Southern Rural Water
Managing Water. Serving Communities.

12 February 2016

Essential Services Commission
Level 37 / 2 Lonsdale Street
MELBOURNE VIC 3000

water@esc.vic.gov.au

Re: Water Price Review 2016 - Melbourne Water

Southern Rural Water (SRW) values the opportunity to comment on the Melbourne Water (MWC) price submission. Our submission relates to the supply of Class A recycled water from the Western Treatment Plant to Werribee South irrigators, particularly the salinity of the supplied water.

In summary, we support the proposed capital works program for the upgrade of sewers across the Melbourne network and the retention of trade waste (ITDS) pricing signals for the beneficial impact that it will have on the salinity of recycled water.

In addition we propose that a performance indicator relating to the salinity of the recycled water supplied be established, with targets to reduce salinity over the coming years.

History and context

MWC supplies recycled water to SRW's Werribee South irrigators. The recycled water scheme was first developed as a partnership between the Victorian State Government, Melbourne Water, Southern Rural Water and the Werribee South irrigators when the initial impacts of the millennium drought were being felt in the early 2000s. Recognising that the salinity of recycled water was well above recommended salinity limits, the initial phase of the scheme was "interim" where Werribee irrigators would access recycled water from the Western Treatment Plant at a reduced price until the salinity of the recycled water could be reduced to 1,000EC. The recycled water scheme was designed to supplement the river water system providing enhanced security in dry years.

Importance of the Recycled Water Supply

The recycled water scheme became critical to the survival of the Werribee Irrigation District in the millennium drought. The chart below shows the importance of the scheme during this time, where it became the source of water that irrigators relied upon to continue operation.

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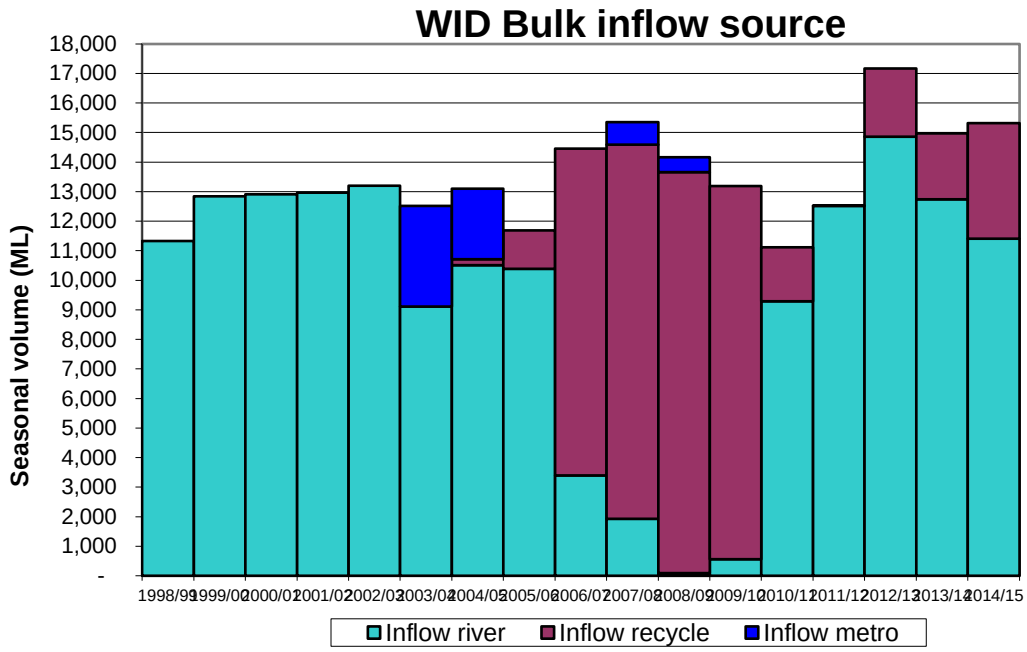

In more recent years, it has resumed its planned use as a supplementary source of supply. However, given the likely impact of climate change, the scheme is critical to maintaining water availability for Werribee irrigators and we cannot rule out a return to it being the primary supply in extreme dry conditions again.

Salinity in recycled water

Reducing salinity

The original plan was to reduce salinity to 1,000EC by 2009. However, studies from Melbourne Water undertaken in 2006 and 2007 indicated that the only practical way of achieving the 1,000EC target was to construct a desalination plant that would cost in excess of $2,000 per megalitre (ML), which was beyond the capacity of irrigators to pay and other stakeholders to subsidise. Further analysis by Southern Rural Water during the Western Irrigation Futures project in 2009 confirmed these costs.

The commitment at that time was to continue to work on opportunities to reduce the salinity at source. City West Water had a “cleaner production program” operating at that time that was working on several projects which would reduce salinity.

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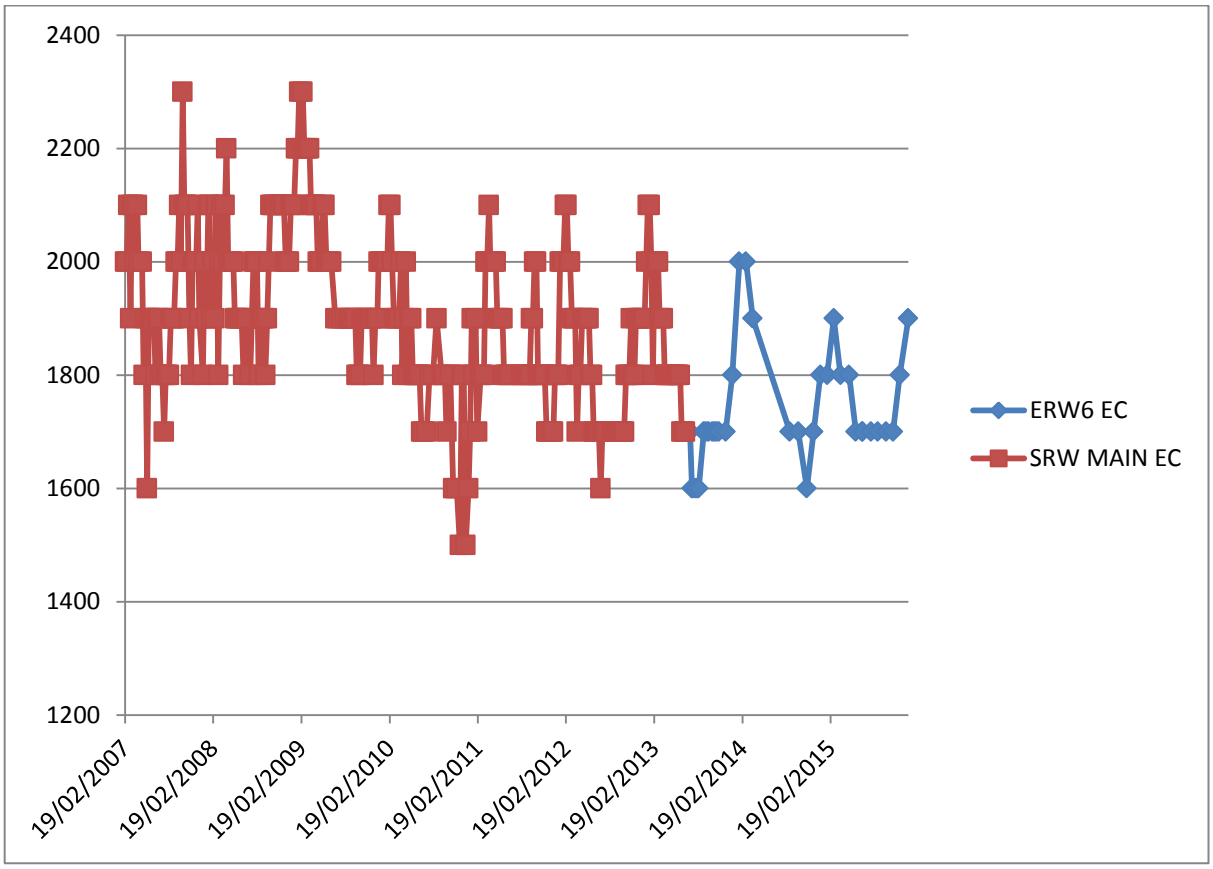
Salinity of supplied recycled water

Recycled water salinity supplied has varied between approximately 1,600 and 2,300EC over the period of supply since 2004.



Impact of salinity on Werribee irrigators

Werribee South irrigators supply a range of vegetables to the Victorian and Australian markets, the largest varieties being broccoli, cauliflower, lettuce and cabbage. While optimal salinity for each variety varies, optimal salinity is under 500EC, salinity is generally managed with minimal cost at less than 1,000EC and a range of additional measures are required where salinity exceeds 1,000EC. The competitors to Werribee South are typically supplied water with less than 500EC.

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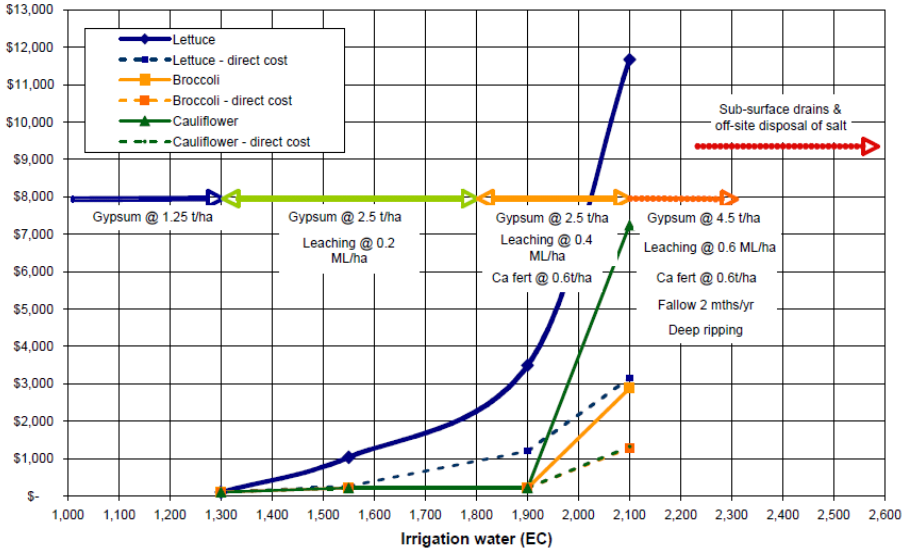
The following chart provides an indicative indication of the on farm management measures required to manage the impact of salinity, developed during the drought:



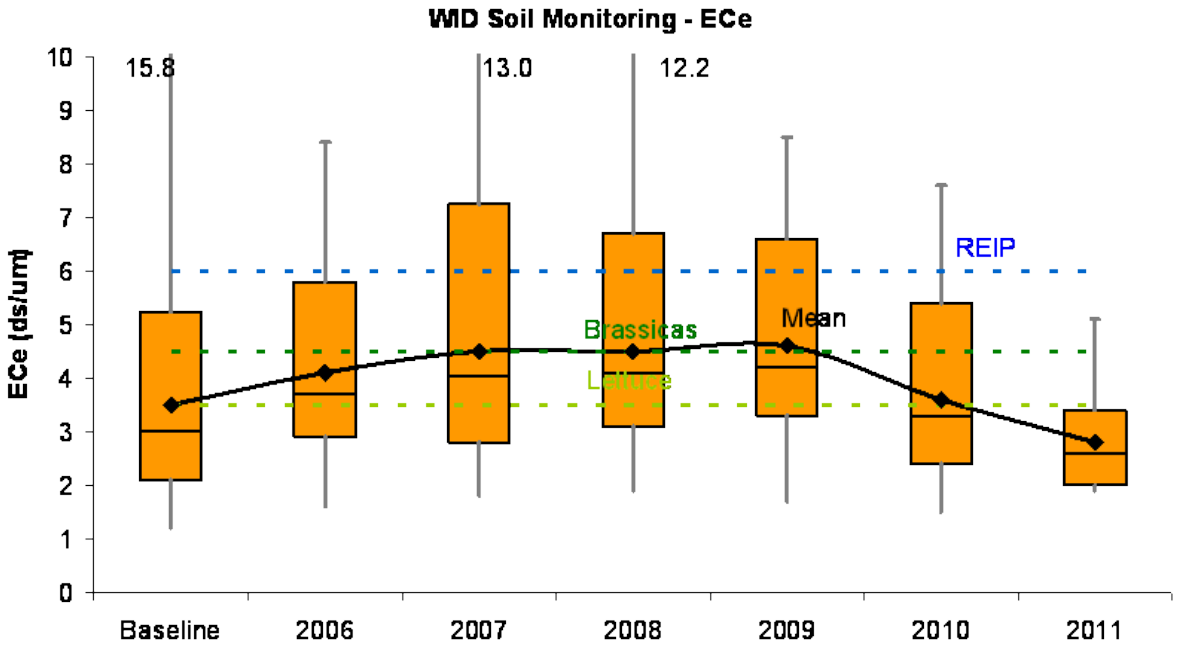
This shows that the cost of managing saline water commences at 1,000EC and that the costs increase exponentially for lettuce at 1,300EC and for other crops beyond 1,900EC. This is obviously compounded by other seasonal factors including the existing salinity in the soil, temperature, humidity and the salinity of river water supply. The impact in 2015 and 2016, where river water salinity has also been high, has indicated an impact on quality and yield for brassica's at a much lower level of salinity.

Financial impact of high salinity recycled water supply

There are several cost impacts of high salinity on irrigators.

Firstly, it should be noted that Werribee irrigators are paying for the recycled water supply in addition to their river and groundwater entitlements – costs that most competitors don't have to pay. At a cost of $332 per ML this season at a 50% take or pay it is a large cost impost.

Secondly, the high salinity incurs substantial on farm costs to manage impacts on soil and crop as identified in the chart above. There are also residual impacts on the soils. The following charts show the impact of the recycled water when used as the primary supply over the drought period, and the impact of high rainfall from 2010 on three critical soil parameters.

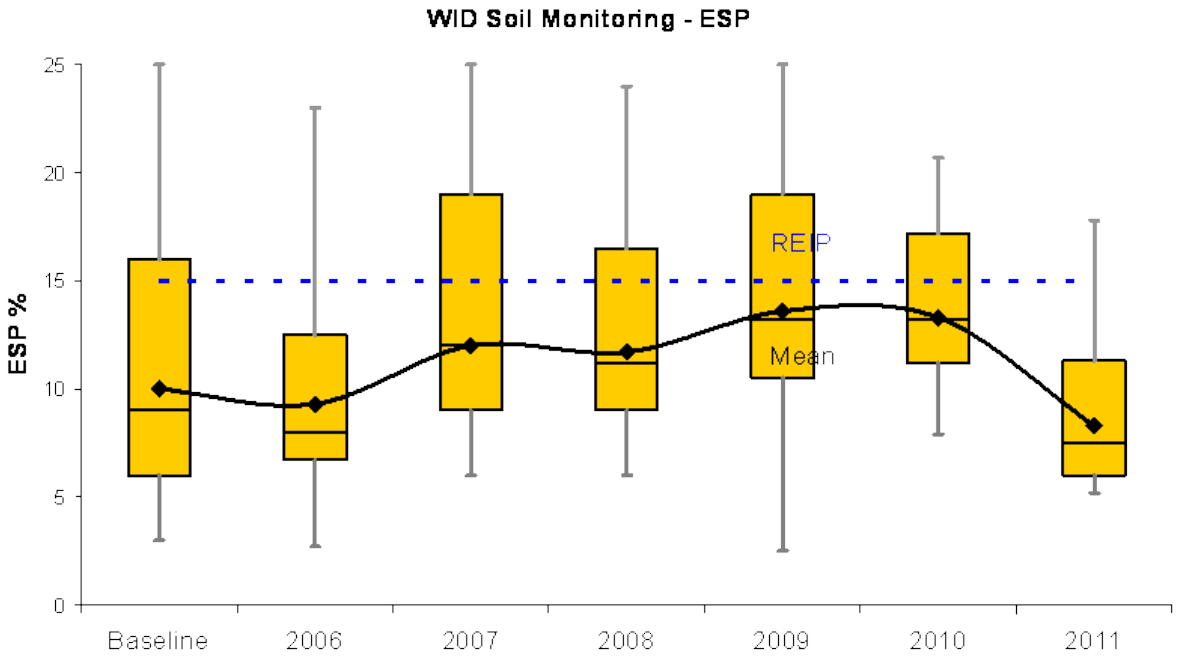


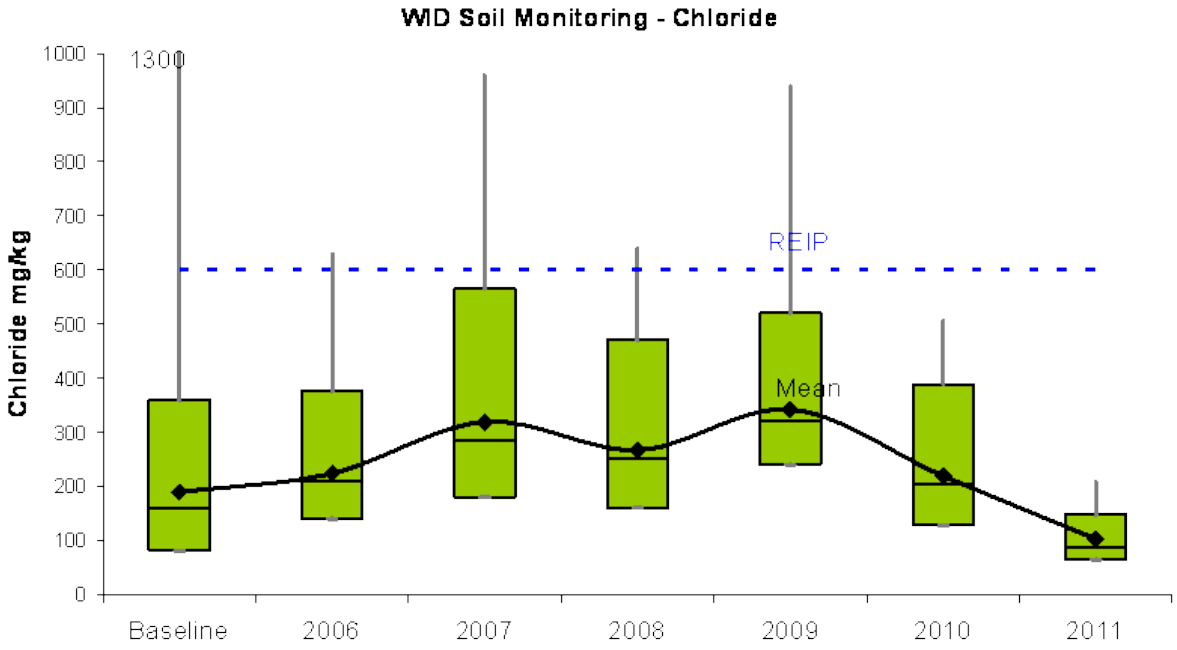
Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) provide guidelines on water quality impacts on a range of water uses. Specifically for vegetables, they identify soil salinity thresholds for many of the crops grown in Werribee South. They indicate that thresholds start with lettuce at 1.3 (EC se ds/m) to 2.8 for broccoli, with yield losses commencing at 2.1 and 3.9 respectively. It should be noted that average ECe was above 4 for the period where recycled water was the primary water source, only returning to below 3 after the significant rains in 2010 and 2011, and a return to river water as the primary water source.

Table 9.2.10 continued

Common name	Scientific name	Salinity threshold (EC_{se} dS/m)[b]	Productivity decrease per dS/m increase (%)	Soil Salinity EC_{se} (dS/m) at 90% yield	75% yield	50% yield	Reference[c]
Vegetables							
Bean	*Phaseolus vulgaris*	1.0	18.9	1.5	2.3	3.6	1
Broadbean	*Vicia faba*	1.6	9.6	2.6	4.2	6.8	1
Broccoli	*Brassica oleracea*	2.8	9.1	3.9	5.5	8.3	1
Cabbage	*Brassica oleracea (var Capitata)*	1.8	9.7	2.8	4.4	7.0	1
Carrot	*Daucus carota*	1.0	14.1	1.7	2.8	4.5	1
Cauliflower	*Brassica oleracea*	2.5					6
Celery	*Apium graveolens*	1.8	6.2	3.4	5.8	9.9	4
Cucumber	*Cucumis sativus*	2.5	13.0	3.3	4.4	6.3	1
Eggplant	*Solanum melongena*	1.1	6.9	2.5	4.7	8.3	8
Kale	*Brassica campestris*	6.5					6
Lettuce	*Latuca sativa*	1.3	13.0	2.1	3.2	5.1	1
Pea	*Pisum sativum L.*	2.5					6
Pepper	*Capsicum annum*	1.5	14.1	2.2	3.3	5.0	9
Rosemary	*Rosmarinus lockwoodii*	4.5					6
Spinach	*Spinacia oleracea*	2.0	7.6	3.3	5.3	8.6	1
Squash	*Cucurbita maxima*	2.5					6
Squash, scallop	*Cucurbita pepo melopepo*	3.2	16.0	3.8	4.8	6.3	4
Tomato	*Lycopersicon esculentum*	2.3	18.9	2.8	3.6	4.9	1
Turnip	*Brassica rapu*	0.9	9.0	2.0	3.7	6.5	4
Zucchini	*Cucurbita peop melopepo*	4.7	9.4	5.8	7.4	10.0	4

a From DNR (1997)
b 1 dS/m = 1000 µS/cm
c References: 1 Maas & Hoffman (1977); 2 Ayers & Westcot (1976); 3 Russell (1976); 4 Maas (1986); 5 West & Francois (1982); 6 Bresler et al. (1982); 7 Ayers (1977); 8 Heuer et al. (1986); 9 Shaw et al. (1987)

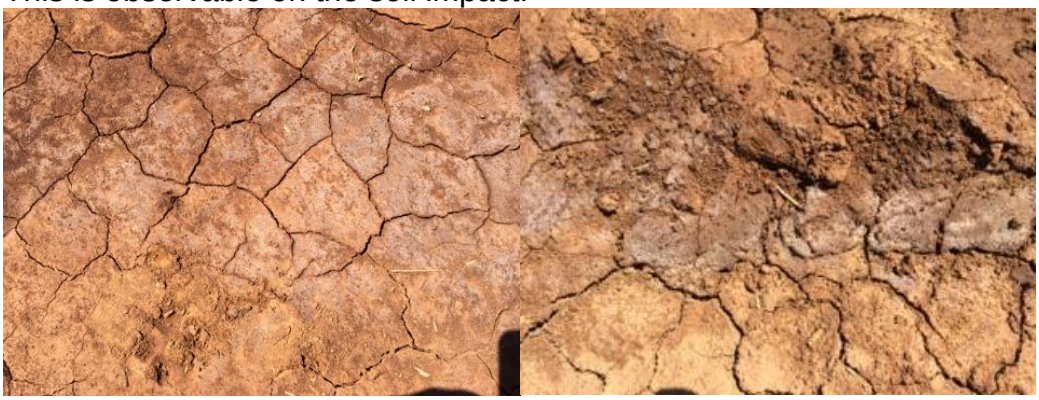




These charts show the average results and also the upper and lower bounds found in soil testing during this period.

The third impact is on crop quality and yield. Individual farmers have reported crop losses of up to 50% in some seasons (note other factors such as temperature also impact on this) and weight losses of up to 30% in some crops such as lettuces which means they command a lower price from customers. Photos taken in 2016 show the impact on high salinity where lower salinity river water was not available to shandy:

This is observable on the soil impact:



Commentary on price submission

SRW understands there are two primary sources of salinity in the delivered recycled water:

- Trade waste discharge – which in many cases contains a salt load significantly above the average residential sewerage discharge; and
- Groundwater ingress from aged and leaky sewers

Trade waste discharge

SRW notes the commentary on the trade waste discharges on pages 64 to 66 of the MWC price submission. SRW strongly supports the retention of the inorganic total dissolved solids (ITDS) as a trade waster parameter reflecting the polluter pays principle which provides benefit to the downstream use of recycled water by Werribee South Irrigators.

Sewerage network upgrade

SRW notes the planned upgrade of several sections of the Melbourne sewer network. SRW in particular supports the Hobson's Bay sewage upgrade proposal. We understand that this will reduce the quantity of saline groundwater seeping into the network and ultimately reduce the salinity of water supplied to Werribee South irrigators. The extent of benefit of these upgrades in terms of quality of salinity reduction is not known by SRW.

SRW strongly supports the upgrade of the sewerage system as a mechanism of reducing the salinity of recycled water. In addition, we believe saline intrusion should be a criteria considered in prioritising which section of the sewerage system is to be upgraded.

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Service parameter

SRW believes that the EC of recycled water supply service to Southern Rural Water should be established as a performance indicator.

Recycled water supply is critical to the future of Werribee South as an irrigation district. Modelling undertaken by Southern Rural Water indicates that the combination of recycled water supply and modernising irrigation channels can ensure the long term water availability required to secure Werribee Irrigation District's future in light of current and potential future climate change impacts.

However, salinity at its current level is problematic for customer long term viability. SRW proposes that Melbourne Water work with Southern Rural Water and City West Water to establish short, medium and long term targets for the salinity of recycled water, noting the original target of 1,000EC and the considerable benefit obtained where salinity is reduced to below 1,300EC.

Thank you for the opportunity to comment on the submission. Please contact me on 03 5139 3100 should you have any further queries.

Kind regards

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