1,172	$2,344	$5,860

* In the Environment Protection Regulations 2009, all fees are expressed in terms of fee units: $1,172 = 2 fee units, $2,344 = 4 fee units, $3,516 = 6 fee units, $5,860 = 10 fee units, $7,032 = 12 fee units.

Under the Regulations, licensees who hold a licence that authorises two or more prescribed activities of environmental significance at a site are only required to pay environment management fees on one activity, ie the activity that is subject to the highest fee. Consequently, businesses already licensed under the Act to undertake other activities at a site where a desalination plant is operated would be subject to licensing of their desalination plant including conditions of licence. However, they would not be required to pay additional environment management fees unless the environment management fee for the desalination plant is higher than any other prescribed activity undertaken at the site.

3.3 Pollutant load based fees

These fees are based on the polluter pays principle. Desalination plants are already subject to load fees for a number of water pollutants that are listed in the Regulations if specified discharge thresholds are exceeded. These pollutants include nitrogen, phosphorus, organic matter, suspended solids, copper and zinc. A salt pollutant load fee is also proposed. As indicated, concentrated salt is toxic to aquatic organisms and therefore is a pollutant. Ecotoxicity testing also indicates that the impacts of concentrated salt can be more significant than that of chemicals in discharges from desalination plants[11].

Proposed load fees for salt discharges from desalination plants are summarised as follows:

- Salt is to be defined in terms of total dissolved solids as applies under the Regulations.
- Load fees to be payable on discharges to inland waters, but not to land where disposal typically occurs to managed systems such as HDPE-lined wastewater lagoons with leak detection monitoring that can be managed by licence conditions.
- A load fee of 50 cents per tonne for discharges to inland waters[12]
- Fees to apply to all discharges to inland waters that have an ambient salinity up to 13,000 mg/L at some time during a year of typical rainfall (ie excluding years of drought). This threshold recognises that water with a salinity of up to 13,000 mg/L is suitable for livestock, whilst waters with a lower salinity are an important habitat for a range of aquatic organisms. Discharges of waste to inland waters that have an ambient salinity of greater than 13,000 mg/L would not be subject to load fees.

However, there are no known existing desalination plants with a production capacity of greater than 200 kL per day that would be subject to current or proposed load fees.

[11] SA Water *Proposed Adelaide Desalination Plant Environmental Impact Statement.*
Hydrobiology Pty Ltd 2006, *Ecotoxicity of Effluent from the Proposed Olympic Dam Desalination Plant*

[12] As indicated, in the Environment Protection Regulations 2009 all fees are expressed in terms of fee units: 50 cents = 0.09175 fee units.

4 Proposed definition of discharges of organic matter from desalination plants

Under the existing fee system organic matter is subject to pollutant load fees when discharges exceed 1,000 kg per year (ie one tonne per year). While organic matter can be measured in several ways, it is currently defined in the Regulations as a reference to biochemical oxygen demand (BOD). BOD is a measure of the oxygen used by micro-organisms to decompose organic waste in water over a set period of time. Large quantities of organic waste, particularly from wastewater treatment plants contribute to high BOD, which in turn deprives other aquatic organisms of oxygen.

Whilst BOD is therefore suitable for measuring organic matter in discharges from wastewater treatment plants, it is unsuitable for measuring organic matter discharged from desalination plants which is primarily concentrated matter removed from intake water. The organic matter in the discharge is likely to be dominated by coloured compounds and weak acids that are not readily broken down by micro-organisms and as such have a relatively low BOD.

In the case of desalination plants that discharge waste to inland waters, the environmental risk of organic matter is primarily related to the total organic loading and its potential impacts on nutrient loads which can result in excessive algal growth. Total organic carbon (TOC) is therefore a more appropriate indicator of this environmental risk because it includes all the components of organic matter that relate to discharges from desalination plants. Consequently, in the case of discharges from desalination plants, it is proposed to define organic matter as a reference to total organic carbon.

5 Proposed methodology for calculating pollutant discharge loads to inland waters

Under the current licensing system, the EPA is required to charge load fees on listed pollutants being discharged to the environment (subject to specified thresholds being exceeded), irrespective of whether or not the pollutants are already in the environment and are being discharged back into the environment as a result of a resource extraction process such as desalination. In this situation, unless pollutants are discharged into a different environment from which they are extracted, the environmental impact of a resource extraction process is primarily through its impact on pollutant loads by increasing concentrations of pollutants.

Two separate load calculation methods for pollutants, including salt, that are discharged from desalination plants are therefore proposed. These are for discharges to the same water body from which source water is extracted for processing, and for discharges to different water bodies from which source water is extracted. These methods are discussed as follows.

5.1 Discharges to same water body from which source water is extracted

In this situation, desalination plants extract pollutants and salt from water and then discharge them back into the environment at higher concentrations, which results in the salt discharges acting as a pollutant. This results in an increase in pollutant loads in areas around discharge points that take time to disperse in the environment.

It is proposed that in this situation the pollution load would be calculated on the basis of the difference between pollutant concentrations in the discharge stream (which would include pollutants added during the desalination process) and ambient concentrations in the receiving environment, which is then multiplied by total discharge volume. This would provide an estimate of the increase in pollutant loads in areas around discharge points. This load would be subject to pollutant load fees subject to specified thresholds being exceeded.

In the case of discharges to groundwater, the ‘same water body’ will be taken to be the same hydrogeological aquifer from which the source water is extracted for processing. For discharges to inland surface waters, whether or not a discharge is to the same water body will be determined by the EPA on a case-by-case basis, given that many watercourses in the upper parts of catchments do eventually end up in the same river system.

5.2 Discharges to different water body from which source water is extracted

In situations where pollutants are discharged into a different water body from which source water is extracted for processing, it is proposed that load fees be charged on the basis of the total load discharged, subject to specified thresholds being exceeded. This reflects the fact that this waste is being discharged to an environment where previously it was not present.

In the case of discharges to inland surface waters, whether or not a discharge is to a different water body will also be determined by the EPA on a case-by-case basis, given that many watercourses in the upper parts of catchments do eventually end up in the same river system.

6 Requirements to install HDPE lining at wastewater lagoons

Wastewater lagoons that have been constructed during recent years for the storage of liquid wastes from a range of activities that are licensed under the Act, have generally had HDPE lining installed as a condition of development approval set by the EPA. This is to protect valuable resources such as groundwater from contamination. Licensees that are required to operate HDPE wastewater lagoons are also required to maintain the liners and leak detection systems.

As highly saline wastewater can react with clay resulting in it becoming ineffective as a pond liner, the only lining that will be generally acceptable is HDPE. Alternative disposal or lining options may be approved by the EPA if the licensee can conclusively demonstrate that a suitable alternative is available that would achieve the required environmental outcome of preventing desalination waste contaminating surface waters and groundwater. The need for HDPE lined ponds may be eliminated if there is a nearby dry salt pan and an appropriate assessment indicates that it can be utilised as an evaporation pond without causing adverse environmental impacts.

Consequently, the broadening of the EPA's licensing powers regarding desalination may result in existing operators of desalination plants that discharge waste into wastewater lagoons not lined with HDPE being required to install this type of lining as a condition of licence. Such a requirement will be based on a site-specific risk assessment, with a particular focus on the risk of highly saline waste leaking into aquifers, rivers and streams. Decisions on the requirements for sizing and lining of lagoons will be based on the following factors:

- climate data for the region
- underlying soil type
- Waste volume
- salinity of waste
- depth to aquifer
- proximity to licensed bores or other users
- quality of water in the aquifer
- other uses of the aquifer
- nature of aquifers (karst, sand, fractured rock, etc)
- proximity to surface waters.

Where an assessment indicates high risk, it is likely that desalination wastewater lagoons in the Northern Adelaide Plains and the Angas Bremer region will require HDPE lining. In the case of desalination in remote areas for mining, wastewater can possibly be used for dust suppression and drilling operations without causing significant environmental harm. However, if a wastewater lagoon is necessary, the EPA may require HDPE lining depending on the factors listed above. Similarly, HDPE lining of wastewater lagoons used for the disposal of wastewater from desalination plants that produce water for regional communities will also be required where necessary.

Given the significant task of installing HDPE lining at wastewater lagoons, the EPA will provide adequate time for affected operators to implement this requirement. Typically this will be done by requiring an environment improvement program (EIP) to be submitted as a licence requirement. The EPA anticipates that in most cases where HDPE lining is necessary, a licensee will be required to submit an EIP within a year of receiving their licence. This will provide licensees with sufficient time to assess the various options available to them and consider ways of funding the project. The EIP would then need to be fully implemented by a specified date with a timetable of intermediate stages. Depending on the costs and complexities involved, most EIPs would be of one to three years duration. This will ensure that all operators comply with required standards within a maximum of four years of licences being issued.

7 Commencement date and transitional arrangements

In order to provide sufficient time for operators of desalination plants who will be affected by these reforms to prepare for the new licensing requirements, it is proposed that they will commence six months their finalisation and all affected parties would be notified by the EPA.

Operators of desalination plants that are currently not licensed under the Act, but require a licence as a result of these reforms, will be expected to submit a licence application. The current application fee is $173.

In the case of desalination plants that are already licensed under activity 8(7) of Schedule 1, no licence application will be required. Transitional provisions have been developed to ensure that existing licences to operate desalination plants will automatically be transferred to the newly prescribed activity of desalination upon commencement of these reforms. These provisions will also allow holders of these licences to continue operating their desalination plants for the same term and under the same licence conditions as specified in their existing licences.