

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

|                     |  |    |   |                          |  |    |
|---------------------|--|----|---|--------------------------|--|----|
| <b>Project Name</b> | Northern Adelaide Irrigation Scheme                              |    |   |                          |  |    |
| <b>Purpose</b>      | Community Committee for Recycled Water Storage                   |    |   |                          |  |    |
| <b>Date</b>         | 27/01/2016   |    | <b>Time</b>                             | 5pm – 7pm                |  |    |
| <b>Meeting No.</b>  | 4  |    | <b>Frequency</b>                        | Fortnightly              |  |    |
| <b>Facilitator</b>  | Jane Wilson, SA Water  |    | <b>Minute Taker</b>                     | Chloe Ringwood, SA Water |  |    |
| <b>Venue</b>        | Virginia Horticultural Centre, Old Port Wakefield Road, Virginia |    |   |                          |  |    |
| <b>Attendance</b>   | Ross Trimboli  | P  | Simon Keith (proxy for Kieren Chappell) | P                        | Mark Wilson                              | P  |
| Ab = Absent         |  |    |   |                          |  |    |
| Ap = Apologies      | Louis Marafioti  | P  | Eddie Stubby                            | P                        | Michael Picard                           | P  |
| P = Present         | Felicia Nguyen   | P  | Matt Sheedy                             | P                        | Rocco Musolino                           | P  |
|                     | Frank Maiolo (proxy for Dino Musolino)                           | P  | Peter Rentoulis                         | P                        | Paul Cleghorn                            | P  |
|                     | Susie Green  | Ap | Dino Musolino                           | Ap                       | Greg Pattinson                           | Ap |
|                     | Nick Pezzaniti   | Ap | Evie Arharidis                          | Ap                       | Kieren Chappell (and proxy Megan Howard) | Ap |
|                     | Nghien Nguyen  | Ab | Danny De Ieso                           | Ab                       |  |    |

### 1 Welcome and Apologies

Jane welcomed all members and introduced proxy's.

The agenda for the meeting was outlined as follows:

1. Welcome and apologies
2. Minutes of previous meeting and review of actions
3. Bolivar Managed Aquifer Recharge and Findings, Guest Presenters: Dr Declan Page, Dr Peter Dillon & Dr Joanne Vanderzalm, CSIRO
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 13 January 2016 were tabled. The following comment was received:

Clarification was sought on minuting statements made from fellow Committee members as anonymous. Jane responded noting that during the first meeting it was agreed by all Committee members that statements would be minuted as anonymous unless specifically asked to be named. It was agreed no changes would be made to the minutes.

### 3 Presentation: Bolivar Managed Aquifer Recharge Research and Findings

Jane introduced the guest speakers from CSIRO:

- **Dr Peter Dillon – Honorary Fellow, co-chair IAH Commission on Managed Aquifer Recharge**
- **Dr Joanne Vanderzalm – Research Scientist Team leader, Liveable, Sustainable & Resilient Cities**
- **Dr Declan Page – Research Scientist Group Leader, Liveable, Sustainable & Resilient Cities**

Jane outlined that this presentation on the Bolivar trial would be broken into the following three sub-topics and acknowledged that some Committee members were involved in the consultation process with CSIRO:

- Research project overview (Dr Peter Dillon)
- Key findings (Dr Joanne Vanderzalm)
- Risk management (Dr Declan Page)

*The presentation slides are attached.*

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

Clarification was sought about testing on the ground or whether it was just modelling. In response, it was noted that Dr Joanne Vanderzalm would explain the findings of the trial in detail next. In addition, Dr Dillon added that this was about the community engagement prior to the trial. The community wanted baseline monitoring on aquifer behaviour before any injection occurred.

A member asked if the study determined whether leakage could occur if the extraction rate of domestic water increased. In response, it was noted that the extraction rate would have to be increased significantly in order to have any impact, however an increase that large would result in exceeding water allocations. Additionally, the study focused on ASR operations that both inject into and recover water from the aquifer, therefore balancing the pressure in the aquifer.

A question was asked why insurance stopped after three years. In response, it was noted that because the project team hadn't identified any risk over that period they were given the confidence to abandon insurance. The member added an additional comment asking whether three years was actually long enough. In response, it was noted that it has been eleven years between first injection and last recovery which is a sufficient amount of time to detect any abnormalities. The trial has provided a high degree of confidence in the results for aquifer storage and recovery.

A member asked if the trial was only taken at one place in the aquifer. In response, it was confirmed that the trial only took place at that location however underwent continuous heavy monitoring compared with stormwater injection monitoring. There are over 20 MAR schemes across Adelaide which inject stormwater into the aquifer, which have provided good knowledge of the hydraulics, recovery and efficiency of these schemes, but these schemes were not monitored as frequently for water quality as the treated recycled water scheme.

A member was interested to learn what would grow in an environment without light. In response, it was noted soils contain microbial content and the light was eliminated to represent the aquifer. It was the nutrients in the water injected water which was studied. It was added that there were monitoring wells around the injection site.

A member was interested about whether there was any difference in the sodium and chloride that was injected from the recycled water. In addition it was raised that the levels of sodium and chloride are relatively high in the recycled water and was interested to learn what happened to these levels in the trial. In response, it was noted that the data showed slightly raised levels of sodium and chloride coming off the aquifer from the very first extraction however, it was noted this only occurred for a short period of time. It was added that the levels were recorded specifically to that trial location and that results may differ at different locations in the aquifer. The quality of water that's injected into the aquifer can change once you extract it because of the mixing that can occur once in the aquifer.

A member asked to seek clarification about the graph on slide 9 'Total Nitrogen Removal' and why cycle 3 is much lower than the other cycles. In response, it was noted that the level of nitrogen depends on the times of the year water is injected. It was added that there is seasonal variability in the source water.

A member asked to see clarification about the graph on slide 10 'Fate of Pathogens'. The data is interpreted that pathogen die-off is far greater with non-filtered injectant over filtered injectant. In response, it was noted that there is still a slow die-off without any organisms but it is a lot faster when the organisms responsible for the decay of the pathogens are present.

Further to this, a member asked if the study was only for E-Coli. In response, it was noted that the tests were carried out for a combination of virus, protozoa and bacteria.

A member asked to seek further clarification about the earlier response to the graph slide 10. The graph shows that the tests were conducted with a medium exposed to non-filtered injectant and non-filtered groundwater within a sterile environment, however the results are interpreted that the die-off is faster in the non-filtered injected. In response, it was added that it was initially thought that the microorganisms in the injected water would be active. However when these experiments were trailed within the zone of the injected water and also outside of that zone, the same results was obtained. The microorganisms in the ground water are largely responsible for the die-off for those pathogens tested. When there are microorganisms present, they attack the pathogens, being E. coli in this case.

A member asked if there is a designated area for the bores to be drilled. In response, Jane reminded the Committee that the location and storage options haven't been determined and are subject to the discussions with the Committee which will also tie in with the EOI proponents.

A member asked if there have been trials which have included detection of narcotics. In response, it was noted that there has been extensive monitoring of organic chemicals and there has been very few detections. It was added that caffeine was consistently detected however to note that the labs can detect extremely low concentrations.

Further to this, a member questioned whether any other narcotics were detected. It was added in response that during the time the study was undertaken concentrations were unable to be detected. As an example, caffeine was detected at high levels in the water going into the treatment plant however the lagoons were very effective in the removal of caffeine which resulted in very low detection levels. It was also added, that in 2013 SAW supplied samples of raw water to the University of Melbourne which detected levels of narcotic in the influent.

Further to this conversation it was added that if there are chemicals of concern, then ultimately they can be addressed in the treatment process. It was added that with ongoing improvements in analytical chemistry, just about anything can be detected.

A member mentioned that the pre reading which was made available to the Committee members about water storage, outlined that the MAR would not go in an area within close proximity to drinking water given the specific criteria. Jane added that the aim of supporting NAIS is not for drinking purpose, it is about primary irrigation.

A member asked for some clarification around the recovery percentage which remains in the aquifer. In response, it was noted that it relates to the volume of water that is recovered that's actually usable compared to the volume that's injected. It was added that there is a percentage that is left in the aquifer that creates a mixing zone or buffer around the storage zone. The recovery efficiency can increase up to 90 percent if the outer area is performing correctly and continues to mix.

Jane added that the next meeting will explore this topic in further detail.

A member asked if the injected water would improve the salinity in the aquifer in the areas that are detecting high salinity levels. In response, it was noted that the level of the salinity would improve with the injected water assuming that the salinity of injected water is lower than groundwater in the storage zone.

A question was raised by Dr Peter Dillon about methods to reduce the salinity in the water. In response, it was noted that there are a number of ways to reduce the salinity including mixing with drinking water, reverse osmosis (RO) and mixing with stormwater. The removal of salinity requires RO which is expensive and therefore an ongoing issue to resolve.

It was added that if it ended up being a combination of mixing stormwater and recycled water then this would require another approach of determining what hazards exist in stormwater and changes the health approvals to food crops.

A member wanted to seek some clarification around the organic products breaking down in the aquifer. In response, it was noted that caffeine is a really good example of this and a good identifier as well as simazine (herbicide) which breaks down but at a much longer rate. It was added by Joanne that assessment of degradation by-products is covered in the MAR guidelines.

Jane encouraged the Committee to stay behind if they have any further questions they can directly ask the presenters.

## 4 Other business

Jane asked the Committee if there was anything they wished to raise. No issues were noted.

Jane asked those that wish to come on the tour of Bolivar WWTP and DAFF Plant that the date has been confirmed for Wednesday 17 February and to let Chloe Ringwood know of your interest. Further details will be confirmed at the following meeting.

## 5 Next meeting

The next meeting is scheduled for 10/02/2016 from 5-7pm at the Virginia Horticultural Centre.

The focus of the meeting will be on aquifer structure and hydrogeology in the Northern Adelaide Plains. Representative from independent Innovative Groundwater Solutions Glenn Harrington will be presenting on this topic.

## 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    | Complete |
| 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 |