

Katherine implementation actions 2026-2036



Further information:

Please contact the Water Resources Division at:

Department of Lands, Planning and Environment
Water Resources Division
PO Box 496
PALMERSTON NT 0830

Email: waterresources@nt.gov.au

Phone: 08 8999 4455

Web: www.nt.gov.au/environment/water

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Acknowledgement of Country

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

We acknowledge the Traditional Owners and custodians of the lands and waters of the Katherine water allocation plan area, and Aboriginal peoples with connections to the waterways of the Katherine 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.



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1. Risk and adaptive management

Overview

This document outlines the implementation actions that will be undertaken to support the Katherine Water Allocation Plan 2026-2036. They are based on risk management and adaptive management principles, intended to ensure water resources are managed in a sustainable and resilient manner over the long term.

There is uncertainty when managing natural systems, including water resources. Risk management and adaptive management are used by the department to ensure water resources are managed in a sustainable and resilient manner over the long term in the context of this uncertainty. Both management approaches involve ongoing monitoring and adjustment to deal with this uncertainty to maintain the health and productivity of natural ecosystems and human communities.

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.

1.1 Risk assessment

The risk assessment process ensures that water resources are managed in a sustainable and resilient manner. It helps to identify potential risks to the water resource, which enables the development of actions to mitigate them, ensuring that water resources are available for future generations. The risk assessment process involves the identification of hazards, risk analysis and the identification of appropriate actions to mitigate and control the risks.

The primary risks to groundwater resources are changes in groundwater recharge and water availability, reduced discharges to surface water sites (rivers and springs), deterioration of water quality, and greater climate variability. Groundwater levels are influenced by the amount of rainfall and recharge, the amount of water that is used and where the water is extracted from. Water quality is influenced by the inherent characteristics of the resource, how the land is used and where water is extracted from. Water users also bear the risk of any reductions to water availability resulting from seasonal or long-term changes in climate.

The risks identified through the water planning processes and development of the water allocation plan reflect the current knowledge and understanding of the water resource, which will improve over time and enable more focused 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.

1.2 Risk management

The detailed assessment and management of the key risks is shown in [Schedule G](#), which outlines the actions that are currently being implemented to address the residual risk, as well as further actions that will be implemented over the term of the plan, to reach the target risk level.

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

1. Reduction in groundwater levels and/or surface water flows below acceptable levels.

2. Deterioration of water quality greater than acceptable levels.
3. Social and economic benefits of the water use are not realised.

The objectives of water sharing, as detailed in section 3.2 of the plan, guide the assessment of each risk in terms of causes, impacts and consideration of possible consequences. 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 further reduce risks, additional controls aligned to the implementation actions are identified, which are intended to achieve the target risk once each action is completed.

1.3 Adaptive management

Combining risk management with adaptive management enables a proactive approach to managing risks, while also being flexible and responsive to changing conditions.

Adaptive management provides an iterative process that monitors the resource's response to water use and management actions and uses this information to improve future actions to meet the objectives of sharing in the plan. This focuses activities on risk mitigation while enabling resource management to be flexible and responsive to changing conditions. This means that as actions are implemented, they must be monitored over time to assure their effectiveness. Based on the results of monitoring, the actions may require refinement, implementation of new actions or discontinuation of those that are not effective.

The water monitoring program is critical to adaptive management. An overview of this program is provided in [section 2](#).

2. Water monitoring program

Overview

Consistent with section 34 of the *Water Act 1992*, a continuous program for the assessment of water resources of the Territory is carried out, 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 monitoring program for the Katherine water resource undertaken by the department to inform management of the water resources in the plan area. 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.

2.1 Groundwater and surface water monitoring

The department has a continuous monitoring program in the plan area. This monitoring network includes both discrete and time-series data from a network of groundwater monitoring bores. The monitoring program is reviewed annually and includes:

- flow gauging and water quality monitoring at seven surface water sites
- water level monitoring at 22 groundwater sites
- water quality monitoring at six groundwater sites.

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

The Katherine water monitoring network is shown in [Schedule E](#) and reflects spatial variability of the resource across the vast area.

The objectives of the monitoring program are to:

- ensure spatial coverage consistent with significant water extraction areas
- ensure good temporal coverage through biannual site visits and the use of loggers
- monitor each of the different formations making up the water resource
- monitor groundwater level trends and recharge, which will be used for model calibration
- better understand connectivity between groundwater and surface water flows.

2.2 Monitoring by licence holders

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

¹ <https://water.nt.gov.au/Data>

3. 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. The actions and key performance indicators are defined for both consumptive and non-consumptive water uses. As water is used in the plan area, more specific triggers may be defined to measure and evaluate the actions.

The implementation actions and key performance indicators (KPIs) are shown in Tables Table 1 to Table 5, with a dictionary in [Schedule A](#). Abbreviations and acronyms are defined in [Schedule B](#).

3.1 Actions related to water requirements to support environmental values and beneficial uses

Table 1. Actions and measures to maintain water quality and availability to support environmental values and beneficial uses

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
1a Groundwater and surface water quality is protected from contamination.	3.1.1 Implement an ongoing water quality monitoring program (section 2.1) and publicly report the results.	Water quality included in annual status of the resource reports	DLPE WRD	Ongoing
	3.1.2 Support land use planning for Katherine with information and advice on water quality risks posed by land use change (e.g. sinkhole locations).	Water quality findings inform Katherine Land Use Plan.	DLPE WRD and Lands Planning	In line with land use plan review cycles
1b Dry season baseflows and spring discharge in the Katherine River support environmental values.	3.1.3 Prepare a collaborative project to refine groundwater inflows to the Daly River and environmental water requirements of key sites and species that incorporates Aboriginal knowledge.	Project developed and submitted for funding	DLPE WRD	2026-2027
1c Water allocations support all declared beneficial uses of water.	3.1.4 Investigate the potential for an ESY increase at extraction points further from the river.	Model review, plan review	DLPE WRD	2034-2036
	3.1.5 Review the department's integrated groundwater-surface water model when total extraction in the plan area reaches 30,000 ML per year.	Provide a report to the Daly River water advisory committee with a summary of key outcomes	DLPE WRD	When annual extraction >30,000 ML per year

3.2 Actions related to Aboriginal cultural values associated with water

Table 2. Actions and measures that ensure Aboriginal people contribute to water resource management to support their cultural values, practices, and responsibilities to Country

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
2a Water supports Aboriginal spiritual, cultural, and social relationships with Country.	3.1.3 Prepare a collaborative project to refine groundwater inflows to the Daly River and environmental water requirements of key sites and species that incorporates Aboriginal knowledge.	Project developed and submitted for funding	DLPE WRD	2026-2027
	3.2.1 Identify and document key water-related Aboriginal cultural sites and species.	Key Aboriginal cultural sites and species are identified	NLC, DLPE WRD, AAPA	2030-2031
2b Culturally significant water-dependent sites, including sacred and burial sites, are protected and managed.	3.2.2 Identify and document the water requirements (quality and quantity) of key Aboriginal cultural sites.	Key Aboriginal cultural sites have defined water requirements	NLC, DLPE WRD	2031-2032
2c Aboriginal knowledge is integrated into water resource management.	3.2.3 Key cultural water sites are included in monitoring program.	Key Aboriginal cultural sites are appropriately monitored	NLC, DLPE WRD	2032-2033

3.3 Actions related to other cultural and social values associated with water

Table 3. Actions and measures that contribute to recognising and supporting the community's cultural and social connections to water, rivers and springs

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
3a Water supports liveability, recreation, and amenity.	3.3.1 Ongoing monitoring by the department (section 2.1).	Results of monitoring available publicly	DLPE WRD	Ongoing
3b Effective communication and engagement improves public understanding of water use, including the impacts of use on the environment.	3.3.2 Educate the community on the move to a Daly basin water plan.	The community are aware of and understand the reasoning behind the development of a Daly River basin water plan	DLPE WRD	2026-2029

3.4 Actions related to water security for public water supplies and essential services

Table 4. Actions and measures that safeguard long-term water security for current and future generations through adaptive and informed management

Outcomes of water sharing		Actions	KPI	Responsibility	Timeframe
4a	Water supplies for public and essential services are prioritised and protected during dry periods.	3.4.1 Independent analysis of domestic water use and growth estimates with recommendations for management strategies.	Research organisation engaged to undertake the study	DLPE WRD	2027-2028
4b	Adaptive management is informed by public reporting and participatory water resource management.	3.4.2 Perform a 'dry run' with stakeholders to develop a procedure for the application of announced allocations (AA).	Provide the Controller of Water Resources with an AA procedure for Katherine water plan area	Katherine Tindall licence holders, NT Farmers, DLPE WRD, NT Cattlemen's Association	2027-2028
4c	Improved understanding and management of unlicensed water use leads to increased confidence in water resource management.	3.4.3 Water Resources to work with other stakeholder groups to improve public reporting of all unlicensed water extraction – starting with RAAF.	Improved understanding of RAAF Tindall water use	DLPE WRD, RAAF	2026-2027

3.5 Actions related to water for regional economic development

Table 5. Actions and measures that maximise the potential for water to support regional economic development

Outcomes of water sharing	Actions	KPI	Responsibility	Timeframe
5a Confidence in water resource management to enable Katherine's economic development.	3.5.1 Work with our partners to deliver education on bore management.	Publish education materials and hold workshops	DLPE WRD, NT Farmers	2026-2027
	3.3.2 Educate the community on the move to a Daly River basin water plan.	The community are aware of and understand the reasoning behind the development of a Daly River basin water plan	DLPE WRD	2026-2029
5b Access to the Aboriginal water reserve delivers economic benefits for Aboriginal people.	3.5.2 Assist eligible Aboriginal people to access water, including through the Aboriginal water reserve.	Produce education materials and hold workshops	NLC, DLPE WRD	2026-2036
	3.5.3 Refine and communicate water licensing processes, including for the Aboriginal water reserve (AWR).	AWR licence application	DLPE WRD	2026-2027
5c Water is regulated and used in ways that are efficient and transparent.	3.4.2 Perform a 'dry run' with stakeholders and develop a procedure for the application of announced allocations (AA).	Provide the Controller of Water Resources with an AA procedure for Katherine water plan area	Katherine Tindall licence holders, NT Farmers, DLPE WRD, NT Cattlemen's Association	2027-2028
	3.5.4 Review water entitlements within the discharge protection zone against the Recovery of unused licenced water entitlements policy.	Outcomes reported in the Katherine Status of the Resource Report.	DLPE	2026-2027

4. 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 an annual report for the plan area summarising:

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

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

³ <https://water.nt.gov.au/Data>

Schedule A. Dictionary

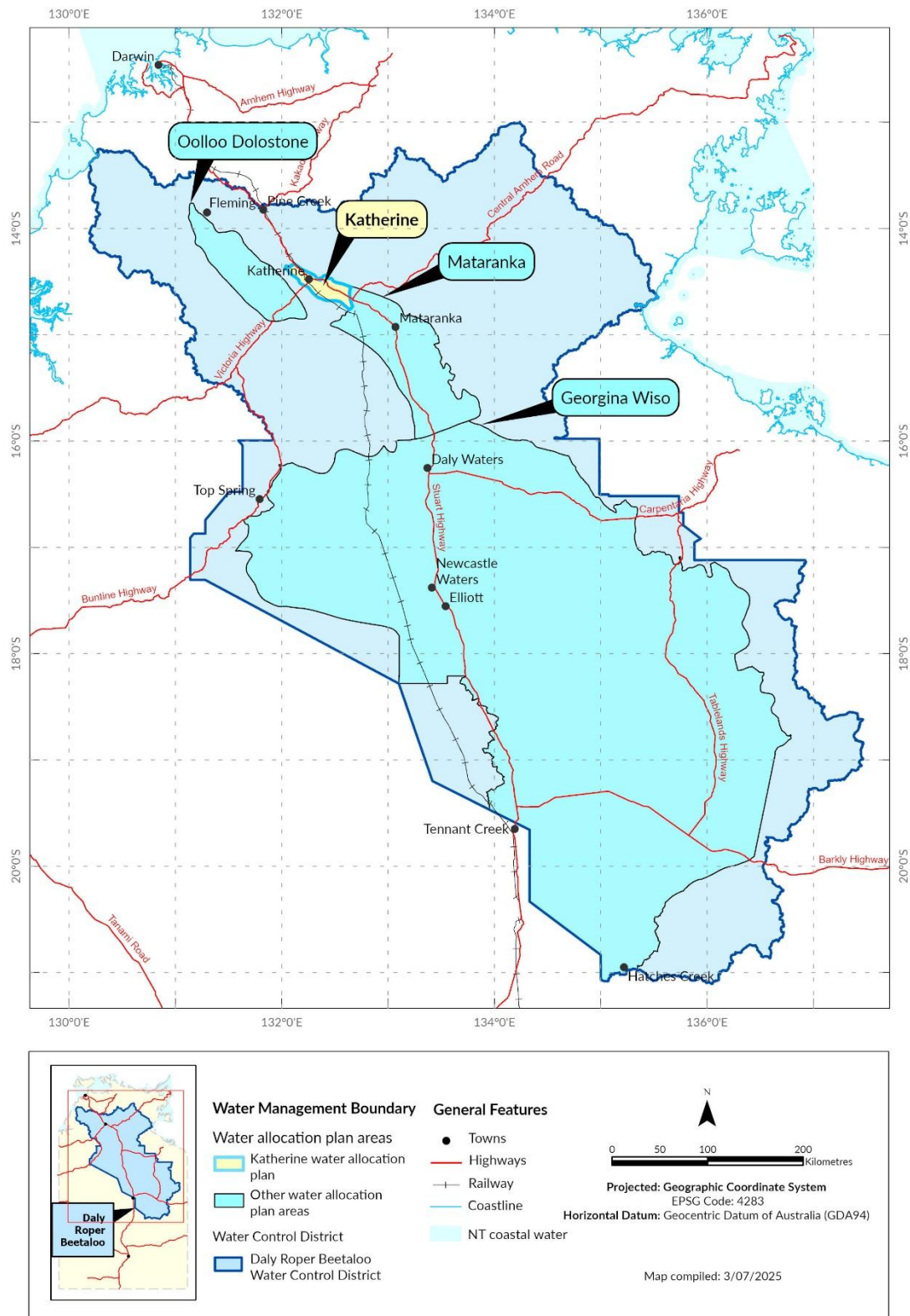
Term	Definition or reference
Aboriginal water reserve	see <i>Water Act 1992</i> , section 4(1)
Act	the <i>Water Act 1992</i> ⁴
beneficial uses	the beneficial uses for the Daly Roper Beetaloo water control district declared by <i>Gazette</i> on 19 October 2022. A copy of the declaration is included in Schedule E of the plan
Controller	the Controller of Water Resources appointed under the <i>Water Act 1992</i> , section 18
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 4.2 of the background report refers
groundwater	see <i>Water Act 1992</i> , section 4(1)
groundwater-dependent ecosystem	an ecosystem that requires access to groundwater to meet all or some of their water requirements
implementation actions	Katherine implementation actions, this document, as amended from time to time
Katherine water resource	Refer section 2.5 of the Katherine water allocation plan 2026-2036
limits of acceptable change	see <i>Water Act 1992</i> , section 4(1)
plan area	the area to which this water allocation plan applies as shown in Schedule C and Schedule D of this document
surface water	see <i>Water Act 1992</i> , section 43
Tindall Limestone Aquifer	a regional limestone aquifer that extends from north of Katherine to southeast 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 Montejinni limestone in the Wiso basin
water control district	the Daly Roper Beetaloo water control district, declared by <i>Gazette</i> 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)
waterway	see <i>Water Act 1992</i> , section 4(1)

⁴ <https://legislation.nt.gov.au/Legislation/WATER-ACT-1992>

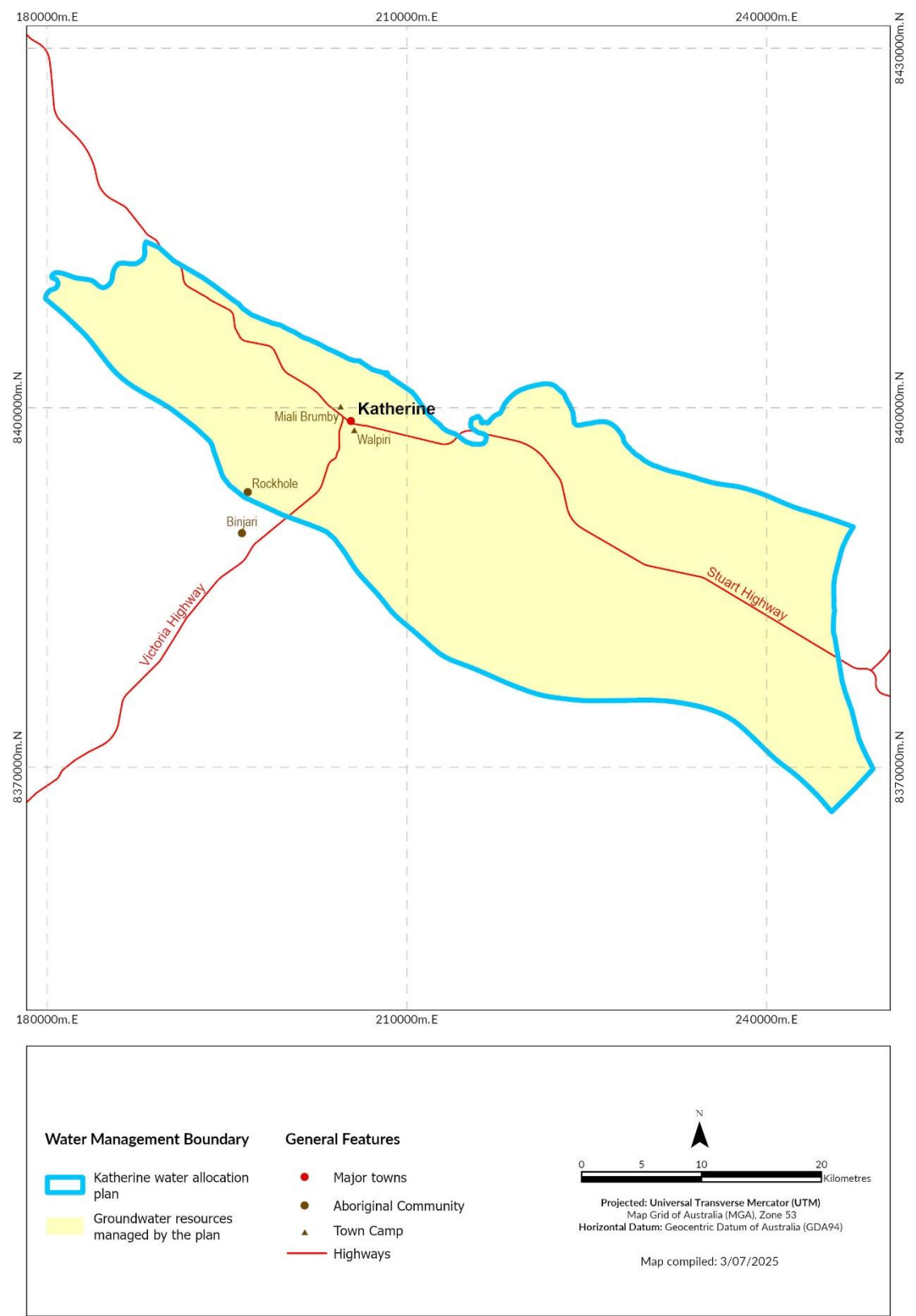
Schedule B. Abbreviations and acronyms

Term	Full form
AA	announced allocations
AAPA	Aboriginal Areas Protection Authority
Act	<i>Water Act 1992</i>
AWR	Aboriginal water reserve
DAF	Department of Agriculture and Fisheries
DCMC	Department of the Chief Minister and Cabinet
District	Daly Roper Beetaloo water control district
DLPE	Department Lands, Planning and Environment
DM&E	Department of Mining and Energy
ESY	estimated sustainable yield
FFD	Flora and Fauna Division, DLPE
GDE	groundwater-dependent ecosystem
KPI	key performance indicator
Minister	Minister for Water Resources
ML	megalitre
NLC	Northern Land Council
NT	Northern Territory
NT Farmers	Northern Territory Farmers Association
NTG	Northern Territory Government
plan	Katherine water allocation plan 2026–2036
PWC	Power and Water Corporation
SREBA	Strategic Regional Environmental and Baseline Assessment
KTLA	Katherine Tindall Limestone Aquifer
TLA	Tindall Limestone Aquifer
WQ	water quality
WRD	Water Resources Division, DLPE

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



Schedule D. Katherine plan area



Schedule E. Katherine water monitoring network

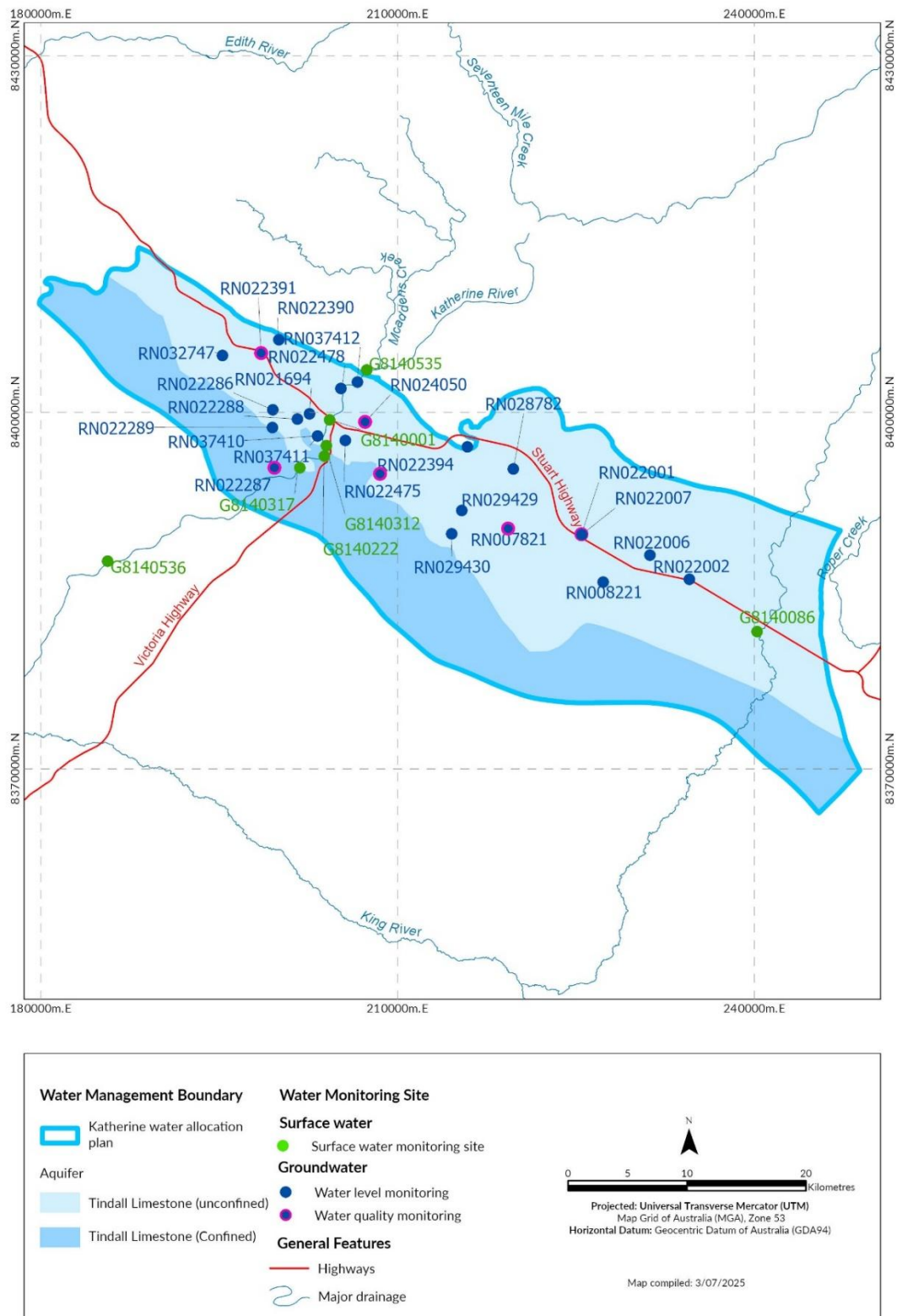


Table 6. Katherine groundwater level monitoring network for the Katherine Tindall Limestone Aquifer (KTLA)⁵

Location	Site	Started monitoring (year)	Monitoring purpose	Program purpose	Continuous	Targeted timing
Mataranka Station	RN007821	1986	GDE, WQ	model cal, extraction	-	end of dry
Cutta Cutta Caves	RN008221	2000	GDE, recharge	model cal, extraction	yes	
Venn Airstrip	RN021694	1998	GDE, recharge	model cal, temporal/formation coverage	yes	
Venn airstrip	RN022001	1985	extraction, WQ - Venn agricultural area	model cal, extraction	-	end of dry
Venn airstrip	RN022002	1983	extraction, WQ - Venn agricultural area	model cal, extraction	-	
Venn airstrip	RN022006	1983	extraction, WQ - Venn agricultural area	model cal, extraction	-	
N of River	RN022007	1987	extraction, recharge, WQ - Venn agricultural area	model cal, extraction, temporal/formation coverage	yes	
N of River	RN022286	1987	extraction, GDE, recharge	model cal, extraction, temporal/formation coverage	yes	
N of River	RN022287	1990	recharge, WQ	model cal, temporal/formation coverage	-	end of dry
N of River	RN022288	1998	extraction, recharge	model cal, extraction	yes	
N of River	RN022289	1984	recharge	model cal, extraction, temporal/formation coverage	yes	
N of River	RN022390	1998	recharge, extraction, GDE	model cal, temporal coverage, formation coverage	-	end of dry
S of River	RN022392	1998	Recharge	model cal	-	
S of River	RN022394	1997	extraction, GDE, recharge	model cal, extraction, temporal/formation coverage	yes	end of dry
N of River	RN022475	1998	extraction, GDE, recharge	model cal, extraction, temporal/formation coverage	yes	end of dry
Venn Airstrip	RN028782	1998	GDE, recharge	model cal, extraction	-	
RAAF	RN029429	1994	GDE, recharge	model cal, extraction, formation/temporal coverage	yes	

⁵ Key: GDE= Groundwater dependent ecosystem, WQ = Water quality sampling

Location	Site	Started monitoring (year)	Monitoring purpose	Program purpose	Continuous	Targeted timing
S of River	RN029430	1998	GDE, recharge	model cal, extraction	-	
N of River	RN032747	2000	GDE, recharge	model cal, extraction, formation/temporal coverage	-	
N of River	RN037410	2011	extraction, GDE, recharge	model cal, GW/SW connectivity	yes	
N of River	RN037411	2011	extraction, GDE, recharge	model cal, GW/SW connectivity	yes	
N of River	RN037412	2012	extraction, GDE, recharge	model cal, GW/SW connectivity	yes	

Table 7. Katherine surface water monitoring network

Water body	Site	Purpose	Timing	Program purpose
Katherine River - Railway Bridge	G8140001	flow gauging; WQ-TM, GP & nutrients ⁶	flow gauging, WQ GP & nutrients: end wet, end dry WQ-TM: 5 yearly	longest record of surface water monitoring for plan area, recharge estimation
King River - Stuart Hwy (downstream)	G8140086	WQ- TM, GP & nutrients	WQ GP & nutrients: opportunistically, early wet WQ-TM: 5 yearly	opportunistic sampling when King River is flowing
Katherine River - Low Level Bridge	G8140222	flow gauging; WQ-TM, GP & nutrients	flow gauging, WQ GP & nutrients: end wet, end dry WQ-TM: 5 yearly	represents groundwater inflow to Katherine River
Katherine River - Hot Springs (CSIRO)	G8140312	flow gauging; WQ-TM, GP & nutrients	flow gauging, WQ GP & nutrients: end wet, end dry WQ-TM: 5 yearly	represents groundwater flow path from the south
Springs - Springvale Tourist Camp (upstream)	G8140317	flow gauging; WQ-TM, GP & nutrients	flow gauging, WQ GP & nutrients: end wet, end dry WQ-TM: 5 yearly	represents groundwater flow path from the north
Katherine River - Ironwood Station	G8140535	flow gauging; WQ-TM, GP & nutrients	flow gauging, WQ GP & nutrients: end wet, end dry WQ-TM: 5 yearly	represents surface water flow that enters the plan area
Katherine River - Wilden Station	G8140536	flow gauging; WQ-TM, GP & nutrients	flow gauging, WQ GP & nutrients: end wet, end dry WQ-TM: 5 yearly	represents discharge out of the KTLA at lowest discharge point

⁶ Key: WQ-GP = pH, EC, TDS, Ca, K, Mg, Na, SO₄, Cl, total alkalinity (includes, HCO₃, CO₃ and OH), hardness, TDS, True colour, EC, Cl, F, turbidity, Na, SiO₂, SO₄, F, Fe

WQ- Nutrients = Filtered nutrients, total nutrients

WQ-TM = Filtered: Calcium, Potassium, Magnesium, Sodium, Silicon as Silica, Sulfur as Sulfate, Total Recoverable: Silver, Aluminium, Arsenic, Boron, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Manganese, Molybdenum, Nickel, Lead, Antimony, Tin, Uranium, Zinc

Schedule F. Risk assessment methodology

The approach to risk assessment is consistent with National Water Initiative policy guidelines for water planning and management⁷. The risk assessment module provides guidance to implement a risk-based approach as part of a water management that is consistent with AS/NZS 4360:2004 Risk Management⁸.

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

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 to 50 years	1 – 20%
3	Possible	Event occurs 1 in every 5 to 10 years	21 – 80%
4	Likely	Event occurs annually	81 – 95%
5	Almost certain	Event occurs many times per year	> 95%

⁷ <https://www.dcceew.gov.au/water/policy/policy/nwi/guidelines-water>

⁸ <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.dcceew.gov.au%2Fsites%2Fdefault%2Ffiles%2Fsitecollectiondocuments%2Fwater%2Frisk-module.doc&wdOrigin=BROWSELINK>

Consequence

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.
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 plan period
Very high	Develop management or investigation plan, cease activities for which high risks may arise	immediate

Schedule G. Risk assessment

Event scenario - risk			Existing controls	Current residual risk			Further controls	Future target risk		
The risk	Why can it happen	Impact on plan objectives	Management in place	Likelihood	Consequence	Risk level	Implementation actions	Likelihood	Consequence	Risk level
Reduction in groundwater levels or surface water flows below acceptable levels.	Climate (variability, change, events e.g. cyclones). Human activities (overuse of water, construction in waterways). Incomplete knowledge about resource. Lack of Aboriginal participation and knowledge input into water resource management.	Regional loss of key environmental values and beneficial uses (objective 1).	Water plan in place: - estimated sustainable yield specific for the area - Discharge protection zone balances productive use and river protection - climate change considered - public water supplies prioritised in allocations and projected demand - estimated stock and domestic water use - provides guidance on water licence decisions, including low flows and announced allocations - participatory water resource management for announced allocations - review at 5 years.	Unlikely Good understanding of water resource; Climate and rainfall is primary driver of water availability - ESY and management arrangements set within natural variation. Sustained extraction in region with no significant impacts observed. Integrated water model in place, annually tested through announced allocations.	Major Extensive damage to ecosystems is not anticipated. A conservative approach has been maintained to ensure effective water resource management for the 3 rd largest town in the Territory. Plan has low flow trigger when most at risk of impact from extraction. Integrated model is used to assess impact of extraction to ensure impacts are acceptable.	Moderate	3.1.1 Develop and implement an ongoing water quality monitoring program and publicly report the results. 3.1.3 Prepare a collaborative project to refine groundwater inflows to the Daly River and environmental flow requirements of key sites and species that incorporates Aboriginal knowledge. 3.1.5 Review the department's integrated groundwater-surface water model when total extraction in the plan area reaches 30,000 ML per year.	Unlikely	Moderate	Low
		Regional loss of key Aboriginal cultural values, practices and responsibilities (objective 2).	Monitoring program: maintain and regularly review program. Integrated model:	Possible Aboriginal sites and values are not identified in the plan.	Moderate Katherine township has already developed along the river and		3.1.3 Prepare a collaborative project to refine groundwater inflows to the Daly River and environmental flow requirements of key sites and species that			

Event scenario - risk			Existing controls	Current residual risk			Further controls	Future target risk		
The risk	Why can it happen	Impact on plan objectives	Management in place	Likelihood	Consequence	Risk level	Implementation actions	Likelihood	Consequence	Risk level
			- maintain and review integrated surface water and groundwater model for the resource. Water advisory committee: - maintain committee to guide implementation. Water licences regulated: - Controller considers key factors when deciding		limited impacts have occurred.		incorporates Aboriginal knowledge. 3.2.1 Identify and document key Aboriginal cultural sites and species. 3.2.2 Identify and document the water requirements of key Aboriginal cultural sites and species (quality and quantity). 3.2.3 Key cultural water sites are included in monitoring program.			
		Regional loss of cultural and social connections (objective 3).	- public consultation on decisions. - compliance program reported annually. Public reporting: - water levels and flows - water licences - annual status of the resource reports for resources managed in plans.	Possible Highest value sites are not specifically identified and protected in the plan.	Moderate Katherine township has already developed along the river with established values and connections.	Moderate	3.3.2 Educate the community, including about the future water plan for the Daly River basin. 3.4.3 Water Resources to work with other stakeholder groups to improve public reporting of all water extraction – starting with RAAF. 3.5.1 Water Resources to work with our partners to deliver education on bore management.	Unlikely	Moderate	Low
		Water for rural stock and domestic and public water supply isn't		Possible Public water supply is prioritised and licensed	Moderate Impact may be greater as predominantly the take is	Moderate	3.4.1 Contract an independent research organisation to improve accuracy of residential water use and growth	Unlikely	Moderate	Low

Event scenario - risk			Existing controls	Current residual risk			Further controls	Future target risk		
The risk	Why can it happen	Impact on plan objectives	Management in place	Likelihood	Consequence	Risk level	Implementation actions	Likelihood	Consequence	Risk level
		secure (objective 4).		While rural, stock and domestic is a relatively small portion of ESY it is estimated so some uncertainty in security.	closer to the river where impacts are greatest.		estimates and recommend additional management strategies.			
		Water for economic development is restricted, including Aboriginal economic development (objective 5).		Unlikely Plan provides protection for licence holders, including announced allocations.	Minor Extraction is regularly reported and monitored to ensure impacts remain acceptable. Department monitoring continues to enable early action if triggered.	Low	Continue routine approach to management. Existing controls: • water plan in place • monitoring program • water advisory committee • water licences regulated • public reporting.			
Deterioration of water quality greater than acceptable levels	Climate (variability, change, e.g. cyclones). Human activities (pollution events, construction in waterways). Incomplete knowledge about resource.	Regional loss of key environmental values and beneficial uses environmental values due to water quality (objective 1).	Water quality objectives established under s73(1) of the Water Act for the water control district to guide decision making. Maintain and regularly review a surface water and water quality monitoring program in the plan area.	Unlikely Foundational understanding of water resource quality. Irrigation is major activity and conducted furthest from the river.	Minor Water quality deterioration is likely to be localised. Rainfall is primary driver of water availability and impact on water quality will be greater in drier years.	Low	Continue routine approach to management. Existing controls: • water plan in place • monitoring program • water advisory committee • water licences regulated • public reporting. 3.1.2 Support land use planning for Katherine with information and			

Event scenario - risk			Existing controls	Current residual risk			Further controls	Future target risk		
The risk	Why can it happen	Impact on plan objectives	Management in place	Likelihood	Consequence	Risk level	Implementation actions	Likelihood	Consequence	Risk level
							advice on water quality risks posed by land use change (e.g. sinkhole locations).			
		Regional loss of key Aboriginal cultural values, practices and responsibilities (objective 2).		Possible Foundational understanding of water quality of cultural sites not established.	Minor Water quality deterioration is likely to be localised.	Low	Continue routine approach to management. Existing controls: • water plan in place • monitoring program • water advisory committee • water licences regulated • public reporting.			
		Regional loss of cultural and social connections (objective 3).		Unlikely Foundational understanding of water quality.	Minor Water quality deterioration is likely to be localised.	Low	Continue routine approach to management. Existing controls: • water plan in place • monitoring program • water advisory committee • water licences regulated • public reporting.			
		Reduced water quality for rural stock and domestic or insufficient quality for public water supplies (objective 4).		Unlikely Public water supply is prioritised and licensed. While rural, stock and domestic is a relatively small portion of ESY.	Minor Water quality deterioration is likely to be localised. Water will be treated for public water supplies,	Low	Continue routine approach to management. Existing controls: • water plan in place • monitoring program • water advisory committee			

Event scenario - risk			Existing controls	Current residual risk			Further controls	Future target risk		
The risk	Why can it happen	Impact on plan objectives	Management in place	Likelihood	Consequence	Risk level	Implementation actions	Likelihood	Consequence	Risk level
					minimising impact of quality variations.		• water licences regulated • public reporting.			
		Insufficient water quality for economic uses of water, including Aboriginal economic development (objective 5).		Unlikely Current water quality is relatively high, with current activities in the catchment.	Minor Department monitoring continues to enable early action if triggered.	Low	Continue routine approach to management. Existing controls: • water plan in place • monitoring program • water advisory committee • water licences regulated • public reporting.			
Social and economic benefits of the water use are not realised	Business uncertainty impacts on investment. Water allocations limit business viability. Workforce availability and capability. Barriers inhibit development of wet season take projects. Land suitability limits economic opportunity.	Water isn't used to provide economic benefits, including Aboriginal people through Aboriginal water reserve (AWR) (objective 5).	Water plan in place: • estimated sustainable yield specific for the area • Discharge protection zone balances productive use and river protection • climate change considered • public water supplies prioritised in allocations and projected demand • estimated stock and domestic water use • provides guidance on water licence decisions, including low flows and announced allocations	Almost certain While the majority of the ESY is allocated only 30% is being used.	Moderate Full benefits are not being realised, especially Aboriginal economic development.	High	3.1.4 Investigate potential for ESY increase for development further from the Katherine River. 3.3.1 Educate the community, including about the future water plan for the Daly River basin. 3.4.2 Perform a 'dry run' with stakeholders within 12-months of the plan being declared, to develop a procedure for the application of announced allocations. 3.5.1 Work with our partners to deliver education on bore management.	Possible	Moderate	Moderate

Event scenario - risk			Existing controls	Current residual risk			Further controls	Future target risk		
The risk	Why can it happen	Impact on plan objectives	Management in place	Likelihood	Consequence	Risk level	Implementation actions	Likelihood	Consequence	Risk level
			• participatory water resource management for announced allocations • review at 5 years. Monitoring program: • maintain and regularly review program. Integrated model: • maintain and review integrated surface water and groundwater model for the resource. Water advisory committee: • maintain committee to guide implementation. Water licences regulated: • Controller considers key factors when deciding • public consultation on decisions • compliance program reported annually. Public reporting: • water levels and flows • water licences • annual status of the resource reports for resources managed in plans.				3.5.2 Assist eligible Aboriginal people to access water (and through the AWR). 3.5.3 Refine and communicate water licencing processes – including the AWR. 3.5.4 Review water entitlements within the discharge protection zone against the Recovery of Unused licenced water entitlements policy.			