

Mataranka Implementation Actions 2024-2034



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Acknowledgement of Country

The Department of Lands, Planning and Environment respectfully and proudly acknowledges the Northern Territory's Aboriginal people and their rich culture, and pays respect to the Elders past and present.

We acknowledge Wubalawun, Yangman, Mangarrayi and Jawoyn peoples as the Traditional Owners and custodians of the lands and waters of the Mataranka water allocation plan area, and Aboriginal peoples connected to the waterways of the lower Roper River.

We recognise the intrinsic connection of Traditional Owners to Country and value their ongoing contribution to managing the lands and waters. We support the need for genuine and lasting partnerships with Traditional Owners to better understand cultural connections, and we will work to establish lasting partnerships to manage water together, now and into the future.



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1. Overview

About the water allocation process

Water allocation is the process of determining how much water must stay in the environment to protect ecological functions and environmental requirements and how much is available for drinking and regional economic priorities. Water allocation in the Northern Territory is undertaken at a regional level within defined areas known as water control districts, which are declared by the Minister for Water Resources (Minister) by *Gazette* notice.

About the Mataranka plan area

The Mataranka plan is within the Daly Roper Beetaloo water control district (the district), an area of 330,000 km² (Schedule C). The district includes a number of basins and aquifers. Separate water allocation plans have been declared or are in development for different parts of the district.

The Mataranka plan applies to an area of approximately 9,282 km² extending about 190 km from north to south, and up to 70 km east to west shown in Schedule C (the plan area). The plan area includes the towns of Mataranka and Larrimah and the community of Jilkminggan. Pastoral leases cover about 40 per cent of the plan area, with approximately 36 per cent of the plan area recognised as Aboriginal land.

About this document

This document is one of three core documents prepared as part of the water allocation process for the plan area. This document references other documents and guidelines that may relate to the plan area, but which do not form part of the core documents. The three core documents are:

Mataranka Water Allocation Plan 2024-2034 (the plan). The plan is declared by the Minister under section 22B(1) of the *Water Act 1992* (Act). The plan describes the estimated sustainable yield for the water resources of the plan area in three water management zones (Schedule D of the plan). The estimated sustainable yield is the volume of water that can be taken sustainably from the water resources to which this plan applies. The plan allocates that water amongst declared beneficial uses and provides for trading of water. The plan takes effect from the date in the *Gazette* by the Minister and will remain in force for a period of ten years.

Mataranka Background Report 2024-2034 (the report) provides details on the information and processes that informed the plan, including available data and research on the surface water and groundwater resources of the plan area. It also describes the key environmental values of the plan area and their dependency on water resources, and the social and developmental context of the region, including existing water use and projections of future water demand. The report collates the information and knowledge regarding the plan area at the time of its preparation.

Mataranka Implementation Actions 2024-2034 (this document, the implementation actions) details how the requirements in section 34 of the Act with respect to the water resources of the plan area is fulfilled. It defines a continuous program for the assessment of water resources in the plan area, including the investigation, collection and analysis of data concerning the occurrence, volume, flow, characteristics, quality and use of water resources. That program is described within the document as a series of implementation actions which includes a body of research, monitoring and analytical work.

The Controller of Water Resources must consider any water allocation plan applying to the area in question when making a decision referred to in section 90(1) of the Act. The Mataranka 2024-2034 background report, implementation actions and other factors may be taken into account, where relevant to the decision.

2. Risk and adaptive management

Overview

The combination of risk management with adaptive management ensures that water resources are managed in a sustainable and resilient manner over the long term, and that risks are effectively managed to maintain the health and productivity of natural ecosystems and human communities. Both approaches recognise that there is inherent uncertainty and complexity in natural systems, and that ongoing monitoring and adjustment is needed to effectively manage risks and maintain water resource resilience.

Risk management typically involves identifying and assessing potential risks to the water resource, such as water availability, or changes in hydrological patterns due to climate change. Actions are then developed and implemented to reduce the likelihood or impacts of these risks. Adaptive management is a complementary approach that recognises that there is often uncertainty and complexity around the effectiveness of actions taken, and that continuous learning and adjustment is needed. Adaptive management involves the ongoing monitoring and assessment of the effectiveness of actions, and the development of new actions as needed based on new information and changing conditions.

The objectives of water sharing in the plan are used to guide the development, implementation, monitoring and adjustment of actions to ensure these remain effective over time and meet community expectations.

2.1 Risk assessment

The risk assessment process identifies risks that may influence the plan's ability to achieve its objectives, and the development of actions to mitigate them. This process ensures that water sharing, as guided by the plan, optimises the benefits to the community which are created by the sustainable use of the water resource. The risk assessment process involves the identification of hazards, an analysis of the likelihood and consequence of a hazard occurring, the identification of existing control measures that provides a residual risk rating, and proposed future actions to mitigate risks down to the target risk rating into the future.

The primary risks to achieving the plan's objectives are associated with changes to groundwater recharge and surface water availability, water quality and economic benefits of water use not being realised. Groundwater levels are influenced by the amount of rainfall and recharge, the amount of water that is used and the location and rate of water extraction. Water quality is influenced by the inherent characteristics of the resource, land use and the location of water extraction. Economic benefits of water use are influenced by a broad range of factors including barriers to entering an industry, certainty in approvals, market conditions, business models and liveability of the region.

The risks identified through the water planning process reflect the knowledge and understanding of the water resource, which is anticipated to improve over time and enable a rationalisation of risk assessment, and for more targeted management actions to be developed.

The risk assessment methodology is shown in Schedule F, which provides a description of the qualitative measures of likelihood, consequence and risk rating categories that were used to determine the risk.

2.2 Risk management

The detailed assessment and management of the key risks to the water resource are shown in Schedule G. This document outlines the actions that are being implemented to reduce the residual risk, as well as additional actions that will be implemented during the life of the plan, to reduce the risk rating to an acceptable level.

This process involves defining the key events and hazards that impact the water resource:

- a) groundwater levels decline below acceptable levels
- b) water quality declines to unacceptable levels
- c) surface water flows and discharges decline below acceptable thresholds
- d) water is not used for regional development.

The objectives of water sharing in section 3.2 of the plan are used to guide the assessment, in terms of causes and impacts. The risk assessment methodology is applied to each objective to define the current residual risk with the existing controls in place to manage the resource. To lower the risk level, additional actions are applied which further reduce the likelihood or consequence of the hazard occurring once the actions are completed.

2.3 Adaptive management

Adaptive management is an iterative process that monitors resource response to water use and management actions, and uses this information to improve future actions, to meet the water sharing objectives of the plan. Adaptive risk management focuses activities on risk mitigation while enabling resource management to be flexible and responsive to changing conditions.

Schedule H outlines the steps and relationships between the adaptive management framework and water resource management. The framework is founded on a principle of monitoring and review, with actions implemented and monitored over time enabling an assessment of effectiveness. The outcome of this assessment may result in continuing with an existing arrangement, refining the action, or discontinuing ineffective actions and implementing new ones.

The water monitoring program is critical to adaptive management and an overview of this program is provided in section 3 of this document.

3. Water monitoring program

Overview

Consistent with section 34 of the Act, there is a continuous program in place to support the assessment of water resources of the Territory, including the investigation, collection, collation and analysis of data concerning the occurrence, volume, flow, characteristics, quality, flood potential and use of water resources.

This section describes the water resource monitoring program undertaken by the department to inform management of the water resources in the district. The monitoring is informed by the risk assessment process and underpins adaptive management to maintain the health and productivity of natural ecosystems and human communities. This monitoring is complemented by monitoring undertaken by licence holders.

3.1 Monitoring by the department

The department delivers a continuous monitoring program of the water resources in the plan area. This monitoring network includes both discrete and time-series data from a series of groundwater monitoring bores, as well as surface water gauging sites that measure water flows in the wet and dry season.

The monitoring program is reviewed annually and includes:

- water level monitoring at 31 groundwater sites
- water flow monitoring at 22 surface water sites, within and downstream of the plan area.

Data collected under the monitoring program is available on the department's Water Data Portal¹.

The Mataranka water monitoring network is shown in Schedule E.

The purpose of the monitoring program is to:

- ensure spatial coverage consistent with the significant water extraction areas
- monitor groundwater level trends and surface water flows, which will be used for model calibration
- ensure good temporal coverage through biannual site visits and the use of loggers
- continuously improve understanding of groundwater and surface water connectivity, including springs
- verify that water resources are responding as predicted
- inform adaptive management actions including announced allocations in North Mataranka and South Mataranka.

Priorities for the future expansion of the monitoring network include:

- installing and monitoring of additional surface water sites
- establishing an ongoing water quality sampling program.

3.2 Monitoring by licence holders

The department monitoring program is supported and complemented by the water monitoring conducted and reported by licence holders to the department as a condition of their water licences.

¹ <https://water.nt.gov.au/Data>

4. Implementation actions

Overview

This section outlines the actions being implemented as part of the adaptive management cycle, with continuous monitoring, evaluation and adjustment to ensure they remain effective over time.

These implementation actions address the key risks to the water resource and are described in terms of their contribution to the objectives of water sharing in the plan. As water is used in the plan area, more specific triggers may be defined to measure and evaluate the actions.

The implementation actions, measured through key performance indicators (KPIs), are shown in Tables 1-6 with a dictionary in Schedule A and acronym defined in Schedule B.

4.1 Actions related to water requirements of key environmental values

Table 1. Actions and measures that contribute to: balancing the retention and preservation of key environmental values dependent on water with the overall benefits provided by the water resources

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
3.2.1a There is an improved understanding of the characteristics and environmental values of the groundwater and surface water resources.	4.1.1 Improve knowledge of wet season eco-hydrological requirements through high resolution topographic data for floodplain areas (funded by NWGA)	Project completed, report published	DLPE WRD	2024-2025
	4.1.2 Establish and maintain a surface water flow and water quality monitoring program in the plan area, including the consideration of sites outside the plan area	Water quality monitored at specified intervals and results made publicly available	DLPE WRD	2024-2033
	4.1.3 Improve the understanding of the Jinduckin formation within the plan area	Additional bores are drilled, registered and monitored	DLPE WRD	2033
	4.1.4 Determine the specific groundwater requirements of key terrestrial and aquatic species associated with the Tindall Limestone Aquifer and the Roper River	Reports published on selected indicator species	DLPE WRD, FFD	2029
	4.1.5 Improve resource conceptualisation of the area through drilling and field investigations	Additional bores registered and monitored	DLPE WRD	Ongoing
	4.1.6 Verify the throughflow contribution between the Georgina Basin, Larrimah water management zone and South Mataranka water management zone	Model recalibration completed Additional bores registered and monitored	DLPE WRD	2025-2026 Ongoing

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
3.2.1b The condition of groundwater dependent ecosystems is known and monitored as far as practicable, and accounted for in water planning and licensing	4.1.7 Review the probability map used to define the likely extent of GDEs	Key GDE map published/updated	DLPE WRD, FFD	2027-2029
3.2.1c Key environmental values are appropriately accounted for in water planning and licensing	4.1.8 High biodiversity values in the plan area are protected under section 36 of <i>Environment Protection Act 2019</i>	Declare a protected environmental area	DLPE NT EPA	2025
	4.1.9 Produce communication products that explain how environmental values are managed	Materials produced and appropriately communicated	DLPE WRD	2025-2026 Ongoing

4.2 Actions related to key Aboriginal and other cultural values associated with water

Table 2. Actions and measures that contribute to: Ensure water licence decisions consider Aboriginal and other cultural values dependant on water

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
3.2.2a There is an improved understanding of Aboriginal cultural values and other cultural values associated with the water resource	4.2.1 Collaborate with Traditional Owners and appropriate Aboriginal representatives to establish and maintain an Aboriginal reference group or an appropriate mechanism to share knowledge of resources and ways in which Aboriginal people can be involved in water management	Group established and maintained	DLPE WRD, AAPA, NLC, Aboriginal representatives	2025-2026 Ongoing
	4.2.2 Collaborate with Traditional Owners and appropriate Aboriginal representatives to agree suitable regional mapping of cultural values and information dissemination (if appropriate)	Cultural values information is mapped and used in decision making	DLPE WRD, AAPA, NLC	2025-2027

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
	4.2.3 Collaborate with Traditional Owners and appropriate Aboriginal representatives to quantify water requirements of key cultural sites and establish an ongoing monitoring program	Water requirements of key sites are defined Key sites included in monitoring program	DLPE WRD, NLC, AAPA	2027-2029 Ongoing
3.2.2b Key Aboriginal cultural sites that rely on water are monitored and potential impacts on such sites are appropriately accounted for in water planning and licensing	4.2.4 Collaborate with Traditional Owners and appropriate Aboriginal representatives to identify and document key Aboriginal cultural sites where significant water extraction is occurring (property scale)	Key sites are identified and documented	DLPE WRD, NLC, AAPA, licence holders	Ongoing
	4.2.5 Collaborate with Traditional Owners and appropriate Aboriginal representatives to assess and monitor the condition of key Aboriginal cultural sites	Key site baseline is documented Key sites included in monitoring program	DLPE WRD, Aboriginal representatives, licence holders	2025 Ongoing
3.2.2c Other cultural values that rely on water are monitored and potential impacts on such values are appropriately accounted for in water planning and licensing	4.2.6 Collaborate with other stakeholders in the identification, protection and monitoring of other cultural values and sites.	Values and sites are identified, documented and protected Key sites included in monitoring program	DLPE WRD	2031-2032
	4.2.7 Collaborate with Traditional Owners and appropriate Aboriginal representatives to produce appropriate communication products explaining how Aboriginal cultural sites are identified, monitored and protected	Materials produced and appropriately communicated	DLPE WRD	Ongoing

4.3 Actions related to water for rural stock and domestic purposes

Table 3. Actions and measures that contribute to: Secure water for rural stock and domestic purposes

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
3.2.3a The amount of water needed to support stock and domestic use is met	4.3.1 Review, and if necessary improve, the methodology used for estimating domestic water needs and use	Methodology reviewed	DLPE WRD	2025-2026
3.2.3b The quality of water sourced for stock and domestic purposes is maintained	4.3.2 Develop and implement water quality monitoring program across the district, including licence conditions requiring monitoring and reporting	WQ included in monitoring program Regulatory compliance	DLPE WRD, licence holders	2025-2026 Ongoing
3.2.3c Community members and relevant stakeholders understand water management	4.3.3 Use appropriate communication materials and methods to increase understanding of water supply and water management arrangements, service delivery and the application of regulations and policies	Materials developed and appropriately communicated	DLPE WRD, OWS, DCF, PWC	2025 Ongoing

4.4 Actions related to water for public water supplies

Table 4. Actions and measures that contribute to: Provide long term security, of a sufficient quantity and quality, of water for public water supplies

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
3.2.4a The amount of water needed to support public water supply continues to be met	4.4.1 Review long-term planning for population and community growth for public water supplies	Allocation sufficient for public water supply needs	PWC	2032-2033
3.2.4b The quality of water sourced for public water supplies is maintained	4.4.2 Regular water quality monitoring of water extracted for public water supplies is reported to WRD	Source water quality data to WRD	DLPE WRD, PWC	Annually

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
3.2.4c Community members and relevant stakeholders understand water planning and licensing outcomes	4.4.3 Use appropriate communication materials and methods to increase understanding of water supply and water management arrangements, service delivery and the application of regulations and policies	Materials developed and appropriately communicated	DLPE WRD, OWS, DCF, PWC	2025 Ongoing

4.5 Actions related to water for local Aboriginal economic development

Table 5. Actions and measures that contribute to: Set aside water to support local Aboriginal economic development

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
3.2.5a Local Aboriginal people have access to water through the Aboriginal water reserve to support economic development	4.5.1 Recover unused water to increase water allocations to the Aboriginal water reserve in North and South Mataranka water management zones	Regulatory compliance	DLPE WRD	Ongoing
3.2.5b Arrangements to access the Aboriginal water reserve are documented and communicated	4.5.2 Use appropriate communication materials and methods to support the use of water from the Aboriginal water reserve in partnership with appropriate Aboriginal representatives	Materials developed and appropriately communicated	DLPE WRD, NLC, OWS	2024
3.2.5c Aboriginal people are receiving benefit from Aboriginal water reserve	4.5.3 Assist eligible Aboriginal people to access the Aboriginal water reserve	Aboriginal water reserve licence applications lodged	NLC, CM&C, DAF	Ongoing
	4.5.4 License water use from the Aboriginal water reserve. Defining local benefits, qualitative and quantitative	Aboriginal water reserve water licences are used	NLC, CM&C	Ongoing

4.6 Actions related to water for regional development

Table 6. Actions and measures that contribute to: Providing access to water to support regional development for the benefit of the Territory

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
3.2.6a Water is available to support sustainable economic development in the region	4.6.1 Complete model recalibration using data from current and future water users and reviewing future climate change projections (funded by NWGA)	Model recalibration completed	DLPE WRD	2025-2026
3.2.6b Industry is confident to invest in the region	4.6.4 Water resource planning and management underpins regional investments	\$ investment and # of jobs (regional scale)	NTG	2028-2029
3.2.6c Water is used for productive purposes and in a water-efficient manner	4.6.5 Appropriate water management practices are in place	% Water use Regulatory compliance	DLPE WRD, DAF, licence holders	Ongoing

5. Reporting

Overview

This section outlines how the management of water resources in the plan area will be reported. Regular public reporting by the department will ensure a level of community understanding of the management of the resource.

The department maintains a public record of all water extraction licences on its Water Licensing Portal².

The department maintains a public record of water monitoring results on its Water Data Portal³.

The department will produce a report annually for the district which summarises:

- an overview of the water resources
- key monitoring results
- regulatory performance
- progress against the implementation actions.

² <https://DLPE.nt.gov.au/water/permits-and-licences/water-licensing-portal>

³ <https://nt.gov.au/environment/water/water-in-the-nt/water-data-portal>

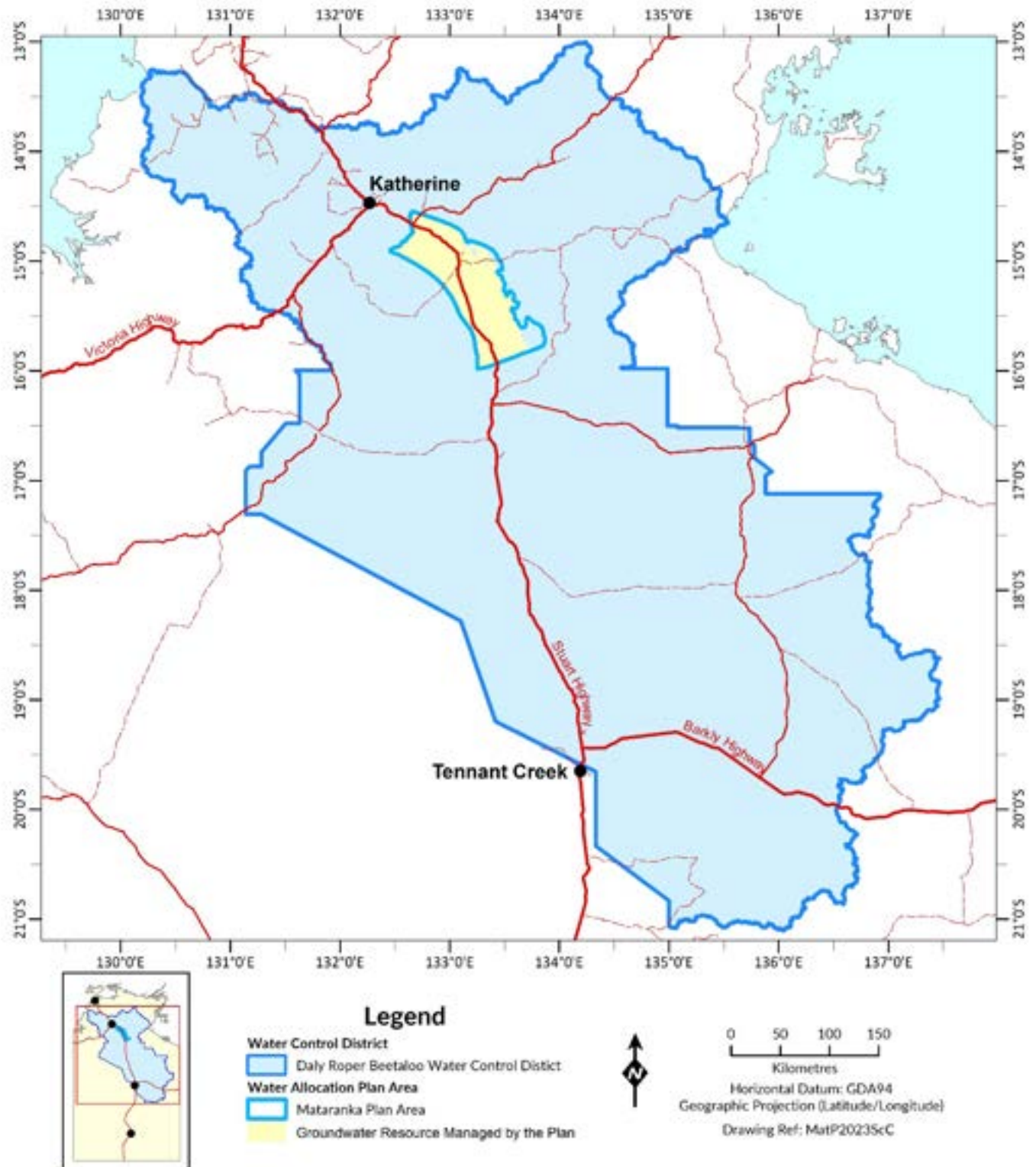
Schedule A. Dictionary

Term	Definition or reference
Aboriginal water reserve	see <i>Water Act 1992</i> , section 4(1)
Act	the <i>Water Act 1992</i>
beneficial uses	the beneficial uses for the Daly Roper Beetaloo water control district declared by Gazette no. G41, 19 October 2022
Controller	the Controller of Water Resources appointed under the <i>Water Act 1992</i> , section 18
consumptive pool	the amount of water that can be made available for beneficial uses in a given water system and where a water plan has rules, in accordance with those rules
department	the department with the responsibility for administering the <i>Water Act 1992</i> , according to the Northern Territory of Australia Administrative Arrangements Order
eligible Aboriginal people	see <i>Water Act 1992</i> , section 4(1)
estimated sustainable yield	the amount of water that can be allocated from the water resource to support declared beneficial uses that is sustainable, section 3.1 and 3.4 of the plan refers
groundwater	see <i>Water Act 1992</i> , section 4(1)
groundwater dependent ecosystem	an ecosystems that requires access to groundwater to meet all or some of their water requirements
licence holder	the person granted a licence to take water under section 45 or section 60 of the <i>Water Act 1992</i>
plan	Mataranka Water Allocation Plan 2024–2034
plan area	the area to which the water allocation plan applies as shown in Schedule C
Protected Environmental Area	see <i>Environment Protection Act 2019</i> , section 4
Tindall limestone aquifer	a regional limestone aquifer that extends from north of Katherine to south east of Tennant Creek. Locally referred to as the Katherine and Mataranka Tindall limestone aquifers in the Daly Basin, Gum Ridge formation in the Georgina Basin and Montjinni limestone in the Wiso Basin
water control district	the Daly Roper Beetaloo water control district, declared by Gazette no. G41, 19 October 2022 under section 22 of the <i>Water Act 1992</i> . A copy of the declaration is included in Schedule E of the plan
water licence / water extraction licence	see <i>Water Act 1992</i> , section 4(1)
water management zone	those areas of land within the plan area separated for management purposes as depicted in Schedule D of this document

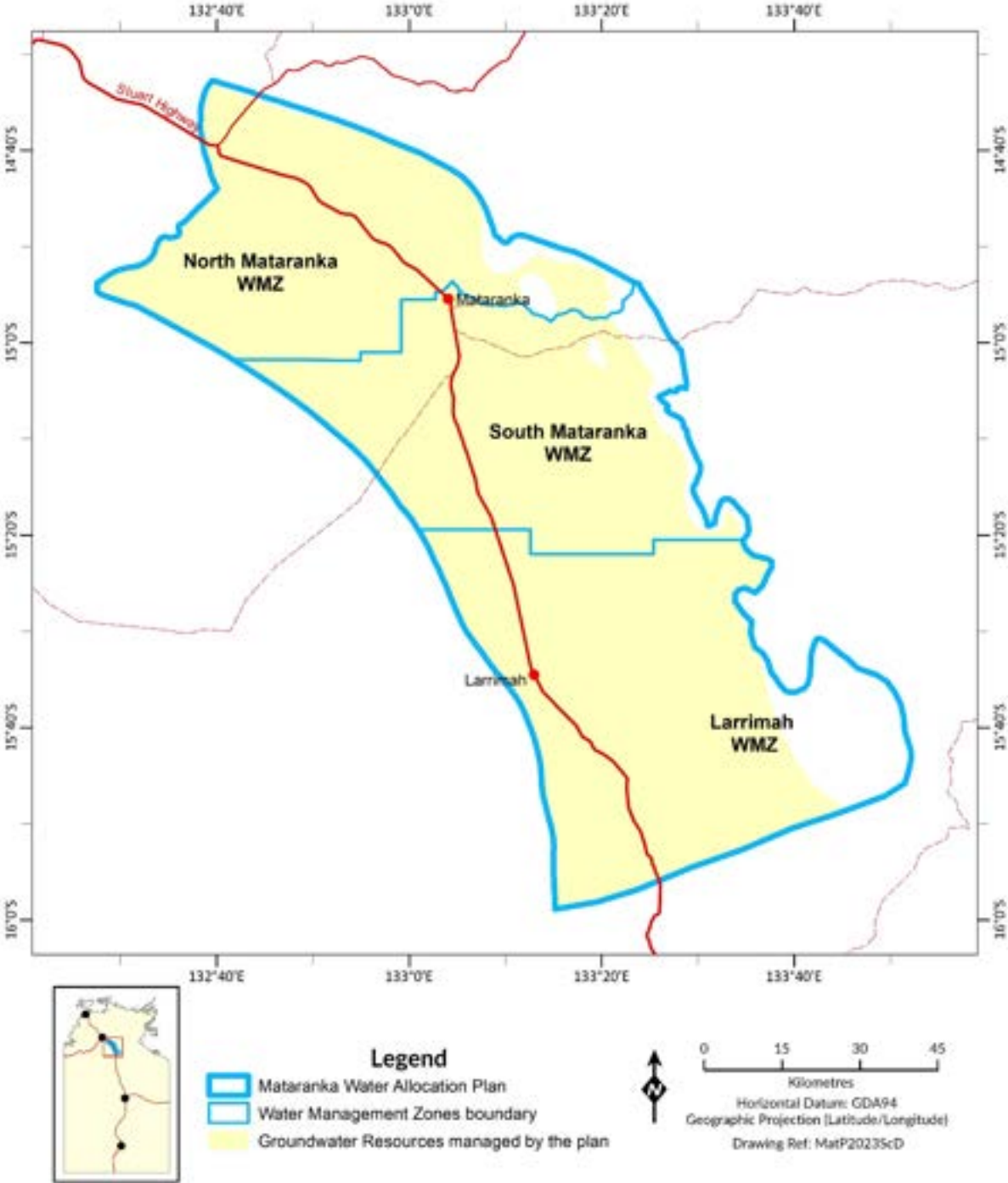
Schedule B. Acronyms

Acronym	Full form
AAPA	Aboriginal Areas Protection Authority
CLC	Central Land Council
CM&C	Department of the Chief Minister and Cabinet
DLPE	Department of Lands, Planning and Environment
DAF	Department of Agriculture and Fisheries
DCF	Department of Children and Families
ESY	estimated sustainable yield
FFD	Flora and Fauna Division, DLPE
GDE	groundwater dependent ecosystem
km	kilometre
KPI	key performance indicators
ML	megalitres
NLC	Northern Land Council
NTG	Northern Territory Government
NWGA	National Water Grid Authority
OWS	Office of Water Security, DLPE
PWC	Power and Water Corporation
TLA	Tindall Limestone Aquifer
WRD	Water Resources Division, DLPE

Schedule C. Daly Roper Beetaloo water control district and Mataranka plan area



Schedule D. Mataranka water management zones



Schedule E. Mataranka water monitoring network

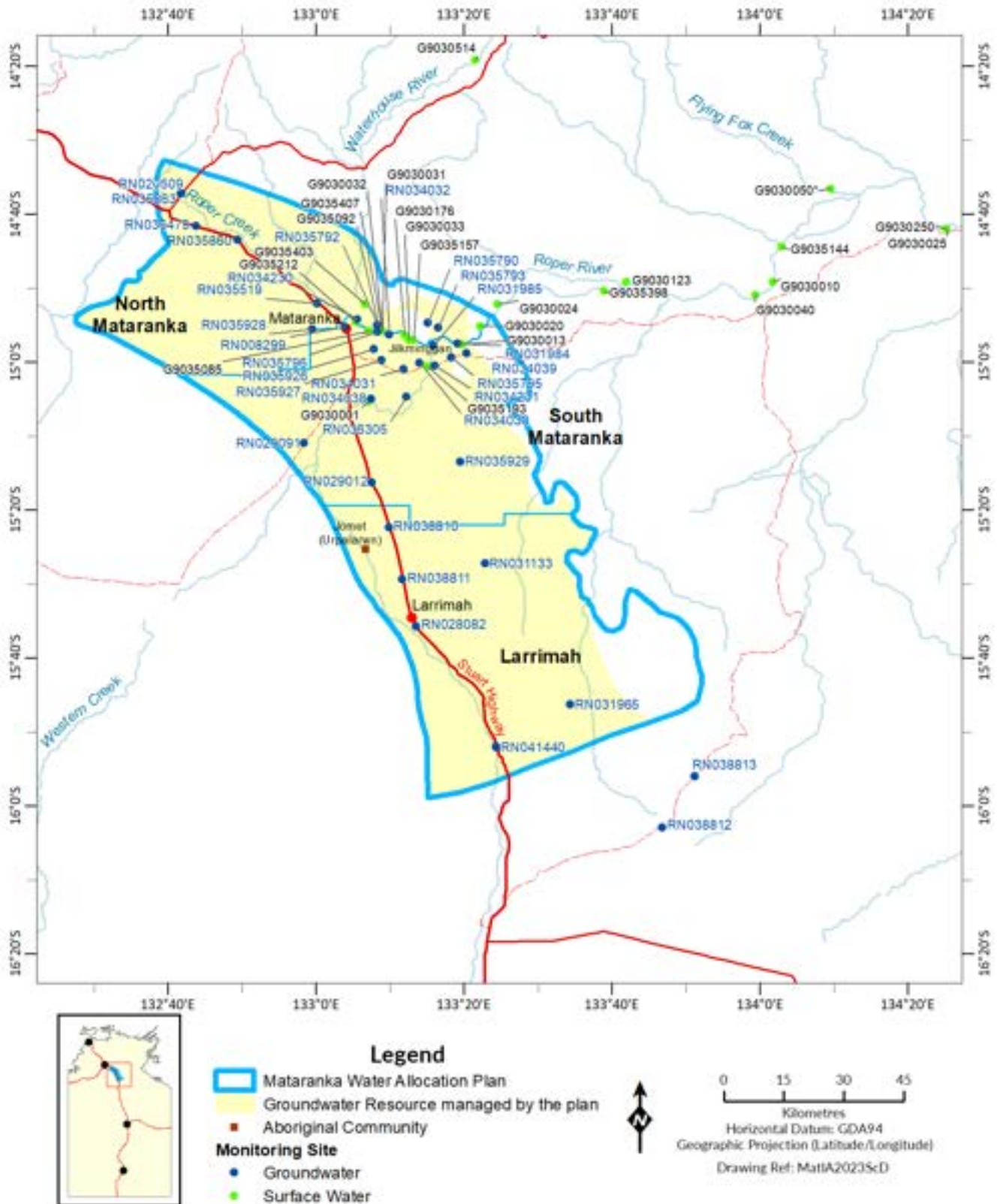


Table 7. Mataranka groundwater monitoring network

Water management zone	Aquifer monitored	Site	Latitude	Longitude	Started monitoring groundwater level (year)	Purpose	Groundwater level logger	Water quality
North Mataranka	Cretaceous	RN020509	-14.62	132.70	1985	Model	-	-
	TLA	RN034230	-14.90	133.09	2004	Spring monitoring	Yes	-
	TLA	RN035519	-14.87	133.00	2008	Model	-	-
	TLA	RN035790	-14.91	133.25	2008	Regional	-	Yes
	TLA	RN035792	-14.92	133.14	2008	Spring monitoring	Yes	-
	TLA	RN035793	-14.92	133.28	2008	Model	Yes	-
	TLA	RN035796	-14.93	133.14	2008	Spring monitoring	Yes	Yes
	TLA	RN035860	-14.72	132.82	2008	Model	Yes	-
	Cretaceous	RN035863	-14.62	132.70	2007	Model	-	-
	TLA	RN035928	-14.93	132.99	2009	Model	-	-
	TLA	RN036479	-14.69	132.73	2014	Regional	-	-
	South Mataranka	TLA	RN008299	-14.92	133.06	2007	Model	Yes
TLA		RN029012	-15.27	133.13	1993	Model	Yes	-
TLA		RN029091	-15.18	132.97	1993	Model	-	-
TLA		RN031984	-14.96	133.32	2007	Regional	Yes	-
TLA		RN031985	-14.96	133.27	2007	Model	-	-
TLA		RN034030	-15.00	133.23	2004	Model	-	-
TLA		RN034031	-15.02	133.20	2004	Model	Yes	-
TLA		RN034032	-14.94	133.16	2004	Model	Yes	-
TLA		RN034038	-15.08	133.12	2004	Model	Yes	-
TLA		RN034039	-14.98	133.34	2004	Model	-	-
TLA		RN034231	-15.01	133.27	2004	Model	-	-
TLA		RN035795	-14.99	133.30	2008	Model	-	-
TLA	RN035926	-14.97	133.13	2009	Model	Yes	-	

Water management zone	Aquifer monitored	Site	Latitude	Longitude	Started monitoring groundwater level (year)	Purpose	Groundwater level logger	Water quality
	TLA	RN035927	-15.00	133.15	2009	Model	Yes	Yes
	TLA	RN035929	-15.23	133.33	2009	Model	Yes	-
	TLA	RN036305	-15.08	133.20	2012	Regional	-	-
Larrimah Other	TLA	RN028082	-15.60	133.23	1992	Model	-	-
	TLA	RN038810	-15.37	133.17	2014	Model	-	-
	TLA	RN038811	-15.49	133.20	2014	Model	-	-
	TLA	RN041440	-15.87	133.41	2020	Model	-	-
	TLA	RN031965	-15.77	133.57	TBD	Regional	-	-
	TLA	RN031133	-15.45	133.38	TBD	Regional	-	-
	TLA	RN038812*	-16.05	133.78	2014	Regional	Yes	-
	TLA	RN038813*	-15.93	133.85	2015	Regional	Yes	-

* Sites also included in Georgina Wiso groundwater monitoring network

Table 8. Mataranka surface water monitoring network

Water management zone	Water body	Site	Latitude	Longitude	Started monitoring	Purpose	Type	Water quality
Downstream (incl. downstream contributions)	Wilton River	G9030003**	-13.71	134.40	2016	Regional	Flow	-
	Roper River (Judy Crossing)	G9030010***	-14.82	134.03	2017	Regional	(See G9030040)	Yes
	Roper River	G9030025***	-14.70	134.42	2017	Regional	Flow	-
	Roper River (Packsaddle Pool)	G9030040***	-14.85	133.99	2021	Model	Flow, level	Yes (field)
	Flying Fox Creek	G9030050*	-14.61	134.16	2018	Model	Flow	-
	Mainoru River	G9030074**	-14.04	134.09	2016	Regional	Flow	-
	Flying Fox Creek	G9030108**	-14.17	133.73	2016	Regional	Flow	-

Water management zone	Water body	Site	Latitude	Longitude	Started monitoring	Purpose	Type	Water quality
	Roper River (Moroak)	G9030123***	-14.82	133.70	1960	Model	Flow, level	Yes (field)
	Roper River	G9035144***	-14.74	134.05	2016	Model	Flow, level	-
	Roper River (Red Rock)	G9030250***	-14.70	134.42	1966	Model	Flow, level	Yes (field)
	Wilton River	G9035283	-14.68	134.57	2018	Regional	Flow, level	Yes (field)
	Roper River	G9035300	-14.71	134.51	2007	Regional	-	Yes
	Roper River	G9035398***	-14.84	133.65	2008	Regional	-	Yes
North Mataranka	Rainbow Springs	G9035092	-14.92	133.14	2006	Spring monitoring	Flow	Yes
	Bitter Springs	G9035212	-14.91	133.09	2006	Spring monitoring	Flow	Yes
	Waterhouse River	G9030514***	-14.32	133.36	2016	Regional	Flow, level	Yes (field)
	Waterhouse River	G9035407	-14.93	133.15	2003	Model	Flow	Yes (field)
	Waterhouse River	G9035403	-14.87	133.11	2021	Regional	Flow	Yes (field)
North & South Mataranka	Roper River	G9030013	-14.96	133.33	1953	Model	Flow, level	Yes (field)
	Roper River	G9030020	-14.92	133.37	2021	Regional	Flow	Yes (field)
	Roper River	G9030024***	-14.87	133.41	2017	Model	Flow	Yes (field)
	Little Roper	G9030031	-14.93	133.15	2017	Regional	-	Yes
	Waterhouse River	G9030032	-14.93	133.15	2017	Regional	-	Yes
	Roper River	G9030033	-14.95	133.21	2021	Regional	-	Yes
	Roper River	G9030176	-14.94	133.20	1961	Model	Flow, level	Yes (field)
	Little Roper	G9035085	-14.93	133.12	1996	Model	Flow, level	Yes (field)

Water management zone	Water body	Site	Latitude	Longitude	Started monitoring	Purpose	Type	Water quality
	Fig Tree Spring	G9035157	-14.95	133.22	2007	Spring monitoring	Flow	Yes
	Eley Creek	G9030001	-15.09	133.12	2016	Model	Flow, level	Yes
	Eley Creek	G9035193	-15.01	133.25	2007	Model	Flow	Yes (field)

* If not accessible use G9035287

** Outside map extent to the north

*** Outside plan area

Schedule F. Risk assessment methodology

An assessment of the level of risk posed by the described risk can be a useful way to prioritise the way in which the water will be managed. The relative level of a certain risk can be determined by considering the likelihood of a threat occurring and the consequence associated with that threat on a scale of 1 to 5, and using a matrix below to determine the risk level:

Risk level

Risk level		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Rare	very low	very low	low	moderate	moderate
	Unlikely	very low	low	low	moderate	high
	Possible	low	low	moderate	high	high
	Likely	low	moderate	moderate	high	very high
	Almost certain	moderate	moderate	high	very high	very high

Likelihood

Category	Qualitative descriptor	Frequency	Probability of occurring in life of plan
1	Rare	Event occurs 1 in every 100 years	< 1%
2	Unlikely	Event occurs 1 in every 20–50 years	1 – 20%
3	Possible	Event occurs 1 in every 5–10 years	21 – 80%
4	Likely	Event occurs annually	81 – 95%
5	Almost certain	Event occurs many times per year	> 95%

Consequence

Category	Qualitative descriptor	Ecological/water quality impacts	Socio-economic impacts
1	Insignificant	No noticeable impact to ecosystem.	Short period of low level water restrictions causing minor inconvenience to households, no material impact on irrigation allocations, minimal financial impact on industry and little to no loss of amenity.
2	Minor	Some impact on marginal ecosystems, for example, edges of riparian zones or small mixed dependency ecosystems.	Extended period of low level water restrictions causing some inconvenience to households, reduction in irrigation allocations with minimal material impact, potential financial impact for some industries and minor loss of amenity. First signs of impact on public morale.
3	Moderate	Water availability is so low, such that only the highest value environmental sites receive or retain water, putting vulnerable species at risk.	Medium level of water restrictions directly impacting on households, reduction in irrigation allocations resulting in some loss of productivity, some industries severely impacted or forced to close tourism, prioritisation of watering for amenities, increased impact on morale.

Category	Qualitative descriptor	Ecological/water quality impacts	Socio-economic impacts
4	Major	Water availability is at critically low levels and groundwater systems become depleted beyond recharge rate. Extensive damage to ecosystems occurs with potential irreparable damage in some areas	High level water restrictions directly limiting household water use, limited irrigation allocations resulting in low levels of productivity, some industries forced to close which may impact on national economy, severe loss of amenity and morale, some people leave.
5	Catastrophic	Irreparable damage to ecosystem; severe adverse impacts to environment.	Water supply to major town becomes insufficient to ever again sustain community or nationally significant activity; no irrigation allocations, collapse of industry, total loss of amenity, dislocation of people, and significant impact to the national economy.

Risk response

The risk level will indicate the type of response that may be required to mitigate or avoid the risk.

Risk Level	Action	Timing
Very low - low	Continue routine approach to management - no specific actions required	Ongoing
Moderate - high	Manage by specific monitoring or response procedures	Within water plan period
Very high	Develop management or investigation plan, cease activities for which high risks may arise	Immediate

Schedule G. Risk and adaptive management

Event scenario - risk			Existing controls	Current residual risk			Further controls	Target risk		
Hazard identification	Why can it happen	Impact on objectives	Management in place	Likelihood	Consequence	Risk level	Actions	Likelihood	Consequence	Risk level
Groundwater levels decline below acceptable levels Surface water flows, and flows from the aquifer to surface, reduce below minimum thresholds	Climate Excessive water use Lack of knowledge about resource	3.2.1 Regional loss of key environmental values	Water plan and ESY in place Annual allocation licence conditions Ground and surface water monitoring program in place Annual review of monitoring program Key sites and values are mapped and inform decision making Recognition of Roper discharge zone	Unlikely	Major	Moderate	4.1.1 Improve data 4.1.2 Extend water monitoring 4.1.3 WQ monitoring 4.1.4 Enviro flow requirement 4.1.5 Improve resource conceptualisation 4.1.6 Throughflow understanding 4.1.7 Key GDE map published 4.1.8 Declare a protected environmental area	Rare	Major	Moderate
		3.2.2 Regional loss of key Aboriginal cultural values	Regulatory compliance and enforcement Prioritisation of water allocation Staging licence conditions				Possible			

Event scenario - risk			Existing controls	Current residual risk			Further controls	Target risk		
Hazard identification	Why can it happen	Impact on objectives	Management in place	Likelihood	Consequence	Risk level	Actions	Likelihood	Consequence	Risk level
							4.2.5 Assess and monitor cultural site water requirements 4.2.6 Other cultural aspects defined			
		3.2.3 & 3.2.4 Insecurity of water supply for rural stock and domestic, and public water supplies		Unlikely	Major	Moderate	4.3.1 Long term planning of demand 4.4.1 Long term planning of demand	Rare	Major	Moderate
		3.2.5 & 3.2.6 Limited water for regional development including Aboriginal economic development		Unlikely	Moderate	Moderate	4.6.1 Further model development	Rare	Moderate	Low
Water quality declines to unacceptable levels	Land use Overuse of resource	3.2.1 Regional loss of key environmental values	Water plan and ESY in place Annual allocation licence conditions	Possible	Moderate	Moderate	4.1.2 WQ monitoring 4.1.7 Key GDE map published 4.1.8 Declare protected environmental area	Unlikely	Moderate	Low

Event scenario - risk			Existing controls	Current residual risk			Further controls	Target risk		
Hazard identification	Why can it happen	Impact on objectives	Management in place	Likelihood	Consequence	Risk level	Actions	Likelihood	Consequence	Risk level
		3.2.2 Regional loss of key cultural sites	Ground and surface water monitoring program in place Key sites and values are mapped and inform decision making key protection areas over groundwater recharge zones Regulatory compliance and enforcement Consideration in water licence decisions s90(1) Act	Possible	Moderate	Moderate	4.2.1 Aboriginal people involved in water management 4.2.2 Culture considered in decisions 4.2.3 Baseline condition cultural sites 4.2.4 Identify and document cultural site water requirements 4.2.5 Assess and monitor cultural site water requirements 4.2.6 Other cultural aspects defined	Unlikely	Moderate	Low
		3.2.3 Insufficient quality for rural stock and domestic use	Land planning and clearing regulation (Planning and Pastoral laws)	Unlikely	Moderate	Low	4.1.2 WQ monitoring 4.3.2 Licence holder water quality monitoring licence conditions	Unlikely	Minor	Very low
		3.2.4 Insufficient quality for public water supplies	As above, and: Water quality monitoring program (PWC)	Rare	Moderate	Low	4.1.2 WQ monitoring 4.4.2 Water quality monitoring program 4.4.3 Communication on service delivery arrangements	Rare	Moderate	Low

Event scenario - risk			Existing controls	Current residual risk			Further controls	Target risk		
Hazard identification	Why can it happen	Impact on objectives	Management in place	Likelihood	Consequence	Risk level	Actions	Likelihood	Consequence	Risk level
		3.2.5 & 3.2.6 Decreased regional economic development	Recovery of unused water policy Staged licence conditions policy Regulatory compliance and enforcement	Unlikely	Minor	Low	4.6.1 Further model development	Rare	Minor	Very low
Economic benefits of water use not realised	Business uncertainty impacts on investment Barriers inhibit new entrants to the region Water availability limits business viability Workforce availability and capability	3.2.5 Allocated water is not used to provide benefit to eligible Aboriginal people	Aboriginal water reserve is established by the plan	Possible	Major	High	4.5.1 Recover unused water in North and South Mataranka zones 4.5.2 Assist eligible Aboriginal people to benefit from access to water 4.5.3 Aboriginal water reserve licence applications 4.2.7 Explain how Aboriginal cultural sites are identified, monitored and protected 4.1.9 High biodiversity values protected 4.1.10 explain how environmental values are managed	Unlikely	Major	Moderate

Event scenario - risk			Existing controls	Current residual risk			Further controls	Target risk		
Hazard identification	Why can it happen	Impact on objectives	Management in place	Likelihood	Consequence	Risk level	Actions	Likelihood	Consequence	Risk level
		3.2.6 allocated water is not used to provide benefits to the region	Trade is established by the plan ESY and certainty in long term government policy is established by the plan Regulatory compliance and enforcement of licence conditions Recovery of unused water policy	Possible	Moderate	Moderate	4.6.4 Reliable water resource planning 4.6.5 Appropriate water management practices 4.3.1 Long term planning of demand 4.4.1 Long term planning of demand 4.2.6 Identify and protection other cultural values and sites 4.2.7 Explain how Aboriginal cultural sites are identified, monitored and protected 4.1.9 High biodiversity values protected 4.1.10 Explain how environmental values are managed	Unlikely	Moderate	Low

Schedule H. Adaptive management framework

