

DRINKING WATER QUALITY MANAGEMENT PLAN

Registered Water Service Provider No. 534

May 2024

Revision 11



WEIPA
TOWN AUTHORITY



Title	Drinking Water Quality Management Plan V11			
Service provider	Weipa Town Authority			
Revision	Date Reviewed	Prepared By	Reviewed By	Date Approved
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Glossary

AC	Asbestos cement
ADWG	Australian Drinking Water Guidelines
DI	Ductile iron
DRDMW	Department of Regional Development, Manufacturing and Water
DWQMP	Drinking Water Quality Management Plan
ML	Megalitre
NATA	National Association of Testing Authorities
NHMRC	National Health and Medical Research Council
NTU	Nephelometric turbidity units
PE	Polyethylene
PVC	Polyvinyl chloride
RMIP	Risk Management Improvement Plan
RTA	RT Weipa Pty Ltd (Rio Tinto)
WTA	Weipa Town Authority
WTP	Water Treatment Plant

1. Introduction

1.1. About this Document

The Weipa Town Authority's Drinking Water Quality Management Plan (DWQMP) is a risk-based management plan that addresses the requirements of Section 95(3) of the *Water Supply (Safety and Reliability) Act 2008* (the Act), which requires drinking water service providers to prepare a DWQMP. This document has been comprehensively reviewed and updated against the regulator's guidelines (*Guideline for the preparation, review and audit of drinking water quality management plans, 2022, DRDMW*).

The registered service details are included in Table 1-1.

Table 1-1 Registered Service Details

Service Description	Details
Service Provider Identification Number (SPID)	534
Registered Business	RTA Weipa Pty Ltd (T/A Weipa Town Authority) 6 Hibberd Drive Rocky Point QLD 4874 Phone: (07) 4030 9400 ABN: 54 137 266 285

The purpose of this plan is to ensure that the drinking water provided by the Weipa Town Authority is at all times safe and reliable.

This plan supersedes any previously approved version/s of the plan.

The DWQMP documents consists of:

- The DWQMP (this document)
- Risk Register and Improvement Plan (Excel, supporting document)
- Monitoring Programs (Excel, supporting document)
- Water Quality Data Analysis – DWQMP Data Analysis 2024 (supporting document)

1.2. Location

Weipa is a vibrant coastal community situated on the Albatross Bay, on the west coast of Cape York Peninsula, in the Gulf of Carpentaria. The township sits about 200 kilometres south of Cape York and approximately 800 kilometres from Cairns by road (or 500 km by air). Weipa is home to approximately 3,673 people with an additional 2,615 people living in the adjoining communities of Napranum, Mapoon and Aurukun. Weipa is the service hub of the region with major health, education, transport and shopping facilities located in the town.

Weipa is unique in Queensland in terms of its governance. It is the only town in Queensland that does not currently have a local government. The Weipa Town Authority (a subsidiary of RTA Weipa Pty Ltd) manages the town, which is partly funded by RTA Weipa Pty Ltd, under the *Comalco Act 1957*. This Act gives the town the status of a Special Bauxite Mining Lease which is now controlled by RTA Weipa Pty Ltd and covers an area of approximately 3,860 square kilometres.

The Weipa community commenced development in 1965 as a part of the original Comalco Bauxite mining lease.

Figure 1-1 provides a locality map of Weipa.



Figure 1-1 Locality map Far North Queensland. Source: EPA Queensland (now DESI)

1.3. Town and Community Water Management Structure

The Weipa drinking water supply is the joint responsibility of Weipa Town Authority (RTA Weipa Pty Ltd trading as Weipa Town Authority - WTA) and RTA Weipa Pty Ltd's Tailings and Water Department. Hence, it's the same organisation (Rio Tinto) with WTA and the Tailings and Water Department seen as different branches. WTA owns and maintains the DWQMP document but both branches (WTA and the Tailings and Water Department) jointly manage the water supplies.

WTA is the Local Authority for the town of Weipa. WTA is the caretaker of Weipa Town Assets. These include roads, water, sewer, parks, gardens, public buildings and sporting facilities. WTA maintains these assets using a limited rates budget while the majority of major capital works are funded by RTA Weipa Pty Ltd. WTA, through the rates system, charges Weipa residents and businesses for water connections and use.

The DWQMP covers three water supply schemes:

- Rocky Point Water Supply Scheme;
- Evans Landing Water Supply Scheme;
- Airport Water Supply Scheme.

The drinking water delivery, quality, water testing (and sampling) and infrastructure operational responsibilities of WTA and the Tailings and Water Department for each water supply system are demonstrated by the following figures and tables:

- Figure 3-1 Rocky Point Water Supply Scheme – Rocky Point (including Golf Links Estate), Trunding and Nanum Schematic;
- Figure 3-6 Evans Landing Water Supply Schematic;
- Figure 3-12 Airport Water Supply Schematic; and
- Table 4-1 Water Quality Sampling locations.

It should be noted that WTA and the Tailings and Water Department have an internal agreement:

- Outlining delivering, quality, water testing (and sampling) and infrastructure operational responsibilities as detailed immediately above;
- For the Tailings and Water Department to provide potable water in compliance with the ADWG and this DWQMP to each of the three water reticulation networks (Rocky Point, Evans Landing and Airport);
- For WTA and the Tailings and Water Department to assume and undertake responsibility for the operational and verification monitoring as per this DWQMP document;

- Outlining incident parameters, triggers, incident management processes and reporting requirements as defined by this DWQMP document;
- That WTA is responsible for all Regulator Water Service Provider requirements and reporting; and
- That WTA is the contact for customers regarding any water issues or concerns.

These water supply systems provide water to approximately 1,800 connections.

Table 1-2 outlines the water supply schemes, operational responsibilities and current estimate of demands in each area based on flowmeter data. Note, there is a temporary increase in population in Rocky Point due to an annual rodeo event but this does not adversely impact water supply.

Table 1-2 Listing of Drinking Water Supplies

Scheme Name	Operational Responsibility		Communities Served	Pop. Served (2021 census)	No. Connections	WTP Capacity (ML/day)
	Source and Treatment	Distribution				
Rocky Point	Tailings and Water Dept	WTA	Rocky Point (including Golf Links)	2,214	1,145	15.1
			Trunding	929		
			Nanum	904		
Evans Landing	Tailings and Water Dept	WTA	Evans Landing (Weipa)	56	66	2.00
Airport	Tailings and Water Dept	WTA	Airport precinct	600 ¹	7	1.03
TOTAL				4,703	1,218	18.13

1.4. Key Stakeholders

Table 1-3 lists the key stakeholders who contribute to the management of, hold an interest in, or could be impacted by the quality of drinking water supplied by the three schemes.

¹ Permanent population served is less than 30. 600 is the itinerant population passing through the airport terminal.

Table 1-3 Stakeholders

Stakeholder/ Organisation	Contact Name or Position and Details	Relevance to Weipa Town Water Supply	How the stakeholder is engaged in the DWQMP
Weipa Town Authority (WTA), RTA Weipa	<p>Superintendent 07 4030 9400 (overall position responsible for the DWQMP)</p> <p>Public Works Supervisor 07 4030 9400</p> <p>Public Works Coordinator 07 4030 9400</p> <p>Communities Supervisor 07 4030 9400 (responsible for review and update of the DWQMP)</p> <p>Other WTA Staff, as relevant</p>	<ul style="list-style-type: none"> Responsible to the Regulator for Weipa Town Water Responsible for distributing, testing and water quality Customer service - complaints, queries, concerns, issues, notification Networks – management, investigation, engineering, design, upgrades, modification, chemicals, monitoring, reporting 	<p>Development and maintenance of the DWQMP – information, data, reports, operational details, risk assessment, reviews and audits</p>
Tailings and Water Department, RTA Weipa	<p>Manager Tailings and Water 0417 615 136</p> <p>Superintendent Tailings and Water 0447 076 374</p> <p>Tailings and Water Technical Lead 0499 556 037</p> <p>Process Engineer 0447 076 374</p> <p>Civil Utilities maintenance supervisors 0428 673 810 (Crew 3) 0457 223 201 (Crew 4)</p> <p>Water and Sewerage Callout Phone – 0439 709 048</p>	<ul style="list-style-type: none"> Sourcing, treating and supplying drinking water to the WTA distribution networks at a standard described by the ADWG and in accordance with the Tailings and Water Department – internal Agreement with WTA to supply drinking water. Approval of funding for major capital works Reporting raw water quality issues to WTA Health safety and environment services WTA's maintenance provider for raw water – reporting to/direction from WTA Support WTA in the management, investigation, reporting and rectification of water quality or delivery concerns. 	<p>Providing input into DWQMP</p> <p>Participated in risk assessment workshops</p> <p>Involvement in plan review, as relevant</p>
Cairns Regional Council Water & Waste - Laboratory Services	<p>Lab Manager 07 4044 8344</p>	<ul style="list-style-type: none"> WTA's preferred suppliers for laboratory services - engaged to process water and sewage samples 	<p>Not directly engaged</p>
SGS Australia, Cairns	<p>Lab Manager 07 4035 5111</p>	<ul style="list-style-type: none"> Tailings and Water Department's supplier for laboratory testing 	<p>Not directly engaged</p>
Department of Regional Development, Manufacturing and Water	<p>Water Supply Regulator PO Box 15456 City East Q 4002 Ph 1300 596 709 (incident hotline)</p>	<ul style="list-style-type: none"> Water Regulator For WTA SP 534 reporting, incidents and Regulator requirements 	<p>Regulatory oversight – provide support materials, guidance, plan approval, incident reporting requirements</p>

Stakeholder/ Organisation	Contact Name or Position and Details	Relevance to Weipa Town Water Supply	How the stakeholder is engaged in the DWQMP
Queensland Health	Environmental Health – Tropical Public Health Services (Cairns) 07 4226 5555 0428 560 670	<ul style="list-style-type: none"> Reporting of risks to health 	Advice and guidance in relation to incidents
Consumers / Customers	Jaime Gane – WTA Chairperson 0447 696 970	<ul style="list-style-type: none"> WTA members approve yearly rates budgets which include operation/capital funding for water/sewer plus minor projects Representative for the Weipa Residents In case of emergency – Chair of the Weipa Disaster Management Committee 	Not directly engaged

1.5. Regulations

The regulations relevant to the supply of drinking water are:

- *Water Supply (Safety and Reliability) Act 2008*
- *Public Health Act 2005*
- *Public Health Regulation 2018*
- *Plumbing and Drainage Act 2018*
- *Environmental Protection Act 1994*

2. Catchment Characteristics

Weipa is based in the equatorial (savannah) climatic zone, with an average annual rainfall of 2000 mm. Average annual temperatures are 30°C, with average daily minimum of 22°C and average daily maximum of 33 °C. The associated catchment drains to both the Embley and Mission Rivers, which serve as the Port of Weipa.

The area has a forecasted risk of dryland salinity in 2050, based on national dryland salinity risk mapping. Figure 2-1 shows a map of the surrounding area.



Figure 2-1 Map of Weipa and Surrounding Area

There are two continuous operating mines within a 50 km radius of the Weipa township (East Weipa and Andoom), mining bauxite. Other mines and mineral deposits in the region include:

Table 2-1 Mines and Mineral Deposits

Name	Operating Status	Commodities
Weipa	Historic Mine	Kaolin
East Weipa	Closed Mine	Bauxite
Amrun	Operating Mine	Bauxite
Napranum	Operating Mine	Sand
Urquhart Point	Under Construction	Sand

There is no surface water supply in the scheme, and water is sourced from the Weipa Tertiary Sediments / Shallow Aquifer. This is recharged over the wet season, with a general groundwater

decline over the year, until recharge occurs. Details of the shallow (as compared to the Great Artesian Basin) aquifer bores including depth and flows are given in Section 3.

Weipa Township Wastewater Treatment Plant is located 5 km north of the township along Andoom Road and discharges to the Mission River. Lorim Point Wastewater Treatment Plant (Evans Landing Scheme) is located along the Peninsula Development Road and discharges to the Embley River. Both discharges have environmental licences. While both treatment plants do not pose a risk to the water supply catchment, sewerage reticulation assets are located close to bores in Rocky Point which are used to source water. However, the sewerage pipes are located at different depths and locations to the water pipes, hence minimising the risk of cross connection and cross contamination. The sewerage treatment plants are operated by the RT Mine under its EA licence EPML00725113 and EPP03383115.

The Weipa Landfill is approximately 7 km from Evans Landing and is not located in close proximity to any bores. RT Weipa manage the landfill under its EA licence EPML00725113.

A tailings dam is located along Andoom Road. This contains sand and water, and is benign.

The new Amrun bauxite mining operation south of the Embley River, not in the direct vicinity of the Weipa Township, does not impact the water supply management and delivery for Weipa, as it is supplied water by mining operations (outside of the DWQMP scope).

There are no other chemicals of concern used in relation to the mining operation which would cause a risk to the drinking water supply. The types of chemicals transported include fuel for vehicles and equipment, as well as chlorine, caustic and lime for drinking water treatment.

There are natural oscillations of groundwater levels between the wet and dry seasons.

The high-quality source water for all three supplies means that only chlorine disinfection is needed. However, the source water is naturally low in pH, so pH correction is also conducted.

Further details on land-use in catchment and potential sources of hazards is included in the *Risk Register and Improvement Plan 2024* spreadsheet (a DWQMP supporting document).

Additionally, information on catchment/source protection is included in the *DWQMP Data Analysis Report 2024* (DWQMP supporting document).

3. Source, Treatment and Distribution Summary

3.1. Rocky Point Water Supply Scheme

The town of Weipa consists of four community areas - Rocky Point (including Golf Links Estate), Trunding, Nanum and Evans Landing (separate supply scheme). All supplies are potable water and pressure on demand.

Figure 3-1 below provides a schematic overview of the Rocky Point water supply scheme.

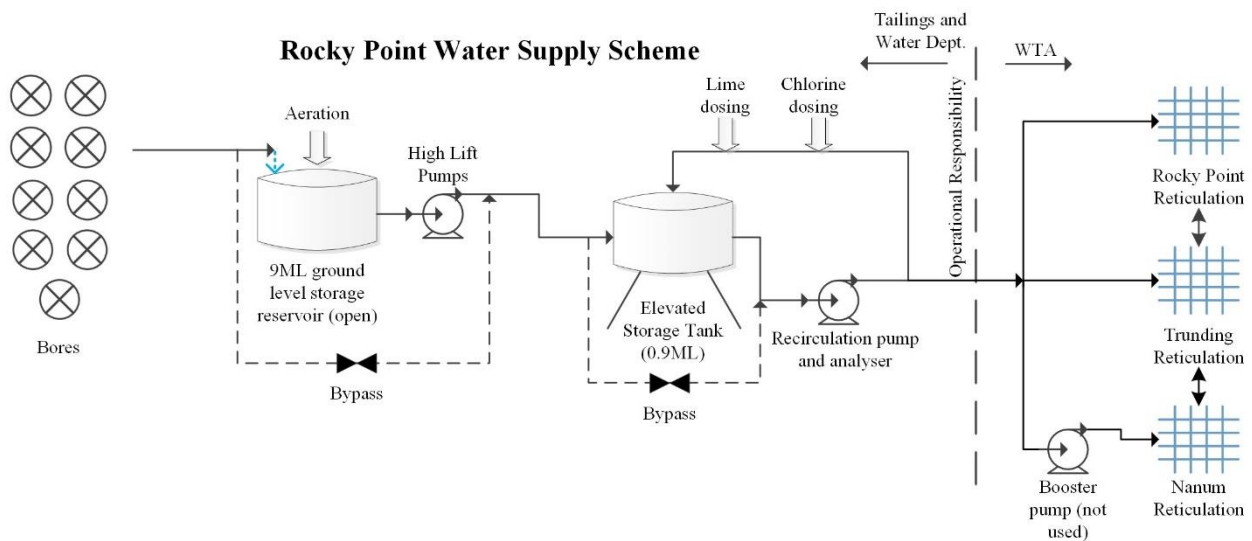


Figure 3-1 Rocky Point Water Supply Scheme - Rocky Point

3.1.1. Source

The Rocky Point water supply scheme water storage facility is located on Land Street, Rocky Point. This water supply scheme provides water to Rocky Point (including Golf Links Estate), Trunding and Nanum. The water for this scheme is sourced from nine shallow aquifer bores (Town and Andoom bores).

RT Weipa Pty Ltd hold a licence (under the *Water Act 2000*) with a nominal entitlement of 4,000 ML (licence number 179120).

Figure 3-2 shows the locations of the bores supplying the Rocky Point scheme. Note, SA350 is a bore for irrigation use by the Golf Club and is not a drinking water bore.

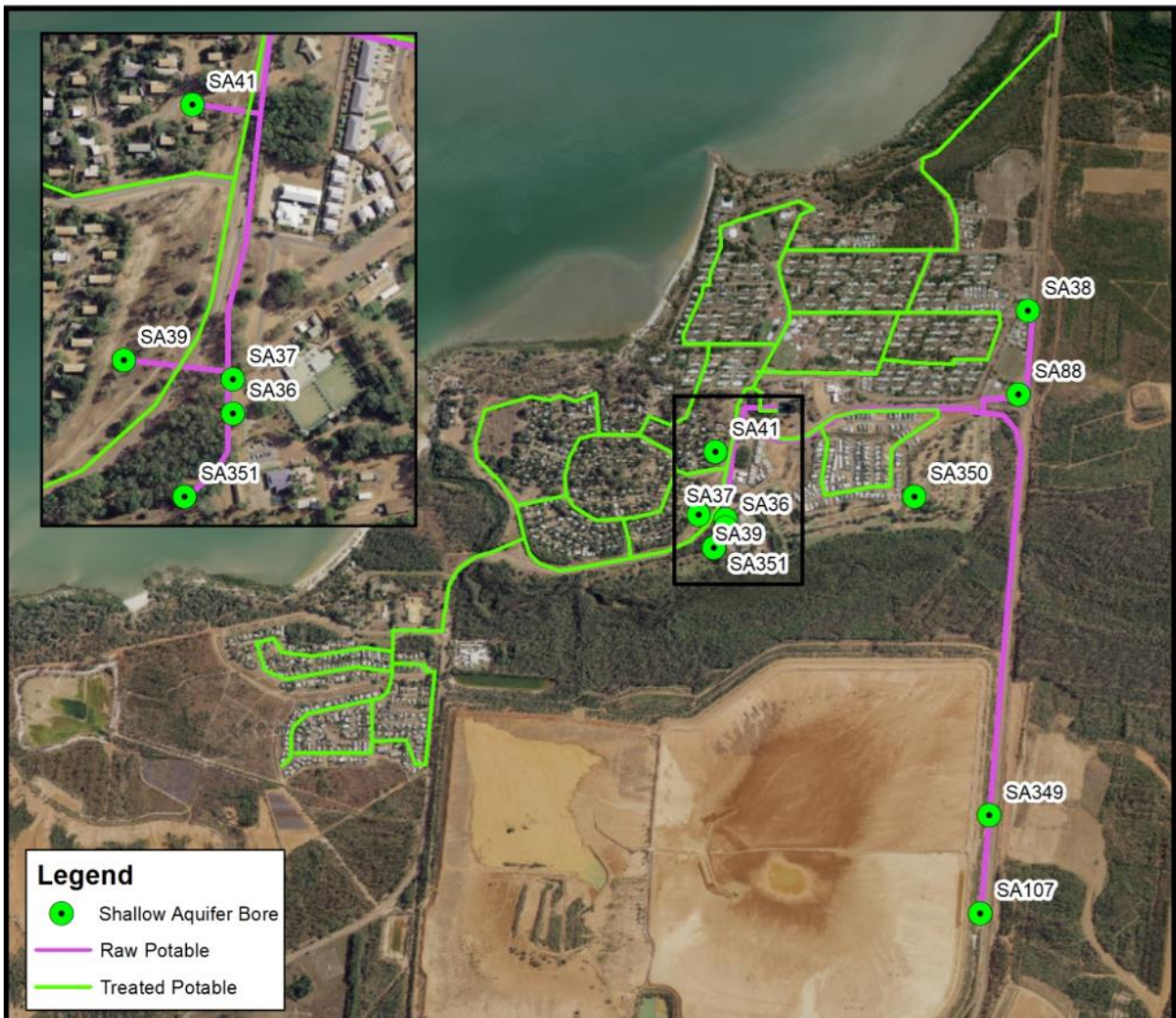


Figure 3-2 WTA Bore Locations – Rocky Point Scheme

All bores are linked and controlled via telemetry, however, all can also be controlled manually, as required. The bore pump operations are set within the programming of the central telemetry system. The program operates the bore field in a starting sequence based on a defined dam level input. The duty bores are generally not rotated as the main duty bores produce the bulk of the water within the system. The program does allow for rotation of duty bores, as required.

The bore fields are not located in an area that is affected by the bauxite mine. The bores are generally referred to by groups;

- Andoom Bores (SA38, SA88, SA349 and SA107)
- Town (or Central Ave.) Bores (SA36, SA37, SA39, SA41 and SA351).

As water demand varies significantly from dry season to wet season, so does the operation of the bores. Generally, during the wet season approximately one to three bores are required to maintain supply. During the peak of the dry season, seven to eight bores are required to maintain supply.

Table 3-1 Town Bore details – Weipa Town Water Supply Scheme - Rocky Point

Bore	Year sunk	Depth (m)	Diameter (mm)	Screen Depth	Yield, Mean Flow (L/s)	Original pump Motor	Current pump Motor	Telemetry
SA36	1976	11.5	254	9.9-11.5	19.2	18	7.5	yes
SA37	1964	12.8	254	9.9-12.8	18.9	11	11	yes
SA38	1983	13.2	203	8.8-11.8	14.7	18	7.5	yes
SA39	1972	13.8	254	11.4-13.8	16.9	18	7.5	yes
SA41	1971	16.8	254	14-16.8	24.9	7.5	7.5	yes
SA88	2018	13.5	455	10.0-13	12.5	7.5	7.5	yes
SA107	1977	16.5	203	11.5-14	18.9	11	7.5	yes
SA349	1997	20.05	285	13.7-18.4	15	18	7.5	yes
SA351	-	11.55	200	8.4-11.55	-	7.5	7.5	yes

The bores are typically constructed with a steel casing and a concrete platform at the surface, generally the casing extends above ground to minimise inundation or surface flows. All bores supplying the potable networks are fenced.

3.1.2. Storage and Treatment

The Town and Andoom bores supply a 9 ML ground water open storage dam, which is HDPE lined. The dam has elevated walls so that the surrounding runoff water does not enter the dam. The length of time that the water is stored in the 9 ML dam depends on water usage. During the dry season, Weipa township uses up to 10 ML of water per day – therefore, water is turned over within the dam in under a day during the peak of the dry season. However, during the wet season the township can use as little as 2 ML per day – therefore, water could be stored for up to five days. The dam does not have roll over or algal issues.

The Rocky Point water supply scheme water quality is generally good. The water is soft, with a low pH. The raw water is ‘aerated’ within the dam prior to the water being pumped to the lime/chlorine plant and the adjacent 0.9 ML elevated reservoir. Water falls into the dam from a height, which provides some aeration action. However, aeration per se is not undertaken to improve water quality.

The high level storage tank is constructed of steel and roofed. The roof of the water reservoir ensures runoff water is directed away from the tank and is generally sealed to prevent access by vermin. Some issues with the reservoir integrity were identified and these will be addressed as part of the Improvement Plan.

The two centrifugal, high lift pumps (one duty, one stand-by) are located in an open concrete pit between the dam and the high level reservoir. The high lift pumps are automatically controlled via hard wired electrical design and are activated through float switches located in the elevated reservoir. The pumps were originally designed to operate on a duty-standby basis but at high demands now can operate as duty-assist.

Lime (calcium hydroxide) and chlorine (sodium hypochlorite) are automatically injected into a trim dosing recirculation line off the elevated reservoir. The outflow sensors are interlocked with the reticulation dosing system to ensure target chlorine and pH levels are achieved within the elevated reservoir. There is also fixed dosing of lime and chlorine that is calibrated to the high lift pump

operation. This is to minimise recovery time of the reservoir following raw water top up. Both lime and chlorine systems are interlocked with the pumps for high level shut off and low level alarm. There are bypasses (dam and reservoir). The dam bypass is used periodically (couple of years) to desilt the dam as needed. However, disinfection is not bypassed. The reservoir bypass has not been used.

Target residual levels of chlorine and pH are included in the Monitoring Programs excel spreadsheet (DWQMP supporting document). These are monitored via SCADA. Operators receive alarms for out-of-spec results. In addition, SCADA is also monitored offsite 24/7 by RTA staff based in Brisbane to provide an additional layer of control measure, especially during out of hours time. Section 4 below outlines the water quality monitoring undertaken on the supply scheme.

Figure 3-3 to Figure 3-5 show the water treatment and storage infrastructure.



Figure 3-3 Open Storage



Figure 3-4 Elevated Water Storage



Figure 3-5 Lime Dosing Facility

3.1.3. Distribution

Water is distributed from the elevated reservoir to the community areas via a reticulation pipework. A booster pump was installed near the Nanum shopping centre to ensure there was adequate water pressure in Nanum Stages 1, 2 and 3. However, this pump is currently not operational and water pressure testing shows adequate pressure in the Nanum area.

The reticulation system consists of pipes of PVC, DI, AC and PE, constructed between 1973 and 2014. There is approximately 47 km of reticulation network supply in Weipa. There are no obvious locations where potential long detention periods could be expected (e.g. dead ends).

3.2. Evans Landing Water Supply Scheme

The water for Evans Landing is supplied to the WTA town boundary located on Florence Hibberd Drive, Evans Landing, via a water storage facility owned and operated by RTA Weipa – Tailings and Water Department. The water storage facility is located within the compound of the RTA Civil Workshop.

Figure 3-6 below provides a simplified schematic process overview of this scheme.

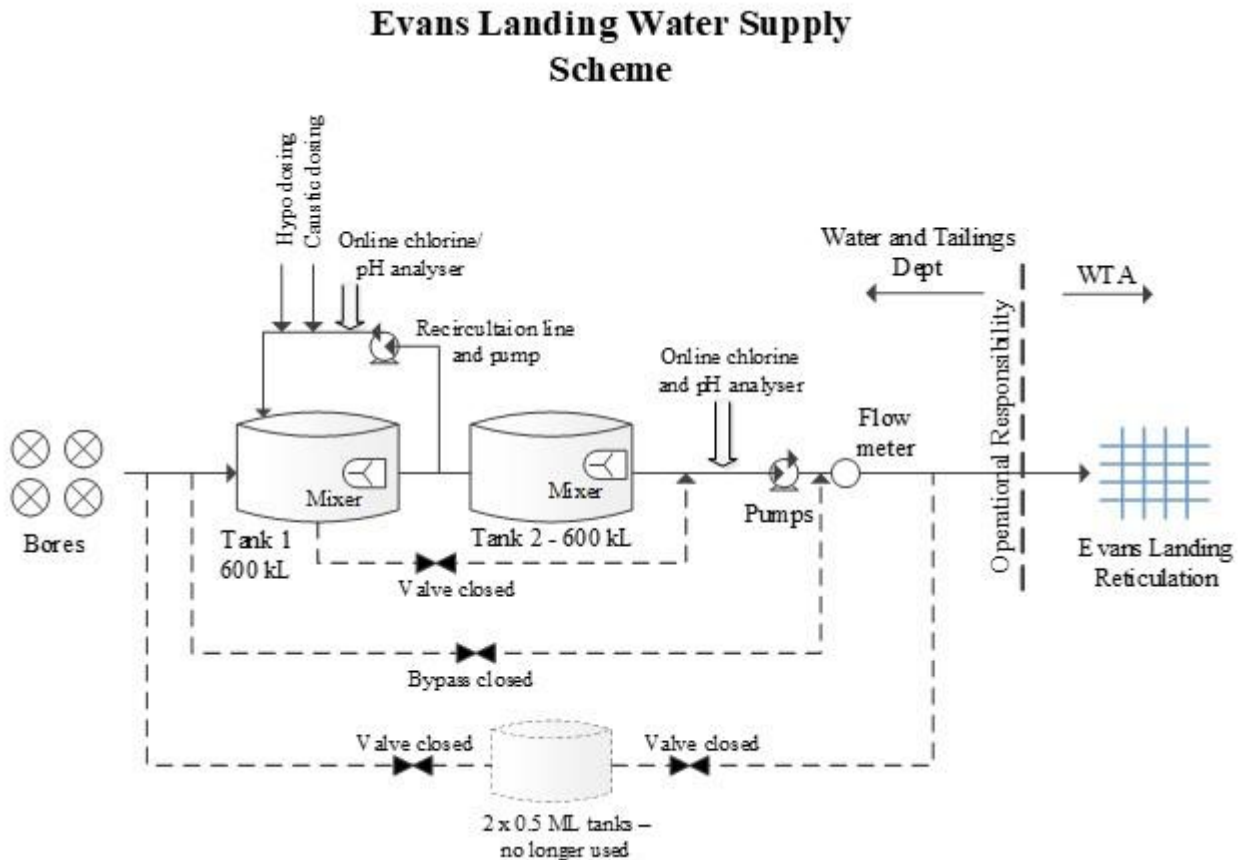


Figure 3-6 Evans Landing Water Supply Schematic

3.2.1. Source

The Evans Landing water is sourced from four shallow aquifer bores licenced to RT Weipa Pty Ltd. Some bores have been decommissioned (SA14, SA15 and SA110). All bores have individual pumps with a central controller and are linked by telemetry. This water storage facility supplies the RTA Weipa site with potable water, in addition to the WTA Evans Landing customers.

The bores are typically constructed with a steel casing and concrete cover, 300 mm above ground as per Rocky Point scheme.

A typical bore head in the Evans Landing scheme is shown in Figure 3-7 and Figure 3-8. Bore details are given in Table 3-2.

Figure 3-11 shows the locations of the bores.



Figure 3-7 Typical Borehead located on RT Weipa Site (SA12)



Figure 3-8 Typical Borehead located on RT Weipa Site (SA12)

Table 3-2 Bore Details - Evans Landing

Bore	Year sunk	Depth (m)	Diameter (mm)	Screen Depth	Yield, Mean Flow (L/s)	Current pump Motor	Telemetry
SA12	2004	20	273	14.5-17.5	47	7.5	yes
SA13	2004	20	273	14.2-17.2	30	7.5	yes
SA17	2004	20	273	15.0-18.0	11	7.5	yes
SA20	2004	21	273	15.3-18.3	33	15	yes

Notes:

- Bore SA14, 15 and 110 are no longer in use.

3.2.2. Storage and Treatment

Evans Landing is the designated industrial area in Weipa and consists mainly of industrial and commercial properties. The water quality is generally good. The water is soft, with a low pH.

The water treatment includes pH correction via caustic dosing and disinfection using sodium hypochlorite (Figure 3-9). The chemicals are dosed into the recirculation pipe to Tank 1, with online analysers at the Tank 2 outlet for auto adjustment of the dosing. The online analysers are linked to SCADA. There are two 600 kL (each) potable water storage tanks constructed of steel (Figure 3-10). The tanks have bolted lids and hatches to prevent access by vermin, and stormwater runoff is directed from the roof away from the tank. The old tanks are no longer used for potable supply and have been valved off.

Section 4 below outlines the water quality monitoring undertaken on the supply scheme.



Figure 3-9 Evans Landing Dosing Systems



Figure 3-10 Evans Landing Potable Water Tanks

The new tanks and dosing systems became operational in July 2021.

The sodium hypochlorite and caustic systems consist of two pumps installed in a duty / standby configuration arrangement. There are also fault alarms if the pumps stop working. A flowmeter measures the potable water flow.

In addition, SCADA is monitored offsite 24/7 by RTA staff based in Brisbane to provide an additional layer of control measure, especially during out of hours time.

3.2.3. Distribution

The water is delivered via a trunk main with a standalone flow meter/comms for Evans Landing, the location of which is shown in Figure 3-11.

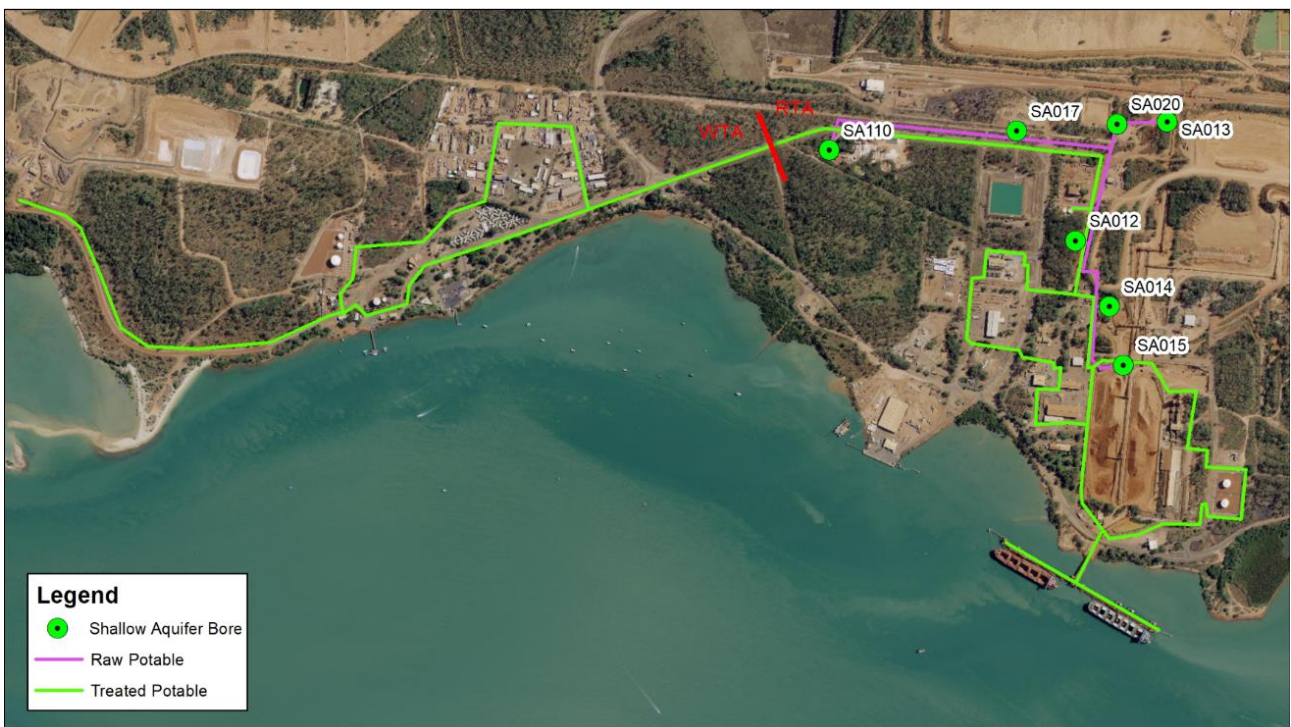


Figure 3-11 Location of Potable Water Meter on Water Supply Main to Evans Landing

The reticulation system consists of PVC and AC pipework, constructed between 1975 and 2003. This network forms approximately 11% (approximately 5 km) of the overall potable water network length in Weipa. There are currently no reported issues with low pressure within this system.

3.3. Airport Water Supply Scheme

The Airport water supply scheme was commissioned and became operational on 18 April 2017. The water for the airport reticulation is supplied to the Airport Precinct boundary via a water storage facility owned and operated by RT Weipa – Tailings and Water Department. The water storage facility is located on mining lease which is part of RTA Weipa’s site and outside of the Weipa town boundary.

Figure 3-12 below provides a simplified schematic process overview of this scheme.

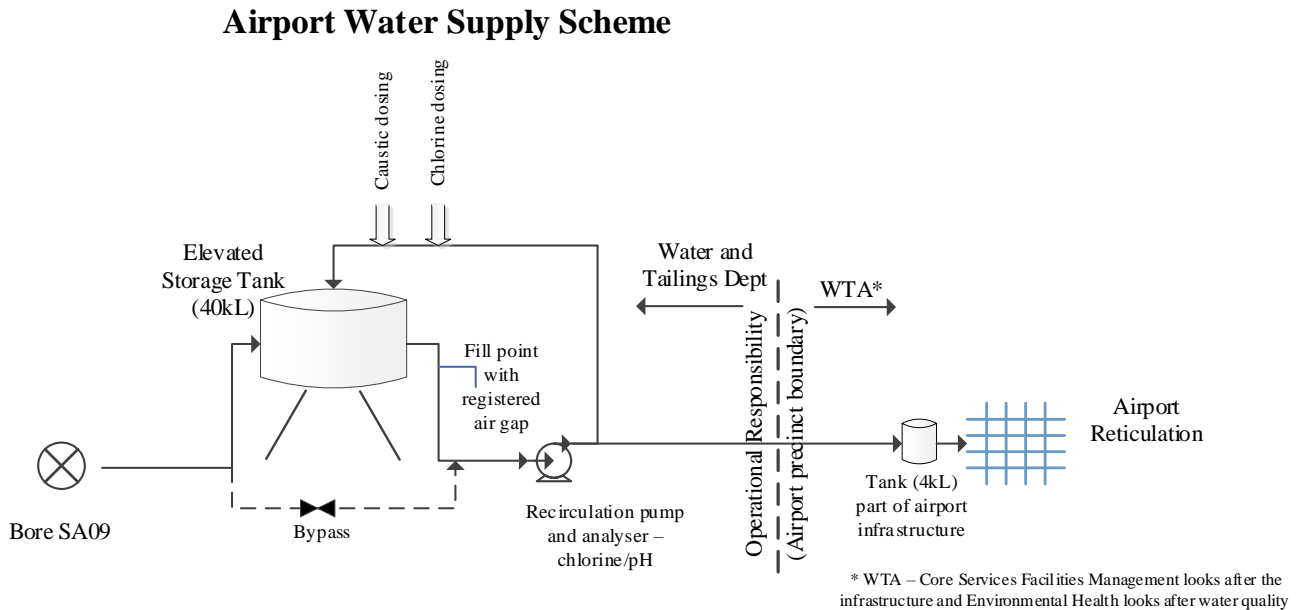


Figure 3-12 Airport Water Supply Schematic

3.3.1. Source

The raw water was originally sourced from two shallow aquifer bores SA26 and SA09 licenced to RTA Weipa. Due to PFAS issues encountered in SA26 in late 2020, SA26 has been disconnected from the supply. The primary bore is now SA09. The bore water is fed to an elevated potable tank which supplies the airport precinct, its surrounding businesses and the motocross tracks. The bore location can be seen in Figure 4-2 marked number 13.

Bore details are given in Table 3-3.

Table 3-3 Bore Details - Airport

Bore	Year sunk	Depth (m)	Diameter (mm)	Screen Depth	Yield, Mean Flow L/s	Current pump Motor	Telemetry
SA09	2006	22	273	15.1-19.1	50	15	yes

Notes:

- Bore SA26 is no longer in use.

3.3.2. Storage and Treatment

The water from the bore is stored in an elevated poly tank with a volume of 40,000 L, refer Figure 3-13.

A new sodium hypochlorite dosing facility was installed and commissioned on 18 April 2017 to provide disinfection to the water supply for the Airport Precinct. The dosing facility is situated adjacent to the elevated water tank. Sodium hypochlorite is pumped into the tank via a recirculation line off the distribution line. A reservoir bypass is in place if required but has never been used.

The following equipment are present at the site:

- 2 x dosing pumps, one each for chlorine and caustic
- 2 x Chlorine and pH analysers and controllers. Both analysers monitor but only one controls the chlorine and pH
- chemical storage tanks with integrated bunding
- 1 x centrifugal pump for recirculation
- 1 x pump for pressurising the main

The duty dosing pump is set to a dosing set point for free chlorine.

pH control is achieved through dosing liquid caustic soda (Sodium Hydroxide) into the same reticulation system as the chlorine dosing. This system was commissioned in September 2019.



Figure 3-13 Elevated Storage Tank

3.3.3. Distribution

Drinking water is delivered to the airport facilities via a trunk main with a bulk meter that measures the cumulative flow. There is a small poly tank (4 kL) at the airport (part of airport infrastructure). The airport distribution infrastructure is maintained by the Core Services Facilities Management Team of RTA while water quality is monitored by WTA's Environmental Health team. The tank is roofed and vermin proof. The pipes are less than 5 years old.

4. Water Quality Information and Monitoring

A detailed analysis and interpretation of available water quality data was undertaken to guide the risk assessment process in 2020, 2021, 2022 and in 2024, including performance, trends and to identify any potential hazards of concern or issues. The most recent water quality data analysis report is available as a separate DWQMP supporting document (Viridis, 2024).

The Tailings and Water Department and WTA undertake a range of water quality testing on source water and treated water for all schemes to inform risk assessments and ensure compliance against the ADWG.

Operational monitoring is undertaken by both WTA and the Tailings and Water Department. The operational monitoring program is appropriate to assess and confirm the effective operation of the preventive measures and barriers. Monitoring locations ensure that the groundwater quality remains protected (CCP1), disinfection is working effectively (CCP2) and chlorine residual is maintained in the reticulation (network operational monitoring). The frequency is appropriate for guiding the need for corrective actions for the supplies, which are simple and not complex schemes, and have low inherent risks. SCADA provides continuous online monitoring of the CCPs. Daily (Mon-Fri) grab/field tests for other parameters works well with no significant historical issues noted over the weekends.

Verification monitoring is undertaken by WTA. The verification monitoring program is appropriate to assess and confirm that the drinking water complies with the water quality criteria (ADWG values). Weekly samples are collected for *E. coli*, total coliforms and HPC. The monitoring locations are representative of the reticulation network. The samples are tested at a NATA accredited laboratory.

Where the water quality test results of treated water have not complied with ADWG Health Guideline Values for Drinking Water, the lab notifies WTA as soon as they have preliminary results. This instigates an investigation, regulator reporting and an incident response, this procedure is described in Section Management of Incidents.

The monitoring programs are described in detail in the Monitoring Programs Excel spreadsheet (DWQMP supporting document). Also included in the spreadsheet (as a tab) is information on the *C.t* for the water supplies.

WTA has also invested in the SWIM software to enhance data record keeping and regular reviews. The use of SWIM came online in early 2021 (although some historical data has been uploaded). Out-of-spec results generate auto SMS on phones and emails to relevant DWQMP team members for follow up and corrective actions, as relevant.

A list of sampling points is provided in the Table below. A map of where sampling points are located are in Figure 4-1 and Figure 4-2.

Table 4-1 Sampling Point Locations

ID on map	Location	Scheme	Testing Responsibility	Raw / Treated
1	Individual Andoom Road bores	Rocky Point	Tailings and Water Department	Raw
2	Individual Town or Central Ave bores	Rocky Point	Tailings and Water Department	Raw
3	Town Dam (combined bore water)	Rocky Point	Tailings and Water Department	Raw
4	Town Supply (base of water tower)	Rocky Point	Tailings and Water Department	Treated
5	Rocky Point tap end of line Hibberd Drive (Weipa Aquatic Centre)	Rocky Point	WTA	Treated
6	Trunding tap end of line Duyfken Crescent (Alby)	Rocky Point	WTA	Treated
7	Hospital Water meter tap - Nanum	Rocky Point	WTA	Treated
8	Christie Avenue - Nanum	Rocky Point	WTA	Treated
NA	Individual bores	Evans Landing	Tailings and Water Department	Raw
10	Tank inlet (combined bore water)	Evans Landing	Tailings and Water Department	Raw
10	Tank outlet (treated water)	Evans Landing	Tailings and Water Department	Treated
11	18 Iraci Crescent	Evans Landing	WTA	Treated
12	Evans Landing tap (Fisheries Office) - end of line Landing Drive	Evans Landing	WTA	Treated
13	Airport Supply (Tap A before treatment, representative of SA09)	Airport	Tailings and Water Department	Raw
14	Airport Supply (after treatment tank outlet)	Airport	Tailings and Water Department	Treated
15	Airport tap (arrivals terminal)	Airport	WTA	Treated



Figure 4-1 Sampling Point Locations - Rocky Point Water Supply Scheme

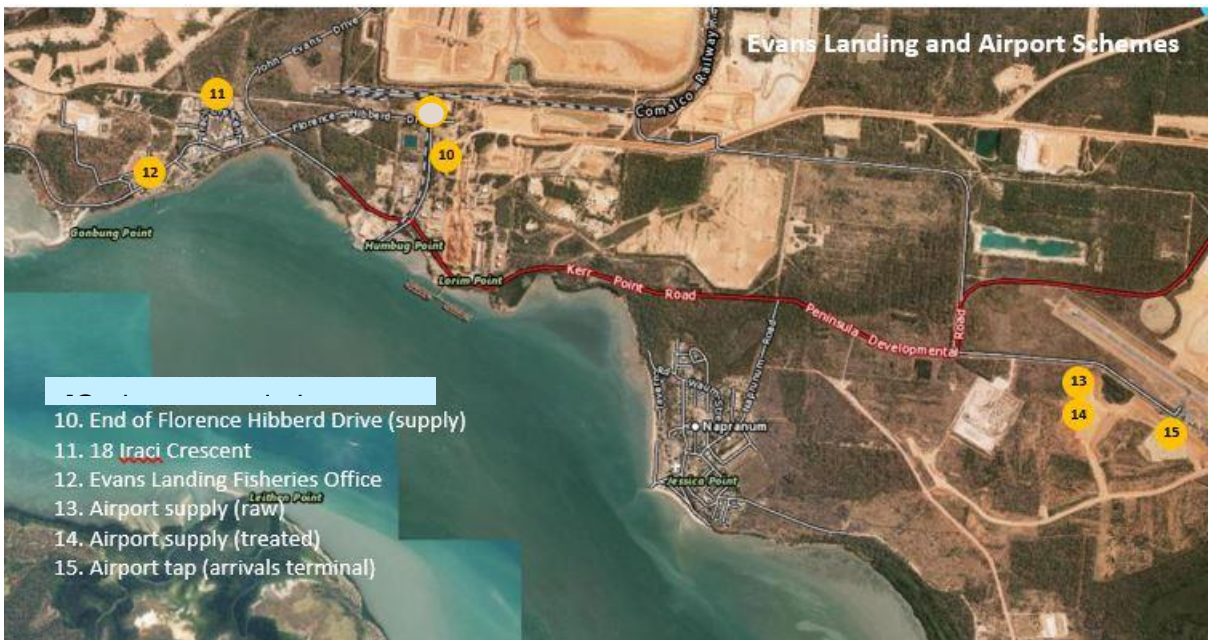


Figure 4-2 Sampling Point Locations - Evans Landing and Airport Water Supply Scheme

5. Identify Hazards and Hazardous Events

5.1. Hazard Identification

Hazards and hazardous events have been identified based on the data/information collected and analysed for the water supply system and infrastructure including treatment, water quality data and catchment characteristics. The hazards and hazardous events were also identified considering the process component and categories depicted by Figure 5-1, where possible.

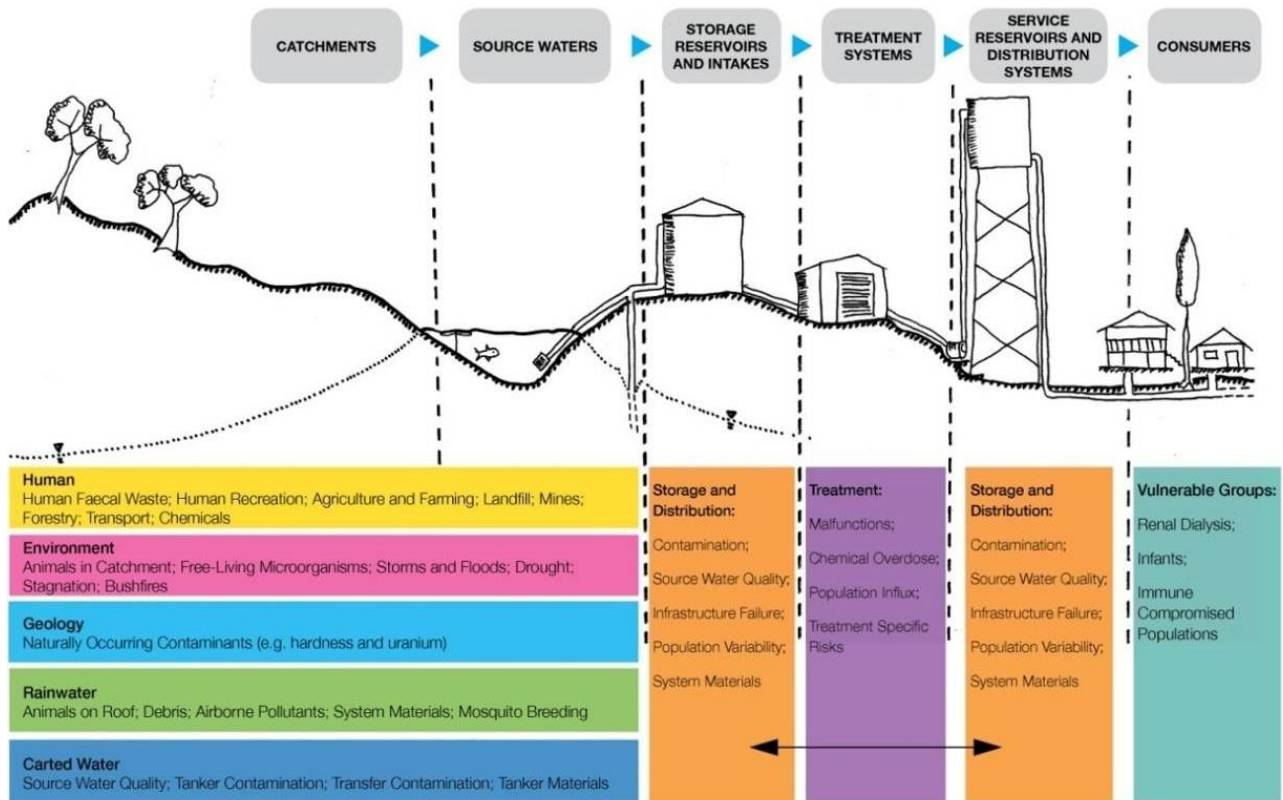


Figure 5-1 General Process Components and Events Considered in the Risk Assessment

5.2. Risk Assessment

The most recent risk assessment workshop was undertaken on 5-6 March 2024 for the supplies. The workshop participants are listed in the Risk Register and Improvement Plan, Excel spreadsheet (DWQMP supporting document).

The previous workshops for the supplies were undertaken in 2020, 2021 and 2022. The workshop participants are listed in the Risk Register and Improvement Plan, Excel spreadsheet (DWQMP supporting document).

The workshop prior to 2020 was held on 04 September 2019 to review hazards and risk management. The details of the people involved in the 2019 workshop can be seen in revision 8 of the DWQMP. The risk team for the workshops from 2020 onwards is maintained in the Risk Register and Improvement Plan, Excel spreadsheet.

The risk assessment outcomes are supported by the risk assessment team, including the WTA Communities Supervisor, WTA Superintendent and Manager Tailings and Water. Refer also to Section 7 for commitment.

5.3. Methodology

The risk matrix used for the risk assessment has been adopted from the Regulator's publication Preparing a Drinking Water Quality Management Plant Supporting Information (Sept 2010). The risk assessment method and application, definitions of likelihood, consequence and uncertainty are presented in the Risk Assessment Method tab of the Risk Register and Improvement Plan spreadsheet (DWQMP supporting document). The risk assessment method application is adopted from the ADWG where both maximum and residual risks are assessed.

5.4. Acceptable Risk

Residual risks scored as low and medium, are classified as acceptable risks. Risks with a rating of high or extreme in the risk assessment (unacceptable risks) have an associated action entered in the Improvement Plan. However, low and medium risks can still have improvement actions assigned where it is identified that the process could be improved or optimised to ensure an enhanced risk management strategy.

6. Managing Risks

6.1. *Preventive Measures*

The preventive measures were identified at the risk workshop and are listed in the Risk Register and Improvement Plan, Excel spreadsheet (DWQMP supporting document).

6.2. *Critical Control Points*

A critical control point (CCP) is defined as an activity or process at which control can be applied and which is essential to prevent a hazard or reduce it to an acceptable level. Not all activities are amenable to selection as CCPs. The ADWG recommends establishment of CCPs.

A CCP is generally a point or location where the hazard is significantly controlled or reduced, monitoring frequency is appropriate (online continuous preferred, if possible) and timely action can be taken to remove or reduce compromised water from getting to customers. Hence, these are generally upstream of reticulation and is different to general operational and verification monitoring.

The preventive measures were investigated to determine if they were a CCP, based on guidance from the ADWG and technical knowledge of the risk workshop facilitator. For each identified CCP, target and limits were set and defined as follows:

- Target – this is where you want your system to be operating. Try to maintain levels equal to or better quality to the required value.
- Alert – indication your system may have a problem or a potential problem.
- Critical Limit – urgent action is required e.g. consider isolating bore or shut down the supply.

The CCPs identified for the schemes include: raw water extraction and disinfection. CCPs can be found in the Monitoring Programs Excel spreadsheet (supporting document), including corrective actions and reporting requirements. The Monitoring Programs supporting document also includes other key operational parameters with targets, alert limits, corrective actions and reporting requirements (these other operational parameters don't necessarily class as a CCP to have a critical limit, however, still have required actions and reporting requirements as relevant).

6.3. *Operation and maintenance procedures*

The relevant operations and maintenance procedures related to the DWQMP is included in Appendix A.

Documentation of some processes/procedures identified as part of the risk workshop have been noted in the Improvement Plan.

WTA (Communities Supervisor) is responsible for ensuring the currency of the procedures (including the DWQMP and supporting documents) and for maintaining them. Additionally, the Superintendent Tailings and Water is responsible for ensuring the currency and maintenance of the procedures managed by the Tailings and Water Department. The process includes review of the document, assess need for change, update document if required and ensure staff use current version. The review frequency of the operation and maintenance procedures is every 3 years.

The implementation of the procedures is undertaken by relevant staff and ensured by the line supervisor/manager. Staff are trained in procedures relevant to their role through on-the-job training. Implementation is verified as part of the regular DWQMP audit process.

6.4. Management of Incidents

The process for managing drinking water incidents and emergencies is described in Table 6-1 below. It provides the overview (alert level, description, actions and responsibility).

Staff receive on the job training in incident and emergency response protocols.

Table 6-2 includes the contact details of key people to be contacted in the event of an incident / emergency. Vulnerable consumers may be notified by phone and are listed in the community directory found on WTA's website:

<https://www.weipatownauthority.com.au/about-weipa/community-directory>.

WTA may refer to the Queensland Health – Drinking Water Advisories – Guidelines and Templates (Dec 2018) for notification to the public, including templates for boil water alert, do not consume alert, do not use alert and lifting an alert.

Table 6-1 Incident and Emergency Management Process

Alert Level	Description	Brief summary of actions	Responsibility
Level 1: Operational Issue	<ul style="list-style-type: none"> • Ordinary operational issues at plant • Ordinary operational issues in reticulation (e.g. minor pipe breaks) • General scattered customer complaints <p><i>Issue is managed internally within the team. An event or incident is not declared, and the issue can be managed in line with the DWQMP.</i></p>	<ul style="list-style-type: none"> • Commence investigation to determine cause and rectify issue (e.g. review operations and maintenance records for anomalies). • Ensure all control measures identified in the DWQMP are functioning effectively. • Ensure line supervisor/manager is notified, as necessary. • Determine need to increase operational monitoring frequency where required. • In case of customer complaints, coordinate investigation and resolution, including obtaining water samples where required. 	<p>Tailings and Water Department – source and treatment</p> <p>WTA – reticulation and customers</p>

Alert Level	Description	Brief summary of actions	Responsibility
<p>Level 2: Event</p>	<p>An event is anything that has happened or is likely to happen which cannot be managed under the approved DWQMP and/or which may adversely impact public health. Examples of issues which can lead to Event reporting include:</p> <ul style="list-style-type: none"> • Limit breaches for CCP and/or other operational parameters as per the Monitoring Programs where rectification may not be possible within a day and/or as assessed by the water team. • Contamination of source water (e.g. chemicals, flood water impact) which has the potential to contaminate the potable water. • Contamination of treated water or treated water tanks (e.g. evidence that a contamination may have occurred) • Inability to treat water (e.g. equipment failure and no spares, no chemicals, bushfire causes damage to plant) • Widespread or clustered customer complaints • Exceedance of ADWG aesthetic value in verification monitoring – widespread. • Detection of parameter with no guideline value in the current ADWG (e.g. chlorate). • Situation where the verification monitoring requirement has been missed or is unable to be performed. • Cybersecurity related to drinking water treatment (report as Event, refer to Level 4 for response) <p><i>Event is managed internally within the team, but regulator needs to be notified. It may require external resourcing and support from relevant stakeholders or agencies, such as DRDMW, Tropical Public Health Services Cairns (TPHS), emergency responders, Police.</i></p>	<ul style="list-style-type: none"> • Verify data (e.g. re-test). • Following internal notification, WTA Communities Supervisor to assess, in discussions with internal stakeholders, if the issue may be beyond the ability to control in a reasonable and timely manner and may impact public health. If so, then class it as an Event and initiate Event reporting. • Event reporting – notify Regulator (DRDMW) on 1300 596 709 (24/7), as per reporting requirements. DRDMW will coordinate communication and meeting/discussions with TPHS, as needed. • If a meeting is requested by DRDMW/TPHS, ensure relevant information is at hand, if needed, for example, daily operational monitoring results for all sites for preceding 1-2 weeks (like chlorine, pH, turbidity), SCADA results trend for preceding 1-2 weeks (like chlorine), verification monitoring results for preceding 1-2 weeks (esp. microbiological like <i>E. coli</i>, HPC). Discussions with the regulators at this meeting should be undertaken in conjunction or consultation with the Manager WAT or WTA Communities Supervisor or WTA Superintendent. • Managers to ensure personnel and resources are available. • Coordinate notification, investigation and response. • Ensure all control measures identified in the DWQMP are functioning effectively. • Determine need to increase operational monitoring frequency where required. • In case of customer complaints, coordinate investigation and resolution, including obtaining water samples where required. • Consider what community notification / messaging is needed (e.g. do not drink alert or bottled/emergency water distribution). • Coordinate community messaging as required. <p>Also refer to the Identifying and Reporting Water Event Flowchart.</p>	<p>WTA and the Tailings and Water Department (as per the Monitoring Plan)</p>

Alert Level	Description	Brief summary of actions	Responsibility
<p>Level 3: WQ Incident</p>	<ul style="list-style-type: none"> • Detection of <i>E. coli</i> in treated water • Exceedance of chemical health related parameter in treated water against the ADWG • PFAS exceeding ADWG guideline in raw water • Gross alpha and gross beta-40 exceeding ADWG guideline value in raw water <p><i>Incident is managed internally within the team, but regulator needs to be notified. It may require external resourcing and support from relevant stakeholders or agencies, such as DRDMW, TPHS, emergency responders, Police. In some cases, it may require coordination across WTA and Water and Tailings departments.</i></p>	<ul style="list-style-type: none"> • Notify Regulator on 1300 596 709 (24/7), as per reporting requirements, see Flow chart. DRDMW will coordinate communication and meeting with TPHS, as needed. • If a meeting is requested by DRDMW/TPHS, ensure relevant information is at hand, if needed, for example, daily operational monitoring results for all sites for preceding 1-2 weeks (like chlorine, pH, turbidity), SCADA results trend for preceding 1-2 weeks (like chlorine), verification monitoring results for preceding 1-2 weeks (esp. microbiological like <i>E. coli</i>, HPC). Discussions with the regulators at this meeting should be undertaken in conjunction or consultation with the Manager WAT or WTA Communities Supervisor or WTA Superintendent. • Arrange for re-samples to be taken where required. • Managers to ensure personnel and resources are available. • Coordinate notification, investigation and response. • Ensure all control measures identified in the DWQM Plan are functioning effectively. • Review associated laboratory reports and operational records. • Determine need to increase operational monitoring frequency where required. • Consider what community notification / messaging is needed (e.g. boil water notice, do not drink alert or bottled/emergency water distribution). • Coordinate community messaging as required. <p>Also refer to the Identifying and Reporting Water Incidents Flowchart.</p>	<p>WTA and the Tailings and Water Department (as per the Monitoring Plan)</p>
<p>Level 4: Emergency</p>	<ul style="list-style-type: none"> • Declared emergency by local stakeholders e.g. extreme natural disaster or security event or terrorism. • Outbreak of waterborne disease. • Cybersecurity breach that causes inability to control or manage water supply operations. <p><i>Is likely to require external resourcing and support from stakeholders or agencies, such as DRDMW, TPHS, local disaster management groups, emergency responders, QFRS, Police.</i></p>	<ul style="list-style-type: none"> • Activate corporate emergency management and response protocols. • Management to ensure personnel and resources are available. • Consider what community notification / messaging is needed. • Coordinate community messaging as required. • Notify Regulator when practicable on 1300 596 709 (24/7). • For cybersecurity events, activate the relevant corporate cybersecurity response protocols. 	<p>WTA and the Tailings and Water Department</p>

Table 6-2 Emergency Contact Details

Business Unit / Organisation	Contact details
WTA	Superintendent – Judey Haeusler – 0427 694 487 Communities Supervisor – Renee Williams – 0439 444 650 Public Works Supervisor – Matthew Turnbull – 0477 360 972 WTA – 07 4030 9400
Tailings and Water Department / Maintenance Service Provider	Manager – Tailings and Water – Tim Ryan – 0455 075 839 Superintendent – Tailings and Water – Thomas Williams – 0447 076 374 Tailings and Water Department – 07 4069 8542
Goodline	Weipa Manager (in the event of a water break, where WTA cannot be contacted) 07 4090 6500
Department of Regional Development, Manufacturing and Water (Water Supply Regulation)	Report Incidents to Water Supply Regulator 1300 596 709
Tropical Public Health Services (Cairns) – Queensland Health	Advice on public health in relation to water quality. Consulted, as needed, for water quality incidents. 07 4226 5555
Cairns Regional Council Water & Waste – Laboratory Services	Laboratory Manager 07 4044 8344
Weipa Hospital	Medical Superintendent 07 4082 3900

6.4.1. Process for Incident Reporting

The incident response and reporting protocols have been adopted from the Queensland Water Supply Regulator Drinking Water Service Provide Monitoring and Reporting Requirements guidelines.

Queensland Water Supply Regulator reporting forms are filled and submitted for reporting as required.:

- *Notification of a drinking water event or detection of a parameter with no water quality criteria: Form WSR507*
- *Notice of noncompliance with water quality criteria: Drinking water: Form WSR017*

Incident reporting forms used are located online at:

<https://www.business.qld.gov.au/industries/mining-energy-water/water/industry-infrastructure/industry-regulation/drinking-water/forms-guidelines>

Reporting requirements are summarised in Table 6-3 below, and also represented as flow charts in Figure 6-1 and Figure 6-2.

Table 6-3 Incident Reporting Requirements

Incident	Reporting Requirements (to Regulator)
Detection of <i>E. coli</i> , detection of a pathogen, failure to meet ADWG health guideline values	Refer to Figure 6-2.
Radiological (exceed ADWG screening levels)	By telephone as soon as practicable. Assessing the impact from exceeding the screening values is complicated and needs input from Queensland Health (Tropical Public Health Unit) to determine dose and impact. WTA will begin to implement the actions in the ADWG flowchart – “ <i>Figure IS2.2.1 Flowchart showing how to determine whether the radiological quality of drinking water complies with the Guidelines</i> ”, while obtaining further advice/input from DRDMW and Queensland Health.
Parameters with no ADWG guideline value	Written confirmation within 24 hours, refer also to Figure 6-1.
An event likely to affect water quality	By telephone as soon as practicable. Also refer to Figure 6-1.
Disaster management	Refer to https://www.weipatownauthority.com.au/disaster-information-1-1/disaster-information-1
Cybersecurity event (Alert 2 or 4 in Table 6-1)	<ul style="list-style-type: none"> • ‘Immediately’ notify event to the regulator of the circumstances and follow up that initial notification by giving written notice in the approved form, ‘as soon as practicable’. • Call Queensland Government Chief Information Office through the Queensland Government Information Security Virtual Response Team (QGISVRT) on 07 3215 3951 immediately, and written correspondence should be sent by email to qgisvrt@qld.gov.au.

Reporting number is 1300 596 709

Email: DrinkingWater.Reporting@rdmw.qld.gov.au

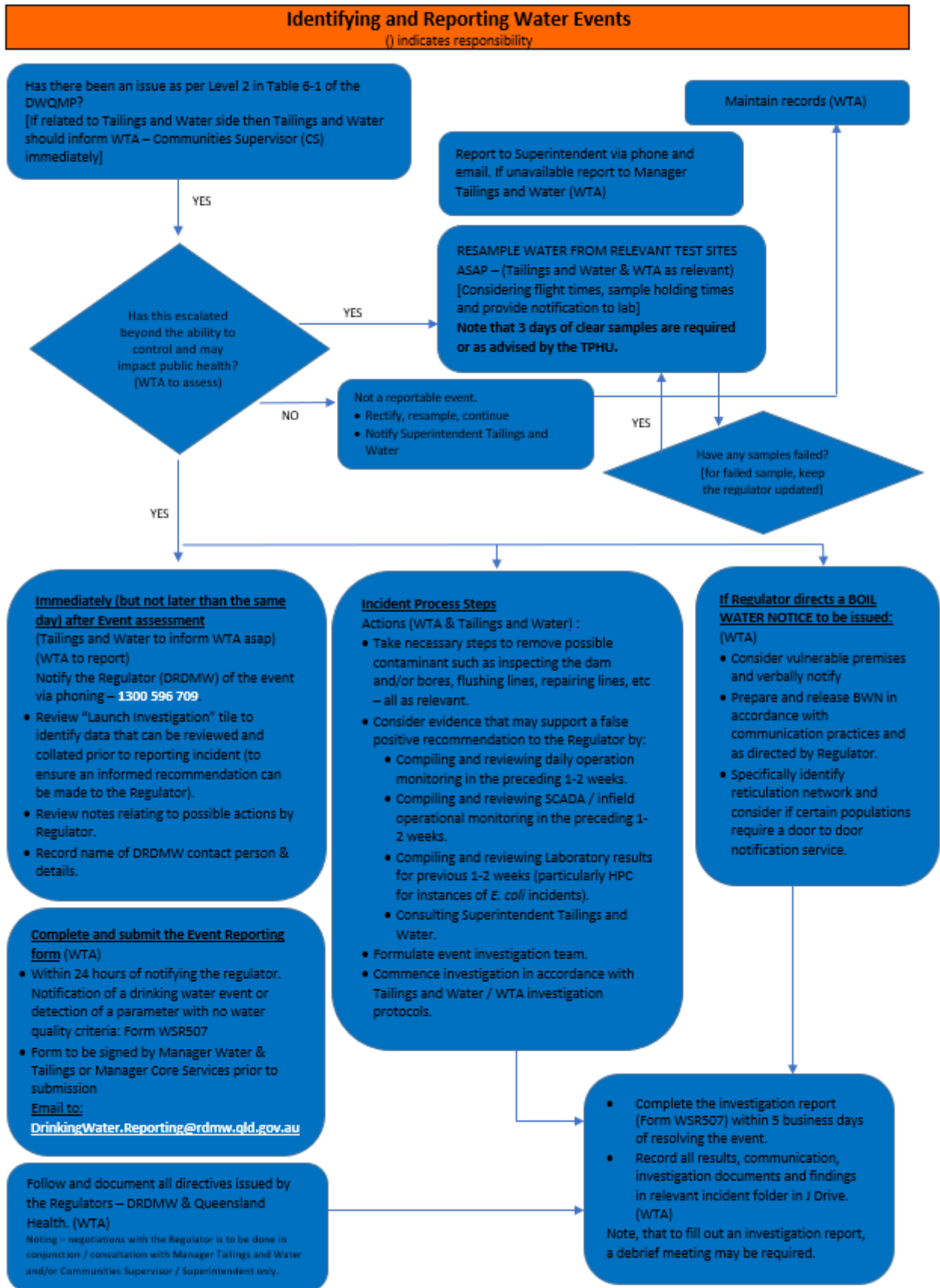


Figure 6-1 Identifying and Reporting Water Events

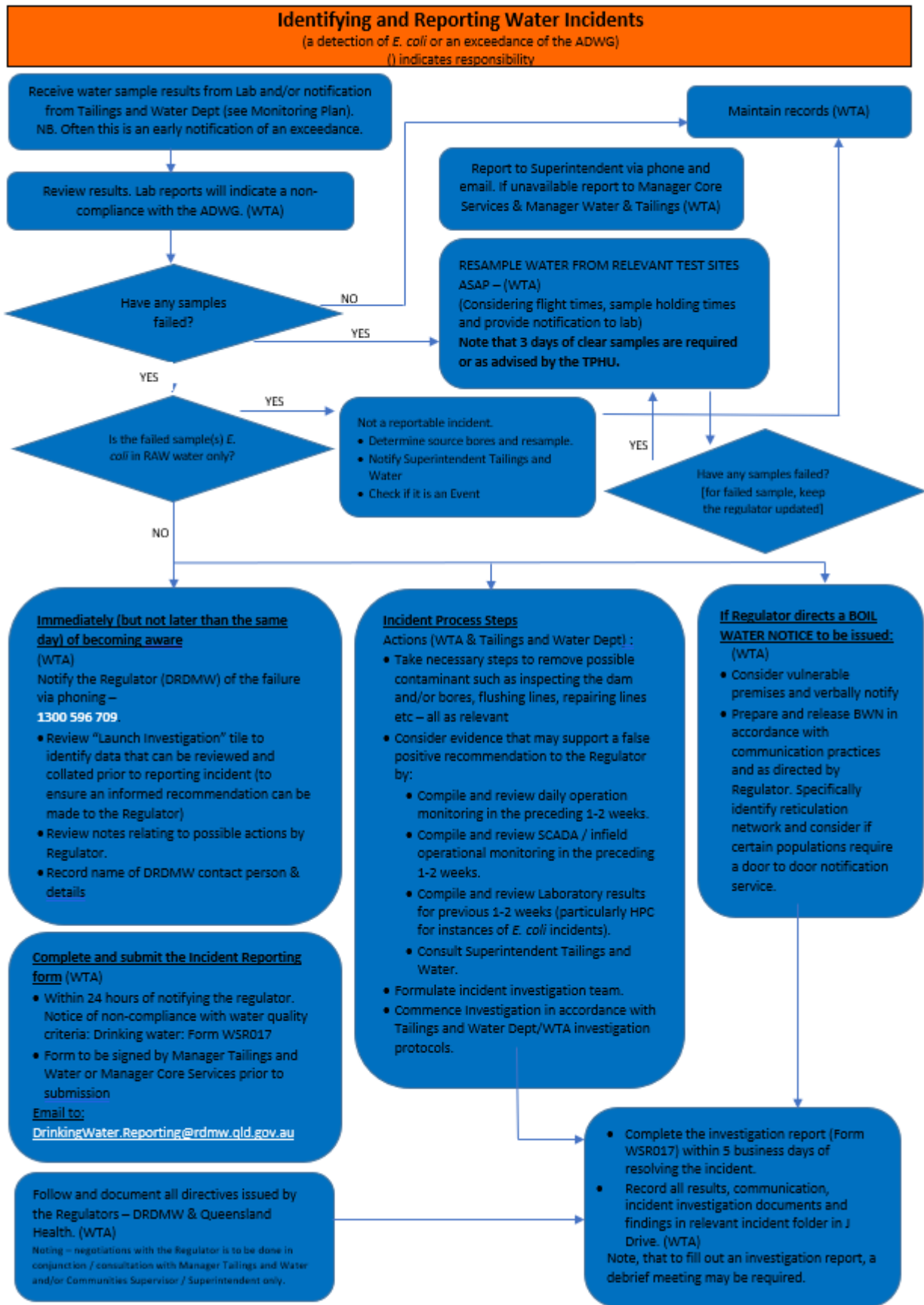


Figure 6-2 Identifying and Reporting Water Incidents

7. Risk Management Improvement Program

The improvements identified as part of the risk assessment process are included in the Risk Register and Improvement Plan spreadsheet (DWQMP supporting document). The process on assigning priority levels to the actions is also outlined in the spreadsheet (separate tab).

The improvement actions form the Improvement Plan and includes timeframes and responsibilities for implementation. Progress on the Improvement Plan is reported to the Regulator as part of the DWQMP water service annual reports.

WTA is committed to implementing the Improvement Plan, including support from the Tailings and Water Department (Manager Tailings and Water), WTA (Communities Supervisor and Superintendent) and WTA Chairperson.

8. Information Management

Table 8-1 provides an outline of how WTA information related to the management of drinking water quality is managed so that information is readily accessible, accurate, reliable, timely and up to date.

WTA have commenced implementing the SWIM software program and implemented electronic capturing of field data.

The currency of the DWQMP is maintained by WTA (Communities Supervisor). Currency of the other documents is maintained by the relevant document owner or the line supervisor/manager. All relevant documents are available as either electronic or hard copies, as per Table 8-1, which can only be accessed by the respective departments.

Internal and external reporting is undertaken in accordance with the incident response section (Section 6.4). External reporting is also undertaken annually in the form of the DWQMP water service annual reports. All records are maintained for 7 years in accordance with Queensland record retention requirements.

Table 8-1 Summary of Water Quality Management Information

Information / Document	Format	Stored Location
DWQMP	Electronic	Tailings and Water Department – Controlled documents, RT Weipa Intranet WTA – J-drive
Operational monitoring network reticulation daily field test record	Electronic	WTA – SWIM database
Laboratory weekly water test results	Electronic	Tailings and Water Department – Envirosys database WTA – SWIM database and J-drive
Operational monitoring – at treatment facilities	Electronic	Tailings and Water Department – Excel spreadsheets
Bore readings and water usage statistics spread sheet	Electronic	Tailings and Water Department – Excel spreadsheets
All procedures	Electronic	Tailings and Water Department – Controlled document, RT Weipa Intranet WTA – J-drive
Incident process including reporting of positive tests, public advice, reports to DRDMW (relevant DRDMW Forms)	Electronic	WTA – J-drive Regulatory reporting forms - DRDMW web page
Maintenance programs	Electronic	Tailings and Water Department – SAP database

9. References

- ADWG
- DRDMW DWQMP Guide
- WTA DWQMP Aurecon 2017
- Public Health Regulations 2018

10. Appendix A – DWQMP Related Procedures

Process component	Procedure	Last reviewed	Responsibility
Catchment – Rocky Point	WQ Risk Management Rodeo Event Procedure	2024	WTA
Bores	Out of spec potable water operator sample response	2023	Tailings and Water
	Pipe repair procedure	2023	Tailings and Water
	SA Bore water turbidity measurement	2023	Tailings and Water
	Water Monitoring Sampling	2021	Tailings and Water
	Lifting Bore Pump	2021	Tailings and Water
Treatment	Pre-shift start potable and sewage checks	2023	Tailings and Water
	Airport & Andoom Chlorine Dosing Tank Change Over Procedure	2023	Tailings and Water
	Airport Chlorine Inline Calibration	2021	Tailings and Water
	Airport pH Sensor Calibration	2021	Tailings and Water
	EL Chlorine Dosing Line-Injection Point Replacement	2021	Tailings and Water
	Chlorine Testing	2021	Tailings and Water
	Filling Caustic Tank from 1000L Dot to Dosing Tank	2021	Tailings and Water
	Decanting of Chlorine	2020	Tailings and Water
	Evans Landing Chlorine Testing	2020	Tailings and Water
	Decant EL and Airport Chlorine	2020	Tailings and Water
	pH Handheld Field Testing	2020	Tailings and Water
	Airport pH and Chlorine Inspections	2021	Tailings and Water
	Airport Potable Water Inspections	2021	Tailings and Water
	Town Water Operational Inspections	2021	Tailings and Water
	Town Water Chlorine Sensor Head Maintenance	2021	Tailings and Water
Town Water pH Sensor Calibration	2021	Tailings and Water	
Town Water pH Inline Sensor Maintenance	2021	Tailings and Water	

Process component	Procedure	Last reviewed	Responsibility
Reservoirs	Loading Lime into the Hopper at Lime Dosing Plant	2021	Tailings and Water
	Inspection (visually external) program 6-monthly – checklist	PM01 task in SAP	Tailings and Water
	Inspection (visually external) program 6-monthly – checklist – for Airport 4 kL tank	2024	WTA
	Reservoir inspection (internal) and cleaning program and schedule	NA as external contractors used	Tailings and Water
Network	Mains / Pipes – Hygiene, Disinfection and Repairs (including material requirements)	2022	WTA
	Backflow prevention program – Water and Tailings – for STPs	PM01 task in SAP	Water and Tailings
	Backflow prevention program – WTA – for network users	To be reviewed	WTA
Calibration	Calibration register – WTA – calibration and maintenance checklist	To be reviewed	WTA
Chemical quality	Chemical quality assurance	To be developed	Tailings and Water
Sampling and Monitoring	Water Testing Procedures – Water Sampling	2023	WTA
Customer complaints	Customer Service Standard	2023	WTA