

## Community Committee for Recycled Water Storage (Northern Adelaide Irrigation Scheme)

Project Name	Northern Adelaide Irrigation Scheme					
Purpose	Community Committee for Recycled Water Storage					
Date	13/01/2016			Time	5pm – 7pm	
Meeting No.	3			Frequency	Fortnightly	
Facilitator	Jane Wilson, SA Water			Minute Taker	Chloe Ringwood, SA Water	
Venue	Virginia Horticultural Centre, Old Port Wakefield Road, Virginia					
Attendance Ab = Absent Ap = Apologies P = Present	Ross Trimboli	P	Kieren Chappell	P	Mark Wilson	P
	Louis Marafioti	P	Eddie Stubing	P	Michael Picard	P
	Felicia Nguyen	P	Matt Sheedy	P	Megan Howard (proxy for Greg Pattinson)	P
	Frank Maiolo (proxy for Dino Musolino)	P	Dino Musolino	Ap	Greg Pattinson	Ap
	Peter Rentoulis	Ap	Paul Cleghorn	Ab	Evie Arharidis	Ap
	Susie Green	Ap	Danny De Ieso	Ab	Rocco Musolino	Ab
	Nick Pezzaniti	Ap	Nghien Nguyen	Ab		

## 1 Welcome and Apologies

Jane welcomed all members, introduced proxy's and those that have been absent from the previous meetings.

The agenda for the meeting was outlined as follows:

1. Welcome and apologies
2. Minutes of previous meeting and review of actions
3. Recycled water quality continued - Guest presenter: SA Water - Dr Rudi Regel
4. Other business
5. Next meeting

The apologies were noted (as above).

Committee members were reminded to complete or update the Register of Interest document noting any relevant organisations/activities they are involved in, other than those they are representing. This will ensure any conflicts of interest are identified.

## 2 Minutes of previous meeting and review of action items

The minutes of the previous meeting held on 9 December 2015 were tabled. The following comments were received:

### ***Bunyip Water Project***

A Committee member asked to seek clarification around the statement:

“It was also noted that there is an aquifer storage scheme in Kangaroo Flat which currently stores stormwater. Investigations are currently occurring to establish whether this could also be used to store recycled water recycled.” (Page 6)

The member raised that the Development Application for the Bunyip Water Scheme at Kangaroo Flat, contains a reference referring to when 170L/s is reached, 20L/s will overflow into the pumping pond and 150L/s will be injected into Managed Aquifer and Recovery (MAR) wells. The minutes state that “investigations” are occurring into whether aquifer storage is used for recycled water as part of this scheme, while the Development Application seems to be stating that it is more than investigations. Concern was also expressed that these actions seem to be pre-empting the outcomes of the Committee.

The Committee member from Light Regional Council, who is involved in the above scheme, responded noting that the Development Application was seeking approval for above ground storage i.e. dams and tanks. As part of the application process, supporting information related to pipework and potential underground storage was also included. Additionally it was noted that if underground storage was to be sought for the scheme, a future application and approval process would need to be undertaken. It was indicated that no such application has been lodged or approvals sought at this time. The Committee member questioned what will happen to the 150L/s if it's not going to be injected. In response, it was noted that the water will go to a tank and a dam which has capacity of up to 750ML.

In addition, Jane added that the focus of the Committee was to develop a Master Plan for Recycled Water Storage to support SA Water's Northern Adelaide Irrigation Scheme (NAIS). The scope of the Committee doesn't include other aquifer storage proposals driven by other parties i.e. Council.

It was agreed that no changes would be made to the minutes.

### **Role of independent hydrogeologist**

A Committee member asked for some clarification around the open action items (page 7, item 1). The member understood that the intention of engaging an independent hydrogeologist would be for them to carry out a review of the models and assumptions used by SA Water for aquifer storage rather than presenting to the Committee about aquifer structures and general hydrogeology. It was added that this action as recorded in the minutes, dilutes what the issues may be with what SA Water is proposing.

Jane responded noting that the topic was raised in the first meeting by a Committee member during a discussion on future meeting topics. The Committee agreed to use an independent Hydrogeologist (i.e. not Government) to present on the topic of hydrogeology to increase understanding of the Committee. Jane responded that SA Water and the Committee have not reached a conclusion for a method of storage or a proposed location (since Two Wells has been taken off the table) and that is the purpose of the Committee. It would therefore be pre-emptive to engage with a hydrogeologist to undertake an independent assessment of assumptions. It was noted, that aquifer storage encompasses many different skill sets including hydrogeology, wastewater treatment etc. and that SA Water are here to provide the Committee with information about these aspects to enable the Committee to determine how recycled water storage should be addressed. It was reconfirmed that the outcomes of the Committee will be provided to short-listed proponents for consideration in their final proposals.

The Member added that the information SA Water have on MAR's should be provided to us prior to the independent Hydrogeologist reviewing what SAW have found. It will be difficult for the Committee to determine if SA Water has left holes in the system if we cannot have an independent Hydrogeologist do their own findings.

The member noted that the Committee will conclude once a master plan for storage has been established, being prior to final proposals and contracts being established for the delivery of NAIS. Concern was expressed that the public won't have access to the technical assessment information associated with any aquifer storage scheme established for NAIS.

An action was placed on SA Water to consider how an independent hydrogeologist could be engaged to review the assessment process for any aquifer storage scheme established for NAIS and the outcomes of the review provided to the public.

#### **Above-ground storage**

In addition to the above, a comment was received in relation to above-ground storage with the view that it was a safer option than below ground storage. In response, it was highlighted that there are risks associated with above ground storage as well and this will be addressed at a future meeting.

### **3 Presentation: Public Health Aspects of Recycled Water**

Jane introduced the guest speaker from SA Water:

- **Rudi Regel PhD BSc (Hons) Dipl Pr. Man. – Recycled Water Coordinator (SA Water, Wastewater Design & Standards)**

Jane outlined that this presentation would recap the key points from the last meeting in relation to the public health aspects of recycled water and progress to the environmental aspects.

*The presentation slides are attached.*

*The questions received and responses provided during the presentation are summarised as follows:*

In relation to data presented on DAFF filter performance – turbidity (slide 27), a Member sought reasons for the few high instances of turbidity levels. In response, it was noted that because SA Water are monitoring individual inlets, it may have been caused due to a particular filter backwashing and then coming back online. The findings are a daily average and SAW cannot go above 5 NTU for individual filters for more than 1 hour or 1.0 NTU for the combined filtrate of all filters (as measured in the filtered water duct) as a daily average.

A Member was interested about endocrine disruptors (EDC's). In response, it was noted that in 2009, SA Water and United Water researched samples of sewage looking at non-estrogen indicators and chemicals in raw sewage and their removal through the treatment process. It was found that the Bolivar treatment process reduces levels by 97%. Other chemicals which may be EDCs are also below limits of detection.

Research examining disinfection by-product formation and degradation required a boost to Bolivar DAFF chlorination dose. Disinfection by-products are monitored in recycled water and are not a risk for irrigation. CSIRO will present further on disinfection by-product studies in the next meeting.

A member asked if the study on the trihalomethane is still happening at Bolivar before it goes into the network. In response, it was noted that at Bolivar, chlorine disinfection is required for the removal of bacteria and viruses and disinfection by-products will form. The water quality results indicate acceptable concentrations. During the aquifer trials at Bolivar, CSIRO sampled all these compounds going into the aquifer and then subsampled before they extracted from the aquifer so they had a detention time and monitoring points to also measure whether they were picking it up.

The member added an additional comment regarding above ground pipes and the role of heat (temperature).

There have been comments on micro plastics in the media recently. It is important to define the route of exposure and endpoint with recycled water, some of the comments on micro plastics are relating to the marine ecosystem.

Further to this, a question was raised about micro plastics being able to pass through filtration systems. In response, it was noted that Bolivar DAFF plant can remove *Cryptosporidium* at a size of 3 microns. If these micro plastics are bigger than that, then they could be removed. Wastewater treatment processes – i.e. activated sludge would also remove particles through floc formation and clarification. Membranes will also provide a very good removal mechanism. Membranes remove at a size of 0.01 to 0.04 microns.

A Member asked about the duration of the ASR Bolivar research from well drilling to final results. In response, it was noted that cycles one and two began in the late 1990's. This included the establishment of the site and the research program (reported in Martin *et al.*, 2005). Cycle three was completed in August 2006 and four completed in March 2010 and are reported in Barry *et al.*, 2010). It was added that it wasn't a continuous project, rather targeted work which included injection and recovery cycles. Further, cycles 1-3 saw extracted recycled water being discharged to the Gulf of St Vincent and cycle four was recovered and provided through the Virginia Pipeline Scheme for irrigation, with a salinity threshold reaching no higher than 1,300 mg/L. The Environment Protection Authority gave approval for 5 cycles, and it may be possible for SA Water to conduct a fifth cycle in the future.

Jane added that this topic will be covered in further detail by the CSIRO at the next meeting. SA Water will circulate some reports on the research trials for pre-reading material for interested members.

Further to this, a question was asked about future SA Water aquifer schemes, and whether SA Water would be required to do further trials and research. In response, it was noted that SA Water will use everything learned from Bolivar including the frameworks on how to manage risks, hazards and 'biogeochemical' principals behind the hazards (e.g. arsenic or iron release) to inform any future proposed scheme. The impacts on water quality performance that was discovered from these studies i.e. suspended solids, turbidity, pH, nitrogen can all be transferred to other sites. However, there would still need to be selected, targeted studies. In summary, where we are uncertain about any risks then additional study/research will be required to characterise and manage it.

It was asked if the study determined whether there was a safe distance aquifer storage could be positioned in comparison to the closest bore. In response, it was explained that when you drill a bore, there needs to be pump testing i.e. how much you can put in and how much you pull out and these are characterised with well equations to understand storage capacity and yield. Those values go into models to then predict the pressure in the aquifer and solute transport and its impact on surrounding bores. A good tracer of water movement is salinity – salinity of the injectant, relative to the background/baseline salinity of the target aquifer. A future meeting is planned to focus on hydrogeology and will explain these principals further.

In summary it was added that you can predict the water movement within the aquifer on modelling, however depending on the distance of the nearest bore, you may need to look at other forms of monitoring to check what has been predicted. At Aldinga, SA Water have observation bores to check the water quality, pressure, and the water level of the aquifer storage scheme. This data can then be reviewed and used to calibrate and refine models.

## 4 Other business

A committee member asked the Committee whether they knew anything about the water that has appeared west of the northern expressway, near the Gawler River crossing. It was added, whether the water was coming from Bolivar. In response, it was noted that SA Water is not aware of the

specific location, however it was added there are a number of shallow layers in the aquifer and it can appear in a number of different locations depending on the activity of those shallow layers.

## 5 Next meeting

The next meeting is scheduled for 27/01/2016 from 5-7pm at the Virginia Horticultural Centre.

The focus of the meeting will be the Bolivar research trials and the outcomes. Representatives from CSIRO Dr Declan page, Dr Joanne Vanderzalm and Dr Peter Dillon will be presenting on this topic. Jane added that pre-reading including previous reports and information about the trials will be circulated to Members prior.

A Member asked when the visit to Bolivar is likely to occur. In response, it was noted that the tour is being planned for Wednesday 17 February however exact details (including time) are yet to be confirmed.

## Open Action Items Register

No.	Action	By Whom	Date Raised	Status
1.	To obtain an independent hydrologist to present on the topic of aquifer structure and hydrology in the Northern Adelaide Plains.	SA Water	11/11/15	Underway
2.	Consider how an independent hydrogeological assessment of the technical modelling of any future managed aquifer storage schemes established as part of NAIS (in line with established Master Plan) could be undertaken and made publicly available.	SA Water	13/01/16	Underway
3.	Arrange a visit to Bolivar Wastewater Treatment Plant and advise Committee members	SA Water	11/11/15	Underway
4.	Arrange a visit to AWQC and advise Committee members	SA Water	9/12/15	Underway