

To: Cornelia Wiebels
 Manager Warrumbungle Water
 Warrumbungle Shire Council

From: Michael Carter
 Senior Process Engineer
 Hunter H2O

CC: DPIE

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Subject: Mendooran and Binnaway Sewerage Schemes - ERIL prioritisation letter - Supporting Info

1 Introduction

NSW Health and Warrumbungle Shire Council (WSC) have previously identified Binnaway and Mendooran septic systems as a concern and public health risk to the raw water supplying the potable water treatment plants in each community through previous assessments and the IWCM issues paper. Hence Safe and Secure Water Program (SSWP) funding was sought, assessed by the SSWP technical panel and approved for funding on this basis. However, the recent release of the SSWP risk prioritisation framework has resulted in these projects no longer being supported for future funding under the framework given the population of each community is below a population threshold of 2,500 people which is used to downgrade environmental risks.

However, in the specific case of Mendooran and Binnaway, the two towns do not fit neatly within the SSWP risk prioritisation framework due to the public health risks posed and the way that framework has been applied has resulted in an undesirable outcome for community health. Therefore, the septic systems in each town should be considered on the basis of the risk they are currently presenting to the communities. Both of these systems are presenting a health risk to each community and therefore should not be grouped under the environmental risk criteria.

WSC would therefore like to work collaboratively with DPIE to ensure the best outcomes are achieved for Binnaway and Mendooran which results in a resilient and safe water supply with improved public health benefits, along with addressing environmental concerns. A holistic approach to addressing the risks in each community will result in the best outcomes.

Hunter H2O has prepared this information memorandum on behalf of Council.

2 Binnaway and Mendooran Sewerage Schemes

The situations in Binnaway and Mendooran are almost identical and thus are presented together.

2.1 Current risk score basis

Although each project was approved and supported by the SSWP Technical Review Panel under the previous SSWP program guidelines, the recent change and creation of a risk prioritisation framework has resulted in these projects becoming 'lost within the system', and no longer being considered eligible for funding. Under the current scoring system using the SSWP risk prioritisation framework (released June 2020), both Binnaway (Risk ID - 3434) and Mendooran (Risk ID - 3437) resulted in a Risk Score of 2 based on the following assessment:

Table 5. Overall environmental risk impact scores for unsewered communities.

Risk outcomes	Score based on risk
Primary health and high environmental impacts: wastewater from on-site wastewater management facilities has direct impact on drinking water supply source and/or with widespread direct primary contact impact to resident population and/or high impact on waterway uses and values.	5 Binnaway
Secondary health and medium environmental impacts: wastewater from on-site wastewater management facilities has localised direct primary contact impact to resident population and/or medium impact on waterway uses and values.	4 Mendooran

Figure 2-1: Environmental Risk Score for Binnaway and Mendooran assessed by DPIE

Table 6. Environmental risk priority ranking based on population size and inherent risk.

		Inherent risk score					Risk impact score
		5	4	3	2	1	
Population	>2500	5	4	3	2	1	
	>1000-2500	4	4	3	2	1	
	>500-1000	3	3	2	2	1	
	>100-500	2	2	2	1	1	
	≤100	1	1	1	1	1	

Figure 2-2: Risk priority matrix for Binnaway and Mendooran assessed by DPIE

2.2 Justification for review of risk scores

2.2.1 Scoring

In the first instance it should be highlighted that the inherent risk score for Mendooran should be corrected and increased from a 4 to a 5 based on the evidence of a “direct impact on the drinking water supply source”. Due to pre-existing concerns, in 2014 WSC worked with NSW Health to confirm if the raw water was being compromised and contaminated by sewage from onsite septic systems. Therefore, a microbiological monitoring investigation was undertaken by WSC in collaboration with NSW Health over a period of seven months from December 2013 – July 2014. The investigation revealed the presence of *E. coli* in the back-up bore supply with results as high as 9 MPN/100mL and multiple high range readings of total coliforms (>200 MPN/100mL), as shown in Table 2-1.

Table 2-1: Results of microbiological monitoring investigation (December 2013 – July 2014)

Date	E. coli (MPN/100ml)	Total Coliforms (MPN/100ml)
11/12/2013	<1	130
14/01/2014	2	>200
25/02/2014	9	>200
8/04/2014	<1	59
12/05/2014	1	>200
1/07/2014	<1	200

The results from this data collection investigation therefore confirmed the risk of sewage contamination of the backup raw water supply, of which has been required to be used during the recent drought as the river ran dry.

It should also be noted however, that the results are only a few single grab samples in time collected a month or more apart. During significant rainfall or under certain circumstances (septic tank overflow events), the contamination is expected to be significantly worse and is therefore a major concern.

Both Binnaway and Mendooran are therefore identical in that they have a known “direct impact on the drinking water supply source”.

2.2.2 Assessment Criteria

The second point that must be highlighted is that these risks should not be reduced using an environmental risk assessment criteria and population risk reduction matrix as the primary public health impact of greatest concern is on the drinking water supply. An analogous scenario is therefore provided for context in this regard.

2.2.3 Analogous scenario

In order to consider the Binnaway and Mendooran Sewerage Scheme projects within the bounds of the current SSWP risk prioritisation framework, an analogous scenario is described in an attempt to quantify and relate the risk posed to the community in a way that fits within the current SSWP risk prioritisation framework, specifically highlighting the health impact imposed on the community through a direct impact of the drinking water supply.

In the water industry it is well known and documented throughout literature concerning the impacts septic systems have on drinking water sources. Hrudey and Hrudey (Hrudey, 2019) have summarised 24 of the most well-known and researched drinking-waterborne disease outbreaks that have affected affluent nations. Two of these incidents directly relate to septic tank sewage contamination of a drinking water source which has led to a drinking-waterborne disease outbreak:

- **Lake Mývatn, Iceland, 2004** - A septic tank was installed 80m upstream of a shallow well. Sewage contaminated the ground water with norovirus. The outbreak resulted in 4 confirmed cases with a total case estimation of >100 people affected by the outbreak. The reported outbreak in 2004 followed a previous outbreak in 2001 with 117 cases, misdiagnosed as food poisoning at the time.
- **Podgorica, Montenegro, 2008** - Ground water was contaminated by upstream village using septic tanks. The outbreak resulted in 1,699 confirmed cases of gastroenteritis and a total case estimation of 10,000 – 15,000 people impacted in the community.

Another 6 incidents of the 24 reported and documented have been impacted by sewage contamination of the drinking water raw water source; such as:

1. South Bass Island, OH, USA, 2004
2. Lilla Edet, Sweden, 2008
3. Östersund, Sweden, 2010
4. Skellefteå, Sweden, 2011

The Hrudey and Hrudey (Hrudey, 2019) report states: *“The cases reviewed involve disturbingly simple failures such as **not preventing** livestock access or **human sewage discharges from contaminating source waters**. These are threats to drinking-water safety that are entirely well known and thoroughly characterized. **Complacency, naiveté and ignorance seem to offer the only rational explanation as to why such events keep happening throughout the developed world.**”*. The above outbreaks and the risk posed by septic tanks cannot therefore be questioned and should be addressed as a priority.

The analogous scenario is therefore possible (as it has occurred elsewhere in similar situations) and could simply be a rainfall event or septic tank overflow event through human error or complacency resulting in an overload of pathogens which the WTP multiple barriers cannot cope with. Thereby the *“Drinking water management fails to effectively control chlorine sensitive pathogens”* and *“Drinking water management fails to effectively control chlorine resistant pathogens, such as Cryptosporidium.”*. Hence using the SSWP risk prioritisation framework, under the water quality assessment criteria the above scenario would result in a Risk Score of 5. As drinking water risks are not downgraded by population, neither should the Binnaway and Mendooran unsewered communities as there is a direct impact on the drinking water supply source which has been identified. It therefore suggests that the framework has either been incorrectly applied to these two towns in this instance or that the framework requires a review whereby risks to public health are not downgraded through use of the environmental risk assessment criteria when public health is concerned.

The WSAA Manual for Microbial Health Based Targets and the long standing USEPA guidance recommends that source water with high risk of sewage contamination should not be used at all. Therefore, the above scenario also presents a water security issue as the backup raw water supply should not be used when required due to the risk of potential contamination and there is also a risk of

contamination of the primary raw water supply which at times may also be considered unsuitable for human consumption.

In regard to Mendooran in particular, the higher phosphorus detected in the bore water compared to the river water is hypothesised to have been linked to the problematic algae blooms which occurred within the sedimentation process at Mendooran WTP. These algae blooms have both caused water safety concerns due to positive detection of potentially toxic blue green algae and water security issues due to decreased WTP output causing severe water restrictions for months. The higher phosphorus was suspected to have come from sewage contamination from surrounding onsite septic systems and the current concerning practices anecdotally said to be occurring regarding septic tank discharges into private bores.

2.3 Conclusion

As mentioned earlier, based on the SSWP risk prioritisation framework: the schemes are currently being assessed as having an inherent risk score of 5 according to the environmental assessment criteria:

“Primary health and high environmental impacts: wastewater from on-site wastewater management facilities has direct impact on drinking water supply source and/or with widespread direct primary contact impact to resident population and/or high impact on waterway uses and values.”

As identified in Councils IWCW Issues paper the Mendooran and Binnaway systems in particular tick all three of the issues underlined above and are a concern.

The risk and notably the identified public health risk as determined by DPIE has then been incorrectly reduced through application of the risk prioritisation framework and comparison to the Protection of the Environment Operations Act 1997 (POEO Act):

“The population risk score was established by grouping the serviced population into five groups, with the highest population group, greater than the equivalent of 2,500 people, reflecting the POEA Act threshold.” (SSWP risk prioritisation framework – June 2020)

However, the Protection of the Environment Operations Act 1997 (POEO Act) relates only to environmental risks and issues and not public health risks, stating:

“The Protection of the Environment Operations Act 1997 (POEO Act) is the key piece of environment protection legislation administered by the EPA.” “The object of the Act is to achieve the protection, restoration and enhancement of the quality of the NSW environment.” (Accessed from <https://www.epa.nsw.gov.au/licensing-and-regulation/legislation-and-compliance/acts-administered-by-the-epa/act-summaries#poeo>)

Therefore, the risk under the environmental assessment criteria correctly reduces this risk due to the population, only for risks relating to an environmental risk. However, this is not appropriate given the direct risk which has been identified for the drinking water sources. Hence the Binnaway and Mendooran unsewered communities and the risk imposed on them by the septic systems should be considered under the Water Quality Assessment Criteria. As there is no population reduction of water quality risk then these projects should also be assessed under this same approach to be consistent with the SSWP risk prioritisation framework and importance placed on concerns to public health.

Alternately if the current SSWP risk prioritisation framework is not flexible enough to address these concerns for the specific cases of Mendooran and Binnaway, then as both Mendooran and Binnaway water supply systems have been identified as a high risk with a risk score of 5, the sewerage of each town could be included as the holistic solution to address the identified public health risk and concerns. The SSWP objective is to address key risks to regional water safety and security in NSW, to provide safe, secure and sustainable water and wastewater services to regional NSW towns. Therefore, a holistic approach is required for Mendooran and Binnaway to address the drinking water quality risks identified. The public health risk associated with the drinking water supply will not be appropriately reduced if only the WTPs are upgraded and the septic contamination issues are not addressed. Both the septic issues and WTP issues should be addressed to appropriately address the overall combined risk to water quality and to ensure SSWP funds used to address issues in a holistic manner for each community.

Ultimately the current onsite septic systems cannot be managed effectively with the current resource restrictions that Council continually faces and the history of bad practices that occur. The ability to

proactively manage a septic monitoring program, like other larger councils currently manage, for smaller communities, is therefore not practical given the remoteness of the council area, the size of the towns, the span between villages and the continued difficulty in securing staffing and adequate resources to monitor compliance and safety across such a vast geographical area. It is also important to note that there are at least nine smaller towns and villages within regional NSW with populations ranging from 176 people through to 435 people that are already seweraged, such as:

- Goodooga – 176 people
- Ivanhoe – 196 people
- Ungarie – 290 people
- Ashley – 297 people
- Nundle – 310 people
- Tottenham – 334 people
- Gurlargambone – 400 people
- Collarenebri – 435 people.

Council therefore wishes to work collaboratively with DPIE to raise the risk impact scores to a 5 for both Binnaway and Mendooran and identify opportunities to address the drinking water risks affected by both the unprotected raw water supply and the stated septic system contamination issues. Both of these risks must be addressed in order to appropriately reduce the Water Quality Assessment Criteria risk score and ensure a resilient, safe and secure water supply for the Binnaway and Mendooran communities.